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Supporting Nutrition for Australian Childcare (SNAC): The development, implementation and evaluation of an online nutrition education intervention

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Abstract

The provision of a nutritious diet in a child's early years can have an immense effect on their future health and wellbeing. Due to the increasing number of children attending child care, this setting is strategically placed for teaching children important food literacy skills and establishing positive eating habits, which remain through to adulthood. However, food served in child care facilities is often not of the best nutritional quality (Zuercher, Grace, & Kranz, 2011) and there is lack of positive role modelling among staff. Both of these factors pose obstacles to a health-promoting environment for the children who attend.

The nutritional needs of young children are well known. This research sought to identify the child care specific nutrition education resources currently available, and to understand the broader needs of Australian child care staff that would enable them to provide a healthy eating environment. The findings of this research phase informed the design and development of a website to increase child care staff nutrition knowledge and confidence in providing a healthy eating environment, facilitating ongoing continuous improvement in their professional development. Discussion boards to promote a sense of community and provide 'information wrapped in support' were a key website feature.

Qualitative interviews were conducted with child care facility staff and key industry stakeholders. Although positive attitudes towards promoting healthy eating were demonstrated, data revealed that recommended nutrition resources were not well known or utilised by the childcare sector and staff reported a lack of confidence and workplace support. Guided by the Spiral Technology Action Research model (H. Skinner, Maley, & Norman, 2006), a health promotion project management tool, these findings informed

the development of the website, "Supporting Nutrition in Australian Childcare" (SNAC), containing a range of resources, recipes, discussion boards and links.

Use of the website, staff nutrition knowledge, attitudes, confidence and sense of community were evaluated using a qualitative, netnographic approach, through conversation threads, interviews and observations. Quantitative data collection methods including pre- and post-intervention surveys and web analytics were utilised to triangulate these findings.

Despite the "netnographic slog", that is, the persistence and continued attempts to recruit educators and encourage them to engage with the website, findings suggest that the SNAC website was well utilised and valued by more than 1200 SNAC members, attracting over 90,000 page views and 600 posts/comments. Educators valued the 'information wrapped in support' offered by the website, and a sense of community developed, particularly around shared emotional connection. Educators reported positive attitudes and high self-efficacy towards providing a healthy eating environment. However, evaluation results demonstrated disparity between reported knowledge and behaviours, such as high self-efficacy, and those observed, such as poor quality menu plans.

This research has shown the need for changes in public health policy to reprioritise a healthy eating environment in Australian childcare facilities; changes that foreground optimal nutrition in the early years as vital for future health and wellbeing. However, given that high-level policy change is often difficult and time consuming, the demonstrated disparity between reported and observed knowledge and behaviours highlights the need for shorter term strategies that address the support so badly needed, to ensure the long-term sustainability of these changes.

Declaration

I certify that this thesis does not, to the best of my knowledge and belief:

(i)   incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;

(ii)   contain any material previously published or written by another person except where due reference is made in the text; or

(iii)   contain any defamatory material.

Signed:

Date: 4th March, 2016

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CHAPTER ONE:

INTRODUCTION

Background

The role of child care and early childhood education and care services

Child care and early childhood education and care services play a significant role in the wellbeing of families and the communities in which they live, by providing important opportunities for child development and enabling workforce participation, thus contributing to the building of stronger families (Baxter & Hand, 2013). These services are provided through formal arrangements including long day care, family day care, pre-school, kindergarten and outside-school-hours care, and which focus on providing both child care and education (Baxter & Hand, 2013). The main focus of this study was long day care, centre-based services, therefore the term 'child care centre' will be used to encompass all formal child care and early childhood education services offered in Australia.

There have been observed changes in family structure, gender roles and the need for economic security, which have increased the need for child care in recent years (Briley & McAllaster, 2011), with parental employment cited as the prime reason for children attending a child care service (Baxter & Hand, 2013). In Australia, the number of children aged 0-4 years attending child care centres increased to over 630,000 in the June quarter of 2014 (Department of Social Services [DSS], 2015), compared to 171,000 in 1996 (Department of Education, Employment and Workplace Relations [DEEWR], 2012). Children aged two and three years have the highest attendance, whilst fewer children aged one year attend and babies aged less than one year have a

relatively low attendance (Table 1.1). Attendance at age four years decreases further as many children are typically enrolled in pre-school programs (Table 1.1). On average, a child will attend a centre for 27.6 hours per week (DSS, 2015) although some children may attend for as many as 45 hours per week (Australian Bureau of Statistics [ABS], 2012).

Table 1.1 Percentage of children attending child care (ABS, 2012)

Age group	<1 year	1 year	2 year	3 year	4 year
Children who usually attend child care	32.5%	62.6%	73.6%	70.1%	63%
Children who attend long day care	6.6%	30.1%	46.1%	32.1%	32.1%

The number of child care centres in Western Australia (WA) increased from 330 in 1997 (Pollard, Lewis, & Miller, 1999) to 570 in June, 2014 (DSS, 2015). Many provide food and beverages, although at some centres all food and beverages are provided by the parents or carers. Children attending child care centres where food and beverages were supplied had their food choices predetermined (Pollard et al., 1999), and furthermore, the food served in this setting can make a major contribution to the child's overall diet quality and subsequent health (Zuercher et al., 2011). This raised concerns about their nutritional welfare as research from Australia and overseas has found that food served in this setting may lack key nutrients vital for optimal child growth and development (Ball, Benjamin, & Ward, 2007; Birch, Savage, & Ventura, 2007; Briley, Jastrow, Vickers, & Roberts-Gray, 1999; Jennings, McEvoy, & Corish, 2011; Landers, Warden, Hunt, & Boulton, 1994; Pollard et al., 1999; Sambell, Devine, & Lo, 2014).

The child care environment is an important setting for the development of positive lifelong food habits in young children (Briley & McAllaster, 2011). There is enormous potential to teach food literacy skills (Parletta, 2014), that is, the knowledge, skills and behaviours needed to feed yourself (Vidgen & Gallegos, 2014), as well as promoting the consumption of healthy foods and teaching children about healthy eating. This could significantly influence their future health and wellbeing (Birch et al., 2007), whilst also adhering to legislation and regulations applicable to the provision of these services.

Legislation affecting child care

The Australian Childhood Education and Care Quality Authority (ACECQA) was established in 2010 to regulate and ensure high quality early childhood education and care in Australia, and is the overseeing authority as defined in the "National Quality Framework for Early Childhood Education and Care" effective from 1st January 2012 (ACECQA, 2012).

The new National Quality Framework (NQF) was agreed by the Council of Australian Governments (COAG) in 2009, to ensure that all Australian children, regardless of location, received the best possible start to life through quality early childhood education and care. This national legislative framework included National Quality Standards (NQS), an assessment and rating system, a regulatory authority in each state or territory and ACECQA (2012) as the overseeing authority.

Each state and territory is responsible for the legislation under which child care centres are licensed, administered by the relevant regulatory authority in each state. The Department for Local Government and Communities (DLGC) holds responsibility for monitoring and licensing child care centres in Western Australia, ensuring they comply

with the Education and Care Services National Law (WA) 2012 and the corresponding National Regulations (WA) (West Australian Government Gazette, 2012). Under the auspices of these regulations, the Education and Care Regulatory Unit (ECRU) assesses, rates and monitors child care providers in accordance with the NQS, whilst also providing assistance and advice to guide providers towards meeting their requirements under this framework (Government of Western Australia, 2012).

There were seven 'quality areas' identified within this framework, of which, Quality Area 2 – Children's Health and Safety, is pertinent to this study. The relevant elements of this quality area stated: "healthy eating and physical activity are embedded in the program for children" and "healthy eating is promoted and foods and drinks provided by the service are nutritious and appropriate to the age of the child" (Early Childhood Development Steering Committee, 2009, p. 14). There was also a requirement for current health and hygiene practices to be implemented and for food and beverages to be nutritious, varied and of adequate quantity. The criteria detailed in the National Quality Standards about food and nutrition were broad and lacked specific detail about how to deliver nutritious foods for children. This is confirmed by a review of the NQS conducted in 2014, in which child care services have reported continuously contacting regulatory authorities to clarify 'ambiguous' requirements (ACECQA, 2014c). Canadian research also suggested that child care staff may find "broad recommendations difficult to implement" (Geoffroy et al., 2013, p. 757). The NQS guided child care staff towards the Australian Dietary Guidelines (ADG) (National Health and Medical Research Council [NHMRC], 2013), which include the "Dietary Guidelines for Children and Adolescents in Australia" and the Department of Health and Ageing (DoHA) Get Up and Grow resources (2013) for additional clarification.

However, further training and guidance may have been required to enable child care staff to appropriately interpret these resources and adhere to the regulations.

Significance

The importance of early childhood development is well documented in the literature, as is the premise that early life experiences can affect health in later life. Whilst most Australian children are thriving, concerns have been raised about a number of developmental issues such as overweight and obesity, macro- and micronutrient deficiencies, dental caries and food safety, alongside an increased dependence on formal child care (Australian Institute of Health and Welfare [AIHW], 2011). There has been a significant increase in the numbers of children attending child care centres in recent years, and the food served in this setting can make a major contribution to children's overall diet quality (Zuercher et al., 2011). It is well documented that the nutritional quality of this food can be sub-optimal, thus increasing the risk of children's health being affected in the longer term. Furthermore, it appears that important food literacy skills are not being taught as staff were reported to be role modelling unhealthy eating behaviours (Erinosho, Hales, McWilliams, Emunah, & Ward, 2012; Gubbels, Gerards, & Kremers, 2015), and staff may not be actively teaching children about good nutritional habits (Kim, Shim, Wiley, Kim, & McBride, 2011), given their own limited mandatory nutrition training.

The 2009 Australian Institute of Health and Welfare report "A Picture of Australia's Children" stated that, in 2007, 19% of children aged two to four years were either overweight or obese, which increased the risk of developing asthma and Type 2 diabetes and could lead to general poor health and reduced psychological wellbeing (AIHW, 2009). Moreover, children with a high body mass index have a higher risk of being

overweight or obese in adulthood (Guo, Wu, Chumlea, & Roche, 2002) and are predisposed to an increased risk of atherosclerosis and hypertension, precursors to cardiovascular disease (Daniels, 2009). Moreover, Daniels' (2009) research also reported that these symptoms are presenting more commonly in childhood, indicating that the current generation of overweight and obese children may have shorter lifespans than previous generations. Of further concern, a recent Canadian study reported a significantly increased risk of child overweight or obesity associated with attendance at centre-based child care (Geoffroy et al., 2013).

With regard to children's intake of micro-nutrients, deficiencies can affect cognition and mental health, and Parletta (2014) noted that sub-optimal levels of micronutrients such as iron, zinc and omega-3 fatty acids are widespread, even in developed countries such as Australia. These essential nutrients play a critical role in brain function and development, and sub-optimal intakes can contribute to learning difficulties and behaviour problems.

Iron deficiencies are reported as the most widespread micronutrient deficiency worldwide and children aged one to four years are at particular risk if dietary intake is inadequate (Georgieff, 2011; Roberts & Heyman, 2000). Even if iron deficiency is treated, the risk of permanent neurobehavioral impairment remains, which can affect; brain maturation, attention span, intelligence scores and academic performance, whilst adolescents who suffered iron deficiency as a toddler may have lower intelligence quotients, increased anxiety and depressive symptoms (Georgieff, 2011; Roberts & Heyman, 2000). Although diagnosed iron deficiency incidence in Australia is low at 5% (Zhou, Gibson, Gibson, & Makrides, 2012), these potentially serious effects emphasised the need to ensure that young children's diets are iron sufficient.

Deficiencies of other nutrients such as vitamins A, D and E, and dietary fibre, whilst also relatively rare in Australia, can negatively impact on child health resulting in conditions such as poor vision, reduced bone mass, impaired growth, susceptibility to infections, autoimmune conditions, rickets and constipation (Gastroenterological Society Of Australia, 2010; Huh & Gordon, 2008; Munns et al., 2012; Wahlqvist & Wattanapenpaiboon, 2000). Excessive intakes of sodium are compounded by suboptimal intakes of potassium that can increase the risk of developing the early symptoms of cardiovascular disease (National Health and Medical Research Council (NHMRC) & New Zealand Ministry of Health (MoH), 2006). The overall quality of a child's diet is also associated with academic performance and intelligence quotas. A longitudinal population cohort study in the UK reported that children with a 'junk food' dietary pattern at age three had increased hyperactivity and lower academic performance at age eight (Northstone, Joinson, Emmett, Ness, & Paus, 2012). Furthermore, these children also displayed a small reduction in IQ scores at eight years, whereas as children with a healthy diet had a small increase in IQ scores at the same age.

A number of studies have identified that the food served at child care centres was nutrient deficient (Braveman, Sadegh-Nobari, & Egeter, 2008; Briley et al., 1999; Gelissen, Wall, Lilburne, & Truswell, 1992; Landers et al., 1994; Padget & Briley, 2005; Zuercher et al., 2011). Therefore, improvements in the child care environment are necessary to maximise the significant potential to influence the health and wellbeing of the children attending. Moreover, child care centres can play a significant role and exert influence on families who have limited time, awareness or the available means to provide or promote healthy eating at home (Parletta, 2014).

Under the auspices of the National Quality Standards, there were a number of stipulations in regard to food and nutrition. There must be adequate food hygiene practices; the food provided to children must be nutritious and varied; meet specific dietary needs, such as religious or health related; drinking water must be readily accessible; and the menu must be prominently displayed. Failure to follow these regulations could result in fines of between $1000 to $2000 (West Australian Government Gazette, 2012). Food preparation staff employed at child care centres must have, or be working towards, at the absolute minimum, one module of the Certificate III in Child Care Services qualification. This module includes basic information about nutrition and food hygiene and equated to approximately 30 hours tuition. Other staff must have, or be working towards a minimum of the Certificate III in Child Care Services, which also includes the nutrition and food hygiene module.

Despite these regulations, studies have identified that food provided at some child care centres was of poor nutritional quality (Braveman et al., 2008; Briley et al., 1999; Gelissen et al., 1992; Landers et al., 1994; Padget & Briley, 2005; Sambell et al., 2014; Zuercher et al., 2011). This suggested that the mandatory training did not provide the skills necessary to prepare nutritionally adequate food for children, and that the training was not recent or was not based on current research and information. Furthermore, given the punitive dimension for non-compliance, staff may have regarded the mandatory training as a matter of regulation compliance rather than a learning opportunity.

The DLGC publishes details of child care centres that have been subject to enforcement actions for non-compliance with regulations. There were few reported enforcement actions against centres for non-compliance with training requirements suggesting that the majority of staff were receiving or had received the required training in food

hygiene and nutrition. There were no reported enforcement actions regarding the nutrient content of the food provided, other than a Family Day Care service failing to display a weekly menu (DLGC, 2015), indicating this regulation was broad, lacking specificity and perhaps difficult to monitor or enforce.

The assessment criteria for this quality area refer to "food being provided that is consistent with the *'Get Up and Grow'* guidelines and/or the *'Australian Dietary Guidelines'*" (ACECQA, 2011, p. 65). Although the Get Up and Grow resources offer a plethora of materials and information, there was no accompanying training to guide their implementation in a child care centre (DoHA, 2013); therefore staff were not necessarily taught how to translate evidence-based information into practice. Research by Geoffroy et al (2013, p. 757) reported that "broad recommendations" such as those included in these guidelines may be "difficult to implement' and subsequently, it was anticipated that this research would demonstrate these resources to be underutilised. There are numerous other nutrition and healthy eating resources available for use in child care centres and research has indicated that accreditation or award schemes could be effective in improving food and nutrition practices, food hygiene and adherence to state and national guidelines (Matwiejczyk, Colmer, & McWhinnie, 2007; State Government of Victoria, 2012b). However, face-to-face training and site assessments, typically key components of such award criteria, were viewed as onerous and were reported by staff from non-participating centres as a barrier to enrolling in such programs (Matwiejczyk et al., 2007).

In light of these barriers, a website was planned to incorporate previously developed resources for download by child care staff, 'bite-sized' online activities around food, nutrition and healthy eating and forums to encourage discussion, learning and interaction. Studies have demonstrated that online learners can outperform traditional

learners (Mao & Brown, 2005) and online training may improve learning performance (Lim, Lee & Nam, 2007). In addition, online forums or discussion boards promote the exchange of information and advice (Liang & Scammon, 2011) whilst increasing feelings of social connectedness and companionship to others (Bonniface & Green, 2007) that could add a further layer of support for child care staff. It was also purported that online activities around food, nutrition and healthy eating would also enrich child care staff's knowledge and expertise in this important health area, adding value to the mandatory training. It was therefore, anticipated that the development of a food and nutrition specific website could increase staff contact with healthy eating resources in an easily accessible and more time efficient format.

When developing a community health promotion project, it is important that the program resources were effectively communicated to priority populations, being child care staff in the case of this study. For example, Colby, Johnson and Eickhoff (2011) surveyed an American community-based cohort of adults (n=437) and found that almost 29% of interviewees preferred to receive information about health resources from the internet, with younger adults having a much stronger preference for this mode of delivery. Moreover, women were increasingly using the internet as a tool for improved access to both education and healthcare (Donelle & Hoffman-Goetz, 2008), which is especially pertinent as 95% of child care staff are female (ABS, 2010). Therefore, the use of the internet to deliver the intervention resources was considered appropriate as approximately 80% of West Australian households had access to the internet and a computer at home, with 77% of West Australians reporting that they access the internet on a daily basis (ABS, 2011b).

In summary, optimal nutrition in childhood is essential to ensure appropriate growth and development, laying the foundations for lifelong health. Whilst Australian children are

relatively healthy, there were concerns about current levels of overweight and obesity and whilst rare, macro- and micronutrient imbalances could be cause for concern. Under national and state legislation, child care centres are required to meet certain criteria around the provision of nutritious food to children, but these guidelines are apparently open to interpretation. Furthermore, child care staff may have experienced difficulties understanding and implementing the guidelines and the recommended supporting nutrition resources due to this ambiguity and a lack of appropriate training.

The proposed solution was the provision of a website with downloadable resources, incorporating manageable online activities around food, nutrition and healthy eating that would facilitate an increase in staff knowledge, attitudes and behaviour, enabling staff to provide and promote a healthy eating environment for the children in their care. Online forums added a further layer of support, where staff and researchers could encourage these behaviours through the exchange of information and ideas, and increase feelings of social connectedness to others. Furthermore, the internet was an appropriate means of delivering the intervention to the majority of the priority population, as this is a widely used mode of accessing information and resources in today's society.

Purpose

Aim

The first aim of this study was to establish, through formative evaluation, the needs of child care staff in relation to providing a healthy eating environment for the children in their care. Based on this formative evaluation, the second aim was to develop a website, incorporating online activities and a discussion board to assist child care staff to promote this environment. Thirdly, this study aimed to increase nutrition knowledge,

and the confidence of child care staff to provide a healthy eating environment, whilst promoting a sense of community and providing information wrapped in support.

Research Questions

1. What gaps are identified in existing Australian and overseas child care nutrition education programs?

2. What are the formative needs of child care staff in relation to providing and promoting a healthy eating environment in the child care setting?

3. How does a web-based nutrition education intervention influence the nutrition knowledge, attitudes and confidence of child care staff to promote a healthy eating environment? How does this intervention add value to existing mandatory training?

4. Do child care staff believe the intervention promotes a sense of community within the child care setting, and is this valued as an additional means of support?

Expectations

A multi-faceted nutrition specific website would provide tools, resources, activities and conversation forums that added value to current required minimum training, build a sense of community and offer information wrapped in support. This would enable child care staff to increase their nutrition knowledge, confidence and ability to provide a healthy eating environment to children.

Definitions/Important Terms

Child Care

Early childhood education and care is a term that incorporates both child care and early childhood education (Baxter & Hand, 2013) and includes a number of *services*, including long day care, family day care, outside-school-hours care and pre-school. A definition of each type of service is offered below, but for the purpose of this study, and ease of reference, the collective term '*child care or child care centre*' will be used, unless it was necessary to specify which particular type of service was being discussed. These collective terms are also used as they are more commonly used than the industry preferred term 'early childhood education and care'.

Long Day Child Care Centres

"Long day care (LDC) is a centre-based form of child care service. LDC centres provide quality all-day or part-time care for children of working families and the general community. For-profit and not-for-profit organisations, local councils, community organisations and employers may run these services" (DEEWR, 2010, p. 11).

Family day care

"Family day care services (FDC) services support and administer networks of FDC carers who provide flexible care and developmental activities in their own homes for other people's children" (DEEWR, 2010, p. 10).

Outside school hours care

"Outside school hours care (OSHC) services provide care before and after school and care during school vacation time" (DEEWR, 2010, p. 12).

Pre-school

Many children attend pre-school in the year before they commence full-time school. Whilst LDC, FDC and OSHC focus on the provision of both child care and early education, in pre-school the objective shifts to focus exclusively on early years' education, to help prepare children for school, although many parents do use pre-school as an alternative, or to supplement child care (Baxter & Hand, 2013).

Child care staff

The language used within the National Quality Framework refers to child care staff as 'educators' and other organisations such as Child Australia, use the description 'Early Years Educators', which seemingly excluded other important roles such as directors and food coordinators. For ease of reference, and in keeping with the terminology discussed above, the term '*child care staff*' is used unless a specific role is being discussed. A description of the roles typically held at child care follows:

Director/Manager/Coordinator/Licensee/Approved provider*:* holds overall responsibility for the day to day running of the centre and is legally responsible for ensuring compliance with regulations. This individual may also be the owner. The 'second in charge' (2IC) is suitably qualified to step into this role when required.

The director may take complete responsibility for menu planning and shopping, or may share these duties with the food coordinator. However, they are ultimately responsible of the quality of the food provided, and for the provision of a healthy eating environment.

Food preparation staff*:* primarily responsible the preparation of food, and are known as food coordinators or cooks. They may also be responsible for menu planning, food shopping and budgeting, or these duties may be shared with others, such as the director.

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At a minimum, food preparation staff should have, or be working towards the nutrition and food hygiene module of the Certificate III in Children's Services.

Early Years Teacher: depending on the number of children attending a service and the number of hours the centre is open, an early years teacher must be employed for some or all opening hours and must hold a relevant and approved degree or higher diploma qualification, such as a Bachelor of Early Years Education.

Educators – 'early childhood practitioners who work directly with children in early childhood settings' (DEEWR, 2009, p. 5), but would not be classified as an early years teacher unless they held the required qualifications detailed above.

Both early years' teachers and educators may be responsible for providing a healthy eating environment, and a relaxed educative atmosphere for eating at mealtimes. They may also form partnerships with families and report on children's eating at the centre.

Healthy eating environment

Healthy eating environment refers to the *foods and beverages* supplied at child care centres and the environment that they are consumed in, which encompasses effective *role modelling* of healthy eating behaviours by staff, and the provision of *nutrition education* to children. This environment should also engage children in experiences, conversations and routines that promote relaxed and enjoyable mealtimes and promote healthy lifestyles and good nutrition (ACECQA, 2013).

Foods and beverages

Healthy foods and beverages are defined according to the Australian Dietary Guidelines (NHMRC, 2013).

"Enjoy a wide range of nutritious foods from these five groups every day:

- Plenty of vegetables of different types and colours, and legumes/beans.

- Fruit.

- Grain (cereal) foods, mostly wholegrain and/or high cereal fibre varieties, such as breads, cereals, rice, pasta, noodles, polenta, couscous, oats, quinoa and barley.

- Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans.

- Milk, yoghurt, cheese and/or their alternatives, mostly reduced fat (reduced fat milks are not suitable for children under the age of 2 years).

- Drink plenty of water.

Limit intake of foods containing saturated fat, added salt, added sugars and alcohol. For example, sweet biscuits, cakes, processed meats and sausages, crisps and other fatty and/or salty snacks, cream and butter.

Foods containing high levels of saturated and total fat, sodium and added sugars are known as *discretionary* foods. The guide recommends that the food served at child care, or included in lunchboxes, should only include items from the five core food groups, and discretionary items should not be offered" (NHMRC, 2013, p. p. 20).

Role modelling

Positive role modelling is defined in the Get Up and Grow manual and incorporates behaviours such as sitting with children at meals and encouraging healthy behaviours, eating the same foods as the children, not discussing personal likes and dislikes, encouraging children to try new foods, not using food as a reward or a punishment and maintaining a relaxed and positive environment at mealtimes (DoHA, 2013).

Poor role modelling includes behaviours such as eating unhealthy foods in front of children (Gubbels et al., 2015).

Nutrition education

Child care staff can teach children about the role of healthy food in our daily diets, which will assist children learn how to make healthy choices and develop food habits and preferences that last into adulthood (Birch et al., 2007). Opportunities such as mealtimes, or planned learning experiences can be utilised to deliver these important messages.

Thesis Overview

Chapter One: Introduction

This chapter has provided background information about the role of child care in long term childhood development, and outlined the legislation that governs the provision of food in this setting. The significance of this study is also presented, which explained the impact macro- and micronutrient inadequacies could have on a child's long term health, the role of child care centres in the provision of a healthy eating environment and a rationale for the proposed study design. The research aim and questions are followed by the definition of key concepts. The final section of this chapter follows, and provides a précis of each of the chapters presented in this thesis.

Chapter Two: Literature Review and Theoretical Framework

Chapter Two presents a literature review and supporting theoretical framework. The literature review will examine issues that influence the establishment of healthy eating environments in child care settings, and identify gaps in current Australian child care specific nutrition programs. Issues affecting the provision of healthy eating, and opportunities to promote healthy eating in a child care environment are considered, in light of recently introduced government legislation. The effectiveness of web-based programs, and the advantages of developing online communities of practice are outlined, as are the potential benefits of developing a sense of community as an additional method of providing support and facilitating change with the child care setting. The theoretical framework discusses the qualitative approach utilised for this study, and introduces the Spiral Technology Action Research model as a project management tool.

Chapter Three: Methodology and Methods

Chapter Three presents both the research design adopted and the research methods implemented for both stages of this study. The research design section reflects the qualitative epistemological approach presented in the previous chapter. The research methods section describes recruitment procedures, and the data collection and analysis techniques utilised across the study. Also detailed are the ethical considerations about research techniques used to ensure study trustworthiness.

Chapter Four: Stage 1 Formative Evaluation

Chapter Four presents the findings from the first stage of this study, in a combined results and discussion section, and is summarised with recommendations for the development of the website intervention. Using a qualitative, formative research design, a needs profile of the child care industry is established, in relation to the provision and promotion of a healthy eating environment and a number of key findings are identified.

Chapter Five: Website Development and Launch

Chapter Five outlines the second stage of this study; the building and testing of the web-based intervention, together with the recruitment and engagement strategies employed to attract participants. An overview of the construction of the Supporting Nutrition for Australia (SNAC) website, including design, technical aspects and the content therein is presented. Reflections on the communication issues encountered, together with an insight into the difficulties experienced during management console development and web analytics data downloads are also offered. Finally, the launch of the website, including recruitment and engagement strategies are described.

Chapter Six: Constructing the SNAC Community

This is the first of the findings chapters that examines how the SNAC community emerged, and how the participants engaged with the intervention, as an important precursor to establishing if a sense of community was established. The demographic profiles of SNAC participants are provided, together with an evaluation of the entrée techniques used to recruit members and engage them in early participation. How SNAC members 'used' the website along with the barriers and motivators that influenced their activity, is also discussed.

Chapter Seven: Sense of Community

Chapter Seven assesses whether or not a sense of community emerged from SNAC. The first part of this chapter presents the sense of community scores, measured by the quantitative pre-and post-intervention survey, which provides an average, or *shared* community score. As it is also suggested that sense of community can be constructed and calculated as an individual construct, the antecedents of community are also presented qualitatively from individual SNAC members' perspectives. These are then linked to the four constructs of shared community – membership, influence, fulfilment of needs and shared emotional connection.

Chapter Eight: Knowledge and Attitudes

Chapter Eight provides an assessment of SNAC members' nutrition knowledge and attitudes towards providing a healthy eating environment, following their interaction with the SNAC website. Knowledge of nutrition concepts was measured qualitatively by analysing various topics that have emerged, such as menu planning, role modelling and fussy eating. The attitudes of child care staff towards providing a healthy eating environment were also interrogated. Although actual behaviour change was not

measured in this study, reflections on observed behaviours are provided as indicators of acquired knowledge and changes in attitude.

Chapter Nine: Efficacy

Chapter Nine is the final findings chapter to scrutinise the three efficacy concepts – self, outcome and collective, which form the basis of Social Cognitive Theory, an integral part of the theoretical framework developed to support this study. These concepts are explored through the analysis and discussion of qualitative data from the community forums, exit interviews and observations, and are triangulated with data from the pre- and post-intervention survey.

Chapter 10: Concluding Comments and Reflections

The final chapter provides concluding comments and reflections on the findings described in previous chapters, which readdress the research questions. The disparity between attitudes towards healthy eating, high levels of self-efficacy and the levels of nutrition knowledge and nutrition behaviours displayed are discussed, in terms of the many levels of influence on child care staff. The issues of critical mass and sense of community are considered as a measure of SNAC's success. The strengths and limitations of this study are also presented, together with recommendations for future interventions, which suggest the reprioritisation of child nutrition as a significant factor in optimal short and long-term child health.

CHAPTER TWO:

LITERATURE REVIEW AND THEORETICAL

FRAMEWORK

Purpose of the Literature Review

This review was designed to examine the issues that influence the establishment of healthy eating environments within child care settings and to identify the gaps in current Australian child care nutrition programs. The issues affecting the provision of healthy eating, and the opportunities to promote healthy eating in child care environments are considered, in light of the recently introduced government legislation. This review will also examine the effectiveness of website based programs and online communities of practice, and how a developing sense of community could act as an additional means of providing support and facilitating change within the child care setting.

There are multiple levels of influence that affected the provision of a healthy eating environment in the child care setting, and these are presented in the second section of this chapter under a theoretical framework. Given these numerous significant influences, it was important to consider a multi-faceted approach to this project, which is presented in the form of a web-based, nutrition education intervention, specific to the child care setting.

Main Findings

The child care setting is well documented as an environment where children can learn about and enjoy healthy foods. For example, Story et al. (2006) noted this setting represents an untapped source of strategies that can assist children acquire positive and healthy food habits and preferences. This concept is supported by Birch et al. (2007)

who suggested that patterns developed in childhood persist through to adolescence and adulthood, maintaining there is a tremendous opportunity to improve the role of child care centres as an environment where children can learn to accept and eat healthy foods. In their commentary about nutrition and the child care setting, Briley and McCallaster (2011, p. 1298) observed that the quantity and quality of foods served in this environment should be considered an important public health matter as "lifelong food habits are established in these early formative years".

The following section of this review presents literature that examined the main components of a healthy eating environment. Firstly, the typical nutritional value of meals served at child care centres are reviewed, followed by staff as effective role models, and staff issues such as training and nutrition knowledge. Finally, the role of food and nutrition policies in promoting healthy eating messages is examined.

Provision of healthy food

It is recommended that children are provided with between 50-75% of their daily dietary needs whilst at child care, depending on the number of hours they are attending (Gubbels et al., 2009; Soanes, Miller, & Begley, 2001). It is, therefore, concerning that there are a number of international studies reporting a lack of nutritional quality in the foods offered at child care. For example, Ball et al. (2007) studied 20 long day care centres, and compared observations of children's food consumption to current dietary recommendations. This study revealed that serves of whole grains, fruit and vegetables were sub-optimal and saturated fat levels were high. In their literature review of the influencing factors that affect eating behaviours during childhood, Birch et al. (2007) reported children aged two years typically eat energy dense, nutrient poor food at child care, and 33% (n=997) did not consume any vegetables. These findings are supported

by Jennings et al. (2011), whose study of 54 Irish centres reported about 80% were serving inappropriate snacks and beverages to children, and a US study that reported 224 (87%) of the participating centres (n=258) served sweet or salty foods as a snack at least three times a week (Copeland, Benjamin Neelon, Howald, & Wosje, 2013). A comparison of the food provided at 851 English nurseries (similar to Australian kindergartens) reported that cordial was offered frequently and more than 30% of centres did not offer vegetables daily (Benjamin Neelon, Burgoine, & Hesketh, 2015).

Following a review of menus in 28 Canadian child care centres, a number of nutrient and menu quality deficiencies were identified, together with an overall lack of food variety (Romaine, Mann, Kienapple, & Conrad, 2007). For example, two-thirds (n=19) of the centres did not offer sufficient kilojoules and menus were found to be lacking in folate, iron and calcium. Moreover, processed meats were used frequently, with one centre providing these in eight out of 20 meals.

This is confirmed by American research that indicated even following the revision of menus intended to increase serves of vegetables and whole grains and decrease fats and sugars, some nutrient levels remained sub-optimal (Zuercher et al., 2011). For example, sub-optimal levels of vitamins D and E and potassium were evident, whilst sodium content remained excessive. However, this research was based on the revision of a single centre's menus, so although it is a useful indication of the complex nature of menu planning, the results are not generalisable to the wider child care population.

There is a paucity of Australian studies that have examined the nutritional quality of the food offered at child care, but the available data does present similar findings to the abovementioned international studies. In their study of the food consumed by 98 children attending child care centres, Gelissen et al. (1992) reported that energy, calcium, zinc and iron intakes did not meet dietary recommendations. A later study also

reported the dietary intake of 33 children attending Western Australian child care centres. The food provided did not meet 50% of the children's recommended energy needs, and despite the small sample size, the intake of iron, calcium and zinc were significantly lower than recommended (Soanes et al., 2001).

More recently, two Australian studies have also highlighted the nutritional shortcomings of the food offered in child care centres. Presenting findings similar to Soanes et al. (2001), baseline data gathered prior to the implementation of a nutrition award scheme revealed children's total energy intake and calcium intake was below the 50% recommended level (Bell, Hendrie, Hartley & Golley, 2015). Furthermore, consumption of saturated fat and sodium were in excess of recommendations. The impact and evaluation of this nutrition award scheme is discussed later in this literature review.

A pilot study conducted in Western Australian child care centres assessed the provision of foods from the five core food groups, and compared this to the Australian Dietary Guidelines (National Health and Medical Research Council [NHMRC], 2013), revealing some concerning data. Of the eight centres assessed, none met the 50% recommendation for all five core food groups, and the food group least likely to meet recommendations was meat and meat alternatives, followed by dairy, vegetables and grains/cereals, whereas as fruit and fats were overprovided (Sambell et al., 2014). This corresponded with findings from the evaluation of the Start Right-Eat Right (SRER) nutrition award scheme, which also reported that at baseline, half the centres surveyed (n=96) were not meeting the core food group servings targets for meat and meat alternatives, dairy foods and vegetables at baseline (Bell et al., 2015). Moreover, under provision of foods in the meat and meat alternatives core food group was reported by Soanes et al. in 2001, indicating that the nutritional standard of food offered in the

Australian child care environment has not improved in the last 15 years (Sambell et al., 2014).

Furthermore, even when healthy foods and beverages are offered, there are a number of reasons why some children may still not achieve the recommended requirements. Some may simply have a limited physiological capacity to consume the volume of food required to meet these requirements (Soanes et al., 2001). Other children may be too busy or distracted to eat sufficient food, prefer to eat familiar foods whilst in an unfamiliar setting, or be influenced by other children or poor staff role modelling (Erinosho, Dixon, Young, Brotman, & Hayman, 2011).

Staff role modelling behaviours

Early childhood is a time of significant physical, cognitive and emotional growth and a time when children learn to enjoy new foods, develop feeding skills and establish food habits, behaviours and preferences (Brown, 2011). A child's food preferences develop from a natural inclination towards sweet and salty foods (Rosenstein & Oster, 1988), therefore the bias towards energy dense foods is embedded (Benton, 2004). Furthermore, some children also tend to reject many vegetables because of their bitter and unpleasant taste (Rohlfs Dominguez, 2014). Although these predispositions can be learnt, they are also subject to environmental influence. For example, a preference for energy dense foods is most easily established in the presence of an important adult, such as a parent or carer, so the child who observes this adult consuming and enjoying these foods, may have their own preferences profoundly influenced (Benton, 2004).

Over the last three decades, child care has largely replaced the 'family table' as the environment that children learn about food and nutrition and develop their lifelong habits and preferences. For instance, in a European study, observations of 135 children

in nine centres found that when a 'family' serving style was adopted, in which the child served themselves food, food intake increased and waste was reduced, particularly when the children ate with staff (Gubbels et al., 2009). However, international studies have reported only 45 (n=425) and 37% (n=95) of services respectively (Benjamin Neelon et al., 2015; Copeland et al., 2013) adopted the practice of staff eating with children. Lynch and Batal (2012) concurred, reporting that whilst staff perceived eating with children as a positive strategy, many found this practice unrealistic in terms of the other duties that needed to be performed at mealtimes. Research has also indicated that the practice of 'family serving', where children served themselves, was not widespread, with Copeland et al. (2013) reporting more than half of the centres surveyed (n=129) portioned out food on behalf of the children, concurring with a similar study, where only one third of centres (n=9) allowed children to serve themselves (Maalouf, Evers, Griffin, & Lyn, 2013). Staff explained a reluctance to engage with this practice due to concerns about food hygiene and the spreading of viruses and germs, and the need to control the service of food given the numerous children with allergies in their care (Lynch & Batal, 2012).

Child care staff can significantly influence children's eating environment and their behaviours, as patterns established in childhood continue into adolescence and adulthood (Birch et al., 2007). This renders child care a significant setting for the development of lifelong healthy food and nutrition habits and preferences. Children have an innate sense of satiety so should be allowed to decide how much to eat, but staff and parents retain the important role of deciding what children eat, thus discouraging overeating and the subsequent formation of poor food habits (Briley & McAllaster, 2011). However, studies have revealed child care staff often served children the food

they requested without question and few attempted to determine if the child was still hungry before offering more food (Copeland et al., 2013; Maalouf et al., 2013).

However, staff are keen to support a healthy eating environment and considered this as part of their role, but many had not received formal training and at times believed they were battling against the community, parents and a fast food culture (Moore et al., 2005; Sellers, Russo, & Baker, 2005). However, whilst some staff considered good role modelling important and stated they actively engaged in this behaviour, there is a demonstrated disparity between thought and action. For example, an American study found that of the 111 staff (90%) who reported modelling healthy behaviours, only 88 were actually observed doing so, and 28 were observed consuming unhealthy foods, such as fast foods and salty snacks, in the presence of children (Erinosho et al., 2012). Similarly, another study of 24 child care centres observed staff at four (16%) of these centres consuming less healthy food in the presence of children (Maalouf et al., 2013).

Staff training in food and nutrition

Revisiting current legislation, it is specified that depending on the number of children enrolled, there must be an Early Childhood teacher present some or all of the time the centre is open, and this teacher must hold the relevant and approved teaching qualification, usually at degree or higher diploma level (ACECQA, 2012). At least 50% of other staff must hold, or be actively working towards a diploma level education and care qualification and all remaining staff must hold, or be actively working towards a Certificate III level education and care qualification. Additionally, under ACECQA guidelines (2012), a "nominated supervisor" is responsible for ensuring that food served at a child care centre is nutritious, varied, meets any special dietary requirements and that menus are displayed. This person must hold a "supervisor certificate" to hold this

role, and the qualifying criteria specified that they must have either 'relevant' work experience or a diploma level or early childhood teacher qualification.

However, the level that nutrition topics are adequately addressed as part of these qualifications appeared to be somewhat unclear and varied between levels of qualification. For example, many Australian universities offer early childhood teaching degrees, yet these courses typically do not include any nutrition related content, according to a review of the degree outlines offered at Edith Cowan University, Notre Dame University, Griffith University and Australian Catholic University. The Certificate III in Children's Services offered at West Coast TAFE, does include a nutrition and food hygiene module entitled "promote and provide healthy food and drinks" (West Coast Institute of Training, 2015). The Department of Education and Training (2015) describe the three core components of this 30 hour unit as "1) promote healthy eating, 2) plan food and drinks that are nutritious and appropriate for each child, and 3) maintain food safety while carrying out food-handling activities". However, there is no requirement for child care staff to repeat this training, or engage with any refresher training, which is concerning given that the provision of healthy food is a practice that is constantly revised. For example, in 2013, the revised Australian Dietary Guidelines were released, which amongst other important changes, introduced guidelines for children aged two to four years for the first time. However, there was no legislated requirement for child care staff to revisit this NQS quality area, and indeed, some registered training organisations who deliver the Certificate III in Children's Services still referred to the out dated version of the guidelines.

If staff do not already hold the required qualification, regulations state that they must be "working towards" it, meaning they must be enrolled in an appropriate course, be making adequate progress and meeting requirements to maintain enrolment (West

Australian Government Gazette, 2012). However, food coordinators are only required to complete (or be working towards completion of) the nutrition and food hygiene module, unless they are included in the staff to children ratio. Therefore, as the child care industry typically has a high staff turnover and relatively low rates of pay (Jovanovic, 2013), there may, at times, be a number of staff without relevant training, who do not hold the required qualifications.

To illustrate point this further, research conducted by Pollard et al. (1999) noted that the food preparation staff at 280 West Australian child care centres had limited nutrition training and when surveyed, 196 (70%) of these staff reported they required additional nutrition training. As a result of that study and further research by Lewis and Pollard (2002), changes were made to Western Australian legislation that obligated food preparation staff to attend nutrition and food hygiene training within 6 months of their appointment or face penalties of up to $4000 (Government of Western Australia, 2007).

Researchers from South Australia reported their community-based participants (n=201) had some basic knowledge of key dietary guidelines, such as eating more fruit and vegetables and reducing fatty food intake, but this knowledge was not well translated into practical applications (Hendrie, Coveney, & Cox, 2008). Given the specialised role of child care food preparation staff and the low levels of nutrition knowledge evident amongst the wider population (as reported above), it was not entirely unexpected to hear anecdotal evidence that indicated child care food preparation staff in Western Australia remained concerned about their skills, knowledge and ability to provide food of adequate nutritional quality to children.

This is supported by a US study, which reported less than 50% of child care staff surveyed (n=18) had received any relevant nutrition training. As a result of this lack of training, discrepancies were found between menu planning and practice, which resulted

in nutrient and menu quality deficiencies, and increased staff requests for improved resources and ongoing childhood nutrition training (Romaine et al., 2007). Similarly, another study reported only 164 (64%) of centres had only one staff member who had undergone specialised early childhood nutrition training, and only 31% (n=51) reported these staff repeated the training annually (Copeland et al., 2013).

When staff received training, either through attendance at a workshop or through the centre engaging with a nutrition award scheme, nutrition standards were seen to improve. For instance, Pollard, Lewis and Miller (2001) reported that most food coordinators at centres participating in the Start Right-Eat Right (SRER) program (n=47, 92%) found the training useful and relevant, making menu revisions as a result of their attendance. This is substantiated by further evaluation of the SRER program in South Australia, with Matwiejczyk et al., (2007) reporting that at the 50 centres completing the program, the nutritional quality of menus and the quality of food policies improved and the number of staff completing food hygiene training increased from 18 pre-intervention to 307 post-intervention. Moreover, increased numbers of staff (n=87) attended nutrition workshops, reported to have increased their nutrition knowledge and ability to develop appropriate menu plans. More recent evaluation of this program in South Australia involved 184 child care staff completing a telephone survey about mealtime practices. This study also revealed higher frequencies of staff role modelling (80% post-intervention vs. 56% pre-intervention, where children were actively encouraged to taste new foods (Golley, Bell, Matwiejczyk, & Hartley, 2012). Others have recommended nutrition training be provided for all child care staff, citing this as a significant predictor of whether they are capable of educating children about nutrition concepts (Gubbels et al., 2015). Thus, nutrition training specific to the child care setting was seen to have a positive effect on the quality of menus and nutrition

policies, an increase in food hygiene training, an increase in staff role modelling positive eating behaviours to the children and increased ability to teach nutrition concepts.

However, the method that the required training is delivered by may have impacted on uptake. For example, online food hygiene training is available free of charge via local Councils and Shires (Alert Visual Concepts, 2012), and online anaphylaxis training is available via the Anaphylaxis Society (Australasian Society of Clinical Immunology and Allergy [ASCIA], 2012). These programs were designed and developed to provide staff with reliable, consistent, accessible and sustainable training at no cost. Moreover, this type of 'e-learning' resulted in reduced staff travel time and cost, and meant more staff could be trained more frequently, and in shorter sessions that did not impact significantly on centre operations (Bartley & Golek, 2004). Child care staff reported gaining skills from both face-to-face and online training (Powell, Diamond, & Koehler, 2010) and many preferred a combination of both to maximise their learning opportunities (Weigel, Weiser, Bales, & Moyses, 2012).

There were many other nutrition resources available (discussed later in this review) designed to assist child care staff promote and provide a healthy eating environment, with accreditation and award schemes, in particular, reporting positive outcomes (Golley et al., 2012; Matwiejczyk et al., 2007; Pollard et al., 2001). However, where resources are provided but limited guidance given on their implementation, it was not known if staff had the ability, available time or literacy levels to best utilise these. The formative evaluation conducted in Stage 1 of this study facilitated further understanding of this issue and underpinned the anecdotal evidence presented earlier about food and nutrition training.

In summary, evidence suggested there are child care staff with little or no nutrition training, supervising children at mealtimes (Pollard et al., 2001; Romaine et al., 2007), who are unable to display appropriate role modelling behaviours, therefore missing the opportunity to use mealtimes as an important time to educate children about nutrition and healthy eating. This may have inadvertently had a detrimental effect on the development of children's food habits and preferences in this crucial early stage of life. Aside from the mandatory training child care staff are obliged to complete, it is also important to consider what other resources are available to support the provision of a healthy eating environment. The following section therefore evaluates the availability and effectiveness of these various resources.

Nutrition education resources promoting healthy eating in child care

In the past, Australia and other countries have implemented nutrition education interventions and programs that specifically targeted child care, and there are also many other nutrition education resources available for child care. These are now reviewed to determine their usefulness in the development of a food and nutrition website for child care centres in Australia. The following section summarises existing and previous nutrition education interventions, programs and resources and discusses the evaluation where available.

Nutrition award schemes

The Start Right-Eat Right (SRER) program, discussed previously in this chapter, was originally developed and implemented in Western Australia in 1997 (Pollard et al., 2001) and operated in South Australia until 2013, contributing to the South Australian government's nutrition and healthy weight strategies. The program recognised and rewarded child care centres who were providing a nutritionally adequate menu that met

at least 50% of children's daily nutritional requirements, where food hygiene practices were in place and where a healthy eating environment was supported (Matwiejczyk et al., 2007). The nutrition 'award' was achieved when necessary training was completed, a written assignment about menu planning submitted and a satisfactory site appraisal had been conducted by a program dietitian.

Evaluation of the South Australian SRER program highlighted that the nutritional value of menus improved, as did food hygiene and safety practices, improvement of food policies and an increase in staff capacity to strengthen nutrition practices (Matwiejczyk et al., 2007). Researchers have also established that SRER centres had significantly more nutritious menus than non-SRER centres, and the children who attended SRER centres had healthier diets at home than those who attended non-SRER services (Tysoe & Wilson, 2010). More recent evaluation has found that participating centres are more likely to adhere to state and national guidelines and their staff had increased confidence to discuss nutritional matters with parents (Golley et al., 2012). Following the withdrawal of government funding and the closure of the SRER program, a final evaluation of the program in 20 centres found it effective in improving children's dietary intake, in particular grains, fruit, dairy and meat (Bell et al., 2015).

Similarly, the Victorian 'Kids – Go For Your Life' program aimed to improve children's healthy eating and physical activity behaviours in the child care environment, through the promotion of nutritional recommendations such as increasing water consumption, fruit and vegetable intake and reducing foods high in fat, sugar and salt (Silva-Sanigorski et al., 2010; State Government of Victoria, 2012a). Accreditation was achieved when policies and practices were improved according to program criteria, with program evaluation reporting significant improvements around policy and staff confidence (State Government of Victoria, 2012b).

The 'Move Well Eat Well' award scheme was adapted from the 'Kids-Go For Your Life' program and operates within child care centres and primary schools in Tasmania. Again, healthy eating and physical activity are promoted and capacity building is facilitated through the provision of resources and professional support to create healthier environments, in line with the principles of the International Union for Health Promotion and Education (Dyment et al., 2014). Child care centres who received the award were seen as "health-promoting settings that have successfully changed their policies and practices to meet internationally recognised standards" (Dyment et al., 2014, p. 268), and feedback from participants has revealed that achieving award status is meaningful and provides a sense of accomplishment. Moreover, the program has also impacted on the wider community by influencing families, local food suppliers, fundraising activities and sport and recreation providers.

'Munch and Move' is a healthy eating and physical activity program, focusing on children aged three to five years in NSW. This program was based in pre-schools, and aimed to reduce the number of discretionary food items provided in children's lunchboxes, as well as reducing screen time and increasing physical activity. Evaluation of the program revealed there was no significant improvement in the quality of the food items appearing in children's lunchboxes, but this was attributed to the short intervention period of six months (Hardy, King, Kelly, Farrell, & Howlett, 2010). Whilst there is no further evaluation available, the program is still operational indicating its value to pre-schools in NSW.

The 'Good for Kids, Good for Life' program that also operated in NSW, extended the 'Munch and Move' program to child care services through to high schools serving food, and provided a range of resources to support the provision of a healthy eating environment, increased physical activity and reduced screen time (NSW Government,

2015). Evaluation of this program demonstrated a significant increase in the number of food and nutrition policies on home-packed food being developed and implemented, the serving of water or plain milk and compliance of menus with healthy eating guidelines (Bell et al., 2014).

Subscription services

Asides from specific and targeted programs, there are a number of other free or fee-based services available. For example, Nutrition Australia is a non-government, not-for-profit, community based, independent, member organisation that aims to promote the health and well-being of all Australians. The Queensland division operates a subscription based advisory service to child care centres that provides accurate and current nutritional information for an annual fee of $100 (Nutrition Australia [Queensland Division], 2015). Subscription includes access to a dietitian or nutritionist, newsletters and discounts on resources, services and products. Centres subscribing to this service also have access to other fee-based services such as nutrition workshops, menu assessments and food hygiene and handling courses, and can also request assistance in working towards achieving the requirements of National Quality Framework. Evaluation of the Nutrition Australia (Queensland) service indicated that participating centres found the advice received to be friendly and professional, and overall, the service is useful as guidance to the NQS (Nutrition Australia [Queensland Division], 2015). The Victorian division of Nutrition Australia, in partnership with the Victorian government, have developed the Healthy Eating Advisory Service. Their remit covers child care centres (amongst other population groups) and replaced the now defunct Kids-Go For Your Life program. This project provides free advice, training and support to assist child care centres with menu planning, food and nutrition policy development and support in providing a healthy eating environment.

Recommended resources

The NQS refers child care centres to two sets of free resources; the Australian Dietary Guidelines and the Get Up and Grow manuals for guidance on healthy practices and the provision of nutritious and safe food. The Australian Dietary Guidelines are based on widely accepted scientific principles and designed to assist Australians develop the skills and knowledge necessary to make healthy food choices (NHMRC, 2013). These guidelines were reviewed in 2013 and now include recommendations for children aged 0-4 years, providing additional guidance for child care centres. However, international research has indicated that government produced nutritional resources are often perceived as unsuitable by child care staff (Lynch & Batal, 2011), thus the Australian Dietary Guidelines and the Get Up and Grow manual could be underutilised in the Australian child care environment.

The Get Up and Grow manual provided a set of evidence-based resources available online, in print, in different languages, and catering for families, child care staff and other carers, food coordinators and directors. They were designed to provide practical information that promoted and supported healthy eating and physical activity. Whilst these resources are reported as being well received and relevant to the child care setting (DoHA, 2013), no face-to-face or online training is provided to assist staff to translate this evidence-based information into practice. Other limitations such as time, staff turnover and varying literacy levels may have also hindered the use of these resources.

Overseas resources

Overseas interventions included the "Nutrition and Physical Activity Self-Assessment for Childcare" (NAPSACC) program in the US, which was based on a self-assessment of areas for improvement, and supported by tailored training. Evaluation indicated

positive nutrition measures were implemented and an overall satisfaction with the program (Alkon et al., 2014; Ward et al., 2008). "Eat Well Play Hard in Childcare Settings" was developed from this intervention, extending the scope to include children and their parents, and evaluation of this program revealed an increased consumption of fruits and vegetables (Center for Health Promotion and Disease Prevention [CHPDP], 2009). The "Colour Me Healthy" program also reported increased recognition and consumption of fruits and vegetables, and an increase in nutrition knowledge (Witt & Dunn, 2012).

Resources such as the Get Up and Grow manuals provide a plethora of information at little or no cost to child care centres, but provide limited practical assistance in the translation of evidence into practice. Staffing issues such as available time, turnover and varying literacy levels may impact the effectiveness of such resources and as a result, levels of nutrition knowledge may remain poor. The US interventions used self-assessment methods to identify improvement areas and provided specific staff training that was effective in improving policies and practices. However, programs such as this are usually subject to successful funding thus sustainability may be an issue if continued funding is not forthcoming. Moreover, many programs, such as "Move Well Eat Well" and the Victorian Healthy Eating Advisory Service are supported by government funding, thus if this funding is withdrawn, the programs are at risk of closure, as demonstrated by the now defunct SRER in South Australia and Western Australia. This demonstrates the need for effective program design that incorporates elements of self-sustainability to ensure the program can continue if funding is not available, or has ceased.

A Multi-Faceted Approach

Many current health promotion programs and interventions use specifically designed websites to deliver messages and resources to participants. Each of the schemes, programs or interventions described previously utilised a website to achieve this, and also as a means of disseminating information and evaluation to other health professionals. Furthermore, the advancement of technology and the accessibility of the internet supported the use of a website as an environment that could reach rural and remote child care services and thus improve longer term sustainability of the project.

It was surmised that the use of a program-specific website could be further extended to incorporate the establishment of an online community of practice to facilitate interaction between child care staff at different centres, which could lead to a sense of community being developed. In this thesis, sense of community is defined as "a feeling that members matter to one another and to the group, and a shared faith that the member's needs will be met though their commitment to be together" (McMillan & Chavis, 1986, p. 9). A sense of community can be extended to encompass an online community resulting in a sense of *virtual* (or online) community where "members' feelings of identity, belonging and attachment to a group that interacts primarily through electronic communication" (Blanchard, 2007, p. 827). Online communities are advantageous as they are accessible 24/7 and do not require physical proximity (Abfalter, Zaglia, & Mueller, 2012), thus allowing child care centres across Australia to communicate freely.

Studies have suggested that once established, online communities have enabled participants to exchange information and advice (Liang & Scammon, 2011), maintain or extend typical human relationships (Kanayama, 2003) and increase feelings of social connectedness and companionship to others (Bonniface & Green, 2007), potentially

creating a further layer of support for child care staff. The purpose of the proposed intervention was to meet the needs of child care staff in relation to the provision of a healthy eating environment, and given the intended online delivery, it was appropriate to refer to this emerging community as an online community of practice. Online communities per se are defined as "persistent collections of people with common or complementary interests whose primary method of communication is the internet" (Ren et al., 2012, p. 3). They offer a range of benefits to their participants, including sourcing information (Gu, Prabhudev, Balaji, & Chen, 2007), emotional support (Bonniface & Green, 2007; Preece, 2001), discussion (Bateman, Gray, & Butler, 2011), social networks (Agarwal, Gupta, & Kraut, 2008) and the opportunity to meet new people (Wellman, Haase, Witte, & Hampton, 2001). Moreover, the development of such online communities may facilitate knowledge sharing that could help resolve problems occurring in the workplace (Fang & Chiu, 2010), such as difficulties with menu planning (Romaine et al., 2007), dealing with fussy eaters (Lynch & Batal, 2012) or preparing the service for an NQF assessment (Woolcott Research and Engagement, 2014).

To develop this concept further, communities of practice are defined as "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger, McDermott, & Snyder, 2002, p. 4). This definition is broad enough to incorporate people across different settings, such as those working for large child care companies, as well as those not constrained by any organisational context (Hara, Shachaf, & Stoerger, 2009), such as independently owned and operated centres. Advances in information technology over the last 20 years have allowed traditional face-to-face and normally geographically constrained communities of practice to

expand, facilitating effective access to, and interface with, other community members and colleagues (Zhang & Watts, 2004).

However, initial engagement and ongoing participation are reported as potential barriers to the success of an online community, as many new members may contribute little, leave quickly and not return (Ren et al., 2012). As the research objective was to recruit participants not known to each other, who were geographically distant but experiencing the same workplace issues (Bonniface, Green, & Swanson, 2006), it was important to consider successful recruitment and engagement strategies that would encourage the development of effective communication patterns and ensure the success of the community.

There are few current examples of online communities within the child care industry. Early Childhood Australia established an online forum to support child care staff during the implementation of the 'National Quality Standard Professional Learning Program', part of the NQF. Forums were developed for each of the seven quality areas, together with other more generic forums that discussed topics such as holistic approaches to early years' education and partnerships with families (Early Childhood Australia [ECA], 2015). However, there was no dialogue about early childhood nutrition or healthy eating, thus illustrating the potential benefit of an online community specifically focussing on this important issue. In a Canadian study, child care staff described the social support they received from belonging to an online child care community as useful, citing benefits such as convenience and the immediacy of responses (Lynch & Batal, 2011). This is supported by a US study, where more than 75% of the child care staff surveyed (n=816) agreed that a forum connecting them with other staff, and with an expert, were important features of a child care specific website (Weigel et al., 2012).

Another potential layer to the website concept proposed for this study was the use of online activities, incorporating concepts such as basic nutrition knowledge, role modelling behaviours, menu planning and food safety, which child care staff could complete as part of their ongoing professional development. Literature suggested that as technology continues to expand and the internet continues to 'shrink' the surrounding world, organisations are moving away from traditional training workshops and have emphasised the need for employees to be 'lifelong learners', promoting the 'earner-learner' environment (Bartley & Golek, 2004). Larger numbers of child care employees could use the web environment compared with traditional methods of sharing information, thus rendering a web-based intervention a more cost-effective method in the longer term. Moreover, an online environment increases the reach and scope of access to e-information and support, could be self-paced and is accessible in a number of different locations (Bartley & Golek, 2004). This is supported by Weigel's study (2012), where 85% (n=693) of child care staff surveyed rated online training as an important feature of a child care specific website.

Furthermore, evaluation of the South Australian Start Right-Eat Right program revealed that child care centres who did not participate in the program cited staff turnover and lack of available time as reasons for their non-participation (Matwiejczyk et al., 2007). The proposed activities were intended to be concise and manageable, and as access to this information was self-paced, it could therefore be an effective medium in which individuals could up-skill and add value to the minimum required training as specified by the NQS (H. Lim et al., 2007). This is especially pertinent in child care centres where available time, travel to workshops and staff turnover may be restrictive factors to ongoing learning and professional development.

Summary

An increasing number of children are attending child care centres and for some, the food they consume at child care may be their only source of nourishment on those days. It is reported that the nutritional quality of foods served in some child care centres does not meet recommendations, a worrying trend as optimal nutrition is essential for children's growth and development, throughout childhood and into adulthood. There are a number of current concerning child health issues, the most significant being overweight and obesity. Other nutrient related issues such as iron deficiency, although relatively rare, can have a significant impact on children's long-term health and development.

New legislation introduced during 2011-2012 under the NQF, means that child care centres must comply with and meet the stipulations of seven national quality standards (NQS), of which "Child Health and Safety" legislates food and nutrition. The criteria in the NQS around food and nutrition are vague, open to interpretation and refer to guidelines that some child care staff did not have the capacity to translate, put into practice, or simply preferred not to use. Thus, child care staff required further support and guidance to ensure a healthy eating environment was provided for the children in their care.

There were many health promotion and nutrition accreditation schemes, programs, interventions and resources available to child care centres, but many were underutilised due to limited time and high levels of staff turnover. As child care staff play an important role in the provision of nutritious food and in role modelling healthy eating behaviours to children, it was essential they had readily accessible, supportive information that was reliable, consistent and sustainable.

A child attending a full day at child care centre may spend up to 25% of this time engaged in food or nutrition related behaviours, such as eating, washing hands and clearing away. The importance of this issue within the child care setting was therefore demonstrated, as educators would have significant opportunities to teach children about health eating. A multi-faceted approach to a food and nutrition intervention targeting child care centres, including a website with online activities and discussion boards, was thought to be an effective pathway to promote and support healthy eating behaviours amongst staff and the children in their care. It was proposed this would improve the role of child care centres as a venue where children could learn to accept and eat healthy foods, and in which the foundations of good, lifelong health are established.

Theoretical Framework

Introduction

The literature review identified the child care setting as one where there is significant opportunity to influence children's food habits and preferences and consequently their growth, development and lifelong health. Individuals employed in this sector play an influential role in the provision of nutritious food, and in teaching children important nutrition concepts. However, organisational practices and policies – often determined by legislation - are also influential. Given the intervention developed for this research was designed to foster a community of practice among child care staff, sense of community was also regarded as a potentially powerful influence on individual and organisational practices. However, it was important to consider that the legislation under which child care centres are monitored might equally influence the dynamics of community, and whether or not a community of practice would evolve.

There are numerous theories that inform and explain the individual and organisational influences on behaviour. In this study, the Spiral Technology Action Research (STAR) model was considered the most pertinent because it brings together health promotion and information communication technology using theoretically grounded methods and hence, provided the underpinning theoretical framework (Figure 2.1). It is a particularly comprehensive model because it applies "multilevel concepts and behaviour change strategies from a number of social science perspectives" (H. Skinner, Maley & Norman, 2006, p. 408). Elements of this model were used to manage the research process as it interweaved technological design with community involvement, through a series of developmental cycles – listen, plan, do, study, act – that also guided the development and evaluation of this website intervention. Moreover, given the importance of identifying the needs (H. Skinner et al., 2006) of potential participants, the STAR model provided a constant reminder about the importance of involving community in the developmental process, particularly given individual and organisational issues could potentially thwart the success of the website.

The multi-faceted approach provided in the STAR model was particularly appropriate for the development of the proposed website because there were multiple levels of influence on individuals and the settings in which they worked. For example, individuals could be influenced by their colleague's positive or negative attitudes towards healthy eating, but also by the legislation that guides food and nutrition practices in the child care setting. Furthermore, it upheld the idea of an ecological perspective in health promotion, which acknowledges that behaviour affects and is affected by multiple levels of influence and that behaviour shapes and is shaped by the social environment (Sallis, Owen, & Fisher, 2008). In keeping with the ecological perspective broadly discussed in the following section, the influences that were

considered important in this study can be categorised at the individual, social, organisational/political level; all of which can shape (and be shaped by) community.
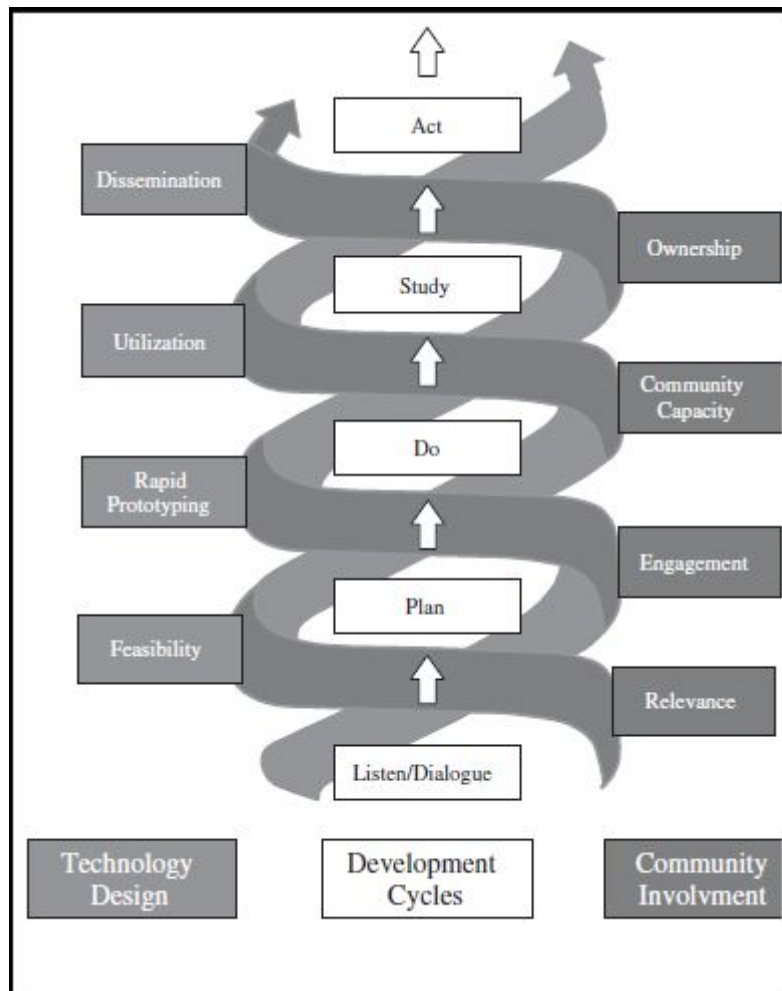
Figure 2.1 Spiral Technology Action Research model

(H. Skinner et al., 2006)

Ecological perspective

Overview

In 1979, Bronfenbrenner first proposed a theoretical model of human development and behaviour that examined people, their environments and the emerging interaction between the two. These ecological models, when applied to health behaviours, typically

aim to explain the multidimensional relationship between the individual, their environment and the policies that affect these individuals and the environments in which they live and work, whilst incorporating social and psychological factors to guide more comprehensive health protective interventions (Sallis et al., 2008). These models acknowledge the broader organisational, community and policy influences on individual and collective health behaviours, and the need to integrate multiple theories (Stokols, 1992). Healthful behaviour outcomes are thought to be increased when environments and policies are supportive, and individual motivation and education exist to facilitate these choices (Ottawa Charter for Health Promotion, 1986). Whilst behaviour change was not specifically measured in this research thesis, it was expected that data would be generated to indicate a participant's intention to change his or her behaviour. In this respect, knowledge and attitudes, as well as efficacy were constructed as the reliable precursors to behaviour change and are well represented in ecological health models, and a more detailed examination follows in the next section. Figure 2.2 illustrates the theoretical framework developed for this study.

Sallis et al. (2008) proposed four core principles for an ecological approach to health promotion, based on a comprehensive review of published historical and contemporary literature. Firstly, the numerous influences affecting health behaviours at intrapersonal, interpersonal, organisational, policy and community levels are recognised, and secondly, it is acknowledged that concepts such as sociocultural factors and physical environments interact to influence behaviour across these multiple levels. On an individual basis for example, a child care worker with high motivation to promote a healthy eating environment may respond differently to the intervention than one who is unmotivated. However, this motivation could be influenced by many factors, such as their level of education, personal beliefs and organisational practices.
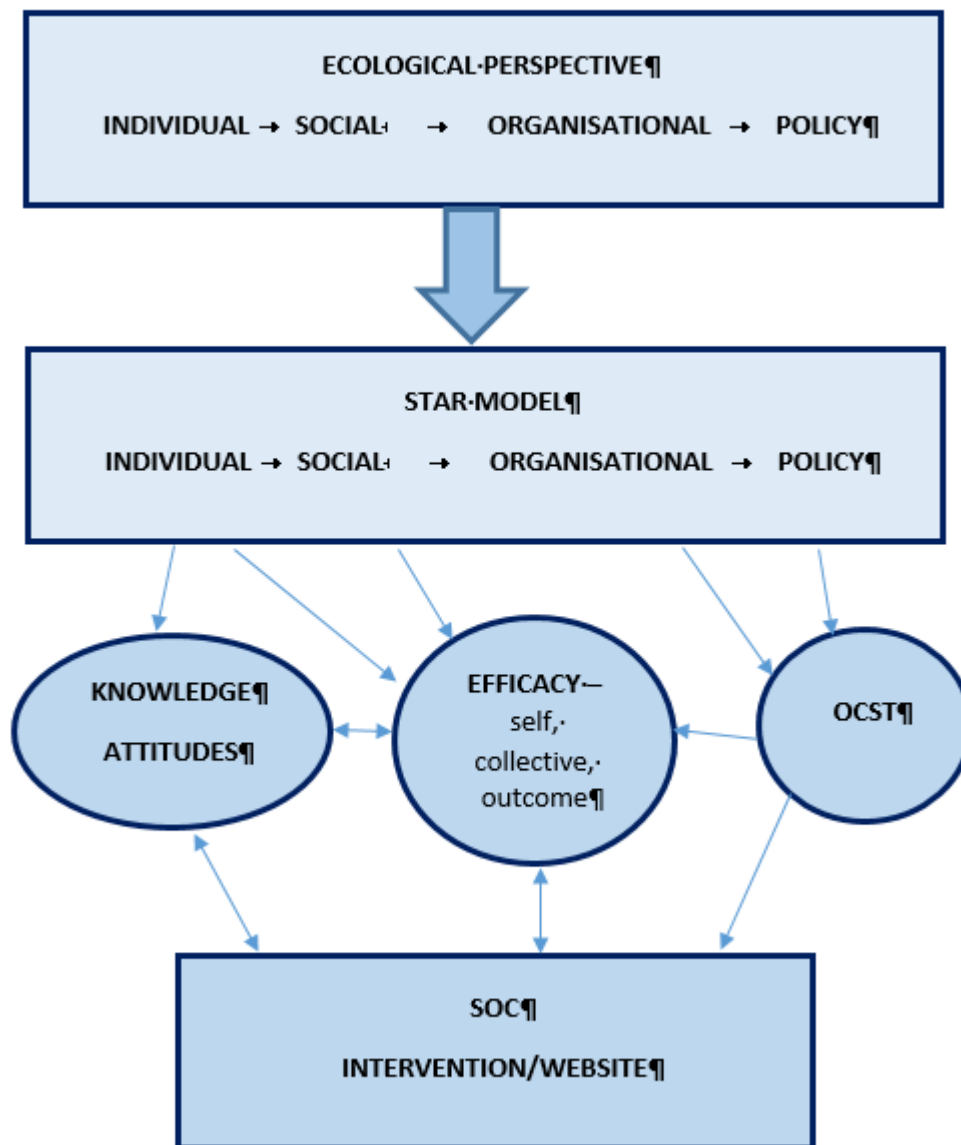
Figure 2.2 Theoretical Framework

OCST = Organisational Change Theory

SOC = Sense of Community

The third principle proposed that these multilevel interventions are the most effective in changing health behaviours as single level interventions often only demonstrated success in the short term (Sallis et al., 2008). Conversely, others have proposed that focussing on multiple ecological levels may be impractical due to limited project scope

and resources, and that single level interventions still fit within an ecological model (Golden & Earp, 2012), although informational interventions aimed at influencing health beliefs and behaviours are more effective when policies and environment are supportive (Sallis et al., 2008). In their critique of social ecological models published in the previous two decades, Golden and Earp (2012, p. 368) maintained that few interventions target upstream levels of influence, stating:

> It seems unlikely that health promotion planning processes that are based in a social ecological understanding of a problem would consistently deem **institutions, communities, and policies** as inefficient leverage points for change across all health topics in all intervention settings.

Whilst the proposed intervention did not have the capacity and was not intended to influence government legislative policy, it was designed to provide 'information wrapped in support' in order to increase knowledge, attitudes and confidence by providing an opportunity for a community of practice to emerge. If that could be done, then it was quite possible that policy, at least at an organisational level, may also be influenced; perhaps around the development and implementation of robust food and nutrition policies. The community of practice also presented an opportunity to better understand the effect legislative policy had on individual behaviours, child care centre practices and organisational policies. For example, research evidence might suggest that menus are inadequately reviewed as part of the NQS assessment and legislative change is required to strengthen this aspect of practice. Moreover, if, for the purpose of this study, institutions considered as child care centres, whether they are privately owned, standalone services or part of a large corporation, can influence whether they are willing (or able) to participate in the study.

Whilst single level interventions do fit within an ecological model (Golden & Earp, 2012), focusing on one single level alone, such as the environment, may not be sufficient to influence the precursors to behaviour change (Sallis et al., 2008) and other factors such as policy and education may need to be considered. For example, merely providing fruit and vegetables at a centre may not necessarily result in children consuming more of them, unless this environmental change is supported by child care staff receiving the training and support to effectively role model, and to acquire the nutritional knowledge required to discuss the benefits of eating fruits and vegetables with children. Hence, this study was premised by the idea that creating 'community' could provide added value for child care staff in this regard.

The final principle alludes to ecological models being most effective when they are developed with one particular health behaviour in mind. However, this can be challenging as an intervention that works for one public health issue, for example smoking cessation, may not work for the provision of a healthy eating environment (Sallis et al., 2008). It was, therefore, imperative that the environmental and policy factors influencing the targeted behaviour (providing a healthy eating environment) were identified, to ensure that a robust, effective intervention was developed. For this study, the provision of accurate and reliable resources and support delivered through an online medium, aimed to support the provision of a healthy eating environment. From a policy perspective, local policies might be influenced by providing examples of a robust food and nutrition policy, but in a higher legislative setting, this project could examine the effectiveness and robustness of NQS assessments in terms of menu reviews and provision of nutritious, varied food, thus informing the need for legislative change.

Strengths and limitations of an ecological perspective

The major strength of an ecological perspective is the focus on multiple levels of influence that can affect the precursors to behaviour change, thus changes to policy and environmental factors are expected to impact on the wider population rather than individuals (Sallis et al., 2008). Whilst the influence of this intervention on policy is expected to be more localised, the resources and support are intended to encourage and support environmental change across services, as well as on an individual basis. However, this could depend on the influence of the director/owner in their role as gatekeeper of information, and their commitment to disseminating important health promotion messages to their staff.

A major limitation of the ecological perspective often faced by health promotion professionals is the difficulty in identifying the most important factor, influence or variable as the focus of the intervention (Sallis et al., 2008). The development of testable, operational models that offer guidance for other interventions is recommended, and this study aimed to produce a model that could be utilised to promote healthy eating environments in similar settings.

Summary

Ecological models can assist health promotion professionals understand how individuals relate to the broader personal, social and work environment. Motivating individuals and building behaviour changing skills alone may not be effective if their environment and influential policies diminish or thwart their healthful intentions. Therefore, creating environments and policies conducive to facilitating healthful choices should be a precursor to motivating and educating individuals, even if only focussing on a single level of influence.

Community, sense of community and sense of virtual community

Sense of community (SOC) is defined by McMillan and Chavis as "a feeling that members have of belonging, that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (1986, p. 9). Communities have evolved rapidly in recent years to encompass the vast array of online information and communication technologies now available, so it is important to also understand community in an online setting.

Howard Rheingold could be considered the 'grandfather' of online communities, given his book *The Virtual Community* was first published in 1993. Rheingold was among the first to describe how an online environment could develop into a community where members feel they belong. He defined online communities as "social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyber space" (Rheingold, 1993, p. xx). More recently, sense of virtual community has been defined as "the human experience of a community feeling in a virtual environment" (Tonteri, Kosonen, Ellonen, & Tarkiainen, 2011, p. 2216). A strong SOC, whether face to face, online or a combination of both, signifies a healthy community and can positively affect individuals and the community itself (Talo, Mannarini, & Rochira, 2014). Moreover, SOC is associated with improved quality of life, enhancing individual wellbeing and increasing empowerment within organisational settings.

Sense of Community is constructed of four elements, described by Talo et al. (2014) as *membership,* that is, feeling part of a community; *influence* as having influence in and being influenced by the community; *fulfilment of needs* (also known as reinforcement

of needs), being the benefits derived from membership; and ***shared emotional connection,*** being the social ties between participants. These SOC elements interweave with the individual, social and organisational constructs that affect and can be affected by human behaviour, thus are presented throughout the following sections.

Individual

On an intrapersonal level, individuals are often defined by their knowledge, attitudes, beliefs and behaviours. Whilst this intervention was designed to increase individuals' knowledge, it was expected that their attitudes towards learning and the value they placed on that learning might influence whether they actually engaged with the intervention and if their behaviours were subsequently influenced. Allen (2010, p. 71) stated "the provision of information alone rarely changes health behaviours", therefore it was important to consider individuals attitudes regarding the desired health outcomes. Attitudes involve thoughts, feelings and a willingness to act in relation to a person, object or event and are pivotal to decision making about health behaviours (Jones, 2003). Whilst individual behaviour change was not objectively measured as an outcome in this study, data was collected that could inform their intention *to* change or any self-reported indications *of* change. However, even if evidence of intention to change (or actual change) was not evident, it is generally accepted that behaviour change is complex and takes time (Allen, 2010). In this respect, it was particularly important to understand any change in the knowledge and attitudes of participants (rather than behaviours per se) as a precursor to any behavioural changes that may occur in the future. It was also important to understand if a sense of community through participation in the community forums was experienced by individuals, and whether the influence of other contributors led to an increase in knowledge or change in attitude, beliefs or behaviours.

It is important to remember the common health promotion assumption that an individual's beliefs about another person, a group, an issue, object or behaviour (in this case, promoting a healthy eating environment for the children in their care), will determine their attitude towards it (Egger, Spark, & Donovan, 2013). These attitudes are guided by social norms and self-efficacy, which subsequently predicts how the individual might perform towards the other person, group, issue, object or behaviour (Bandura, 1998). In keeping with social ecological models, this behaviour may be influenced by "environmental facilitators and inhibitors, both perceived and actual" (Egger et al., 2013, p. 34). For example, a food coordinator's favourable attitude and intentions towards producing a nutritious, well-balanced menu may only translate into actual behaviour if she has been adequately trained, and is provided with a sufficient budget.

Given the influence that knowledge and attitudes can have on subsequent health behaviours, it seemed pertinent to consider elements of a knowledge-attitude-behaviour (KAB) model, such as Fishbein and Ajzen's Theory of Reasoned Action (2010), to guide intervention objectives on an intrapersonal level. This theory demands that the behaviour of interest should be clearly identified, in this case, the provision of a healthy eating environment by child care staff to the children in their care. It was also important to consider what beliefs staff held about this behaviour, and to consider if these were shaped by personal experiences, level of education, or how information is sought, obtained, interpreted and remembered (Fishbein & Ajzen, 2010). Thus individuals from different social backgrounds, holding different roles within the industry are likely to vary in the beliefs they hold, which may, in turn influence their attitudes towards providing a healthy eating environment. As previously stated, behaviour change was not specifically measured in this research thesis, but it was expected that data would be

generated to indicate a participant's intention towards behaviour change. Therefore, knowledge and attitudes were constructed as reliable precursors to behaviour change, and confidence (or self-efficacy) is explored in the following section as a social, rather than individual factor.

Social

On an interpersonal level, individuals can also be defined by the groups to which they belong and the influence this has on their social identity, role definition and social support (Glanz & Rimer, 2005). Thus elements of Social Cognitive Theory (SCT) were utilised within this framework because it usefully linked the relationship between an individual and their environment (McAlister, Perry, & Parcel, 2008), and if they chose to engage with the community forums this is could be considered part of the environment that influences them.

Within a typical child care setting, there are various levels of seniority, from the director, through to early years' teachers, food coordinators, educators and trainees. Although these roles are specifically defined, there may be varying interactions in staff relationships between individuals and in combination with the child care environment itself. However, regardless of seniority, elements of SCT were used to examine any change in behaviour through increased skills and confidence and whether their participation with the community forums was influential according to their role. For example, a junior staff member may be fearful of making posts on the community forum due to her lack of seniority.

Key to this relationship was the concept of 'reciprocal determinism' that recognises how the environment shapes individual and group behaviour but also examines individual and group capacity to alter this environment. An individual's capacity for

collective action is also emphasised, which enables individuals to work together in an organisation, to achieve environmental changes that will benefit the whole centre (McAlister et al., 2008).

SCT also pays special attention to social outcomes, a key concept of the Theory of Reasoned Action outlined in the previous section, which is concerned with individual perspectives on knowledge, attitudes and behaviour. Moreover, SCT is a key concept in the STAR model that is used both underpin this theoretical framework and to guide the intervention development (McAlister et al., 2008).

Efficacy

Whilst *self-efficacy* is generally an individual construct and could have been included in the previous section, individual confidence is often influenced by others, thus it was included in these sections about efficacy. Self-efficacy is another key concept of Social Cognitive Theory that refers to the belief in one's own ability to successfully perform a behaviour and is an important factor in behaviour change (Nutbeam, Harris, & Wise, 2010). If individuals are given the knowledge and skills necessary for behaviour change, this may lead to increased confidence and subsequently increased self-efficacy. Bandura (1986) proposed that perceived self-efficacy is significant in determining performance independently of fundamental skills. For example, if an individual *believes* they can effectively role model healthy eating behaviours to children, they are more likely to do so, thus they have high self-efficacy. This thesis sought to investigate if a sense of community derived from participation in the community forums may assist an individual to a) enhance their self-efficacy (by learning about effective role modelling) or b) have influence on others (by sharing their own experiences).

Collective-efficacy extends this concept further, as many outcomes can only be achieved effectively by individuals working together within an organisation (McAlister et al., 2008). The two main constructs of collective-efficacy are the individual's appraisal of their own capabilities to perform a task within the group, and their appraisal of the group's capabilities to operate as a whole (Bandura, 1986). For example, an individual with high self-efficacy believes they can effectively role model healthy eating behaviours to children and actively does so, but if they do not believe their colleagues can also be effective role models, they may be less inclined to do so themselves. However, if all individuals have high self-efficacy, believing they can be effective role models and actively doing so, this may increase the capacity, either within a particular centre, or throughout the industry as a whole, for collective change. Furthermore, a strong sense of community resulting from membership of the community forums may influence other individuals to bring about change at their own centre, thus broadening the collective change throughout the industry.

The reciprocal effect that outcome-efficacy can have on self- and collective-efficacy was also considered with the bounds of this theoretical framework. Outcome-efficacy is defined as "a person's estimate that a given behaviour will lead to a certain outcome" (Bandura, 1977; p. 193) and whether they consider this outcome to be valuable. Outcome-efficacy could also have been considered as an individual construct but as for self-efficacy is included in this section given it is often influenced by social factors.

When an individual makes a decision about whether to engage in or continue with a behaviour, they also consider the personal value of the outcome, and this decision can be a motivating factor (Young & Kline, 1996). Therefore, both high self-efficacy and high outcome-efficacy can create the ideal environment for change. An individual who believes they can be an effective role model has high self-efficacy and if they also

believe that this could result in children developing their own lifelong healthy food habits as a result (a desirable outcome), they also have high outcome-efficacy.

However, this individual may still refrain from these role modelling behaviours if they believe they were incapable of performing them well (low self-efficacy) even if they believe the outcome to be desirable. By engaging child care staff in an intervention where they are able to increase their knowledge and acquire skills, this may enable them to modify their working environment, increasing both self- and outcome-efficacy and lead to positive outcomes within the child care setting. It was therefore theorised that the promotion of self-improvement and increasing awareness of the benefits delivered to the children in their care might help bolster a high level of self-efficacy, and the belief that the outcome is worthwhile (increased outcome-efficacy). Moreover, if the majority of staff who interacted with the children were persuaded to engage with this support, collective-efficacy could also be increased, thus increasing the capacity of the centre as a whole to bring about change. Thus individuals who engaged with this support could be contributing to the development of a sense of community that could then in turn have influenced others not yet engaged to do so.

Organisational/policy

From a broader organisational perspective, Organisational Change Stage Theory (OCST) was used to identify processes and strategies that supported the adoption of both individual and organisational behaviours in the early years setting. The theory guides the development of health promotion interventions to bring about policy, organisational and individual behaviour change. Organisations can be considered as "integrated social systems" (Butterfoss, Kegler, & Francisco, 2008, p. 336) and produce defined outputs, such as the education and care offered by long day care, family day care and after school care centres under the early years services umbrella. These

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services (organisations), are an important setting for the development of positive lifelong food habits in young children (Briley & McAllaster, 2011). There is considerable potential to promote the consumption of healthy foods that could significantly influence children's future health and well-being (Birch et al., 2007), whilst ensuring adherence to legislation and regulations under law regarding the provision of this service.

Whilst organisational change is neither a specific aim nor an expected outcome in this study, understanding the influence of this concept on the individuals in this setting was important given organisations may establish policies and environments that can support or hinder healthy practices (Butterfoss et al., 2008). Organisational change fits within the broader ecological perspective by recognising individuals as part of a wider social system and acknowledging the interaction between these individuals and their environments, in this case, the workplace, which can influence health outcomes (Golden & Earp, 2012). Organisational change can occur at multiple levels, in keeping with the influential levels proposed by Sallis et al. (2008) in their review of ecological models, being individual, social and organisational/ political; all of which can shape (and be shaped by) community.

On an individual basis, the focus is on intrapersonal skills such as knowledge, attitudes, beliefs and motivation whilst acknowledging the important influence of colleagues and supervisors (Butterfoss et al., 2008). In particular, organisational leaders such as the directors or owners of individual services, or area and state managers of larger corporations, may be in powerful positions to facilitate or resist change; or in this case, engagement with the proposed intervention. From a team perspective, any change (or acceptance of the intervention) would need to be based on effective communication; that is, the gatekeeper of the incoming messages (usually the director) disseminating

these messages to the staff under their management, and encouraging their involvement with the intervention, providing nutritious food and role modelling appropriate behaviours.

From an organisational perspective, change requires a number of approaches that address both internal and external influences, and should be directed at many different levels throughout the organisation (Butterfoss et al., 2008). For example, in the case of this proposed intervention it was important to consider the service or company philosophy (internal), and any overarching legislative requirements (external). Whilst achieving organisational change was not an aim of this study, these contextual issues were important in interpreting the research outcomes.

It has been proposed that the strongest health promotion strategies and methods are those targeting upstream, population-level policies, which modify the health environment, and do not rely exclusively on individual behaviour change (Egger et al., 2013). For example, the legislation that governs the provision of healthy food in child care could be targeted, although it is acknowledged that driving policy change is often very difficult to achieve and time-consuming for the health promotion professional (Egger et al., 2013). Indeed, Golden and Earp's (2012) critique of ecological models lamented the lack of interventions targeting public policy or legislation over the last 20 years. The underlying objective of this project was to initially build relationships with individuals and small groups, as a means of understanding the broader child care landscape, thus the targeting of legislation or public policy falls outside the project boundaries. This project aims to provide support and information, and could influence policy on a more localised scale through, for example, providing assistance to develop healthy eating focused food and nutrition policies. However, this study will gather

evidence that could inform future research and may be able to influence legislative or policy change at a more upstream level.

From a community perspective, it is important to consider to what extent individuals, teams or organisations value participation in a workplace community, online or face to face. A strong sense of community signifies a healthy community that can, in turn positively affect individuals and groups, enhancing wellbeing and increasing empowerment within organisational settings (Tonteri et al., 2011). However, child care staff engagement with this suggested community on an individual basis could depend on personal preferences, for example, if the individual is computer literate and feels comfortable participating in the community forums. On an interpersonal level, individuals may feel encouraged or restrained by social norms and the posts made by other participants, which may in turn motivate or detract them from participating themselves. On an organisational level, individuals may be wary of participating for fear of being reprimanded, so if a strong sense of community can be fostered, this in turn may lead to feelings of increased empowerment within the organisation.

On an interpersonal level, individuals may feel encouraged or restrained by social norms and the posts made by other participants, which may in turn motivate or detract them from participating themselves. On an organisational level, individuals may be wary of participating for fear of being reprimanded, so if a strong sense of community can be fostered, this in turn may lead to feelings of increased empowerment within the organisation.

Summary

This study was ultimately guided by an ecological perspective, recognising that behaviour affects and is affected by multiple levels of influence and that behaviour

shapes and is shaped by the social environment. As a multi-strategy intervention was planned, the STAR model was considered most appropriate as the basis of a theoretical framework to guide the study through development, implementation and evaluation. This model blends health promotion and information communication technology constructs using a number of theories on an individual and organisational level, whilst guiding the development of the website through a number of 'listen, plan, do, study, act' cycles, that are informed by the community for which it is developed.

Most importantly, the STAR model enabled these multi-strategy influences to be systematically investigated at the intrapersonal (individual), interpersonal (social) and organisational/policy levels, whilst interweaving the additional SOC concept. The individual influences of knowledge, attitudes and behaviour were acknowledged as were the social influences outlined in the SCT, particularly the relationship between self, outcome and collective-efficacy. The organisational influences such as staff relationships, company and legislative policy were also examined, and subsequently interweaved the individual and social changes involved (Figure 2.2). SOC could act as an influence on these individual, social and organisational constructs as well as being influenced by them.

CHAPTER THREE:

METHODOLOGY AND METHODS

Introduction

The previous chapter presented a literature review that examined the important influence of early years' nutrition on the long term development of child health, and the significance of the child care industry as a setting that can support and nurture optimal development. The theoretical framework was also presented and the Spiral Technology Action Research model introduced as a project management tool.

This chapter presents both the research design adopted, and the research methods implemented for this study. The research design section reflects the qualitative and netnographic epistemological approach adopted for this study. The research methods' section details the recruitment, data collection and analysis procedures used in Stages 1 and 2 of this study, together with ethical considerations. A comprehensive discussion of the techniques employed to ensure trustworthiness across the whole study concludes this chapter.

Research Approach

The research approach adopted for this study examines the child care industry through the epistemological lens of interpretivism, where the idea of a single truth is rejected. 'Reality' is viewed as a precept that is both subjective and socially constructed, due to the active involvement of the researcher in the research, and also defined by the participant's understanding of their own realities. Thus, a qualitative approach was adopted as it allowed both the researcher and the participants to "articulate the meanings of their social realities" (Liamputtong, 2010, p. 12). A qualitative design suited the

research aim and questions as it sought to identify the variables that were to be examined (Creswell, 2009) in the first formative stage of the study. Moreover, a qualitative method also offered a fluid and flexible approach with which to understand the subjective experiences (Liamputtong, 2010) of the child care staff as they engaged with the web-based intervention.

The overarching approach to this study was netnographic, essentially online ethnographic research and thus qualitative in nature. Ethnography is considered an anthropological approach to research (Kozinets, 2010) involving the systematic observation of groups or cultures, with the researcher being immersed in the lives of the participants (Madden, 2010). Fetterman (2008, p. 1) described ethnography as the "art and science of describing a group or culture" that incorporates typical qualitative concepts such as contextualisation and multiple realities from a holistic perspective. Netnography adapts the common participant-observation ethnographic procedures to computer mediated social interactions (Kozinets, 2010), such as this web-based intervention. Whilst netnography as a research approach is not usually constrained by literature and theories, it was deemed appropriate to include a research framework to ensure methodological rigour, as a means of managing the project efficiently, and to address the multiple levels of influence on the child care staff and setting. Thus, the Spiral Technology Action Research model (H. Skinner et al., 2006) was positioned within the netnographic approach, and became the main tenet of the theoretical framework used to manage this study. This model was a good fit within the netnographic approach, as it incorporated elements of a qualitative action research approach. In particular, participatory action research allowed the participants to be actively involved in the development of this intervention whilst also allowing the deep investigation required (H. Skinner et al., 2006). Through continuous improvement

cycles and collaboration between researchers and participants (O'Leary, 2010), this approach guided problem identification and aimed to produce user-friendly solutions appropriate to the setting (Bowling, 2009).

Many current health promotion programs and interventions use specifically designed websites to deliver messages and resources to participants, and as a means of disseminating information and evaluation. Furthermore, the advancement of technology and the wide accessibility of the internet, supported the use of a website as an environment to reach rural and remote child care centres, thus a netnographic approach was considered wholly appropriate. The use of a program-specific website was extended to incorporate the building of a child care community, allowing staff at different centres to interact and develop a sense of community. For the purposes of this study, community is defined as "a feeling that members matter to one another and to the group, and a shared faith that the member's needs will be met through their commitment to be together" (McMillan & Chavis, 1986, p. 9). This sense of community was extended to encompass an online community, where members' feelings of identity, belonging and attachment to the group took place primarily through electronic communication (Blanchard, 2007, p. 827). Once established, online communities can enable participants to exchange information and advice (Liang & Scammon, 2011), maintain or extend typical human relationships (Kanayama, 2003) and increase feelings of social connectedness and companionship to others (Bonniface & Green, 2007), thus enabling child care centres Australia wide to communicate with each other and the researcher.

A prospective, longitudinal design was appropriate for this study, as it took place over a forward passage of time, and involved several points of data collection (Bowling, 2009). This design enabled the new web-based intervention to be assessed for effectiveness

over a period of time, and was also valuable in identifying participants whose attitudes towards, or confidence about providing a healthy environment had changed (Bowling).

Finally, a comparative design was deemed suitable to study contrasting scenarios using identical methods (Bryman, 2012), namely the difference in nutrition knowledge, attitudes towards and confidence to provide a healthy eating environment, and sense of community, according to participants level of interaction with the intervention.

Research Design

STAGE 1: Formative evaluation to inform a needs assessment for child care staff

Recruitment

To ensure a manageable study size, the initial intention was to limit recruitment for Stage 1 to staff working at long day child care centres only. Whilst the important role of staff at family day care and other child care settings was acknowledged, these providers were not included in the scope of the study at this formative stage.

Initially, it was intended that data be collected through focus groups, or by interview for child care staff living and working in rural or remote areas.

A sampling frame was generated from the contact information of the 550 long day care centres in Western Australia, which is available from the Australian government website www.mychild.gov.au. An email was sent to all centres listed on the sampling frame in January 2013, inviting staff to participate in a focus group or if preferred, an interview, either in person or by telephone, dependent on geographical location.

The initial response from the emailed invitation was very low (n=3) and despite the email being repeated one week later, responses or enquiries about the study were limited (n=5). Of the centres that did respond, all but one was located in the Perth metropolitan

area, however, they were too geographically distant from one another to effectively arrange focus groups. It may have been possible to conduct a focus group with all staff working at one centre; however, another consideration was the important impact of group dynamics. The influence of demographics, personality and physical characteristics are all important issues and focus groups whose members are homogenous are considered more productive and better able to work together (Stewart & Shamdasani, 2015). Conversely, Stewart and Shamdasani also indicated that focus groups conducted with 'real' groups, such as all staff at one centre, might even encourage participants to talk more. However, it was vital that participants shared at least one important characteristic (such as their role in the centre), to encourage attendance and facilitate discussion about similar shared experiences (Barbour, 2007). In the child care setting, it was important to ensure that all staff, whatever their role, felt able to speak freely. For example, a junior staff member may have been reluctant to contribute openly to focus group discussions in the presence of the centre director, as they may have perceived a threat to their job security.

Site Visits

As the initial invitation to participate in Stage 1 received few responses, new recruitment strategies were considered. Site visits were made to a number of child care centres, prearranged as part of the ECU Masters of Nutrition and Dietetics placement program. Ten centres were visited in one day, across a wide range of suburbs within the Perth metropolitan area. It was apparent from the subsequent conversations with centre directors that focus groups would not be practical, and interviews, either in person or by telephone, were preferred as it was easier to manage staff cover in the centre during this interview process. By adopting this flexible approach to data collection, it was possible to arrange firm interview appointments with a number of child care staff at five of the

centres during these visits, with more confirming soon after. As a result, the recruitment rate increased substantially and eleven centres agreed to make time for their staff to be interviewed on site.

Prior to the interview, participants were asked to complete a brief online survey (Appendix 2), administered through Qualtrics (2013), which collected demographic data such as age, gender, level of qualification, years of experience in the industry, job description and self-rated computer literacy skills.

Interviews were conducted with staff (n=48) at all levels of seniority, such as directors, food coordinators, early years' teachers, educators and junior staff. They were conducted in person at centres within the Perth metropolitan area, and by telephone for services in rural or remote areas. The flexible nature of the semi-structured interview method enabled a defined question plan to be utilised to guide the start of the interview, whilst allowing the conversation to flow naturally, in order that any interesting or unexpected data emerging could be captured (O'Leary, 2010). The development of a semi-structured interview guide (Appendix 1) was directed by the theoretical framework and the second research question – what are the formative needs of child care staff in relation to providing and promoting a healthy eating environment in the child care setting?

This tool was used to steer the course of the interviews at the beginning, whilst still allowing unexpected or interesting data to be collected (O'Leary, 2010). Interviews were audio-recorded with participant consent, which allowed raw data to be preserved for review and transcription at a later date, thus enabling the researcher to focus on the process of conducting the interview (O'Leary).

Appropriate to qualitative study design, the interviews continued until saturation (n=48), being the point where no new themes emerged and no new data added richness or understanding (O'Leary, 2010). Each emergent theme was explored in detail and in a number of different contexts, depending on interviewee role. Saturation was reached when no new insights were being offered.

Audio-recordings were professionally transcribed and uploaded to the qualitative analysis Software program NVivo, version 10 (QSR International Pty Ltd. Version 10, 2012) for organisation and analysis. In line with the qualitative approach adopted for this research project, content analysis of the data was conducted to gain an understanding of participant feedback, in order to inform the development of the proposed website. As a means of identifying the emerging 'themes', data was coded descriptively (Bazeley & Jackson, 2013), using the main question guide headings as titles. Coding is a means of naming, indexing and organising data for further analysis (Corbin & Strauss, 2008) and re-contextualisation of the data was achieved through examination by category, rather than source, thus moving from simple document analysis to deeper interpretive analysis (Bazeley & Jackson). A 'broad-brush' approach to coding was adopted, 'chunking' the data into broad topic areas, using the question guide headings, which allowed for easy identification of the relevant data segments. Categories and sub-categories are presented in Chapter 4.

The data gathered from the interviews (n=48) was used to guide Stage 2 of the project – the development and implementation of the online intervention, and this information collection phase of the project formed the first part of the 'listen, plan, do, study, act' development cycle of the STAR model (H. Skinner et al., 2006). Additionally, a consultancy group, including representatives from other key stakeholders and early childhood organisations (such as Ngala, Child Australia, Meerilinga, Early Childhood

Australia) was formed, which steered and informed the development of the intervention. Further details about the development of this group and its role in the project are provided in Chapter Five, page 125.

Ethical considerations

This study adhered to the principles outlined in the 'National Statement of Ethical Conduct in Human Research' (National Health and Medical Research Council [NHMRC], 2007) and the 'Policy for the Conduct of Ethical Human Research' (Edith Cowan University, 2014).

When child care staff agreed to be interviewed, they were emailed an online demographic survey via Qualtrics (2013). Embedded in this survey was a consent form (Appendix 3) and an information letter (Appendix 4). The Qualtrics 'survey mailer' function enabled the researcher to monitor the interviewees who had returned the consent form and survey prior to the interview. A separate log was maintained to record that consent has been given and the survey returned, data were then de-identified to ensure participant confidentiality. Survey results were stored securely on the Qualtrics website, within the researchers password protected user profile. As the interview commenced, confirmation was sought that the information letter had been read and understood, and participants were invited to ask any questions they had about the study. When presenting the interview findings in subsequent chapters, pseudonyms were used to protect participant confidentiality.

An ethics application for Stage 1 of the study was submitted to the Edith Cowan University Ethics Committee, and assessed as low risk. Approval for Stage 1 (8727) was received in December 2012. As the development of the intervention in Stage 2 was dependent on the analysis of data from Stage 1, the ethics application was amended and

resubmitted to the committee at a later date for further approval, which is detailed later in this chapter. Furthermore, whilst anecdotal evidence suggested there was interest amongst child care staff to engage with this research, the initial response to the interview requests was low. To encourage participation, each centre that responded, and each staff member who agreed to an interview, was entered into a draw to win a small, healthy eating related prize, and this incentive was also approved by the Ethics Committee.

STAGE 2 – Development and implementation of the intervention

Overview of netnographic methods

Kozinets (2010) provides a comprehensive set of principles for conducting online ethnographies, and although they have been developed to guide research on established online communities, they can be adapted for use in this project. The five steps of netnography are 1) entrée, 2) data gathering and analysis, 3) ensuring trustworthiness, 4) ensuring ethical research and 5) providing opportunities for feedback. These procedures are discussed throughout the following sections of this chapter.

Recruitment of SNAC members to build community

The formative evaluation from Stage 1 informed the development of a website, named 'Supporting Nutrition for Australian Childcare' (SNAC) that included downloadable resources, online activities and discussion boards. The look, feel, and content of the website was guided by the consultancy group and from the formative evaluation gathered in Stage 1, thus incorporating the 'listen, plan, do' part of the STAR developmental cycle (H. Skinner et al., 2006). Initially, only staff employed at licensed long day child care centres in Western Australia were targeted as potential participants. However, all staff were considered potential participants regardless of their level of

seniority, as it was important to obtain multiple perspectives from varied viewpoints. As was the case for Stage 1, purposive sampling was used. The sampling frame developed for Stage 1 was utilised again, and an invitation (Appendix 5) to register for the newly developed SNAC website was emailed to all West Australian centres, and repeated on a number of occasions over the first few weeks of recruitment. As an additional awareness raising strategy, a flyer was also developed (Appendix 6) and circulated amongst other relevant early childhood organisations.

The netnographic procedure of entrée is described as a technique used by researchers to identify the online community of interest by considering its relevancy, activity and interactivity levels and critical mass (Kozinets, 2010). However, given the aim of this study was to *develop* community rather than examine an established community, this procedure could have been deemed inappropriate, as at the launch of the website, the researcher was the only member, and there was no activity, interactivity or critical mass. Nevertheless, the aim of the project was to attract child care staff to the website to build community on SNAC. It was, therefore, important to consider which strategies would need to be implemented to achieve this goal, how, and to what extent the researcher would interact with the community, and to create a culture that would be attractive to the intended participants (Kozinets, 2010). Thus, the developmental, testing, and piloting methods, together with recruitment and engagement strategies (or entrée techniques) implemented to build community were carefully considered, as achieving 'critical mass' was key to the success of the online SNAC community. These strategies are described in Chapter Five, and the extent of their success is discussed in Chapter Six, including how the reach of the project was extended to child care staff across *all* child care services and Australia wide. The issue of critical mass itself is discussed in Chapter Ten.

A sample size as such, is not normally required for qualitative research. However, in the case of this study, as quantitative measures were used as part of a triangulation strategy, power calculations were applied to ensure better rigour and reliability. In particular, it was important to understand the number of participants required to complete the pre- and post-intervention survey (detailed later in this chapter) to ensure statistical significance was attained. In consultation with a statistician, an 'a priori' power calculation was performed to determine an adequate sample size to detect a small-medium treatment (pre-intervention vs. post-intervention) and level of interaction (active member vs. passive active members) effect on change in the dependent variables. Pre- and post-tests were used to determine the change in a range of independent variables, namely knowledge, efficacy, attitudes and sense of community. Four dependent variables could conceivably be used in a model, therefore a Bonferroni corrected alpha level of 0.0125 (i.e., α = 0.05/4) has been applied to the power calculation. Using a power of 0.8, α = 0.0125, a correlation of within subjects repeated measures = 0.5, for a small-medium interaction effect (Cohen's f = 0.15), 172 subjects were required to see a difference between the dependent variables across the intervention and level of interaction.

Data collection

Techniques and tools

Data gathering is a vital netnographic component and relies on communication with and between members of the online community. Online this occurs in many different forms, but ultimately it is the individual members and the community, *not* the website, with whom these connections needed to be forged (Kozinets, 2010), that is between the researcher and the SNAC members. Moreover, multiple data collection strategies are

recommended to ensure rigour in qualitative studies (Baym, 2009), thus a comprehensive series of data collection points were implemented. Whilst a netnographic approach underpinned this study, multiple data collection points, beyond those generated on the SNAC website itself, ensured that many and varied participant perspectives were gathered.

Data were collected when a new member registered on SNAC, during the course of their participation, and at the end of the intervention. As a research project, SNAC operated for a period of 17 months between August 2013 and December 2014, although the website still remains live and available to the child care sector as a valuable resource. Table 3.1 provides an overview of the data collection methods implemented throughout the various phases of Stage 2.

Table 3.1 Timeline and overview of Stage 2 data collection methods

When	What	Dependent Variables	Chapter
Registration for SNAC	*Web analytics* *Qualtrics pre-intervention survey*	Demographic data Attitudes, perceptions and efficacy	6, 8, 9
Ongoing engagement with SNAC	*Netnographic data* – conversation threads, posts, centre websites, Facebook posts *Spontaneous participant observations* – gathered at presentations via emails, telephone conversations, other site visits *Member surveys* – to obtain feedback from early participants (December 2013) *Google analytics* *Web analytics*	Knowledge, attitudes, efficacy, sense of community, website useability Web statistics	6, 7, 8, 9 6, 7, 8
End of intervention	*In-depth, semi-structured exit interviews* *Qualtrics post-intervention*	Knowledge, attitudes, efficacy, sense of community, website use and useability Demographic data, attitudes, efficacy, sense of community	6, 7, 8, 9

Qualitative data collection techniques

Online data

Key to the netnographic approach used in this study, conversation threads and comments made on SNAC were captured for analysis, from the launch date of 1st August 2013. The SNAC Facebook page (detailed in Chapters 5 and 6) was also a useful source of data as both SNAC members and non-members posted and commented on various topics, thus it was possible to capture these data through the 'newsfeed' function.

As the project progressed, it became apparent that many child care centres have active websites, as do many other businesses. Before attending a centre to promote SNAC, a Google search was conducted to establish if a centre website existed, in order to gain some insight or background information prior to the site visit.

Reviewing the centre's website was a useful source of information about weekly menu plans, as these were often posted on their websites for parents. Most of the posted menu plans lacked sufficient detail to facilitate an in depth menu assessment, however, they were a valuable means of assessing compliance with the menu planning tools available on SNAC. For example, menus do not typically supply recipes or an explanation of food items and their components, but it was still possible to evaluate the quality of the menu to some extent, the amount of food variety and the number of discretionary food items offered. These data were useful as an independent measure of demonstrated nutrition knowledge and menu planning abilities. Moreover, as these data were available in the public domain, ethical clearance was not required, although care was taken to de-identify all data and maintain participant confidentiality through the use of pseudonyms and paraphrasing (Kozinets, 2002).

Spontaneous participant observations

Free presentations were offered to child care centres in Western Australia, as a recruitment and engagement strategy, and are described in Chapters 5 and 6. These presentations offered the researcher an opportunity to capture spontaneous observations of the activities and actions of the staff attending, and was a useful tool for gaining a greater understanding beyond the spoken word (Bowling, 2009). Detailed notes and reflections were made immediately after each site visit as researcher observations are also an important construct of intermix, the interconnection of online and offline social interaction described by Kozinets, (2010). There were also a number of emails and telephone conversations about SNAC or associated topics with SNAC members. Some of this content was important as it provided another perspective and raised some interesting concepts, thus was useful as an additional source of data.

Interviews

In-depth, semi-structured qualitative interviews commenced in September 2014 (after SNAC had been operational for approximately 14 months), through to March 2015. The purpose of these interviews was to gauge how the website was used, if it helped to increase participant's nutrition knowledge and confidence to provide a healthy eating environment, and to examine any developing sense of community resulting from their interaction with SNAC. In qualitative research, interviews are considered as the 'gold standard' to facilitate comprehensive discussions between the researcher and participants (Barbour, 2014). This method expedited the collection of rich, descriptive data, which represented participant viewpoints and provided flexibility for the gathering of unexpected data (Bryman, 2012). The question guide used to facilitate these interviews is provided as Appendix 7.

The two criteria applied were geographical location and the level of interaction with the SNAC website. The geographical location was important to ensure a representative sample was selected. The level of interaction with SNAC alludes to the 'natural comparison' group described in Chapter 5 (page 135).

Geographical location was classified according to the Australian government site www.doctorconnect.gov.au. The Australian Standard Geographical Classification - Remoteness Area (ASGC-RA) system allows for comparisons between 'city' and 'country' Australia (Department of Health, 2015). The Remoteness Area (RA) categories are RA1 Major Cities; RA2 Inner Regional; RA3 Outer Regional; RA4 Remote and RA5 Very Remote and have been calculated by "measuring the road distance to the nearest Urban Centre in each of the five classes based on population size" (Department of Health, 2015). These classifications were also utilised by ACECQA in their Annual Report (2014a), to examine the effect of remoteness on the quality ratings applied to centres. These were considered appropriate to this study as they offer a means of categorising SNAC members according to their geographical location, and therefore ensuring a representative sample is achieved. Whilst ACECQA maintained that remoteness "has a minimal effect on the spread of quality ratings" (ACECQA, 2014a, p. 62), this study may generate data that suggests otherwise.

As a criterion for selecting interviewees, the interaction levels with SNAC were examined both subjectively and objectively. Subjectively, the researcher was considered to be the ultimate research instrument having been immersed in the SNAC community for the previous 14 months (Gibbs et al., 2007), therefore an intuitive understanding existed of who among the SNAC members would provide valuable data.

These were members who commented frequently with quality posts, and had interacted with the researcher both online and offline.

Objectively, it was possible to estimate the number of times a member had logged on to SNAC, and approximately how many pages they clicked through whilst signed on. However, this function was not 'switched on' until March 2014, some nine months after the site was launched, due to the management console developmental issues detailed in Chapter Five (page 149). This meant not all web analytical data was captured from the launch date. Moreover, some members appeared to remain signed on indefinitely, thus it was difficult to gauge their true online habits. However, login status did highlight that 80% of the members not known to the researcher had browsed the website regularly, but had never posted or commented in the community forums. Another management console function also allowed the identification of 'non-users' (11%), those who registered but never returned to the site. This sub-sample was important as they could provide diverse data enabling the researcher to analyse the differences in member experiences (Gibbs et al., 2007) of SNAC.

Other management console functions also provided the number of posts or comments per member, but as the discussion boards were not 'buzzing', there was not enough data generated for this to be a meaningful method of differentiating between active and inactive members. Hence, this objective numerical definition was considered too simplistic and did not allow for the intuitive understanding, gained from the netnographic process of being a community member, of how best to draw a sample group (Gibbs et al., 2007). The researcher was therefore keen to establish a more appropriate set of definitions for SNAC members, according to their level of interaction, which are presented in Chapter Six.

Having applied these two criteria, and once potential interviewees were identified, they were contacted either by email or telephone to arrange a convenient time and interview location. As registered SNAC members were dispersed across all States and Territories in Australia, their location largely determined whether interviews were conducted in person or by telephone, due to the researcher's limited time and travel budget. However, some WA participants also preferred to be interviewed by telephone despite being within easy travelling distance of the researcher. Face-to-face interviews were also augmented with researcher notes about the individual, the centre and any other significant information observed during the visit, a common method of ensuring multiple sources of data collection (Gibbs et al., 2007).

The more active SNAC members who had previously interacted with the researcher were keen to provide their feedback and were willing to be interviewed, but it was considerably more problematic to persuade 'unknown', inactive members to engage at this level. The hardest SNAC members to recruit for an interview were those who, after their initial registration never returned to the community. To overcome this reluctance, a compromise was offered, in that they gave 5-10 minutes of their time by telephone, to provide brief answers to a number of questions about SNAC. These brief, 'focused' interviews (Bryman, 2012, p. 213), whilst not ideal, did provide some insight into their reluctance to access SNAC after their initial registration.

Many members preferred to be interviewed by telephone regardless of their location, thus it was important to address potential concerns about the suitability of telephone interviews in qualitative research (Sturges & Hanrahan, 2004). It has been suggested that when interviewing by telephone, there is potential for reduced rapport between the interviewer and interviewee, loss of non-verbal data such as facial expressions, loss of contextual data and a loss or distortion of the verbal data itself (Irvine, Drew, &

Sainsbury, 2012). However, telephone interviews are also considered a cost effective data collection method that may help overcome respondent reluctance (Sturges & Hanrahan, 2004), as experienced in Stage 1 of this project. This meant that potential respondents who were unwilling to be interviewed in person may have been more willing to agree to a telephone interview, thus capturing important data otherwise lost. Moreover, Sturges and Hanrahan's study (2004) also found that this mode of interviewing did not influence the quality or number of the responses.

Although Irvine et al., (2012) suggested concerns about the 'unnatural' nature of telephone interviewing, they also recognised that Australians are accustomed to communicating both formally and informally by telephone, and others have reported it is possible to establish new ways to develop and maintain rapport with telephone interviewees (Stephens, 2007; Sweet, 2001). It was found that by adopting a friendly, informal approach to the interviews and by explaining I would "like to have a bit of a chat about SNAC", that this encouraged interviewees to talk about their own experiences in a relaxed way. In addition, using verbal cues to advertise the researcher's online presence and interest in the conversation, such as "mm hmm" or "okay" (Irvine et al.) ensured that rapport was established.

Exit interviews - sample size and saturation

The following discussion about sample size and saturation relates to the qualitative exit interviews only, as one of the major sources of data collected at the end of the intervention period. Discussion about the adequacy of the number of members registered for and interacting with SNAC is provided in Chapter 6.

A method of ensuring an adequate sample size is regularly acknowledged as interviewing sufficient participants until 'data saturation' is achieved (Francis et al.,

2009) but often an explanation of *what* data saturation means and *how* it was achieved is not provided (Bowen, 2008). Data saturation is described as the absence of any new themes, findings, concepts or problems in the data, but there is no agreed method of establishing this (Francis et al., 2009). It has been proposed that the saturation concept is not always an appropriate quality control method and the focus should be less on sample *size* and more on sample *adequacy* (O'Reilly & Parker, 2012). Bowen describes meeting the requirement for adequacy by obtaining data from multiple sources to ensure depth, as well as from enough participants to ensure breadth, thus both 'saturation and replication' are important (2008, p. 141). Importantly, the limitation of any sample shortfall should be made apparent to ensure the transparency of the study (O'Reilly & Parker, 2012). Francis et al. (2009) have suggested that a sample size larger than required is unethical as it wastes research funds and participant time, whereas a sample size that is too small could produce insignificant, un-transferable data.

Quantitative data collection

A number of quantitative data collection points were implemented as part of the triangulation strategy to ensure differing study aspects were discovered and investigated, leading to stronger findings, enriched interpretations (Rothbauer, 2008) and the overarching trustworthiness of the study. Kozinets (2010) noted that netnography is often more efficient when combined with other data collection methods, and combining netnography with targeted surveys, such as the pre- and post-intervention survey, could increase validity.

A pre- and post-intervention survey was administered that provided demographic data, and measured variables such as attitudes, confidence and sense of community. Web analytical data were available via the management console, which together with Google Analytics data, measured how SNAC was utilised and the growth of the community.

Pre-and post-intervention survey

Pre-intervention, a comprehensive survey was administered to new SNAC members as they registered, to collect demographic data and measure attitudes, confidence and sense of community. This survey was administered electronically via Qualtrics (2012) as part of the website registration process between the launch date of 1st August 2013, and the data collection closed on 31st July 2014. Participants who had completed the pre-intervention survey were then invited to complete the same survey post-intervention, which included additional questions to measure sense of community (Appendix 8).

This survey was based on previously used and published instruments, which have tested and rationalised the questions therein. Firstly, Lofton and Carr (2010) designed a questionnaire to measure holistic, overarching perceptions of a wellness environment within the child care setting. This instrument was adapted to incorporate a 'healthy eating' environment for this study and was believed to be an appropriate measure of perceptions and attitudes. Original questions pertaining to physical activity or the physical environment were removed, and only questions relating directly to food and nutrition or healthy eating were retained. The wording of some statements alluded to American data or programs so they were adapted to suit an Australian population. A number of statements were also excluded as they were not deemed appropriate to the Australian context. For example, Lofton and Carr's (2010) questionnaire includes the question (Q.2, Section 2): "children are receiving healthy beverages (water, 100% juice, low-fat milk) throughout the day". This was amended to omit the option of 100% juice as according to the Australian Dietary Guidelines, water or milk are the recommended options (NHMRC, 2013). See Appendix 9 for details of specific questions omitted or adapted.

Secondly, Brenowitz and Reeves Tuttle (2003) developed a nutrition-teaching specific self-efficacy scale, adapted from two other science and health-teaching efficacy scales, which were reviewed by experts and pretested with a number of teachers. Internal consistency was established and the scale was determined to be a valid measure of nutrition-teaching self-efficacy (Brenowitz & Reeves Tuttle, 2003). This is relevant as child care staff are engaged with the children in their care, as well as other educators and parents, about nutrition and healthy eating. This questionnaire was a tested and reliable nutrition specific self-efficacy scale appropriate for use in the child care setting and questions have been adapted to ensure they are appropriate to both the Australian and the child care context. For example, questions referred to the Australian Dietary Guidelines as opposed to the American Food Group Pyramid. Questions have also been adapted to steer away from specific 'teaching' statements, to confidence about their own knowledge of key nutrition concepts. See Appendix 9 for details of specific questions omitted or adapted.

Thirdly, Chavis, Lee and Acosta (2008) developed and tested a revised 'Sense of Community Index' (SCI-2) that covered all attributes of a sense of community as described in the original theory, but using a Likert scale instead of a true/false answer option. The scale was tested on a large sample of 1800 participants and results indicated a reliable measure (coefficient alpha = 0.94). The SCI-2 index has also been tested on an online community and the original four factor structure proposed by McMillan and Chavis in 1986 was validated (Abfalter et al., 2012). However, Abfalter et al. proposed amendments to the SCI-2 index when specifically measuring sense of online community, by omitting a number of questions that were suggested as irrelevant. Although Dr. Chavis gave his permission for the SCI-2 index to be used in the SNAC study, this permission was specifically for the original format he designed and tested

with Lee and Acosta. Thus, the original SCI-2 index was used, without incorporating the amendments suggested by Abfalter et al.

Given that this survey was based on three already validated data collection instruments, it was not tested on the study population prior to general release. It was however, checked for face validity and tested for logic flow on Qualtrics by the supervisory panel.

Ethical considerations

A fundamental ethical consideration when conducting research online is whether online communities are considered private or public spaces. Participative netnography, where the researcher interacts with the online community, belongs to 'human subjects research' within the code of ethics, thus it is essential that informed consent is obtained from online research participants (Kozinets, 2010). The SNAC website was classified as private, as new members could only obtain a user name and password once they had given explicit consent to participate in the study.

A report detailing additional ethical considerations relevant to Stage 2 of the study was developed and submitted to the Ethics Committee at Edith Cowan University. This report included details about IT development, sampling procedure and size, a newly developed quantitative survey to be administered pre- and post-intervention and recruitment strategies. Approval for these amendments was received from the Ethics Committee in June 2013, effectively authorising the launch of the SNAC website.

A specific set of website Terms and Conditions were developed (Appendix 10), and were made available to new members when they registered to use the SNAC website. New members checked a box to confirm they had read and understood the information letter and Terms and Conditions, and consented to taking part in the study. These

documents, together with the researcher's contact details, were also made available on the SNAC website.

This study adhered to the principles outlined in the 'National Statement on Ethical Conduct in Human Research' (National Health and Medical Research Council [NHMRC], 2007) and the 'Responsible Conduct of Research' (Edith Cowan University, 2014). In addition to informed consent, and due to the online nature of this research, specific care was taken to protect the identity of SNAC members, the information they supplied and the way that this data was then analysed, disseminated and stored (Edith Cowan University). All participant names, whether their actual or user name, were replaced with completely unrelated pseudonyms, as were the names of centres mentioned in the findings chapters.

Data analysis

Netnographic data

All netnographic data was captured using NVivo's 'NCapture' function (QSR International Pty Ltd. Version 10, 2012). Spontaneous observations were typed as MS Word documents shortly after the presentation or site visit. Exit interviews were audio-recorded and transcribed verbatim, also as MS Word. Whilst transcription is often considered a laborious task (Bryman, 2012), it allowed the researcher to become immersed in the data.

By observing the concept of *coherence* (Kozinets, 2010), the researcher ensured that all collected netnographic data were integrated into one rational pattern for analysis. This enabled a unified and coherent interpretation of the results, thus assuring confidence in their quality. Data were coded and a concept driven approach was adopted towards developing themes, as suggested by Gibbs (2007), which aligned with the broad themes

of the theoretical framework, namely individual, social and organisational. These broad themes were then refined into sub-categories to provide the rich, detailed description required. The nodes and sub-nodes are tabulated in Appendix 11, which demonstrates the process of thematic analysis and interpretation applied to this data. This enables the reader to follow the interpretative nature of the qualitative analyses employed thus providing another measure of trustworthiness.

Quantitative data

The pre-and post-intervention Qualtrics survey data were downloaded and imported to SPSS for analysis. A Wilcoxon signed-rank test was used to compare the change in dependent variables post-intervention.

Sense of community was measured using the Sense of Community Index 2 (SCI-2) (Chavis et al., 2008). This index contains a total of 25 questions, the first being an initial question to measure the respondents overarching view on his or her sense of community. The remaining 24 questions are organised into four constructs: **Fulfilment of Needs, Membership, Influence** and **Shared Emotional Connection**, each containing six questions (Appendix 8). Each of these questions is structured with a four-point Likert scale to which the respondent can answer *not at all* (0), *somewhat* (1), *mostly* (2) or *completely* (3), therefore scoring of the items ranged from 0-3. Participants' totals were summed to produce the SCI-2 scores (0-72), and were further organised into the four sub-scales according to Chavis' (2008):

Fulfilment of Needs = Q1 + Q2 + Q3 + Q4 + Q5 + Q6

Membership = Q7 + Q8 + Q9 + Q10 + Q11 + Q12

Influence = Q13 + Q14 + Q15 + Q16 + Q17 + Q18

Shared Emotional Connection = Q19 + Q20 + Q21 + Q22 + Q23 + Q24

Descriptive statistics including the means, standard deviations, ranges and inter-quartile ranges were obtained. Reliability analysis was performed to ascertain a Cronbach's Alpha score for each construct and the total sense of community in SNAC. A Spearman Rank correlation test was used to establish if there was a statistically significant relationship, or inter-reliability, between participants' responses to the first main sense of community question and the four constructs.

In addition to this survey data, specifically constructed web analytics and Google analytics were also available.

Web Analytics

Table 3.2 tabulates the data available via the web analytics portal (Chapter 5). Other standardised data were available through the management console and included the total number of users, basic Google Analytics data, and quiz statistics. Demographic data (age, role and location) were downloaded to MS Excel spread sheets and imported to SPSS. Descriptive analysis provided a demographic profile of SNAC members, which is presented in Chapter 6.

Table 3.2 Web analytics

Report	Information provided	Variable measured
Post data statistics	Authorship, date created, number of participants, total responses	Level of interaction with site
Post data with comment list summary	Written comments	May indicate knowledge, confidence, attitudes, sense of community, level of engagement with site
Activity logs	Running log of when members logged on and the website pages they viewed	Helps to identify regular members who do not post or comment Type of engagement with SNAC
Website uses per member	Reports the number of comments made on SNAC posts by individual members. Reports the date of member registration and last log in date	Level and type of engagement with SNAC
Demographic profile data	Captures the information provided at registration – age, role and location	Demographic data
Forum data statistics	Number of posts per overarching forum (not the corresponding sub-forums)	Overarching view of general areas of interest to SNAC members

Google Analytics

Google Analytics is a widely used website statistics service that generates detailed data about website traffic and traffic sources. This is a service usually utilised by profit driven organisations to increase traffic to their website to maximise sales. For SNAC, Google Analytics was a useful tool for measuring how often the site was visited, where members visited the most, how many pages they viewed and their average length of time on the site, as a means of gauging their level of engagement (Table 3.3).

Using Google Analytics charts and graphs, it was possible to build up a cumulative picture of member engagement with SNAC throughout the intervention period, which is reported in Chapter Six.

Trustworthiness and netnographic representation

As standards of excellence in qualitative research are often considered vague or unclear (Kozinets, 2010), trustworthiness and representation are important concepts, allowing rich description of the research design, as a way of demonstrating its rigour, without forcing this description into quantitative terminology (Given & Samure, 2008). Importantly, Baym (2009) noted that generalisability, the mainstay of quantitative research, is neither possible nor desired in qualitative research, and it is comparability or the ability to offer coordinated analyses that is more important. The main concepts of qualitative research – transferability, credibility, dependability, confirmability and authenticity are discussed in this section. Moreover, there are a number of evaluative standards that are particularly useful to netnography, and these are also described alongside the well-known qualitative concepts of trustworthiness.

Table 3.3 Google analytics data

Analytic	Description	What does it measure
Number of sessions	A session is a group of interactions including multiple screen or page views.	How many SNAC members were engaged during a specified time period

Cumulative measures of engagement with SNAC and community growth |
| Number of page views | The average number of pages viewed during a specified time period | Engagement with SNAC

Community growth |
| Channel groupings | How do members find SNAC, e.g. direct log in or referral from another organisation | Familiarity with the SNAC web address |
| Most popular pages | Ranks pages according to number of views | Indicates the aspects of the website with which members were most engaged

Success of engagement strategies such as e-newsletter publications |
| Bounce rate | Percentage of single page visits | Indicates a lack of engagement - members leaving from the entry page |
| Number of new vs. returning member | Understanding how new members act differently to existing members | Engagement with the site

Community building |

Transferability

Transferability is concerned with the rich description of the study in question, in order that its application to other contexts may be readily determined (Given & Samure,

2008). Firstly, the research participants should be linked closely to the context of the research and secondly, a comprehensive picture of the context should be presented, which fully answers the research questions (Jensen, 2008c).

To address issues of transferability, firstly a thick description of the context, participants and research design was provided to enable the transferability of the study to other contexts (Jensen, 2008c). Kozinets (2010) described this quality standard as *verisimilitude,* meaning the description of the research results are credible and realistic, offering a sense of cultural and communal contact and ensuring the reader feels although they have "actually contacted the community, culture and its members" (p.175).

Secondly, purposive sampling was utilised to ensure that the participants represented the context of the research study (Jensen, 2008c). In other words, child care staff were specifically targeted as participants for the SNAC website as they clearly represented the context of the early years setting. Moreover, a broad range of staff that represented all levels of seniority were recruited, further strengthening the transferability of this study.

Credibility

Credibility is concerned with the rich and accurate description of the phenomenon in question (Given & Samure, 2008), and triangulation is a suitable methodological procedure utilised to ensure credibility in this study.

A typical triangulation strategy is the combination of data collection methods at different points in time, enabling data to be collected from several perspectives and in different contexts. The triangulation strategy applied enabled the researcher to discover, investigate and comprehend different aspects of the study that, as Rothbauer (2008)

suggests, leads to stronger, more reliable findings, reduced biases and enriched interpretations. For example, variables such as self-efficacy, sense of community and attitudes were measured qualitatively through the analysis of the discussion board conversations and posts, and a quantitative survey also measured these variables pre- and post-intervention. Moreover, qualitative exit interviews explored the reasons for regular or irregular use of the SNAC website, thus adding value to the web and Google Analytics data. Thus, study credibility was assured as this triangulation strategy confirmed the authenticity of each data source.

Reflexivity is also recommended as an important strategy to ensure the credibility of qualitative research (Pilnick & Swift, 2010). This term relates to the process of critical self-reflection as a researcher and demands that the role of the researcher as an influencing factor is examined (Denzin & Lincoln, 2011). Indeed, both Kozinets (2010) and Baym (2009) acknowledge that an important netnographic quality control measure is reflexivity, where the researcher recognises their own role in the conduct and analysis of the netnography, whilst demonstrating multiple perspectives and inviting other interpretations of the data. This was achieved by offering reflective summaries at certain stages of the research process. For example, in Chapter Five, reflective practice was used to examine the communication difficulties encountered between the researcher and the information technologists during the website build.

Confirmability

Confirmability alludes to the basic aims of qualitative research – understanding the phenomenon from the participant's perspective and the meanings they give to these experiences (Jensen, 2008a). A clear audit trail was maintained and recorded, which allowed a transparent research process, and ensured the essential verification of these processes as a means of providing study confirmability.

Kozinets (2010, p. 173) described this standard as *rigour*, explaining it as the degree to which the research "recognises and adheres to standards of netnographic research". Thus, by maintaining a comprehensive audit trail that verified the research process, and illustrated how the research was conducted following netnographic standards, this study is assured confirmability.

Groundedness is a specific netnographic standard that also assures confirmability. Kozinets (2010) described this as ensuring the links between the data presented and the theories underpinning the study are strong and resounding, and specifically, the researcher demonstrated a thorough understanding of the research participants through their online interactions. The findings chapters present examples from the netnographic data, collected from multiple sources, which support the theoretical framework underpinning this project.

Dependability

A challenging aspect of qualitative research is the constantly changing environment in which the researcher works (Jensen, 2008b). Through thorough groundwork – literature reviews and developing appropriate research designs, the researcher can be well prepared, but may find that the actual context is very different to that anticipated. Making and recording changes to research methods as deemed necessary, is one method of overcoming issues arising in this variable research forum (Jensen). For example, this study originally sought to facilitate focus groups to gather formative data in Stage 1. When it became apparent this was unlikely to happen, the data collection method was adapted to in-depth qualitative interviews. Such changes to the research methods have been documented thus ensuring the dependability of the study.

Authenticity

In order that authenticity may be confirmed, researchers look for confirmation that the conduct and assessment of the research is honest and reliable, both in terms of the participant's experiences, but also on the broader platform of political and social implications (James, 2008).

The first aspect of authenticity to be considered is *fairness*, which ensures that all stakeholder opinions, viewpoints, standards, claims, fears and voices should be evident in the written evaluation of the study, and that failure to do so amounts to a form of bias (Denzin & Lincoln, 2011). This practice ensures that participants are not marginalised and their stories are accurately and fairly presented.

Catalytic and *tactical* authenticities allude to the extent to which the study firstly, prompted the participants to take action and secondly, provided training for participants to take action if desired (Denzin & Lincoln, 2011). From a netnographical perspective, Kozinets (2010) alludes to this standard as *praxis* – the extent to which practical action is aimed at social betterment, and to which the study inspires and empowers social action within the participant group. The findings chapters in this thesis aimed to uphold the principle of authenticity and ensured that participant's stories are accurately portrayed. Moreover, the very nature of the SNAC project and the participatory action research elements used have encouraged participants to take action, and information wrapped in support is available on the SNAC website to facilitate this if required.

Summary

This chapter presented the research design in terms of the epistemological and ontological stance of the researcher, being qualitative and netnographic. In relation to the qualitative, netnographic design, the Spiral Technology Action Research model was

employed as a project management tool to ensure methodological rigour. Aspects of participatory action research, key to this study, were also discussed as appropriate methodologies for data collection.

The research methods section presented the procedures for both stages of the study, together with a comprehensive summary of the data collection methods, instruments and analyses. Finally, methods to ensure study trustworthiness were presented.

The next chapter presents the results of Stage 1 data collection, which in turn informs the development of the intervention.

CHAPTER FOUR:

STAGE 1 FORMATIVE EVALUATION

Introduction

The first aim of this study was to develop a website to assist child care staff to provide and promote an environment in which children's healthy eating practices, behaviours, food habits and preferences could be developed and maintained. Thus, Stage 1 utilised formative research to establish the needs of child care staff in relation to the development of this website, in keeping with the action research elements of the Spiral Technology Action Research model used to manage this research project (H. Skinner et al., 2006). This was achieved by conducting in-depth individual interviews with child care staff at all levels of seniority, from a broad cross-section of child care centres across the Perth metropolitan area and including two regional cities. In addition, demographic data was also collected via a survey administered through Qualtrics (2013) software.

This chapter presents the findings from the qualitative in-depth interviews and quantitative demographic survey, which are presented in a combined results and discussion section and summarised with recommendations for the development of the website intervention. All participant names and locations have been replaced with pseudonyms to protect their confidentiality.

Data Collection

Demographic data

Two rural centres, located in Geraldton and Australind agreed to participate, along with eleven metropolitan centres. Prior to the interviews, demographic data were collected

via a brief Qualtrics survey (2013), which was emailed to each centre for distribution to participants. Consent to participate in Stage 1 of the study was embedded in this survey. However, as some participants did not have a personal email address, paper surveys were provided when requested, which enabled demographic data collection that might otherwise have been missed. Returned paper based surveys were then manually entered into Qualtrics and demographic data from all staff collated (n=48). A descriptive analysis of the data was then downloaded from Qualtrics, which is discussed in the findings section of this chapter.

Qualitative Interviews

A total of 48 semi-structured interviews were conducted during March and April 2013, each taking an average of 20 minutes to complete. Of these, 16 interviews were conducted by telephone (two rural centres and two metro centres) and 32 face to face interviews at the centres. The timing of the interviews was prearranged with the director, as their management role meant they best understood when minimal disruption to centre operations would occur. This ensured that all staff, regardless of their role, had the opportunity to give an interview during their normal working hours, if they chose to do so.

Findings – Survey data

Demographics

Demographic surveys were completed by participants (n=48) prior to their interview. This sample was representative of the child care industry in terms of gender, age, employment type, qualifications and experience (Tables 4.1, 4.2), compared to an ABS report (2011a).

The initial recruitment strategy was to interview child care staff across a wide range of roles, to ensure that multiple perspectives were gathered. Of the sample, all were female, the majority (n=37, 78%) were aged between 19-45 years and had English as their first language (n=42, 88%). A cross-section of roles typically found in the child care industry was represented (Table 4.1).

Table 4.1 Demographic characteristics of sample

Variable	Result	n	%
Gender	Female	48	100
Age	<18 years	2	4
	19-25 years	17	36
	26-35 years	9	19
	36-45 years	11	23
	46-55 years	4	8
	56+ years	5	10
	TOTAL	**48**	**100**
English as a first language	Yes	42	88
	No	6	12
	TOTAL	**48**	**100**
Role in early years centre	Owner/director	11	23
	Early years teacher	1	2
	2IC/group leader	18	37
	Cook	9	19
	Certificate III/trainee	9	19
	TOTAL	**48**	**100**

The current National Quality Framework requires all child care staff to hold or be working towards a minimum of the Certificate III in Child Care Services (ACECQA,

2012). Depending on the number of children enrolled at a service, at least one early years teacher should be employed, who holds a relevant Early Years degree. Less than 15% of participants reported attending university and only 12% had a teaching or other university degree (Table 4.2). This may be reflective of recent legislative changes requiring an early years' teacher to be employed at centre based services from January 2014, and services were still transitioning towards this requirement.

Table 4.2 Employment and education demographics of sample

Variable	Result	n	%
Employment status	Full time	26	54
	Part time	16	34
	Casual	5	10
	Fixed contract	1	2
	TOTAL	**48**	**100**
Highest level of education	High School	20	42
	TAFE	21	44
	University	7	14
	TOTAL	**48**	**100**
Type of qualification held[1]	None	6	12.5
	Certificate III	14	29
	Certificate IV	1	2
	Diploma	27	56
	Early years teaching degree	3	6
	Other teaching degree	3	6

[1] Some educators hold more than one qualification, hence these figures do not equate to 100%

Participants reported length of experience in the child care industry ranged from four months to 35 years, with an average of nine years. Six participants reported they did not hold a relevant child care qualification (Table 4.2). These participants were food coordinators or cooks who, under previous legislation, were only required to complete the food hygiene and safety components of a Certificate III in Child Care Services (Government of Western Australia, 2007). Due to the recent legislative changes, it could be assumed that these child care staff are now working towards the relevant qualification.

Engagement with information technology

A series of questions sought to establish current levels of internet usage for personal and work life, and attitudes towards using social media sites and discussion boards, to gauge child care staff acceptance of a web-based intervention.

All centres had both a computer and internet connection, and the majority of participants (n=44, 92%) reported having access to these facilities whilst at work. Approximately half the participants reported using the internet for work related purposes frequently (either daily, 2-3 times a week or at least weekly), however, 10% reported never using the internet for work related purposes (Figure 4.1). Only one participant reported having no access to a computer and/or internet connection at home.

Most participants used the internet for personal reasons on a daily basis (n=35, 73%), however one participant reported that they never used the internet (Figure 4.1). This is reflective of the internet use of the general Australian population (ABS, 2011b) and others research about child care staff as internet consumers (Weigel et al., 2012). Moreover, this sample is indicative of women who are increasingly using the internet for education purposes (Donelle & Hoffman-Goetz, 2008) and 40% were aged between

19-25 years, who prefer to receive health and education materials via the internet (Colby et al., 2011).
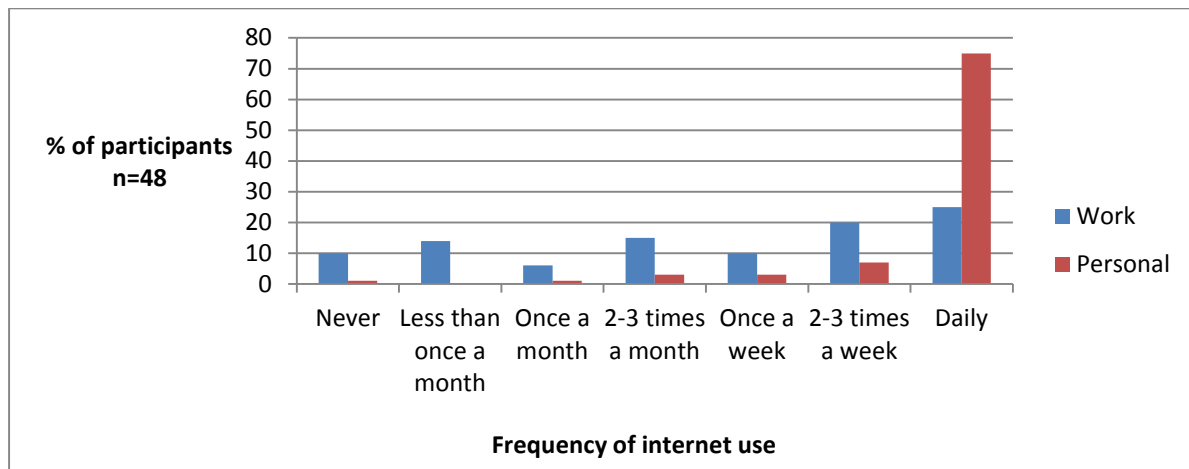
Figure 4.1 Frequency of internet use (work and personal)

Approximately two thirds of participants reported accessing social media sites on a daily basis (Figure 4.2), compared to 50% (n=408) of child care staff who reported using social media regularly in Weigel et al.'s study (2012). The main reasons given for using social media in this study were communication (35%), entertainment (18%) and sharing ideas (15%). The reported use of discussion boards was more limited. Approximately half the participants reported never using discussion boards although 22% (n=10) reported using them on a regular basis (Figure 4.2.). The most common use of discussion boards were reported as searching for information and exchanging ideas.
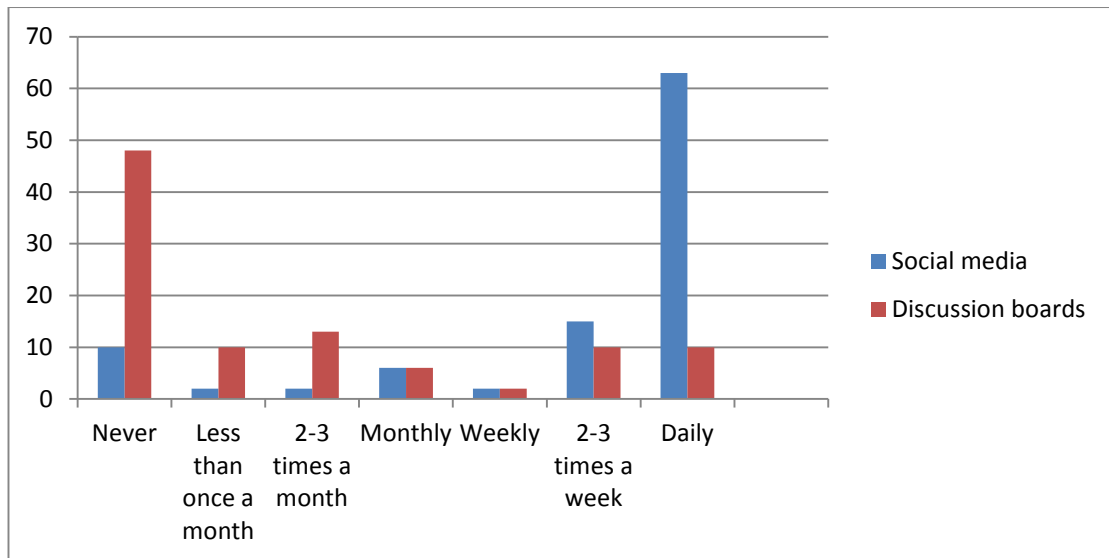
Figure 4.2 Use of social media and discussion boards (n=48)

As expected, the majority of participants used the internet regularly for both work and personal reasons. Social media sites were very popular, discussion boards less so, but based on these data, and from data collected from qualitative interviews, this group appeared to be receptive to a web-based intervention.

Interview data

The themes identified through the initial coding of interview data are displayed in Table 4.3 as categories and sub-categories. The first category described participants' roles in the provision of nutritious food and a healthy eating environment at the centre. Data were organised into categories using the main topic headings from the question guide. Barriers to providing nutritious food or providing a healthy eating environment emerged as an additional category. Some themes were divided into sub-categories for manageability (Table 4.3). Each of these themes or categories are discussed further in the following section of this chapter.

Table 4.3 Categories and sub-categories from Stage 1 interviews

Category	Sub-category
Role in the provision of food nutrition and a healthy eating environment	Description of their specific role Activities in which they engage to support healthy eating?

Resources	Where are resources sourced?
	
	Knowledge/use of:
	
	    Australian Dietary Guidelines
	
	    Get Up and Grow
	
	    Start Right Eat Right

Qualifications	Qualifications held Level of nutrition training Confidence in nutrition knowledge
National Quality Standards	Impact on centre Impact on individual Assessment process
Food and nutrition policy	Knowledge of policy Knowledge of policy details
Attitudes towards providing a healthy eating environment	Importance of providing a healthy eating environment Belief that a healthy eating environment is provided
Networking	Opportunities to network Value of networking
Informing Stage 2	Attitudes to using discussion boards as a means of networking Attitudes towards online training What makes a good website? What would they like to see included?
Barriers to providing a healthy eating environment	Parental influence Children's preferences Staff attitudes

Role in the provision of food, nutrition and a healthy eating environment

Participants were asked to describe their role at the centre, and the involvement they had with the provision of food or the promotion of a healthy eating environment. This involvement varied significantly depending on their role at the centre. Directors have ultimate responsibility for the centre and reported being heavily involved with the menu planning, shopping and food provision, in a management capacity. As expected, cooks and food coordinators played a key role in food preparation, and were usually involved in menu planning, sourcing new recipes and food presentation.

The role of group leaders, early years teachers, junior staff and trainees who were caring for the children 'on the floor', included practical daily activities such as nappy changing and behaviour, mealtimes and planned curriculum activities. Many participants reported being an active role model at mealtimes; sitting with the children as they ate, and demonstrating positive mealtime behaviours, such as encouraging children to try new foods and eating the same foods. This is an encouraging finding, given that the child who observes a significant adult enjoying healthy food may have their own preferences profoundly influenced (Benton, 2004). However, these findings should be treated with caution, given that Eronisho et al. (2012) reported 25% (n=28) of educators who reported modelling healthy behaviours were actually observed engaging in less positive behaviours.

However, evidence of planned curriculum activities to build a healthy eating environment was less apparent. It is a requirement of the National Quality Framework that there are planned curriculum activities around food, nutrition and healthy eating that "incorporate discussions and activities about healthy eating and caring for their bodies into children's everyday experiences" (ACECQA, 2012, p. 61). Examples of such activities are the educational resources and activities offered by Dairy Australia

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(2013), which introduce children to concepts about "paddock to plate" and "healthy bones". Research has demonstrated that teaching children about the nutrients in their food may increase their consumption of healthy food choices (Gripshover & Markman, 2013), thus child care staff who are excluding the topic of healthy eating from their planned curriculum activities, whilst not mandated, may still be missing opportunities to promote a healthy eating environment in the child care setting.

Resources

Participants were asked to recall resources that they already use or may have heard of, which guided the provision of nutritious food and the promotion of healthy eating within the child care setting. More than half the participants (52%) stated they simply used the internet to search for resources and information about food, nutrition, recipes and healthy eating (Table 4.4). However, several participants admitted that they could not be sure of the validity or reliability of the information, such as recipes, menu planning tools and nutrition information retrieved from the worldwide web. Similarly, a study by Gibbons, Graham, Marraffa and Henry (2000), found that most child care staff relied on newspapers, magazines or food company brochures for information about nutrition, and few considered approaching a reliable source, such as a dietitian.

Participants were asked specifically about Get up and Grow (DoHA, 2013) and the Australian Dietary Guidelines (NHMRC, 2013), as these are the resources prescribed by the National Quality Framework (Quality Area 2) to guide the provision of nutritious and varied food. Responses varied, with many participants (63%) reported having never heard of Get up and Grow and about a third (37%) who reported knowing about the program but had not used the resources (Table 4.4). Few participants (12%) actually reported using the resources. Similarly, about half of the participants (54%) knew of the Australian Dietary Guidelines, but only 10% reported actual use. Few were aware

that these guidelines had recently undergone a major review and now included specific recommendations for children aged 2-4 years (NHMRC, 2013).

Participants were also asked to recall the "Start Right-Eat Right" (SRER) program (Government of South Australia, 2010) as it successfully promoted healthy eating environments for child care settings in other states, and was considered a reliable, robust resource (Golley et al., 2012). Two directors were originally involved with the SRER program in Western Australia, so were familiar with the resources and actively used these (12%), along with others. Many participants (60%) however, had not heard of the SRER program and its associated resources (Table 4.4).

Table 4.4 Participants (n=48) reported use of nutrition resources

Resource	Recognised		Using	
	n	%	n	%
Australian Dietary Guidelines	26	54	5	10
Get Up And Grow	18	37	6	12
Start Right – Eat Right	19	40	6	12
Google/Internet	n/a	n/a	25	52

Other resources used by participants but not commonly reported, included Nutrition Australia's "Healthy Eating Pyramid", various child health books, other child care organisations such as Child Australia, materials received on training courses, such as the "Caring for Children" book, produced by NSW Department of Health in 1992

(Bunney & Williams, 2005), which was based on obsolete dietary guidelines. Some junior staff reported that they would simply ask their director or a more senior member of staff if they had a query about nutrition. Directors and cooks reported searching for recipes on the internet and commonly accessed cooking sites that may not necessarily provide child-friendly recipes, in terms of fat and sugar content. Given the lack of demonstrated nutrition knowledge and training, the directors and cooks may not have the skills to effectively modify these recipes in line with healthy eating recommendations. It has been recommended that staff responsible for sourcing recipes and planning menus, should have a higher level of nutrition training and knowledge to be able to successfully develop a nutritionally adequate menu (Gibbons et al., 2000).

Qualifications

The quantitative demographic data presented at the beginning of this chapter illustrated that the majority of participants had, at a minimum, a Certificate III in Child Care Services or a Diploma in Child Care Services, although far fewer had obtained a university level early years degree. Participants were asked about the content of their mandatory training, specifically if any basic nutrition concepts were taught, and whether they believed it equipped them with sufficient nutrition knowledge and confidence to promote a healthy eating environment.

Most could recall the menu planning and food safety components of their mandatory training, but reported that there was little, if any, content about basic nutrient concepts, role modelling or dealing with fussy eaters. Several noted their training was such a long time ago they could not recall the specific content, although others who had completed their training fairly recently, could not recall specific content either. It was reported that the higher level training, Diploma of Child Care Services and early years teaching

degrees, do not contain any nutrition or healthy eating units, and are focused on management and educational strategies.

When asked to what extent food and nutrition concepts were covered, one director had a very firm opinion about the value of the Certificate III training:

> I think it mentions those words once or twice, yeah. Is the module worth anything? Like, I think valueless, but then I think Cert III is pretty valueless. It's been watered down so much along the way so that they could get staff through it, or staff interested in doing it, so it's been simplified and corners cut off here, there and everywhere, that now, it's all stuff they could learn by being here [at the centre]. I don't think it gives them any good background stuff" (Katie).

Some of the food coordinators reported they held no mandatory qualifications, which may be due to the training required under former legislation, that being completion of only the menu planning and food safety components of a Certificate III in Child Care Services. According to Gibbons et al. (2000), cooks and food coordinators should have a higher level of nutrition training and knowledge to be able to successfully develop a nutritionally adequate menu. These findings suggest that participants considered there is little formal nutrition training that is useful to optimise children's physical growth and development and the formation of lifelong food habits. Hence, despite Pollard's research on food and nutrition in the child care industry conducted fifteen years ago (1999), which reported that food preparation staff had limited nutrition training and recommended the implementation of legislative changes to ensure statutory nutrition and food hygiene training, little seems to have changed. In light of participant comments above, it appears that the training mandated as a result of Pollard's research has been 'watered down' over the years and as such, does not now equip trainees with the required skills. These comments illustrated the need for refresher training, with a

focus on basic nutrition concepts as well as menu planning and food hygiene. In the words of another director:

> Very, very important [training]. And there should be something formalised. There should be that training where you could get to that tool to see what you're doing, because there isn't at the moment, isn't it? You do the nutrition and food handling - yes. But after that, that's it and many of them doing the module and there are no refreshers or anything unless it's your own initiative that you do what you do. Because whenever we hit a barrier with additives and that, we've got to get on and Google it or get to the net or the Health Department or whatever and get your answers (Vi).

Many welcomed the concept of nutrition refresher training on an ongoing basis, consistent with American research where staff (n=10) requested improved resources and more specific child nutrition training (Romaine et al., 2007).

Confidence in nutrition knowledge

Some participants expressed a lack of confidence in being able to talk with parents about nutrition and healthy feeding practices. For example, an educator described how a child aged 3 years was sent to the centre with a bottle of milk each morning instead of being provided with breakfast. The educator knew that this was inappropriate for a child of that age, but she did not have the confidence to talk with the parents as she might be 'stepping on their toes'. Lynch and Batal (2011) corroborate this educator's concerns, stating that child care staff often felt uncomfortable discussing child nutrition with parents and tended only to discuss more general issues, such as the child not eating much overall, rather than specific nutritional concerns.

Five participants stated that they were confident in their nutrition knowledge, after having readily acknowledged that their statutory training did not include basic nutrition concepts. This could be considered as a false sense of confidence and should be

regarded carefully, given that the reliability or accuracy of the nutrition knowledge sources utilised is unclear. This apparent gap between high confidence and low nutrition knowledge will be assessed further in Stage 2.

National Quality Standards (NQS)

Participants were asked about the impact the implementation of the National Quality Standards (NQS) legislation had on the centre and their own workload. The NQS took effect on 1st August 2012, and the regulatory body in Western Australia, the Education and Care Regulatory Unit (ECRU) (Department of Local Government and Communities), is in the process of assessing each centre under the new legislation.

As expected, the biggest impact was reported by directors who have overall responsibility for centre operations and for implementation of new legislation. Whilst many directors reported an increased workload, some described it as an 'evidence gathering' exercise as they believed the correct practices were already being followed. Many junior staff did not report any impact from the new legislation, seeming almost shielded from any associated work related stress and stating that their director would just 'tell them what to do'.

Participants were asked specifically about NQS Quality Area 2.2 and the resources they are guided towards in relation to the provision of nutritious food under this legislation (Get Up and Grow and Australian Dietary Guidelines). Some reported they did not know what the guidelines advised or which resources were recommended, substantiating the lack of reported knowledge about recommended resources prescribed for child care services. However, several participants, whilst not being able to recall the guidelines, were confident that they would know where to find this information.

The issue of clarity provided by the NQS was also raised. Quality Area 2 states that food must be nutritious and varied (ACECQA, 2012) and some participants believed this guidance was vague, did not offer clear expectations of what was expected in terms of the provision of nutritious food, and moreover, were open to individual interpretation, both by staff and ACECQA assessors.

> I think they're too broad. I don't think they specify enough, like with the five food groups and how... I don't think they specify enough. I also think that somewhere along the line there should be something about the parent education (Vi).

Several centres had already been assessed and their directors willingly provided feedback about the assessment process and the rating their centre received. The director of a centre that was the first to receive an 'Excellent' rating in Western Australia, found the process fair and manageable. Their fortnightly menu plans were developed using a Cancer Council menu planning tool that the assessors sighted.

On a less positive note and highlighting an apparent inconsistency in the assessment process, the director of another centre who received a lower rating (Working Towards Standards) described her annoyance at the assessors 'obsession' with food safety and hygiene. The centre had recently passed a rigorous environmental health inspection by a specialist, external company but the NQS assessors were dissatisfied with a relatively minor aspect of food safety and hygiene in one room, whilst omitting to assess the six week menu plan for adequate nutrition and food variety.

We'd have it [food hygiene and safety practices] assessed by an external, suitably qualified expert who said 'yep!, we were perfectly on track, stick with it, absolutely fantastic. The review people came in, not good enough, not enough of this, not enough of that, more paperwork, more paperwork and we just threw our hands in the air (Katie).

This director was clearly disgruntled at being awarded this rating in spite of their reported hard work, although it should be remembered that these are the perceptions and beliefs of one person. However, whilst these perceptions and beliefs could highlight potential inconsistencies in the NQS assessment process around food and nutrition, it clearly exposes the many challenges and influences faced by child care centres in the provision of nutritious food and a healthy eating environment.

Food and nutrition policy

As part of the National Quality Framework, each centre is required to have a food and nutrition policy. Participants were asked if they were aware of this policy, whether they were involved in its development and what restrictions it places on them in terms of the food and drink they were allowed to bring to the centre.

Participants were aware of the centre's food and nutrition policy, and most had a reasonable idea of the content. The bigger child care companies, such as Goodstart and YMCA, have a blanket policy developed by their head office, which applies to all centres. In contrast, the community based, not for profit services reported that staff and parents would typically be involved in the development and implementation of the food and nutrition policy.

Most participants were aware they were not permitted to bring foods containing allergens such as nuts and eggs to the service and were only allowed to drink water in front of the children. Most reported they would eat the same food as the children at

mealtimes as a way of role modelling healthy eating behaviours. Several directors stated that what the staff ate and drank in the staff room during their lunch break was their own business, provided they did not consume discretionary items in front of the children.

Attitudes towards providing a healthy eating environment

When asked if they believed that the food provided at centres should be nutritious, the overwhelming response was positive (n=48), with many participants (n=30) expressing the belief that the food children received at home was not nutritious. These expressed attitudes could be influenced by social desirability, specifically "the desire to present oneself in a socially conventional way" (Fisher & Katz, 2000, p. 107). However, child health and obesity prevention are very topical, and the positive attitudes towards providing nutritious food seemed entirely genuine. Hours of work and limited time for shopping and cooking were cited as the main reasons that child care staff believed poor food choices were made by families. However, many participants believed that parents should share the responsibility for the provision of nutritious food, and that it was not the sole responsibility of the centre. This participant stated, when asked if parents should share this responsibility:

> I would hope so, but I know that a lot of parents are busy. They'll work long hours, they'll go home and maybe that's not the top of their priority list, starting from scratch to prepare a good nutritious meal. Maybe they don't have time, maybe for them it's not a priority. I'd like it to be (Lola).

Whilst participants believed that parents should share the responsibility for fostering their children's healthy eating behaviours, they readily acknowledged that the centre also played an important role. Although Lynch and Batal (2011) reported child care staff believed it was difficult to create a healthy eating environment at the centre if

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parents allowed their children to eat unhealthily at home, this was not the case with these participants. They stated that *because* they thought some parents allowed their children to eat unhealthily at home, it was even more important to create a healthy eating environment at the centre.

> Well, I think it is because a lot of these kids go home at six o'clock at night and Mum's tired, she's worked all day too and makes them a Vegemite sandwich and throws them into bed, because that's how it goes in this day and age, isn't it? It was different when I brought our kids up – there was a family meal at night because we were home and we made it and we all sat down together, but listening to what goes on in families these days, it doesn't seem much like that anymore (Imogen).

This was reflected in some participant comments about how important it was to talk with parents about what their children ate whilst at the centre, as some often refused to eat certain foods at home. For example, it was reported that many children readily ate vegetables and drank water at the centre, to their parent's disbelief:

> Yes, some parents do it and some parents come and ask us how come their child eats vegetables here but they can't get them to eat at home. So they're very surprised at this, and that's what we say to parents that we encourage them to eat fruit and if they can do the same at home, then it's helpful for us (Imogen).

These comments and reflections reinforced the need for staff to have confidence in their nutrition knowledge so they can broach sensitive topics with parents, and create partnerships to enable a healthy eating environment for children can be built and maintained.

On a less positive note, there were some participants who displayed attitudes that were less conducive to creating a healthy eating environment. For example, the director of a community based service stated:

> At lunch we eat with the kids as well…….obviously it's unfair if we're sitting there eating a piece of cake or something (Myra).

This comment seemed to suggest that this director perceived the practice of eating cake to be 'unfair' (to the children) rather than inappropriate in terms of promoting healthy eating. It is appreciated that not all cakes are necessarily unhealthy, and low-fat, low-sugar varieties are acceptable as occasional foods in the child care setting. However, when visiting this particular centre to conduct interviews, a party sized chocolate and cream cake was on display in the office, ready to be shared amongst the staff, but out of sight of the children. This illustrated a disparity between their attitudes towards providing a healthy eating environment for the children, and their own healthy eating behaviours, by disregarding these healthful concepts 'behind closed doors'.

At another centre, a junior staff member expressed her annoyance at not being allowed to bring soft drinks onto the premises:

> Yeah, I think that sucks……we're not even allowed to bring soft drinks into the centre (Nadia).

The attitude of this junior staff member may be associated with her youth, a lack of knowledge or complacency about the potential health effects of soft drink consumption, despite her readily acknowledging that she does not allow her own child to consume 'soft drinks'.

Networking and discussion boards

Anecdotal evidence gathered prior to this research project indicated that child care staff would find the opportunity to network with staff from other centres beneficial. It can be difficult for child care staff to meet regularly due to their working hours, and the geographical location of many rural and remote services. Thus given the advancement of technology and the accessibility of the internet, discussion boards were seen as an efficient platform on which to promote an online community within the child care industry. This is supported by US research, where child care staff rated discussion boards, as a means of communicating with others, as important (Weigel et al., 2012).

Most participants reported opportunities to network with staff at other centres were limited. Some centres conducted 'in house' training after the centre closed, as all staff were available. Larger child care companies, such as Goodstart or Buggles, often provide workshops or training where staff from several centres attended. However, some participants indicated that educators preferred not to network outside of their own group:

> Occasionally we will, but if it's in a larger group with about three or four other centres, we will sit at our centre tables unless we're, not forced, but unless we're encouraged to mingle with the others and have an ice-breaker just to get us talking to each other. Most of us seem to stick to our zones (Lou).

It has been suggested that because of a lack of physical attendance, online discussion boards afford participants a greater freedom to express themselves, and a place where questions can be asked without fear of embarrassment, due to their anonymity (Pendergast, Garvis, & Kanasa, 2013). Thus, discussion boards and the internet could be considered a valid avenue to overcome the apparent reluctance of child care staff to

network with others at face to face workshops or training sessions, and provide professional development opportunities (Weigel et al., 2012). Furthermore, it appears that directors had the greatest opportunities for networking as several engage through committees and have regular meetings with other directors.

There was a mixed reaction to the concept of discussion boards as a means of e-networking. Two participants, both older cooks, apparently without child care qualifications, indicated they did not use a computer or the internet, and stated categorically that they would not use discussion boards for any reason. Older and less educated staff have been reported as less likely to use the internet for social networking, compared to older, better educated people who used the internet more to find information for themselves and their work (Weigel et al., 2012).

Other participants indicated they would find the proposed website and discussion boards a useful tool and would use it to search for information, although they might not necessarily contribute. This response to the concept of discussion boards is supported by the demographic data, which reported that almost half of this sample group do not use discussion boards (Figure 4.3). However, online communities are more than discussion boards alone, as by definition, they are not limited to existing purely in an online setting (Howard, 2010). It may be by virtue of becoming involved in this online community, that child care staff find a new way of connecting with their colleagues, given their ability to overcome the barriers of time and distance (Kraut & Resnick, 2012) and the promise of anonymity (Pendergast et al., 2013).

Online activities

Many child care staff already accessed training online, such as the 'I'm Alert!' food safety and hygiene course (Alert Visual Concepts, 2012), child protection (Department

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for Child Protection and Family Support, 2015) and anaphylaxis courses (Australasian Society of Clinical Immunology and Allergy [ASCIA], 2012).   Some participants reported online training to be easier for completing tasks at an appropriate pace and suitable time. Another stated that because of her shyness, she would prefer to work alone rather than in a group environment. Conversely, there were some who reported a preference for a group or workshop environment where they can share ideas with co-attendees and enjoy time away from the centre. It has been suggested that child care staff gain skills from both on-site workshops and online training (Powell et al., 2010) and that many would prefer a combination to maximise their learning opportunities (Weigel et al., 2012).

Apart from the few participants who indicated that they would not use internet based computer training, all other staff were in favour of online activities, as these activities have the potential to offer 'information wrapped in support', refresh their current nutrition knowledge and add value to the existing statutory training. Moreover, Colby et al. (2011) purported internet based training is the preferred method of delivery for younger adults.

Informing Stage 2 website development

Stage 2 of the research project, was based on evaluation of the evidence collated from child care staff in Stage 1. Together with input from other key stakeholders in the child care industry, this evaluation informed the development of a web-based intervention, aimed at assisting child care staff to provide and promote a healthy eating environment to the children in their care.

Participants were introduced to the concept of a website hosting a depository of reliable, evidence based resources, online activities and discussion boards, aimed at supporting

the provision of a healthy eating environment in the child care setting. The question did not seek to understand their *preference* for a specifically web-based intervention as this was not the aim of the research. The researcher sought to understand the content requirements in terms of topics of interest and materials preferred for the website. A wide range of topics were suggested, with most participants expressing a desire to increase nutrition knowledge and learn how to deal better with fussy eaters. Participants were also keen to see a website that was user-friendly and easy to navigate. Suggested topics are listed below, most frequently requested appearing first, through to least mentioned:

- Nutrition knowledge

- How to deal with fussy eaters

- Suitability of low-fat dairy

- Menu planning

- Recipes

- Infant feeding

- Food variety

- Serve sizes

- Role modelling

- Allergies and intolerances

- Dietary guidelines

- Breastfeeding

- Healthy food

- Recipe renovation

Most participants welcomed the notion of a 'one-stop-shop' for accurate, current and reliable nutrition resources and advice. This was reassuring as it was already established that many child care staff would readily search the internet for information without any assurance of accuracy, validity or reliability, which is supported by earlier research of child care professionals as internet consumers (Weigel et al., 2012).

Barriers to providing nutritious food and healthy eating environments

There were a number of barriers that participants identified and discussed in relation to the provision of nutritious food and promoting a healthy eating environment, which are categorised into children's preferences, parental influence and staff behaviours.

Children's preferences

It was reported that children had fluctuating preferences for the same food on different occasions that influenced food provision and wastage. For example, a cook, referring to the same dish offered on different days complained that:

> One day the children won't eat something like that and another day they can't get enough of something (Rosie).

Another cook commented that she tried to provide healthy options, such as wholemeal pizza bases. However, due to the unfamiliar taste and consistency, the children refused the food.

These situations demonstrate a lack of persistence by the cook and other centre staff to offer healthy foods repeatedly to the children to bring about change in the acceptance of new foods. Research has suggested that repeatedly offering new or rejected foods (5-15 times) may promote eventual acceptance (Caton et al., 2014). Satter encourages the "division of responsibility" concept for adults when promoting children's healthy eating habits, which suggests it is the carers role to provide a choice of healthy foods, and the

child's responsibility to eat as much or as little of those foods as they like (Lohse, Satter, & Arnold, 2014, p. 154).

Rosie further corroborated this observation when she also stated:

Kids don't like salad, they won't eat it.

This statement was based on her own experiences of serving salad as a 'mixed' dish. Jan, an educator located at the same centre, discovered that although the children would not eat the salad when it was mixed, if the ingredients were chopped and offered separately with child sized tongs to allow children to serve themselves, the consumption was far greater. This demonstrated a lack of relevant training and experience in serving children's food as Rosie had not previously worked as child centre cook, and did not hold a child care qualification. However, Jan held an early years' degree from a European university, which included comprehensive nutrition training, and had relevant food service and nutrition skills. Attractive food presentation is a significant factor in food service as it can affect consumption (Jansen, Mulkens, & Jansen, 2010; Zampollo, Kniffin, Wansink, & Shimizu, 2012), and thus the clearly illustrated need for effective nutrition training for all staff working within the child care sector is both necessary and recommended.

In regards to fussy eaters, food refusal and decisions regarding offering alternative choices was a commonly reported issue:

Because if you give one a sandwich, then they're all going to want a sandwich and then you feel like you're rewarding the child with what they want, when they're actually not eating. And there are ones that are eating and yeah, it is a bit hard (Nula).

After we've had our main meal we always give the children a piece of fruit and a drink of water so what I do is I just increase the amount of fruit that

child has if they haven't eaten their meal rather than make them something completely different. I feel like there isn't really info there on how to handle that in a centre situation (Audrey).

The number of children in a room at mealtimes influenced the ability of child care staff to focus on one or two fussy eaters. This is a pertinent point given that the staff to child ratio for children older than 3 years is 1:11 (ACECQA, 2012), and that food neophobia peaks in children aged 2-6 years old (Dovey et al., 2008).

These comments further demonstrated the need for clear and comprehensive guidelines about how to deal with fussy eaters in the child care setting, whilst still maintaining the nutritional quality of the alternatives offered, especially when staff:child ratios were so low.

Parental influence

Participants perceiving the parental influence on their children's eating habits was another barrier to emerge from the interviews. Participants reported that they believed some parents were not necessarily interested in *what* their children had eaten over the course of a day, but were looking for a broader perspective of their child's day. For example, the child's overall wellbeing, whether they have slept or not and *how much* or *if* they ate, rather than *what* they ate.

A number of directors have attempted to get parental input into policies and menus, but get little or no response:

> I would love to get some parent input on it, but it's a waste of paper sending it home (Katie).

> Yes, we hand them [parent surveys] out but we don't get them back. We try (Kylie).

Parents had also been offered nutrition and healthy eating workshops, however, the few who attended were already believed to be conscientious about healthy eating. Fothergill (2013, p. 438) expressed the need for a 'team model' with respect to shared care between parents and child care staff, but also found that the norm tended to be "the parents who really need to be here aren't here".

Parents may request specific dietary requirements for their children. For example, an educator reported that an infant in her care had been placed on the Paleolithic diet by her parents. Such requests can lead to concern amongst child care staff as they may not have the expertise to adequately assess the suitability of the diet, cannot be sure if the child is receiving a nutritionally balanced diet and may lack the confidence to approach the parents with these concerns. Thus, the proposed website, and in particular the 'Ask the nutritionist' forum could provide qualified and correct information about such issues.

Staff behaviours

There was an apparent lack of nutrition knowledge amongst some cooks. For example, a cook explained that fish fingers were a menu item that day, due to the lack of availability of fresh fish. Fish fingers are considered a discretionary food item that should limited at child care (Victorian Healthy Eating Advisory Service, 2014) and healthier alternatives such as canned fish should be offered. This provided further evidence of a lack of knowledge about basic nutrition concepts. A director described her former colleagues' viewpoint that it was more important that the children ate

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something rather than nothing, thus the nutritional quality of the food children were offered was less important. This further illustrated the premise that some child care staff had limited knowledge of, or interest in, important nutrition concepts, which would enable them to model healthy food choices, or provide a healthy eating environment:

> Sorry, but it's a really dry subject to me, because it's like fifteen years later and I'm like, ughhh, we're still talking about this [nutrition] (Myra).

One director expressed an alternative viewpoint, commenting that the previous food coordinator had resigned because of the additional demands of the NQS and that she understood the food coordinator role is complex, yet extremely important:

> It is so much more than just cooking…..they must support children's growth and development through good nutrition (Vi).

To summarise these comments and reflections, the demands of the National Quality Framework may be beyond the skills and education levels of many food coordinators and cooks. This, in combination with relatively low wages and increasing amounts of administrative tasks, may result in increased staff turnover.

Consultancy Group

The Spiral Technology Action Research (STAR) model (H. Skinner et al., 2006) was used to manage this research project, and during Stage 1, a vital component was to gain an understanding of the needs of the child care community. Whilst qualitative interviews have garnered the needs of the child care sector from a centre perspective, it was also important to consider the viewpoints and perspectives of other key organisations interacting with the industry.

Therefore, a number of business and industry representatives, community leaders and other relevant parties were contacted and their support requested in an advisory capacity

to inform the project from development through to implementation. As a means of engaging key stakeholders, it was intended that a consultancy group be established that would guide the development of the resources (through the involvement of quality stakeholders and peak child care organisations), improving capacity building and ensuring the sustainability of the project. A similar project in South Australia involved key stakeholders such as representatives from the Health Service, Start Right Eat Right program and the Department of Education and Children's Services. These key stakeholders invested their time on the development of best practice guidelines for nutrition, based on principles from the legislation current at that time, to assist child care centres to review or develop their own food and nutrition policies (South Australian Child Care Nutrition Partnership, 2005).

By investing their time in this consultancy group, members benefitted by ensuring the sustainability of the project, experiencing opportunities to share their expertise and increasing their own expertise by working with others within the industry. Moreover, they contributed to an increase in the knowledge base within the child care sector, as well as increasing engagement amongst the child care community. Their contribution could also be seen as an investment in child health by engaging child care centres in the promotion of healthy eating environments, as well as contributing to the research base, setting industry benchmarks and building professional profiles.

The consultancy group met for the first time in April 2013, and consisted of representatives from Edith Cowan University, Early Childhood Australia, Meerilinga, Ngala, Child Australia, Carewest (peak early years' organisations), Nutrition Australia, (a peak community nutrition education organisation) and one centre director. The preliminary results of the qualitative interviews were presented to the group, together with the proposed website name and logo. The consultancy group determined strategies

to promote the site, provided feedback on the project title and logo, clarified appropriate use of language, suggested resources and online activities and other potential key stakeholders.

All members agreed to promote the proposed site through their own networks and the feedback about the proposed title, 'Supporting Nutrition for Australian Childcare (SNAC)' and logo was positive. The appropriate language for members of the child care sector was established and other potential stakeholders such as the Child Care Association of WA were identified. Suggested resources and online activities included podcasts, quizzes and film clips on topics such as recipe renovation, fussy eating, gardens and food serve sizes.

The input and feedback from the consultancy group was invaluable and provided expert knowledge that assisted the identification of the strategies and resources required to successfully develop and implement the web-based intervention, whilst utilising a the multi-faceted approach. It was agreed that the group would not be required to meet again until the end of the project when preliminary results were to be presented.

Working Towards Stage Two

At the conclusion of Stage 1, the information and evidence gathered from participants of the qualitative interviews and the discussions with members of the consultancy group, provided an understanding of the needs of the child care sector in relation to healthy eating.

The idea of a website that assisted child care staff to provide and promote a healthy eating environment was well received by the participants and the consultancy group members. The need for reliable and current information was established, as was the need for up-skilling child care staff in basic nutrition concepts. E-networking via

discussion boards was welcomed by some, but not all participants, although evidence suggests that child care staff are open to this environment (Weigel et al., 2012). Topics of interest included nutrition knowledge, fussy eating, role modelling, food variety, recipe renovation, food intolerances and allergies and menu planning, amongst others. With this information available, the next step of the project was to build and test the website with the intended audience.

Summary

Using a qualitative approach, 48 interviews were conducted with a broad cross-section of child care staff and a consultancy group was established, to guide the development of the intervention. From the demographic data collected, it was established that this sample group was typical of the child care industry, and most were familiar with, and regularly used information technology.

From the qualitative data, a number of key concepts were identified. Firstly, there was an indication that at some centres, whilst healthy eating concepts were practised at mealtimes, some child care staff overlooked other planned curriculum experiences to introduce nutrition topics to children. Knowledge of the resources prescribed under the auspices of the National Quality Framework was limited, and the majority of child care staff used the internet to search for resources, whilst readily acknowledging quality or accuracy of resources was unknown.

Most participants held or were working towards an appropriate qualification, although the nutrition content of this mandatory training was reported as limited. Despite this perceived lack of nutrition training, most participants reported confidence in their nutrition knowledge, which should be treated with caution as it is unclear on what information this confidence is based. However, some participants reported they were

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less confident and thus unwilling to approach parents to discuss specific nutritional issues.

Implementation of the National Quality Framework had resulted in an increased workload for child care staff, including directors. There was discussion about the lack of clarity provided by the framework in relation to the provision of nutritious and varied foods, and differences in the assessment process were noted, which highlighted inconsistencies in this process. All services had an established food and nutrition policy, and most participants could identify broad elements of the respective policy.

Attitudes towards providing a healthy eating environment were mostly positive, with participants acknowledging it was important to do so, and several questioning the quality of food children received at home. However, some attitudes were less positive, perhaps attributable to a lack of training or disinterest.

Most participants had limited networking opportunities although anecdotal evidence suggested that this would be a useful activity. There was a mixed reaction to the concept of e-networking through discussion boards, with some child care staff stating they would not use them and others stating they would view posts but not necessarily contribute themselves. Overall, participants were in favour of online activities that could offer information wrapped in support. A number of broad healthy eating topics and required resources were identified, for example basic nutrition concepts and fussy eating.

A number of barriers to providing a healthy eating environment emerged, such as children's preferences, parental influence and the skills and knowledge of child care staff. This evidence was used to develop some of the resources available on the website, designed to assist child care staff promote and provide a healthy eating

environment to children attending child care centres. The next chapter details website development, the sourcing and development of resources, the launch of the website, participant recruitment and community building strategies.

CHAPTER FIVE:

WEBSITE DEVELOPMENT AND LAUNCH

Introduction

Using a qualitative, formative research design, a needs profile of the child care sector was established in relation to the provision and promotion of a healthy eating environment. Recruitment strategies, data collection methods, data analyses, and findings from Stage 1 of this project are detailed in the previous chapter (Chapter Four).

A number of key findings were identified. At some centres, healthy eating concepts were reinforced at mealtimes, but other important opportunities, such as planned curriculum activities incorporating these concepts were not evident from discussions. Many child care staff reported that they relied on the internet to search for nutrition resources whilst acknowledging the quality of these resources was unknown. Child care staff also reported limited knowledge of the resources prescribed under the auspices of the National Quality Framework.

Whilst child care staff reported confidence in their nutrition knowledge, little formal nutrition training is currently provided as a component of mandatory qualifications. Positive attitudes towards providing a healthy eating environment were reported, however the source of nutrition knowledge and subsequent confidence remains unclear. Thus, the need for accurate, current and reliable nutrition education resources was identified as a gap that the proposed website could address to optimise and promote a healthy eating environment.

Stage 2 of the project aimed to develop a website to assist child care staff provide and promote an environment in which children's healthy eating practices, behaviours, food

habits and preferences could be developed and maintained. In order to do this, the project aimed to increase the nutrition knowledge, and enhance attitudes and behaviours of child care staff towards healthy eating.

A web-based intervention was considered appropriate to deliver the resources to more than 550 child care centres throughout Western Australia. Most child care staff surveyed (n=48, 92%) in Stage 1 reported having access to a personal computer and an internet connection although staff often reported being busy and time-poor to attend training or personal development opportunities during their working day. Therefore, an intervention available on the 'net' that provided 24/7 access regardless of location was adopted.

Formative work suggested limited opportunities to network with staff at other centres, and there was a mixed reaction to e-networking via discussion boards on the proposed website. However, previous US research (Weigel et al., 2012), together with the increased use of social networks, suggested these would be an appropriate feature to integrate into the design. Topics to be addressed, such as barriers to the provision of a healthy eating environment, were suggested during this formative process. This chapter therefore describes the building and testing of the web-based intervention, together with the recruitment and engagement strategies employed to attract participants.

Website Development

Whilst website design and implementation is discussed in this chapter, it should be noted that the function of the website was that of the research vehicle. Of course, it was important to build a functional website that would attract the required participants, but the performance of one particular web design over another was not a central concept. Hence, this website build was based on best practice design that included setting

appropriate tools and systems in place to enable an online community to evolve. The web technologists 'employed' that is, students for whom this was their project, volunteers and paid professionals, were therefore critical to the construction of a 'best practice' site, which enabled an online community of practice to be nurtured, and the research aims and objectives to be met.

Background

Due to the small research budget, low-cost construction methods were sought. Early discussions with Dr Justin Brown, a Senior Lecturer and Course Coordinator in the School of Computer and Security Science at ECU, resulted in undergraduate and post-graduate Information Technology (IT) students being available to assist with website development. Whilst the end result was successful, it is important to highlight the difficulties faced liaising with the IT students, and overcoming the communication issues commonly experienced between the divergent disciplines (Dutton, Carusi, & Peltu, 2006) of social science and IT.

The first post-graduate IT student joined the project in August, 2012 and was asked to investigate "Moodle", an open-source learning platform suggested as a potential basis for the website. He established a test site, which enabled the research team to understand how Moodle would look and function. This student was not available after November, 2012 as he completed his studies and sought regular employment elsewhere. It was later decided that Moodle was not an appropriate tool for this project, as there were concerns around the flow of the design seeming disjointed, and a potential feeling of leaving the proposed website to enter the Moodle environment. Furthermore, if the Moodle site became unavailable, the research team would be dealing with an external company to rectify issues.

During February, 2013 an undergraduate IT student and a postgraduate web design student were recruited to the project team, with the remit to design and build the required website, including a system for downloading important site data for later analyses. These students (herein known as the 'web technologists') were supervised by Dr Hanadi Haddad, a Lecturer in the School of Communications and Arts at ECU and completed the majority of the design and web build whilst fulfilling the requirements of their own respective degrees. Details of their specific involvement with the project are provided later in this chapter. Again, both graduated in June, 2013 and whilst one did continue to assist in a limited capacity for a few months more, both were lost to full time employment soon after graduation, with the data download remit incomplete.

Finally, in August, 2013 a team of three IT Masters students were invited to work on the project. Carrying on from the previous students work, they were given the important task of developing and installing 'plugins' to enable the download of website data, and developing a 'user manual' for administrators. Unfortunately, these students failed to grasp what was required, and subsequently the tasks remained incomplete. Again, by November 2013, the website remained without a means of downloading important research data.

However, during November 2013, research funding was secured and an external IT specialist was recruited to perform a number of tasks, including the important retrieval of website data and debugging emerging website issues.

In conclusion, a number of personnel were involved in the build and development of the website and extended the research team, but it was not until a paid professional was recruited that the important 'backend' data retrieval tools were finalised.

The Research Team

The research 'team' comprised of the PhD candidate as the researcher together with the research supervisors, whose research experience supported the disciplines represented by this project. Dr Leesa Costello is an expert in netnographic studies, and has extensive research experience in building and supporting online communities. Associate Professor Amanda Devine is an experienced researcher and public health nutritionist, with many years' practice in the early years' sector. . Dr Johnny Lo is a statistician, and assisted in quantitative analyses and research design. My knowledge of qualitative research methodology and methods, and of the models and theories that underpinned this project, added value and led to a well-rounded and capable team. A sub-structure of the research team also emerged, and the 'website development team' consisted of the web technologists, myself as the researcher and my research supervisors.

It was understood that the web technologists would assume the role of service providers, whilst the research team assumed the role of the client, representing and acting on behalf of the other stakeholders. My role as the researcher was to develop and discover content, consider design, the look and feel of the site and to suggest potential features. I had consulted informally with a website specialist prior to collecting Stage 1 data, thus had an understanding of how to communicate my requirements to the information technologists. Even so, the skills of the web technologists as 'experts' was relied heavily upon to deliver a website that fulfilled the project's needs, thus my ability to communicate these requirements was paramount.

After initial contact was established with the web technologists in February 2013, weekly meetings were scheduled, to progress the project and meet the anticipated launch date. This scheduled launch date was chosen to coincide with the 'Nourish'

menu planning workshop and training forum, organised by Nutrition Australia and Child Australia (Figure 5.1). The Nourish forum was a professional development and networking opportunity, specifically designed for directors and food coordinators of child care centres, at which the Nourish Cookbook and menu planning guide was to be launched, together with the website. Attendees met the participant profile for this research study, thus providing an ideal opportunity to co-launch the SNAC website, and optimise recruitment and promote recipes and menu planning resources from the Nourish cookbook that would feature on the website.

NOURISH

The complete guide for Food Coordinators in Education and Care Services

This cookbook and menu planning tool was funded by the Australian Government under the initiative of the Inclusion and Professional Support Program to support Government approved child care services. It was developed and produced under a joint initiative by Child Australia and Nutrition Australia (WA Division).

Figure 5.1 NOURISH Cookbook and menu planning tool

Building the site

The web technologists were provided with the research proposal, an initial outline of the required website and three main remits that were communicated at the initial meeting. The first remit was to build a website to provide a setting for the discussion boards and to house the healthy eating and nutrition resources and activities. The second was to build the functionality to measure member engagement with the website, discussion boards and other resources. Thirdly, it was essential that training was provided on how

to maintain and manage the website, and be able to perform basic maintenance functions such as registering new members, loading content and moderating posts.

The first meetings were also attended by Dr Justin Brown, a Senior Lecturer in the School of Computer and Security Science at ECU. Dr Brown emphasised that during the build, 'backend' functionality, as a means of measuring engagement, was of equal importance to the 'front end', where users interact. His advice was to "build in as much [to the back end] as you can, as you won't know what you need, until you need it". This proved to be imperative given the difficulties associated with designing web databases that can provide multiple reports from which to extrapolate the required data.

The initial research design proposed two participant groups. The intervention group would have full access to all features of the website, whereas the comparator group would only have access to the website resources but not the activities or discussion boards. The difference in nutrition knowledge and attitudes would then be compared between the two groups, post-intervention. However, as team discussions progressed, it became apparent that the comparison group would not be necessary for a number of reasons. Firstly, it seemed 'unnatural' to exclude one group from accessing the website, as all child care staff experience similar issues when providing a healthy eating environment. Secondly, in view of the slow recruitment experienced during Stage 1 of the project there may have not been enough participants available to facilitate two groups. Thirdly, it was thought that a natural comparison group would emerge between members who used the website regularly and non-active members. The web technologist supported this approach as a "significant change in the project. It also helped greatly as it reduced the workload further" (Chong, 2013, p. 6).

The proposed website required two main functions - a social platform as an arena for sharing information, support and seeking advice and secondly, an information section

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that displayed a set of nutrition specific resources and links. Also important was the administration role, essential for the posting of resources and for moderating the discussion boards located on the social platform. The functional and non-functional requirements of the proposed website were detailed in a website specification document (Appendix 12).

The website was built using a web software system, *Wordpress*, which allowed a fully functional website to be built at little cost. Additional features, such as a Google Analytics panel for site statistics, were added through the utilisation of 'plug ins', which were available free or at a nominal cost. An important stage of the website development was the project title, "Supporting Nutrition for Australian Childcare" (SNAC), which was quickly followed by the overall design and development of a logo.

Developing a project title and logo

Deciding on a project title added significant clarity and focus to the website development process, and was a key event in the overall progression of the project. Using several key terms such as nutrition, healthy eating, early years and child care, a list of proposed project titles was generated and circulated amongst the team. In due course, the title "Supporting Nutrition for Australian Childcare", (abbreviated to the acronym SNAC) was thought to be appropriate, as it accurately reflected the content of the website (nutrition) and the intended audience (Australian child care). 'Supporting' also reflected the research aim of providing a supportive network to child care staff. Hence the web address was registered as www.snacwa.com.au

SNAC design

Following on from the completion of the website title and acronym, the web technologist responsible for the website design produced the following logo (Figure 5.2). He described his design approach:

> The proposed logo needed to represent the planned modular look of the website whilst maintaining a fresh and welcoming identity. Linking nutrition somewhere was paramount. I asked Ruth to describe what she wanted the logo to "feel like" using simple words. She described it as fresh, simple and fun. Something she wanted the website to represent (Braich, 2013, p. 1).

Figure 5.2 Supporting Nutrition for Australian Childcare (SNAC) logo

He added:

> SNAC (Figure 5.2) is a representation of children's health and wellbeing. It approaches a common issue through a digital medium with the objective of creating a valuable public resource. This proposed identity looks at highlighting the playful and child centric aspect of SNAC whilst retaining its appeal to an older market with professional and modern design.
>
> The SNAC branding displays a half-eaten orange broken into 4 modules. Each of these modules will be able to represent a portion of the website and colour coded as such. The brand maintains strong recognition and as such, can be applied in a variety of colours.
>
> The wording proposes rounded typefaces as a direct contrast to the sharp, geometric shapes used by corporate companies. This applies a friendly and

welcoming appeal to the brand, further enforcing its design for the people (Braich, 2013, p. 1).

The designer also provided a set of template resources incorporating the SNAC logo and design.

Website organisation

During the design process, the team debated the format, or layout of the website. There are distinct differences in user experience between blogs and discussion boards found on 'traditional' websites. Blogs offer a space for *individual* expression whereas discussion boards promote *group* interaction (Duffy & Bruns, 2006), thus as the aim was to promote a sense of community or belonging, a more traditional approach was deemed appropriate. This layout included a homepage and several other internal, content specific web pages to follow, as opposed to a 'bloggy' or Facebook appearance. This standard and familiar specification was thought to be appropriate, with main navigation on the top and sub-navigation tools to the side. It was important that the website was well organised and signposted, had a professional feel and that resources and activities were well organised and easily accessed. A Facebook page was created at a later stage as a means of publicising the website, and linking with other like-minded organisations.

The project title acronym SNAC was used to guide the way the website was organised into sections and pages, as follows:

Support – hosted resources such as fact sheets, healthy eating activities, links to other reputable organisations and menu planning tools and resources.

Nutrition – hosted recipes specific to the child care setting, adapted from the Nourish cookbook. The nutrition internal page was designed as a standard 2 column layout,

with the left hand column providing the recipe details (ingredients and method) and the right hand modular space providing information about cooking time, allergy and nutrition information (Braich, 2013).

Activities – hosted brief videos on a range of topics such as fussy eating and menu planning. Each video was supported by a quiz to test the uptake of knowledge and accompanying downloadable, printable resources.

Each activity or recipe found in the support, nutrition and activities sections, had a 'leave a reply' comment box function, which enabled participants to leave feedback. Print and email functions were also available.

Community –hosted a series of discussion boards, where participants came to share ideas, seek support and offer advice.

Splash page – the member saw this page first, and had the option to register or log in. All new members were prompted to register for the site, and were asked for basic demographics as well as nominating a user name and password. This registration process required new members to check a box confirming informed consent (Appendix 13). Newly registered members then joined a moderation queue (Figure 5.3), where the administrator approved or rejected their registration, allocated the level of access, and issued an email confirming their access, together with a link to the pre-intervention survey.
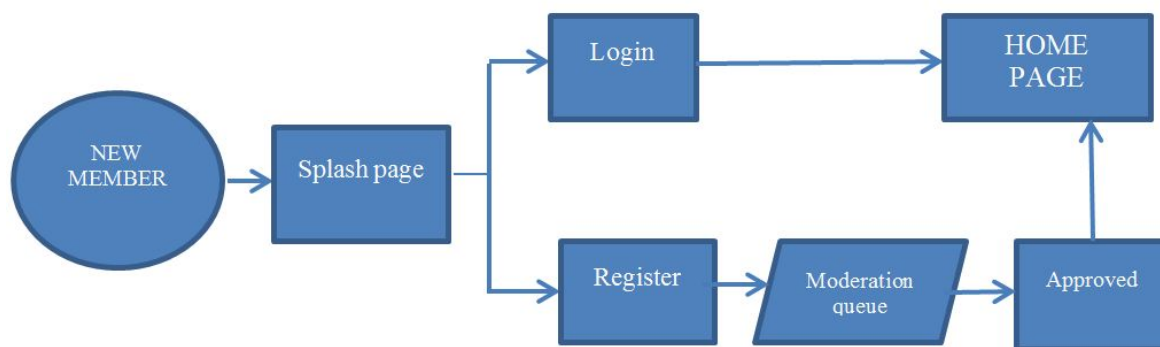
Figure 5.3 New SNAC user registration process

Homepage –once registered and logged in, members were directed to the homepage. As this was the first page available to members, it was imperative that it represented exactly what the website was and what it intended to do (Braich, 2013). Following this modular feel, the site was arranged into divisions organised by specifically designed colours, based on the SNAC logo Figure 5.5).

At the foot of the website, the researcher's contact details were provided, together with a disclaimer tab (Terms & Conditions of website use), an information tab (information about the research project), and a privacy tab (a statement about appropriate use of discussion boards).

Resource Development

Analysis of Stage 1 data illustrated that child care staff frequently browsed the internet for nutrition information and resources, whilst acknowledging they could not be certain of the quality of these resources. Therefore, it was vital that the information and resources provided on SNAC were credible, current and evidence based.

Resources and activities were divided into three areas on the SNAC website under the headings of support, nutrition and activities.

Support

News Articles

Posting news articles pertinent to the child care industry, or with a focus on nutrition and healthy eating was intended to garner the interest of staff and to provide a 'talking point' to stimulate discussion board conversations. Weigel et al. (2012) reported that child care staff valued a wide range of articles available for download. Care was taken to ensure that the information could be traced back to a reputable source, such as a scholarly journal, and had been correctly interpreted in the news article before being posted on SNAC.

News articles on relevant topics such as children's healthy eating, food and nutrition or other health issues were sourced. For example, an article that presented research outcomes explained that children may eat more vegetables if they are taught how the body uses the nutrients. This article was published in 'DailyRX', an online resource providing information about medically reviewed health news and medical information. The original peer-reviewed research journal article on which this was based was sourced, to check both the credibility of the authors and that the content had been correctly interpreted in the news article.

Other issues especially pertinent to the child care industry were also sourced, such as changes in legislation and funding. Such topics were introduced to spark engagement on the discussion boards, but also as a means of offering support when issues detrimental to the child care industry were reported in the media. For example, the Western Australian Sunday Times newspaper published a full page article about services who had recently being assessed as 'significant improvement required' with the headline "Childcare Shame for WA Centres" (Robertson, 2013). The website provided

a support section through which to contact the centres under scrutiny and demonstrate support from SNAC for the child care sector.

Fact sheets

Fact sheets are useful resources for child care staff, not only to extend their own knowledge, but also as an avenue for sharing information with parents and carers. Weigel et al. (2012) noted this as an important feature when designing websites specifically for the child care industry.

Fact sheets were sourced from a number of different organisations, such as Nutrition Australia, Raising Children Network, Start Right Eat Right and Dairy Australia and posted on SNAC, ensuring that the source of the information was acknowledged. A number of new fact sheets were developed specifically for SNAC, such as "*new life on leftover veg*" (Appendix 14). The factual content of these fact sheets was checked for accuracy by a nutritionist prior to publication.

Healthy eating activities

Stage 1 findings revealed that planned curriculum activities incorporating healthy eating concepts were limited, despite being a recommendation of the National Quality Standard (ACECQA, 2012, p. 61). Evidence has suggested that children aged 4-5 years who were taught about the nutrients in their food may increase their own consumption of healthy foods (Gripshover & Markman, 2013), thus it was important to provide educators with ideas for healthy eating activities other than at mealtimes. Moreover, US child care staff reported that availability of a wide variety of learning activities was important (Weigel et al., 2012).

Examples of the healthy activities suggested include the 'Eat for Health' game (based on the Australian Dietary Guidelines) and the 'Growing carrot tops' waste reduction activity, which also introduced basic science and paddock to plate concepts.

Menu planning tools and resources

Previous West Australian research demonstrated that food coordinators with access to training and resources were able to make appropriate menu amendments (Pollard et al., 2001). However, more recent overseas research reported continued requests by food coordinators for improved resources and nutrition training (Romaine et al., 2007). Findings from Stage 1 also established that child care staff and food coordinators in particular, valued menu planning tools and resources, as well as nutrition training, thus these materials were included on the website.

Resources from the Nourish cookbook and the rescinded Start Right Eat Right program were posted in this section, and included menu planning checklists, sample menus and recommended serve size information sheets.

Links to other reputable sources

Given the child care staff reported a willingness to 'surf the internet' in search of nutrition resources and information, providing a list of reputable and trustworthy organisations that could meet these requirements was essential. Links to local and national early childhood organisations and information was considered valuable by child care staff (Weigel et al., 2012), therefore the SNAC website provided links to organisations such as the Australian Dietary Guidelines, Nutrition Australia, National Heart Foundation and Food Standards Australia, which offered credible nutrition information, resources and advice.

Nutrition

Stage 1 findings indicated that child care staff often used the internet to find recipes for children or used 'tried and tested' recipes, many of which when reviewed, are reported to contain high levels of fat, sugar and sodium (Sambell et al., 2014) and therefore not suitable for children. All recipes published on the SNAC website have been adapted specifically for the child care setting and are sourced from either the Nourish Cookbook (Child Australia & Nutrition Australia (WA Division) Inc, 2013) or the More Deadly Tucker cookbook (Department of Health (Western Australia), 2013). These recipes were developed and tested in a food laboratory and provide a unique feature, the "food group calculator". This calculator provides the percentage of a recommended child serve for each of the five food groups and is a useful tool for menu planning. For example, Figure 5.4 demonstrates that a serve of a lunchtime meal (salmon patties) will provide 50% fruit, 150% vegetables, 100% meat/meat alternatives, 70% cereals, no dairy and 40 % fat, of the recommended number of food group serves for a child whilst attending the centre. As this would be the main meal for the day, any 'gaps' in food group provision that do not meet the minimum recommendations of at least 50% while attending care (Sambell et al., 2014), can be increased by accompaniments to the main meal, or by the food served at morning and afternoon tea.
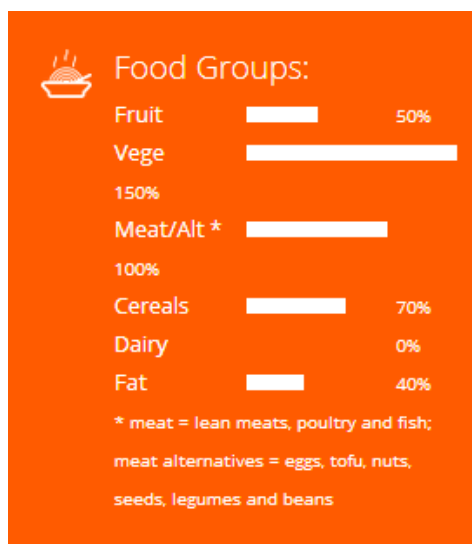
Figure 5.4 Salmon Patties, Food group calculator

(Child Australia & Nutrition Australia [WA Division] Inc, 2013)

Activities

Based on Stage 1 data analysis, a number of themed activities were developed, in the form of brief videos, with accompanying quizzes and other downloadable, printable resources. The themes incorporated into activities were fussy eating, menu planning, basic nutrition concepts and understanding food labels.

Dealing with fussy eating

Child care staff reported fussy eating was a topic of concern therefore it was important to source or develop materials to provide assistance for staff dealing with this often difficult situation. The fussy eating video was developed and based on the division of responsibility principles outlined by Satter (2014) and adapted from materials developed by the University of Nebraska (Wells, 2013). A brief quiz accompanied the video, together with a downloadable, printable fact sheet produced by Start Right Eat Right (Government of South Australia, 2010).

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Menu planning

Menu planning training was another key topic identified during the formative research stage and has been documented by others as an area in which food coordinators requested further training (Romaine et al., 2007). Given that menu planning is a complex task, this topic was broken down into five sub-topics; food groups and serve sizes, using the menu checklist, how to increase serves of food groups, assessing recipes for adequacy of serve sizes and renovating recipes. Each sub-topic comprised a video, quiz and downloadable, printable resources and were based on the materials available in the Nourish Cookbook (Child Australia & Nutrition Australia (WA Division) Inc, 2013).

Basic nutrition concepts

Importantly, child care staff indicated that basic nutrition information was required, given that the mandatory early years' qualifications did not address these important aspects of child development in any depth. Researchers identified more than a decade ago that increasing nutrition training is essential to ensure the successful development of nutritionally balanced menus (Gibbons et al., 2000).

Nutrition is a very complex topic, and to provide a comprehensive set of modules that covered all aspects of nutrition was outside the remit of this study. In view of the limited time available for the development of resources, information on 'key' nutrients especially pertinent to optimal childhood development were selected. Therefore, brief videos about calcium, fat, iron, protein, vitamin C and zinc were developed. Each video was accompanied by a quiz and downloadable, printable resource.

Understanding food labels

Another topic identified by child care staff was the need to accurately read and understand food labels. This topic was further sub-divided into two key areas; understanding nutrition information panels, and understanding nutrition claims. The 'understanding nutrition information panels' video was based on two pocket guides, produced by LiveLighter (2015) and Nutrition Australia (2015) that helped child care staff understand the information which must appear on food labels by law, and how to effectively compare products. The 'understanding nutrition claims' video clarified how nutrition claims work, advised staff about which claims to trust, how to recognise a claim and healthy food choices.

Discussion boards

Discussion boards were organised by categories to enable ease of navigation around this part of the website. Categories were organised as follows:

- Activities to support healthy eating

- Ask the nutritionist

- Discussions about recipes and menus

- General section

    o Introduce yourself

    o Hot new topics

    o Anything goes.

To draw attention to the topics being discussed most currently, the four most recent posts appear on the homepage (Figure 5.5).
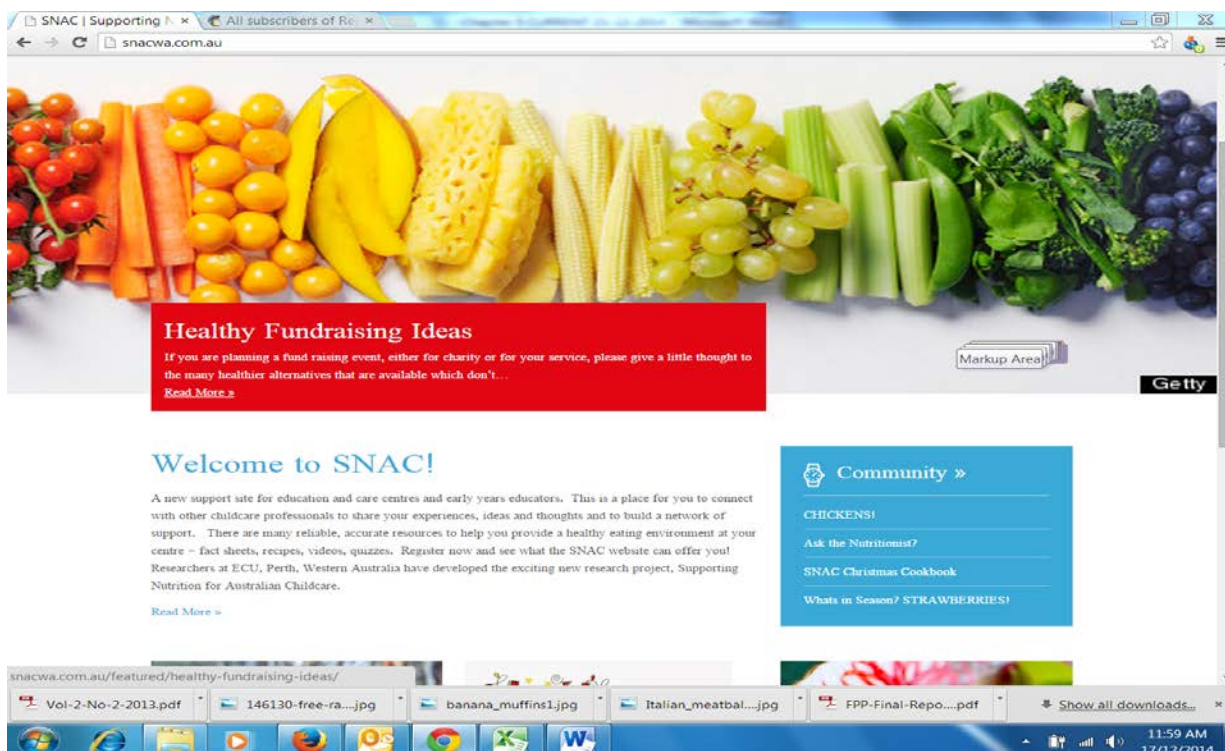
Figure 5.5 Four most recently visited discussion boards

Consultancy Group

A meeting was arranged in May 2013 to present the findings from Stage 1 formative evaluation, and the newly developed SNAC name, logo and outline of the proposed web design to the consultancy group, as part of the ongoing and iterative STAR model process (H. Skinner et al., 2006). These were well received, suggestions offered for other potential resources, and agreement that the project would be advertised throughout each organisation's networks.

Summary

Accurate, reliable nutrition resources were developed or adapted and loaded to the SNAC website under the organisational headings of support, nutrition and activities, with the additional feature of the discussion board forums.

Management Console Development

A key feature of the website, which was communicated on numerous occasions to the web technologists, was the functionality to measure engagement with the website, discussion boards and other resources through the development of a management console. However, by the end of June, 2013 at which point the web technologist support was no longer available, this functionality had still not been built, and "numerous design changes" (Chong, 2013, p. 6) was cited as the reason. Whilst a Google Analytics account had been established for SNAC, which provided group data about page views, bounce rate, and new versus returning members, the functionality to export conversation threads was not in place, nor was the means of capturing individual member activity or the demographic data collected when members registered on SNAC. Moreover, little training about site maintenance or administrative duties had been provided and the researcher was largely self-taught in the administrative and moderation roles.

As discussed at the beginning of this chapter, another team of IT students were assigned to the project in August, 2013. This team were designated the tasks of a) providing a means of exporting data for analysis and b) developing a 'user manual' of maintenance tasks. This team found it difficult to understand the requirements of this project, and by the end of their tenure (November, 2013), regrettably the management console had not been built and the researcher had developed the user manual.

Towards the end of Semester 2, 2013, some research funding was secured and an IT 'specialist' was engaged to provide the required functionality. This specialist brought a more customer focused approach to the project and progressed the development of the management console and data extraction tools.

Reflecting on Communication Difficulties

This section provides a reflection of the communication difficulties encountered during website design and construction by the student web technologists between February and June, 2013. There was an understanding that their role was that of the 'service provider', with one student taking the specific task of website construction (*web technologist*) and the other the design role (*designer*). My role as the researcher was that of the 'client', representing and acting on behalf of other stakeholders, developing and discovering content, considering design, the look and feel of the website and suggesting potential features.

In general, academics are thought to be good collaborators and adept at seeking help from other disciplines (Costello & Green, 2012), thus an inter-disciplinary team was not considered an issue as website development commenced. However, whilst there is immense value in multidisciplinary social research that utilises information and communication technologies, it is known that the 'gulf' that can develop between computer scientists and social scientists during project development can be a crucial factor in the success of the project (Dutton et al., 2006). As a means of mitigating these 'gulfs', it is important to consider the differing cultural attitudes towards technology (Camara & Abdelnour-Nocera, 2010), in this case between myself as a social scientist, and the students as the web technologist and web designer. My personal cultural attitudes towards IT have been influenced by several factors - learning keyboard skills on a manual typewriter, not studying IT at high school and being accustomed to having technical assistance available when confronted with IT issues. In contrast, my perceptions of the web and design technologist's cultural attitudes towards IT were that as part of the younger 'i generation' and having learned IT at high school, they were far

more 'tech savvy' than I, corroborated by their pursuit of an IT career through university studies.

In light of these differing cultural attitudes towards IT, communication was a key part of the relationship between myself as the researcher, possessing minimal IT programming skills and knowledge, and the students as the 'expert' web technologist and web designer. It was therefore vital that team members shared a 'common language' (Costello & Green, 2012). However, this was not a 'normal' working relationship due to their student status, being members of this team by default rather than choice, relative inexperience in communicating professionally and limited customer relationship skills. Their roles as 'expert' web technologist and web designer came under pressure due to my perception that they were unable to interpret what was required, and were restricted by their limited ability to communicate appropriately, due to generational and discipline differences. It is common that team members from differing backgrounds (in this case, social and computing science) might not have "shared histories and meanings …. thus information must be recontextualised to reuse experience or knowledge" (Ackerman, 2000, p. 182).

For example, it appeared that the web technologist was keen on developing a 'blog' or Facebook style of website, which the research team did not consider appropriate, as it did not represent the professional 'feel' being sought. On reflection, and now with a far greater understanding of website design and construction, I contemplated if this push towards a more 'social media' style of website was because it would have been easier to build than a traditional website design. So without 'shared histories and meanings', understanding had to be negotiated, and in this case, perhaps some 'context' had been lost as boundaries between social and computing science were crossed (Ackerman, 2000).

Moreover, it is important to remember that different team members may have different goals, depending on their role within the team. To me as the researcher, the website was an essential building block on which to 'construct' my PhD project, but to the web and design technologist's, this was a project they needed to complete to meet university unit requirements and enable graduation. Thus it is important to acknowledge these differences of opinion that may be necessary when resolving developmental or design disputes (Ackerman, 2000).

Web design can typically begin with many unclear components, and only some imprecise constraint information such as budget, time and available resources being provided by the client to the designers (Beatty & Ball, 2010). However, in this project, I was very precise about what I wanted the site to look like, what it needed to host and the specific functions required. Moreover, it was also made very clear that funds were limited and a definite launch date was advised at the outset of the build. There was, however, a 'grey' area around the initial registration process, as initially it was thought that new members would be directed to one of two sites - either the actual intervention or a comparator site. The decision to build only one active website, early in the process, proved to be a defining event that further demonstrated the communication issues experienced, although the potential workload had been significantly reduced. Up until this point, the team were meeting weekly, but once this significant decision was made, the web technologist declared there was no need for continued weekly meetings and website construction would proceed without further consultation with the team. Firstly, this method of website construction did not compliment the tenet of the STAR model being used to manage this project – an iterative approach involving key stakeholders, that is, the child care staff for who this website was being developed, at every stage (H. Skinner et al., 2006). Secondly, it demonstrated a lack of teamwork skills expected of

IT students, and in particular, professional conduct and effective communication skills. However, whilst potential employers and industry accreditation agencies expect IT students to develop these skills, these are often not explicitly 'taught' and some universities anticipate students will naturally acquire them through team activities (Barkataki & Lingard, 2011). Supervisor intervention by email assured that weekly meetings continued as it was vital that progress was monitored regularly.

As semester progressed, it became apparent that the website may not be ready for the intended launch date, thus the web technologist and I agreed to meet more regularly to force progress. By this time the design remit was complete, and the responsibility to meet the deadline lay with me and the web technologist, by building functionality and providing site content. Despite our best efforts, and the web technologist's assurances that the site was 'technically' ready for launch on the scheduled date, I was not satisfied that it was a 'launch ready' product, especially at a professional industry forum. Thus it was decided to delay the launch for a month, and a new date of 1st August 2013 was agreed, allowing additional time to complete the technical aspects of the site and to develop, produce and load content, whilst prioritising the most important features and content.

The web technologist continued to work on the site past the launch date, fixing up minor glitches and providing some instructions for administration tasks. However, the functionality to enable the downloading 'backend' data, which had been stressed from the initial meeting, was still not in place at the end of his tenure on the project.

On reflection, it is important to reiterate that together, the web and design technologists constructed a website that met almost all initial requirements, and having reviewed the numerous notes and minutes of our meetings and conversations, I can appreciate that a great deal was achieved in a short period of time with limited resources. My moments

of dread and despair were most definitely towards the end of website construction when it became apparent it would not be ready for the original launch date, and euphoria when we finally launched, albeit a little late.

Website Launch, Recruitment and Engagement

Recruitment strategies

When the website was nearing completion, a number of child care staff who participated in Stage 1 interviews were invited to register for the site early, with the intention of testing useability. A small number of ECU students who supported content development also assisted with the testing of the site. On-going testing was also carried out by the research team and any inconsistencies or glitches were reported back to the web technologist. Once the main features were functional, the website was stable and a reasonable number of resources loaded, the website was launched on the revised date of 1st August 2013.

Participant recruitment, promotional and engagement strategies were ongoing and continued throughout the research period. Initially, an invitation to register for SNAC was emailed to all licensed WA centre based services on 1st August 2013 (Appendix 15.). Participants who had given an interview in Stage 1 were emailed a personalised VIP invitation to register, as were attendees at the Nourish workshop who had registered their interest. Recruitment emails were repeated regularly.

It was important to consider that individuals who might want to register for the website might never hear about it (Resnick, Konstan, Chen, & Kraut, 2011). Recruitment issues experienced during Stage 1 of this project demonstrated that the directors of services tend to be the 'gatekeepers' of correspondence. If these gatekeepers chose not to share the SNAC registration invitations with their staff, potentially interested parties may

have missed the opportunity. Therefore, a number of other recruitment, promotional and engagement strategies were employed, which included approaching other child care organisations to promote the site, offering complementary presentations to centres and other media coverage, such as industry newsletters.

When considering strategies to encourage recruitment and drive traffic to SNAC, it was suggested that the popular social media site Facebook could be a useful tool. Consequently, a SNAC Facebook page was established, with the intention of driving participants to registering or logging on to the website, rather than encouraging discussion or engagement on the Facebook page. It was also used to advertise (by sharing) through other early years and child care organisations.

Appendix 16 provides a list of the recruitment and promotional strategies employed. The effectiveness of these strategies is examined in Chapter 6.

Engagement strategies

Recruitment was an ongoing, continuous process, so it was critical to develop strategies to drive engagement, encourage discussions on the community forums and build community online. Online communities are described as permanent groups of individuals with similar interests, (such as the issues experienced within the early years industry), "who communicate mostly through the internet" (Ren et al., 2012, p. 231). However, engagement can be a significant barrier to the success of an online community as many individuals who visit may contribute little and leave quickly. "Build it and they will come" is a common misconception in the developmental stage of online community construction (Resnick et al., 2011, p. 9), thus it was important that effective strategies were implemented quickly. Engagement strategies were also implemented on an ongoing basis and were informed by the feedback from registered

members on a one-to-one basis, and by a brief member survey issued in November 2013.

Whilst there was a steady flow of members who initially registered, they may not have revisited the site if there were no other members to communicate with (Resnick et al., 2011), thus the researcher (as moderator) and other student helpers ensured that comments were posted every day, to stimulate conversation and give the impression that the site was active. Furthermore, it was important that in the community's infancy, all content was professionally generated as appropriate design approaches are vital (Resnick et al., 2011). All website content was generated by the research team, or sourced from other professional organisations. It was important that all resources were accurate and current given that participants from Stage 1 reported regular use of search engines when looking for nutrition information, acknowledging they could not be sure of quality.

It was also imperative to make the emerging community attractive to early members, despite a lack of numbers, and to make effective use of these 'early adopters' (Resnick et al., 2011). Child care staff who attended the Nourish workshops immediately prior to the website launch, and those who participated in the Stage 1 interviews were sent VIP invitations to register for SNAC before the official launch date, and also asked to test and report back any glitches, in keeping with the action research elements of the STAR model (H. Skinner et al., 2006) that underpinned the guiding theoretical framework. The simple SNAC web design meant that these early users did not have to learn complex new IT systems, they were able to quickly build familiarity with the community and build a reputation as leaders (Resnick et al., 2011). The 'early lead adopters' played a useful role in disseminating these important messages to colleagues

both within their own service, and throughout their wider networks, to build community.

However, according to the innovation-need paradox (Resnick et al., 2011), those who need the community the most may not be the best targets for early adoption, and may actually be amongst the last join. Even if a director had registered for SNAC and encouraged her staff to do so, the food coordinators and educators who would also benefit from the resources, may have resisted registering themselves. Free professional development presentations were offered to services within the Perth metropolitan area as a means of promoting the website and demonstrating the available resources to all levels of staff, and certificates of attendance were provided to encourage participation.

Resnick et al. (2011) suggest it is important to create an impression of success and signal positive member responses as proof that the community would succeed. Thus, regular e-newsletters were used to demonstrate success expectations by publishing membership numbers, the use of avatars was encouraged and competitions offering small prizes were utilised to garner interest in the website and drive traffic to the forums. Further member use and current online activity could have been used to signal participation levels and expectations of future success, but only providing there was actual activity (Resnick et al., 2011). Given that funding was limited, as was initial activity on the forums, it was deemed inappropriate to invest valuable time and cost into this feature that, paradoxically, may have driven potential users away from SNAC because of the actual lack of traffic.

During the development of any online community, an important strategy is to demonstrate community growth (Resnick et al., 2011). The moderator posted a welcome message and acknowledgement immediately a SNAC member posted for the first time. Other posts and comments would also receive an immediate response from

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the moderator, who posted every day to give the impression that the website was active. Moreover, once a SNAC user had posted or commented once, they joined a 'regular members' group and the moderator would email individualised messages to maintain their interest, reiterate their importance to the community and encourage further activity online.

These strategies were implemented on an ongoing basis and evolved over time in response to the level of activity on the website. The success of these strategies is examined in Chapter 6.

e-Newsletters

Early attempts at recruitment and raising awareness of the site relied mainly on bulk emails that were sent from the researchers ECU email address. It was brought to the researcher's attention that this was not the most effective way of sending mass emails, as often this e-correspondence would be flagged as 'junk' mail and be directed to the addressee's junk mail folder and remain unread.

To address this issue, a free, web-based, e-mail marketing service Mailchimp (The Rocket Science Group, 2015) was utilised from December, 2013 to prevent SNAC emails being redirected to junk e-mail folders. This service was also useful as it collated statistics about the success of each 'e-campaign' in terms of 'open' and 'click' rates, and also about the level of engagement for each recipient, known as 'member activity ratings', with the emails over time. A summary of the e-newsletters is provided in Appendix 16. Analysis and further discussion of this engagement strategy is discussed further in Chapter Six.

Member survey

In November 2013, registered SNAC members were surveyed about their opinions of the website, useability issues and any required features or resources that may encourage more engagement. It was important to gather early opinion as motivating participation and engagement with online communities can require considerable persistence (Lampe, Wash, Velasquez, & Ozkaya, 2010). This is due to varied levels of member participation, and that the reasons for continued participation could be different to those which lead to their initial registration.

There were two underlying reasons for the decision to utilise a member survey to capture this evidence. Firstly, whilst there were several hundred registered members at this time (n=218), utilisation of the discussion boards was limited. Secondly, the Spiral Technology Action Research (STAR) model (H. Skinner et al., 2006) was used to construct the theoretical framework that underpinned this study. This model marries health promotion strategies and information communication technology, whilst incorporating capacity building and interweaving technological design with community involvement. Thus, it was important to obtain and utilise member feedback about the SNAC website, to ensure 'buy in' and that the intended community were involved in intervention development and evaluation.

A brief nine question member survey was developed using Qualtrics software (2012) and distributed to registered SNAC members (n=218) via the MailChimp email marketing service (The Rocket Science Group, 2015) (Appendix 17). The survey was issued twice, independently of other communications, and included once in a member e-newsletter. As an incentive to respond to the survey, two $50 Coles/Myers gift cards were offered, with winning entries drawn randomly. Approval for this incentive was obtained from the ECU Research Ethics Committee (8727).

By 20th December 2013, 79 responses had been received from a potential 218 registered members (36%), a typical response rate for this industry population (Tysoe & Wilson, 2010). The results of this survey were used to inform further engagement strategies, described below.

It was encouraging that the majority of respondents (n=65, 83%) reported they were likely or very likely to revisit SNAC, 85% (n=66) reported they would recommend the website to other child care professionals and approximately 75% (n=59) were familiar or very familiar with the SNAC logo. Only 72 respondents reported hearing about SNAC via an email, suggesting that directors were not sharing this information with their staff, or were creating a generic centre member profile rather than encouraging staff to create their own individual profiles. Approximately 33% of respondents (n=72) also reported that they had heard about SNAC via another child care organisation such as Early Childhood Australia, thus it was important to renew efforts with key stakeholders to increase awareness through articles in other e-newsletters and publications.

A third of respondents (n=72) reported they visited SNAC weekly and 60% (n=47) less frequently (2-3 times a month or less). Feedback regarding the download speed and broken links on SNAC impacted on these figures, thus all links were tested and fixed where necessary, and issues regarding site speed were referred to the web technologist. Comments were also made about members being unable to locate SNAC when using a search engine such as Google, which may also have impacted on the frequency of visits. The researcher tested how readily SNAC was located using a search engine, such as Bing or Google, and using the terms 'SNAC', 'SNACWA' or 'Supporting Nutrition for Australian Childcare'. The results revealed the SNAC website always appeared in the first three or four entries. Search Engine Optimisation (SEO) is a method of improving

the prominence of a website in search engines results, and the earlier the website appears in the results list, the more likely members are to visit the site (Crowley, 2014). However, given that SNAC was appearing early in the search list results, and that users will only ever be guided to the registration or log in page, improving SEO was not necessary. The researcher also ensured that the link to SNAC was included in all correspondence and was displayed prominently on the e-newsletters.

Respondents were asked to rate the resources found under the Support, Nutrition, Activities and Community tabs on SNAC. The majority (n=174, 80%) rated these resources as good, very good or excellent, with the Nutrition (recipes) resources being the most popular.

Respondents were also asked to identify any nutrition or healthy eating issues at their service, and any topics of interest they would like to see on SNAC. Those reported included parental influence on children's food habits, food provision, nutrition training, food allergies and intolerances. This provided important feedback based on which additional resources or information could be developed or sourced. However, this also raised the issue of promoting the site's resources, as several respondents raised issues about topics where material was already available. The e-newsletter became a useful tool in promoting the content that was already available on the website, but not readily identified by members. Moreover, some respondents mentioned reading about a resource in the e-newsletter but being unable to locate it on SNAC, so future e-newsletters provided the direct link to the relevant section of SNAC.

A special edition of the e-newsletter was issued that provided a summary of the member survey results, assurances that any issues would be resolved and a reminder to users to continue to provide feedback.

Summary

This chapter has provided an overview of the construction of the SNAC website, including design, technical aspects and the content therein. A reflection on the communication issues encountered, together with an insight into the difficulties with developing a management console and extracting web analytics were also presented. Finally, website launch, including recruitment and promotional strategies have been discussed.

The following chapters in this thesis will present the findings of this study. The next chapter outlines the building of the SNAC community and how SNAC was used by the members. Chapter Seven presents sense of community findings, Chapter Eight, findings about knowledge and attitudes, and the final findings chapter (nine) presents efficacy data.

CHAPTER SIX:

BUILDING THE SNAC COMMUNITY

Introduction

The second stage of this project aimed to develop and deliver an online community of practice (SNAC) to support child care staff in their ability to provide and promote an environment where children's healthy eating practices, behaviours, food habits, and preferences could be developed and maintained. The development of the SNAC intervention was premised upon the idea that online communities of practice can facilitate knowledge sharing that help to resolve problems occurring in the workplace (Fang & Chiu, 2010). Research studies of the child care sector have identified problems are often experienced in relation to menu planning (Romaine et al., 2007), dealing with fussy eaters (Lynch & Batal, 2011) or preparing the service for an NQS assessment (Woolcott Research and Engagement, 2014). Similarly, formative work in this study identified similar issues.

Previous chapters have described the development and implementation process of the SNAC website and the strategies used to develop an online community of practice, and the proceeding three chapters present the findings. This is the first of these three chapters that examines how the SNAC community emerged and how its participants engaged with the intervention. This is an important *a-priori* chapter in order to determine whether or not a sense of community was ultimately established – discussed in Chapter Seven. Firstly, a table providing an overview of the data collection points and the corresponding number of participants is presented. The demographic profiles of SNAC members are then provided to familiarise the reader with the study participants. The entrée techniques, which form part of a netnographic 'introduction' for researchers

who are undertaking online participatory research (Kozinets, 2010) are then evaluated in terms of their effectiveness to both recruit members and engage them in early participation. Data is then presented that demonstrates how SNAC members 'used' the site along with the barriers and motivators that influenced their activity. Participant confidentiality is protected through the use of pseudonyms, and no real names or locations are presented in this chapter.

Overview of Data Collection

Table 6.1 provides an overview of the timeline in which data collection took place, together with the number of participants at each stage. This table provides information on data collected as participants registered for SNAC, the ongoing data collection points during the course of the intervention, and those adopted at the end of the intervention.

Table 6.1 Data Collection Timeline

When	What	Date	n	Variable
Registration for SNAC	*Web analytics* *Qualtrics pre-intervention survey*	01/08/2013-31/12/2014	1045 378	Demographic data Attitudes, perceptions and efficacy
Ongoing engagement with SNAC **01/08/2013 - ongoing**	*Netnographic data* – conversation threads, posts, centre websites, Facebook posts *Spontaneous participant observations* – gathered at presentations via emails, telephone conversations, other site visits *Member surveys* – to obtain feedback from early participants (December 2013) *Google analytics* *Web analytics*	01/08/2013-31/12/2014 01/08/2013-31/12/2014 Nov/Dec 2013 01/08/2013-31/12/2014	1045 1045 79 1045	Knowledge, attitudes, efficacy, sense of community, website useability Web statistics
End of intervention	*In-depth, semi-structured exit interviews* *Qualtrics post-intervention* July 2014-October 2014)	Sep 2014-Mar 2015 01/08/2014-31/10/2014	42 189	Knowledge, attitudes, efficacy, sense of community, website use and useability Demographic data, attitudes, efficacy, sense of community

Demographic Profiles

Three sets of demographic data are presented in this section including: a) the users of the SNAC community (SNAC cohort), b) the SNAC members who gave a qualitative exit interview and c) the SNAC members who completed the Qualtrics survey, pre- and post-intervention.

SNAC Cohort

By December 2014, when the intervention had been operational for 17 months, there were 1,045 registered SNAC members from approximately 800 different child care centres, representing 1% of child care staff Australia wide (ABS, 2011a), and 0.05% of registered centres respectively (ACECQA, 2014b). Based on the number of Australian children attending a child care centre, and the number of centres currently operating in Australia, the average number of children per centre is 90 (ACECQA, 2014b). It is therefore estimated that SNAC potentially reached more than 70,000 Australian children.

The majority of SNAC members were female (n=1024, 98%), which is consistent with industry norms (ABS, 2010). However, three-quarters (n=784) were older than 36 years, a proportion significantly larger than that (47%) reported by the ABS for child care workers (2011a). More than half (n=606) of the SNAC cohort were directors or second in charge (2IC), 23% (n=240) were educators and 6% (n=62) were food coordinators. The cohort also included participants (n=135, 13%) in 'other' roles such as compliance officers, training officers, students, dietitians and health promotion officers. Directors represented the largest proportion of all age groups, except in 19-25 year olds (Figure 6.1).
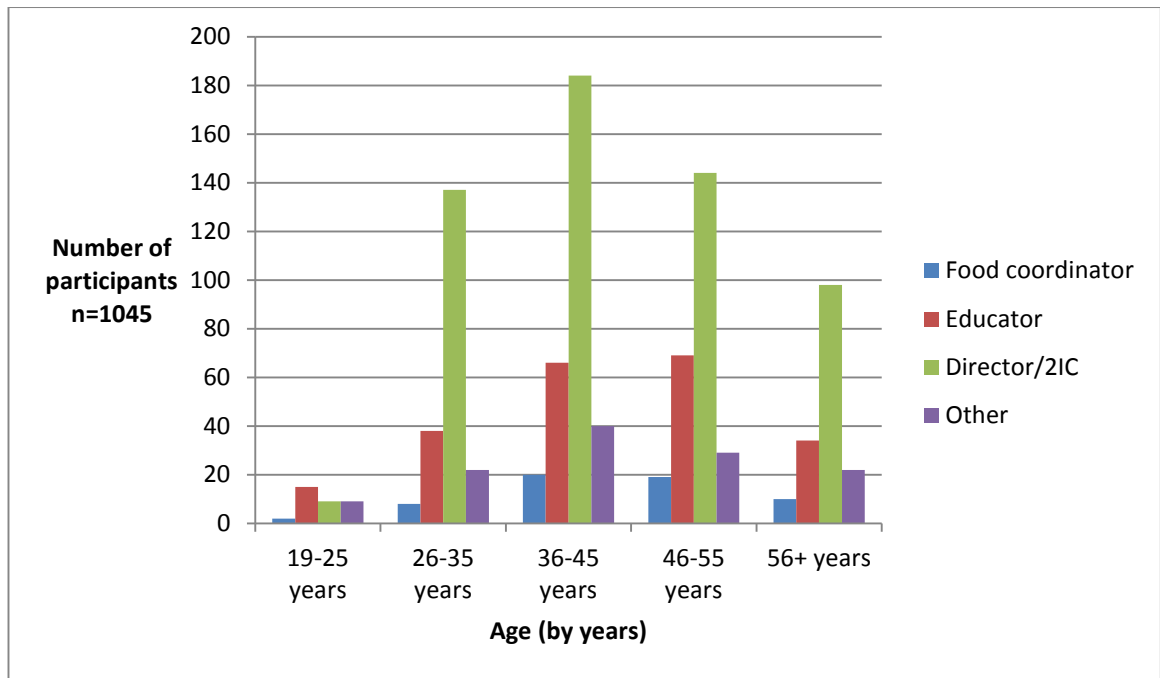
Figure 6.1 Age and role profile of SNAC cohort

Figure 6.1 shows that the profile of the SNAC cohort participants was clearly skewed towards the senior roles (director and 2IC), perhaps because directors were the first point of contact for recruitment in this study. Hence they may have acted as gatekeepers, registered themselves and chosen not to distribute information about the site to employees. It is also possible that the high proportion of directors represented in the cohort is overstated, as there was evidence that directors registered for SNAC, created one profile, and then distributed the log in details to other staff in their centre. Whilst this may have been a more convenient way for child care centres to utilise the site, it also demonstrates the difficulties in monitoring registrations. Hence, determining 'who' used the SNAC site in any given centre by log in details alone became difficult to determine, consequently making it difficult to evaluate individual experiences and determine an accurate member profile.

Geographically, 66% of members (n=690) were located in major Australian cities, 30% (n=313) in inner and outer regional areas, and 4% (n=42) in remote and very remote areas, similar to Australian geographical residential location statistics (AIHW, 2015).

Demographic profiles of SNAC interviewees

A total of 28 in-depth, semi-structured exit interviews were conducted post-intervention, between September 2014 and January 2015, either in person or by telephone. These interviewees were selected according to their level of interaction with the SNAC website and their geographical location, as detailed in Chapter Three (pages 77-81). The demographic profile of these interviewees is presented and discussed in the following sections.

Table 6.2 Demographic characteristics of interviewees

Variable	Result	n	%
Gender	Female	28	100
Age (years)	<18	0	0
	19-25	0	0
	26-35	5	18
	36-45	9	32
	46-55	9	32
	56+	5	18
	TOTAL	**28**	**100**
Role	Director	16	58
	Other[a]	4	14
	Educator	3	10
	Food coordinator	5	18
	TOTAL	**28**	**100**

[a] Other includes roles such as administrator, compliance officer, Family Day Care educational leader and service coordinator.

All interviewees were female. According to role, directors represented more than half of the interview cohort (n=16, 58%), and food coordinators were underrepresented, forming only 18% (n=5) of the cohort (Table 6.2). Given the senior roles tended to be occupied by older age groups, the younger age groups were not well represented either. No interviews were conducted with SNAC members from the under18 years or 19-25 years age groups, half the interviewees (n=14) were aged between 26-45 years, and the other half aged older than 46 years (Table 6.2).

Table 6.3 Geographical location of interviewees

Remoteness Area Location[a]	n	%
1- Major City	16	57
2- Inner Regional	4	14
3- Outer Regional	7	25
4- Remote	0	0
5- Very Remote	1	4
TOTAL	**28**	**100**

[a] Regional Area Remoteness Indicator (www.doctorconnect.gov.au)

The geographical location of the centres where the interviewees worked was representative of the overarching child care population (Table 6.3). Almost three quarters of interviewees were based at centres located in a major city or inner regional area (n= 20, 71%), which is representative of the 3:1 ratio between metropolitan and regional, rural or remote centres in Australia (ACECQA, 2014b).

Table 6.4 illustrates the interview cohort consisted of participants who were either actively, or somewhat actively (low-active) engaged with the SNAC website. This data also reflects interviewees who were more passively involved (passive-active), including one who did not use the site at all (non-active). A more detailed explanation of these levels of interaction and activity are provided later in this chapter.

Table 6.4 *Member definition of interviewees*

Member Definition	n	%
Active *(posted more than 5 comments)*	10	36
Low-active *(Posted between 1-4 comments)*	9	32
Passive-active *(Does not comment but uses SNAC website)*	8	28.5
Non-active *(Registered but never returned to SNAC website)*	1	3.5
TOTAL	28	100

[a] Member definitions provided in Figure 6.11

The method of interview was higher for telephone contacts than for in person (58% vs. 36% respectively), and there were two participants who provided their answers in writing.

Chapter Three described the difficulties in interviewee recruitment, especially from the sub-cohort of SNAC members who registered but did not return to the site. After contacting some of these non-returning members, none agreed to participate in an in-depth interview. However, some agreed to partake in a short interview (between 5-10 minutes, i.e., Bryman, 2012) enabling the collection of some (albeit brief) qualitative data that provided reasons for their inactivity. In total, 14 of these brief interviews were conducted by telephone, which were with female directors (n=6, 43%), child care educators (n=6, 43%) and the remaining two participants were 'others'. Food

coordinators were not represented at all in this cohort. Most of these interviewees were aged over 36 years and were based in a major city or inner regional area. There were no respondents from remote or very remote areas.

Taken together, the 28 in-depth interviews and the 14 brief interviews (n=42) would generally be regarded as a sufficient sample size (Mason, 2010), in terms of providing rich data for qualitative analysis. However, when considering the concept of data adequacy (Bowen, 2008), it is apparent that both the younger age groups (younger than 18 years and younger than 25 years), and members who occupied a food coordinator's role, were underrepresented.

Qualtrics pre- and post-intervention survey

A quantitative survey measuring attitudes, confidence and sense of community was administered electronically as part of the registration process for SNAC. This pre-intervention survey was administered for a period of 12 months, from when the website was launched on 1st August 2013, until 31st July 2014. This enabled a staggered recruitment strategy that allowed members to join the study at any time. The post-intervention survey was administered on a staggered basis, between 1st August 2014 and 31st October 2014, ensuring that all members had been registered on the site for a minimum of three months, before being asked to complete this survey. For example, if a new member registered on 31st July, 2014, they would not be asked to complete the post-intervention survey until 31st October, 2014, therefore allowing three months exposure to the website. This survey was based on previously validated published instruments (Brenowitz & Reeves Tuttle, 2003; Chavis et al., 2008; Lofton & Carr, 2010), which are detailed in Chapter Three.

Table 6.5 *Participant demographic profile*

Variable	Result	n	%
Gender	Female	188	99.5
	Male	1	0.5
	TOTAL	**189**	**100**
Age (years)	<18	0	0
	19-25	1	0.5
	26-35	37	20
	36-45	46	25
	46-55	62	33.5
	56+	39	21
	TOTAL	**185[a]**	**100**
Role	Director	113	60
	Other	18	9
	Educator	43	23
	Food coordinator	15	8
	TOTAL	**189**	**100**
Remoteness Area Location	1-Major City	124	65
	2-Inner Regional	24	13
	3-Outer Regional	30	16
	4-Remote	4	2
	5-Very remote	7	4
	TOTAL	**189**	**100**

[a]several participants gave their date of birth incorrectly as 1900

The pre-intervention survey comprised three parts: demographics, attitudes and perceptions, and efficacy. The post-intervention survey was identical, but included the additional sense of community questions. There were 189 SNAC members (18% of the

total SNAC cohort) who completed the survey both pre- and post-intervention and the demographic profile of these respondents was very similar to the total SNAC cohort and interviewees.

Respondents were predominately female (99.5%). The majority were directors (n=113, 60%) and only 15 food coordinators responded (Table 6.5). Almost 80% of respondents (n=151) were aged over 36 years, and 65% (n=123) were based in a major city (Table 6.5).

More than 80% (n=151) of survey respondents had attended TAFE or University (Table 6.6). Many of the respondents held more than one qualification, usually obtaining higher qualifications in line with an increased in role seniority. Approximately 40% of the survey respondents (n=75) had obtained a degree in teaching (Table 6.6).

A chi-square test for goodness of fit (with $\alpha = .05$) was used to assess whether role was indicative of level of education. This test was statistically significant, X^2 (15, $N = 189$) $= 25.73$, $p = 0.041$, indicating that more senior roles were associated with higher levels of education. As an index of effect size, Cohen's w was 0.61, which can be considered large.

Table 6.6 *Education level and qualifications of survey respondents*

Variable	Result	n	%
Level of education	Year 10	9	47
	Year 11	3	1.6
	Year 12	12	6.3
	TAFE	68	35.6
	University	91	47.6
	Other	6	4.2
	TOTAL	**189**	**100**
Highest Child Care Qualification[a]	Certificate III	38	20
	Certificate IV	2	1
	Diploma	68	35.5
	Advanced Diploma	31	16
	Teaching degree	76	40
	Other degree	34	18

[a]No total as child care staff may hold more than one qualification

Of the various roles, directors had the highest proportion achieving tertiary and vocational levels of education (Figure 6.2), with 42 completing TAFE and 54 completing a university degree. However, five directors reported a maximum education level of Year 10. Educators were the next highest in educational status, with 12 completing TAFE and 25 completing a university degree.
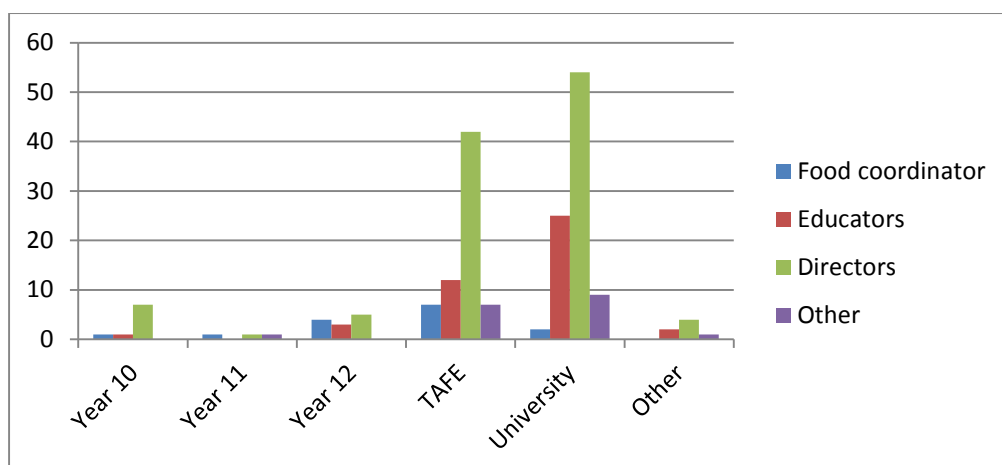
Figure 6.2 Level of education according to role

Summary

The demographic profile across all three groups of respondents is similar and is characterised by females aged older than 36 years in senior roles and based in major cities. The younger age groups and those in less senior roles such as food coordinators are not well represented.

It was not possible to easily define the level of interaction that members had with the SNAC site, given the tendency for directors to create one login profile (and subsequently used by other staff) that masked individual behaviours. It was, however, possible to interrogate an individual's level of interaction during the exit interviews and this data is presented in Table 6.4.

Given these data were collected from multiple sources, symbols are used to indicate the different data sources and are listed as a quick-reference guide in Table 6.7. These symbols are used to identify the where specific data are presented throughout the proceeding findings chapters.

Table 6.7 *Quick Reference Guide: Data sources*

TYPE OF DATA	SYMBOL
Netnography – conversation threads, posts, centre websites, Facebook posts, emails	💻
Telephone calls	☎
In-depth, semi-structured exit interviews	✏
Self-completion survey; pre- and post-intervention (Qualtrics)	📃
Web and Google analytics	💾

Having established the SNAC demographic profiles, an examination of the effectiveness of the recruitment and engagement strategies used during the entrée stage of the netnographic process, to drive community success, are discussed next.

Growing the SNAC Community

By understanding that online communities rarely evolve naturally, it was essential that effective strategies were employed to attract participants to SNAC and stimulate sufficient engagement to create an opportunity for an online community.

Email recruitment

As indicated in Chapter Five, initial recruitment was conducted via email, with mass emails initially being sent to all registered long day care centres in Western Australia, the target population of the original research proposal. Simultaneously, individualised VIP invitations were emailed to participants from Stage 1 of the study where email

addresses had been provided, and to attendees of the Nourish workshop conducted in June 2013.

On a more individualised basis, and to highlight the recruitment difficulties encountered, the researcher co-hosted a Nourish menu planning training session in October 2013, attended by a small group (n=8) of food coordinators and directors. This opportunity was used to reiterate the benefits of registering for SNAC, as the content learned at the workshop was supported on the SNAC website. Each attendee was emailed a personalised invitation to register the day after the workshop, and despite three further reminders, not one attendee registered for SNAC.

Whilst 75 people had signed up to SNAC only two weeks after the launch, this represented a very small percentage of the target population, the child care workforce in Western Australia that consisted of approximately 5000 staff. It was increasingly vital that more members be recruited so that a critical mass could be developed for those who had already signed-up.

Presentations

Another strategy utilised were the staff presentations offered to centres within the Perth metropolitan area, the purpose of which were to a) promote the SNAC website, b) highlight the features of SNAC that supported child care staff roles in promoting healthy eating, and c) encouraging individuals to register. All centres requesting a presentation received one, provided they were located in the Perth metropolitan area as there was no budget to accommodate interstate travel. Presentations at child care centres always took place after the centre had closed, usually forming part of the staff meeting. In total, 20 tailored presentations were delivered to staff cohorts or individual staff members (usually directors) between June 2013 and November 2014.

The response to these presentations varied from enthusiasm to unequivocal disinterest. On one hand, the staff at CCC centre [*pseudonym*] were very welcoming, helped to set up equipment, offered refreshments and were actively and enthusiastically engaged throughout the presentation. Conversely, staff at SH centre [*pseudonym*] were extremely unresponsive, and this was especially disappointing given that their director supported the project and was involved in Stage 1 interviews. Whilst providing valuable insights about how a centre operated and some of the operational issues encountered daily, the response in terms of recruitment, engagement, or driving additional traffic to SNAC was minimal. At most, there would be one or two new registrations after a presentation, which translated into a less effective recruitment or engagement strategy than originally thought, especially in relation to the effort required to provide these presentations. An excerpt from the researcher's journal highlights the sense of frustration experienced at the lack of engagement from the staff:

> *At one centre, the staff did little to hide their disinterest, did not engage with me at all, and it was left to the director to ask questions at the end of the presentation. At another, a staff member fell asleep during my presentation, another came in late, others checked their telephones, openly yawned and so on, and again it is the director who is the most interested and engaged with the presentation, perhaps because she has arranged it.*

There were often equipment and set up issues to deal with:

> *At times I found myself sitting on a child size chair presenting from my laptop perched on my knee. I have been promised that all the necessary equipment is available and when I get there, the laptop is broken, or the projector has gone missing, or quite simply, there is not any wall space to*

project onto. I learnt quickly that internet connections could be an issue, so

always had screen shots of SNAC as a backup, and always took my own set

of equipment.

Of course, the equipment problems were indicative of the 'normal' child care setting. Whilst I was unaccustomed to sitting on a child-size chair, it was apparent that the staff often endured this themselves; hence my adaptation to these trivial problems may have helped to build rapport with staff by demonstrating the old adage of 'if it's good enough for them, it [should] be good enough for me'. However, the apparent lack of interest was disappointing, but it was also important to remember that some staff often worked long hours, provided care that was both physically and mentally demanding, whilst struggling to maintain their own work life balance (Jovanovic, 2013). Indeed, some were also parents themselves or may have been studying for a child care qualification to meet the requirements of the NQS. Moreover, some staff may have been disinclined to participate in SNAC training presentations, as it has been suggested some child care staff could perceive the offered incentives to be limited in terms of increasing their status or income (O'Connor, McGunnigle, Treasure, & Davies, 2014).

Advertising SNAC

Given these recruitment initiatives proved to be less effective than anticipated, a number of early years' organisations were approached with a view to including a brief article in their e-newsletters (Appendix 18), that would be sent to child care staff. One of the most successful of these publications to drive recruitment was an article in the Early Childhood Australia e-newsletter, issued in October 2013, requesting new members for SNAC, resulting in 126 new registrations. The publication of this article coincided with the launch of the Picasso Cow competition (described later in this chapter), which

together, resulted in an increase in page views from approximately 1000 to more than 3500 between September and October 2013 (Figure 6.3).
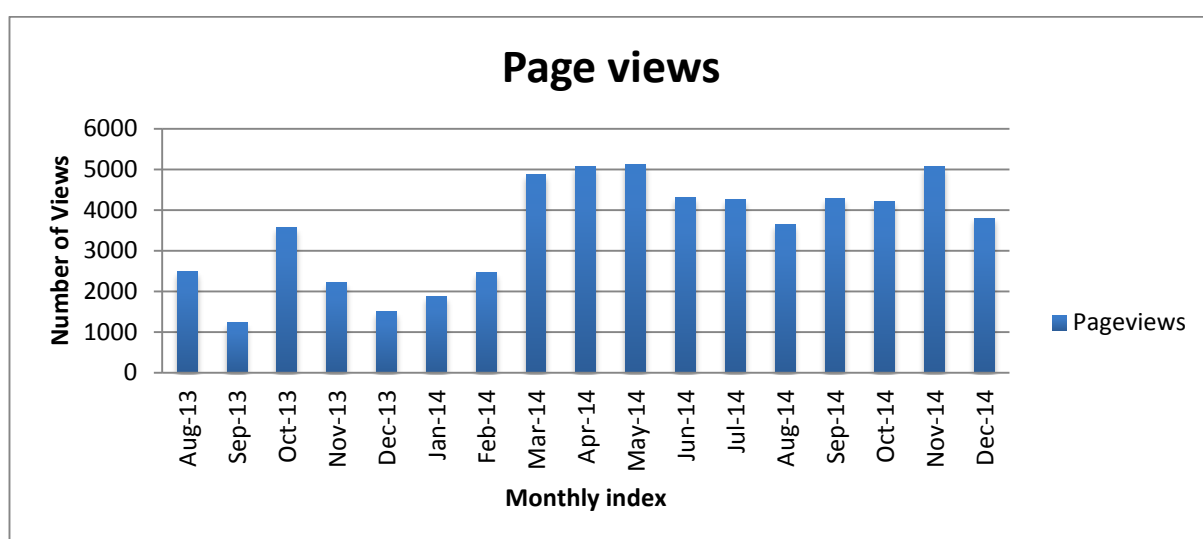
Figure 6.3 Average number of page views per month

Early Childhood Australia also published a brief descriptive article in March 2014, resulting in 215 new registrations. The CareForKids e-newsletter also included a brief descriptive article about SNAC in April 2014, which attracted 238 new SNAC members. These two publications coincided with page views increasing from approximately 2200 to 5000 or more (Figure 6.3, 🖫). Furthermore, these e-newsletters were published Australia-wide, extending the reach of SNAC beyond Western Australia and subsequently, registrations were received from every State and Territory.
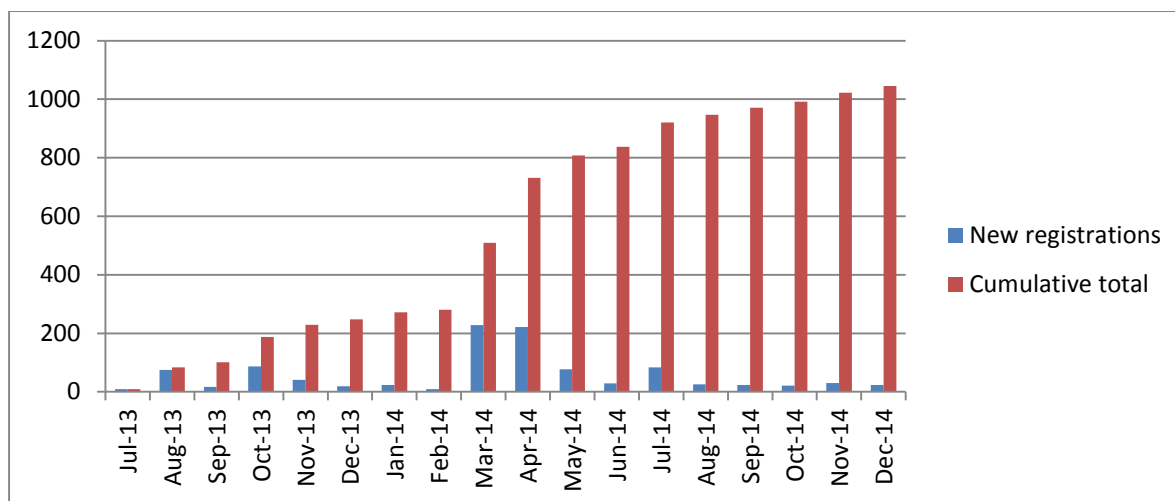
Figure 6.4 New registrations by month and cumulative total

Figure 6.4 (⌷) illustrates the increase in new members during October 2013, March 2014 and April 2014, together with the increasing cumulative total.

Figure 6.5 (⌷) also illustrates the impact the CareForKids newsletter had on the overall number of daily page views, in what had previously been a quiet month for page views on SNAC.
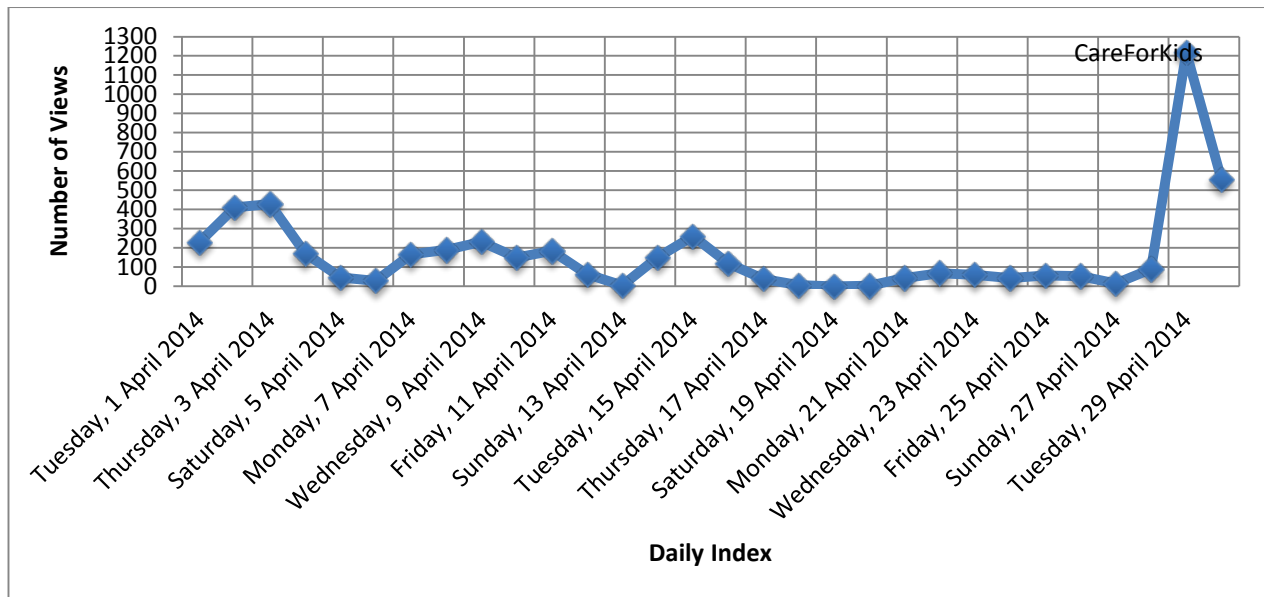
Figure 6.5 Impact of CareForKids e-newsletter on page views

Furthermore, these increased numbers of members also resulted in an increase in the number of comments posted on SNAC, during November 2013, March and April 2014 (Figure 6.6, 💾), also coinciding with the article publications.
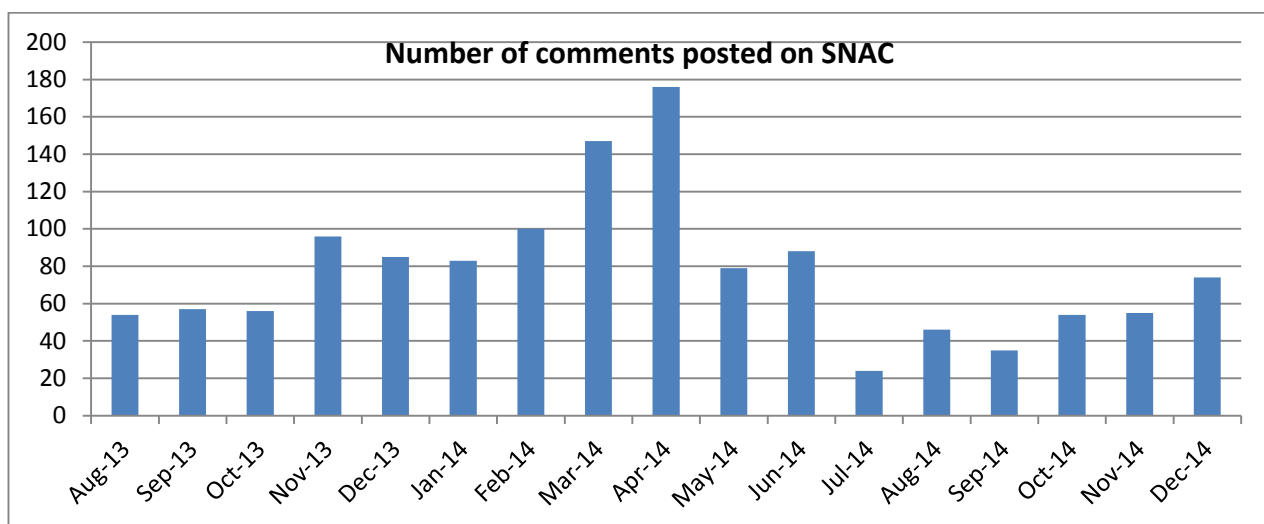
Figure 6.6 Number of comments posted on SNAC

Another measure that indicated the positive impact increasing member numbers had on SNAC was the number of 'sessions' recorded. Sessions are groups of interactions,

performed by a SNAC member within a given time frame, and included multiple screen or page views, events and social interactions (Google Analytics, 2015). By month, the number of sessions remained fairly constant, but the highest number of sessions were recorded in March 2014 (1210) and April 2014 (1285), corresponding with an increase in membership, page views and comments posted. Cumulatively, there was a steady increase in sessions on SNAC, reaching almost 10,000 by December 2014 (Figure 6.7, 🖫).
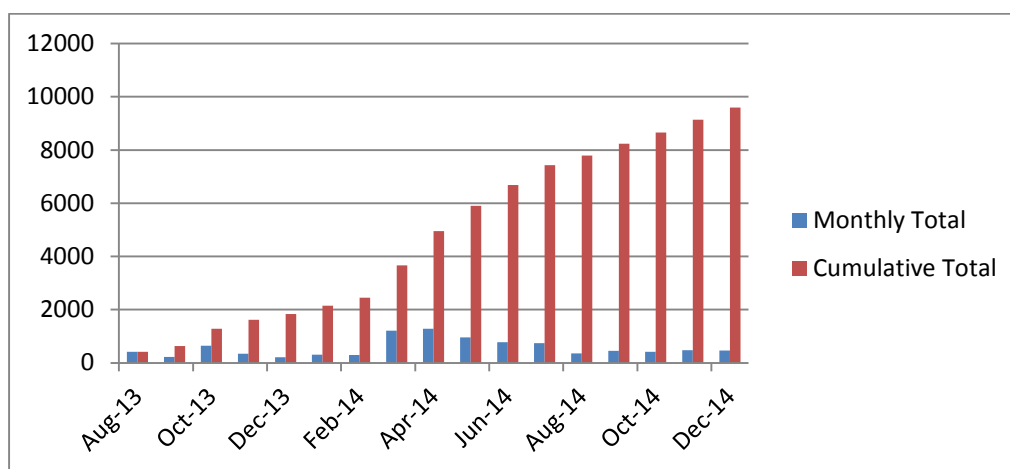
Figure 6.7 Monthly and cumulative totals of SNAC sessions

At this point in the research, having finally achieved a relatively large number of registrations to the SNAC site (n=255, at 31st December, 2013), engagement techniques were now deemed as critical. For many new communities, this is a critical time, where existing members of online communities are at risk of losing interest if website activity is limited by a lack of communication between members (Resnick et al., 2011). This was of immense concern given there was very little activity on the forums in the early days of SNAC, with one member abruptly asking

where is everyone!? [Renee, ⌨].

As such, the engagement strategies described in Chapter Five are evaluated next, in terms of their success in contributing to the emergence of community on the SNAC site.

SNAC is alive!

An important entrée procedure is to constantly "hone and re-hone" the way the community is approached (Kozinets, 2010, p. 79), and as such, a number of strategies were employed. It was important that members were given the impression that SNAC was an active website, as well as making the community attractive to these early participants. This was approached by regularly communicating information to members and ensuring all early content was professionally generated, as described in the following sections.

Champions

One of the early engagement strategies involved the use of 'champions' who were the moderators (including myself as the researcher and a team of volunteer nutrition students at ECU). Moderators posted new material every day to give the impression that there was 'somebody out there' and to seed online discussions. After the site had been live for four months, and discussions were limited at best, the researcher made a plea on one of the site's discussion boards:

> *It has been pretty slow going, trying to get SNAC users on here every day*
> *and to start sharing their stories, thoughts, offer some support, have a chat,*
> *have a laugh, whatever you want to do!! So this is my heartfelt plea for*
> *your help to get this community off the ground and flying high!!! Come and*
> *talk to me and your colleagues! Be a champion!! Be a SNAC pioneer!! Be a*
> *leader not a follower!! (Ruth, ⌨).*

There was only one response to this request on the discussion board:

> Excellent site, and useful in many ways. I will endeavour to visit more often, though it will more likely be a fortnightly visit due to my many other commitments. Hope we can get a few more regular members…Keep up the good work (Carol, 🖥).

Another response was received by email:

> Not sure if I could do it every day but happy to contribute on a fairly regular basis (Libby, 🖥).

These two comments, taken together with the silence of the remaining SNAC cohort (by this stage, several hundred members) indicated that a typical SNAC member might only *want* or *need* to visit the website on occasion or less frequently than I desired them to visit! Given the activity on SNAC was so muted in the first few months, a member survey was conducted in December 2013 to gather general feedback and identify any issues that may have prevented interaction. The data indicated that only 8% (n=6) of members preferred to visit SNAC several times a week and approximately half (n=41) reported visiting SNAC less frequently, either weekly or 2-3 times a month (Figure 6.8,).
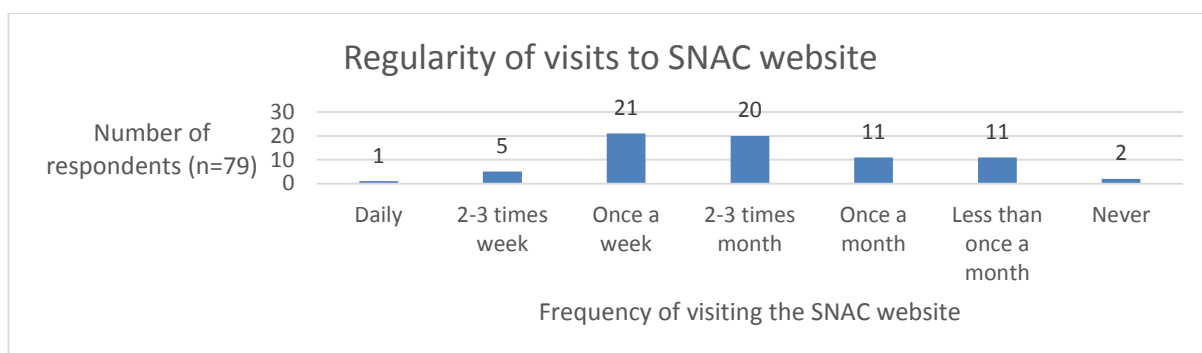
Figure 6.8 Regularity of visits to SNAC website

At this stage, given the less frequent visits to SNAC by these members, it was imperative that they were made aware of the existing content and resources available. In fact, the Stage 1 data revealed that participants tended to rely on general internet searches when seeking nutrition information, thus it was important to create a repository of current and reliable resources that they considered of professional quality, thus design approaches were considered important to the success of the online community (Resnick et al., 2011).

Professionally generated content

In order to achieve this, content was designed with this in mind and was organised under the headings of **Support** (fact sheets, links to other child care professional organisations, healthy eating activities, and menu planning tools); **Nutrition** (recipes specifically designed for child care centres) and **Activities** (videos, quizzes and downloadable resources). Apart from this professionally generated content, all posts were carefully "crafted, reviewed and refined" by the research team, an entrée technique suggested by Kozinets (2010, p. 80) that ensured their accuracy, and that they were based on healthy eating topics relevant to child care centres.

Data from the member survey (December 2013) indicated the SNAC resources were well received, with 75% respondents (n=59) rating them highly (Figure 6.9). Members

189

also indicated other resources they would like to see available, but that had already been uploaded to SNAC, but not located by members. In line with the STAR model (H. Skinner et al., 2006), and the iterative process of implementing feedback received from members, these data demonstrated two points: a) the need to better advertise the resources already available, and b) new material required by members.
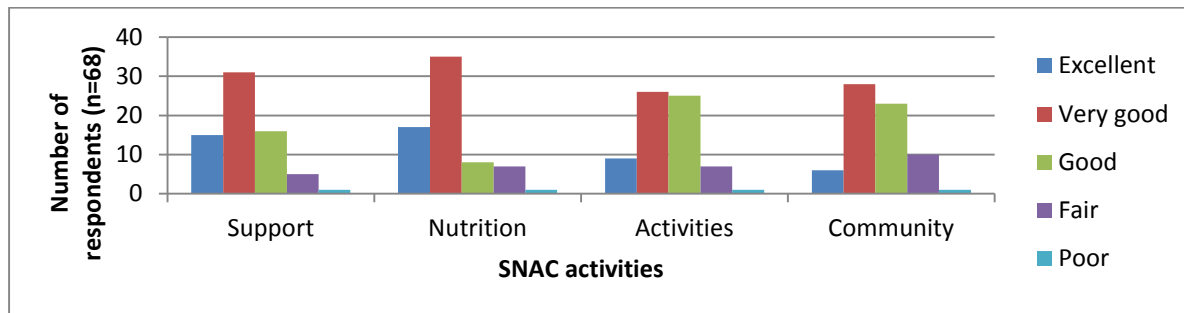

Figure 6.9 Ratings of SNAC activities

SNAC's simple web design meant that members did not need to learn complex new IT systems, however, there were some IT issues reported that required resolution. For example, some members reported the website was slow to download and there were some broken links, which were reported to the web technologist for remedy.

Strategies to create the impression of an active website

E-newsletters advertised new content and resources and complementary conversation threads were created to stimulate discussion easily (Appendix 16). Members' comments and messages received an immediate reply (from at least the moderator), usually the same day, reinforcing the impression of an active website (Resnick et al., 2011).

Members who commented for the first time were sent a personal welcome message, and their contribution was acknowledged on the discussion boards, further recognising the value of early adopters, and as a means of creating relationships with individual

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participants (Kozinets, 2010). They were also added to the 'regular members' group and received individualised email messages to maintain their interest, remind them of their importance to the community and to encourage further activity online. For example, Figure 6.10 is an example of an individualised email sent to an 'early adopter':

Hi Christine

Thank you for your contributions to the SNAC community ☺

Just wanted to give you the heads up on this week's comp – we would love to hear what you think of our newly developed nutrition videos, and if you watch one of them (or as many as you want to watch) and leave a comment, I will provide a certificate of completion for your PD folder and you go in the draw to win yet another $50 gift card. Simple as that!

http://snacwa.com.au/category/activities/nutrition-activities/

I do appreciate your continued support for the SNAC website and hope you are enjoying using it.

Kind regards,

Ruth Wallace
BHSc (Hons), ANutr
PhD Candidate
snac.
www.snacwa.com.au

Figure 6.10 Example of personalised message to 'regular' SNAC member.

This individualised approach was adopted between February and May 2014, but it was not possible to maintain this approach in the longer term for several reasons. Eventually, responses to these personalised emails dwindled, and it was important to find other time efficient strategies to maximise interaction. There were also concerns about 'information overload', especially as emails are commonly cited as a major cause of this issue, which can result in increased workloads and failure to recognise quality information (Benselin & Ragsdell, 2015). When a SNAC member who attended the Nutrition Australia AGM in April 2014 asked the researcher "are you the one who sends all those emails?" it was construed that perhaps the point of overload was

imminent, especially given this group of regular members were mostly directors and senior staff.

Even though information was getting through to these regular members, it was concerning that more junior staff did not seem to be receiving information or have the chance to engage with the site. This problem might be explained by what Resnick et al. (2011) have termed an innovation-need paradox – referring to those who may *need* SNAC the most but who may also be the least likely to adopt it. A director (Tabitha) advised that she thought her staff did not understand how SNAC could benefit them (despite a tailored presentation at their centre where the educator was asleep) and another director (Katie) complained that her food coordinator (Laura) was reluctant to access SNAC or use the discussion boards on a regular basis. Laura agreed to an exit interview where she reported that she visited SNAC two or three times a week, but always forgot to leave comments. However, web analytics revealed that Laura had only visited SNAC on three occasions during the whole intervention period (unless she was using a login created by her director and shared by all staff), leading the researcher to conclude that she did not perceive the need to use SNAC and only did so when instructed by her director. Of course, social desirability (Fisher & Katz, 2000) could have influenced her responses during the interview and may explain her inaccurate reporting of how often she interacted with SNAC. Moreover, Laura was very reticent and particularly difficult to interview, giving the impression that she had been instructed to talk to me by Katie (the director), which also reflected the sometimes inequitable relationship between directors and food coordinators in the child care setting.

Demonstrating community success

Demonstrating community success to members is an important strategy in ensuring the establishment of an online community (Resnick et al., 2011). As such, SNAC developed its own e-newsletters and regularly distributed them to registered members in order to demonstrate community success by providing information about growing numbers, new resources and discussions on the website, as well as launching several competitions. Feedback from the member survey (December 2013) indicated that members found the resources featured in the e-newsletters were sometimes difficult to locate on the website, so the direct link to the resource was included in subsequent editions.

From December 2013, e-newsletters were administered via MailChimp, allowing additional member data to be collated, and offering further information about their interaction with SNAC. On average, 32% of e-newsletter recipients actually opened the email, and a further 7% clicked on a link, comparing favourably with an industry average of a 22% 'open' rate (The Rocket Science Group, 2015). However, these statistics may have understated members' actual engagement with the newsletters, particularly if email settings (to do with image previewing) meant that an opened email was viewed but not registered as opened.

Furthermore, Mailchimp also generated 'star ratings', based on members' level of interaction with the newsletters, a score of 1 star being the lowest and five stars being the highest level of interaction (Table 6.8). These ratings are based on a number of factors including, but not limited to, open rates, click rates, bounce rates and unsubscribe rates (The Rocket Science Group, 2015). Based on the combination of these factors, almost half of recipients had a high level of interaction, either four or five

star, with the SNAC e-newsletters (Table 6.8). An example of a SNAC e-newsletter is provided in Appendix 19).

Table 6.8 Subscribers member activity rating (at 31st December 2014)

Member activity star rating	Number of subscribers	%
5	304	32
4	153	17
3	72	7.5
2	412	43
1	5	0.5
TOTAL	**946**	**100**

It was encouraging to learn that some SNAC members' regarded the e-newsletters as their prompt to visit the website and that they appreciated the email-generated reminder, despite concerns about information overload (Benselin & Ragsdell, 2015) mentioned in the previous section.

I always check out the emails [e-newsletters] when I get them come through, I always go on and check out what's new and that sort of stuff (Riley, ✎).

I always read the newsletters and stuff and if something comes up that kind of appeals to me I'll get on there and make a comment (Cassie, ✎).

Yeah, whenever I get that [newsletter] that reminds me that I haven't looked for a couple of days and I go straight on then and make comments….a good reminder to go back on there, the site (Katie, ✎).

However, several non-active members, when asked why they did not return to SNAC after their initial registration, believed that they were engaging with SNAC simply by reading the e-newsletter.

The pre-intervention Qualtrics surveys also provided an opportunity to remind members about SNAC and advertise a current competition or resource. New registrants were sent a welcome email, which asked them to complete the Qualtrics survey, explore the website, introduce themselves on the discussion board, upload an avatar and provide feedback. Relatively few new members introduced themselves (n=11) or uploaded an avatar (n=22), perhaps because this was a request and not an actual requirement before access to the website was granted. If members had not returned the Qualtrics survey within two weeks of their registration, a reminder email was issued, and a thank you message was also issued when the survey was completed. Both opportunities were used to prompt SNAC members to revisit the website.

Competitions

A number of competitions with prizes were also designed to drive engagement and increase interaction with SNAC (Table 6.8). Competitions were advertised in e-newsletters issued to SNAC members. Participation was limited to posting comments

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on a discussion board. For example, a pumpkin recipe competition was posted at the beginning of Autumn, when pumpkins were in season, and members were asked to provide their favourite pumpkin recipes. Nine recipes were posted so a small recipe book was collated and published as a PDF on the website. Details of the competitions and their success in terms of numbers of comments are provided in Table 6.9, and in page views (Figure 6.3). The increased number of comments during November 2013, March and April 2014 also demonstrated the success of these competitions (Figure 6.6).

When asked about the pumpkin recipe book competition, Tameeka, a director responded enthusiastically:

> We like the pumpkin recipes, the pumpkin cookbook was good, there was an awful lot of pumpkin! And that's a vegetable parents often think oh my kids will like that but what do I do with it?

Whilst the pumpkin competition was a successful strategy in driving traffic to the website and engaging members, it also appeared to have the potential to up skill both staff and parents about how to incorporate a nutritious vegetable into service and family meals.

Table 6.9 *Response to SNAC competitions*

Date	Competition Theme	# Comments	Randomly Drawn Prize
03/10/2013	Picasso Cow	42	$100 gift card
20/11/2014	A & P Introductions	1	$50 gift card
19/02/2014	Introduce yourself and win	25	$50 gift card
25/02/2014	Food myths busted	12	$50 gift card
05/03/2014	Pumpkin recipe	26	$50 gift card
12/03/2014	Nutrition tutorials	42	$50 gift card + PD certificates
19/03/2014	Upload your avatar	13	$50 gift card
25/03/2014	Cultural foods competition	12	$50 gift card
09/04/2014	Healthy Easter alternatives	17	$50 gift card
30/04/2014	Healthy booklists	13	Garry Goanna Goes Healthy book
13/05/2014	National Families Week	10	$50 gift card
03/06/2014	Favourite SNAC recipe	15	Deadly Tucker recipe books
18/06/2014	Eat a Rainbow	22	'I can eat a rainbow' book
28/08/2014	Healthy Bones	21	Picasso cows and Dairy Australia educators resource packs
12/11/2014	Helping children to make healthy choices	11	'Did Roy Royce make a healthy choice' book
27/11/2014	Cook up some healthy holiday cheer	31	Hard copy of cookbook created by SNAC members and $50 gift card

Two other competitions are also noteworthy in terms of engagement strategies. One was a dismal failure (A & P Introduction Competition), attracting only one comment. The other, the Picasso Cows competition, attracted over 40 comments, with some members sending photographs of their efforts. The two competitions are presented next as short vignettes to provide some useful insights into the reasons for members' engagement (or non-engagement) with SNAC.

Competition One – Picasso Cows

When searching for resources to load onto SNAC, the 'Picasso Cows' curriculum guide (Dairy Australia Ltd, 2013) was discovered, and seemed an appropriate activity to assist educators promote dairy products as a part of a healthy diet. Picasso Cows is a free curriculum program that encourages teachers to educate primary school children about the Australian dairy industry and the health and nutrition benefits of dairy foods as part of a healthy, balanced diet. Primary schools involved in the program were provided with a life-size, blank fibre-glass cow that they decorated according to one of three allocated dairy themes – Unbeatable bones, Fuel for Life or Farm to Plate. Although aimed at primary school children and unable to provide the same materials to SNAC, Dairy Australia agreed to provide free miniature cow painting kits to enable child care centres to participate.

This provided resources to launch the 'Picasso Cows' competition via a series of e-newsletters (Appendix 20). SNAC members were invited to request a miniature cow painting kit for their service, and were asked to use this as an opportunity to teach the importance of dairy in a balanced diet to the children in their centre. To enter, they were asked to post a photograph of their decorated cow on SNAC together with their comments about the experienced learning opportunity with the children.

Thirty painting sets were distributed and twelve entries were received, representing a 40% response rate. SNAC members who did post photographs were entered into the competition to win a $100 gift card, randomly drawn in December 2013. One director in particular, Katie, was very enthusiastic about the Picasso Cow competition:

> Katie: yeah great fun, love 'em [competitions], yeah they're good, and I think they're always a good thing to have because that tends to get people a bit more motivated to get involved. And you know even if it is just a, you know, a
>
> Ruth: a cow?
>
> Katie: A cow! Oh no we love our cows! [Picasso Cows, see detail below] Oh look I found the photos of the kids painting those the other day, they were lovely, I loved the cows! (✏).

Although 12 entries was a relatively low response, the success of the Picasso Cow competition was really experienced when the painting kits were still being requested long after the competition had concluded.

The next case study however, demonstrates a less successful participation incentive.

Competition Two - A & P Child Care Centres

A & P [*pseudonym*] are a small privately owned company operating four long day care centres in WA, two in metropolitan Perth and two in remote WA towns. The researcher received an email from Rita, the managing director of A & P (and a SNAC member), in October 2013 with the following request:

> I recently have been made aware of the employees in one of our child care centres effectively passing on their unhealthy eating habits to the children. Whilst I believe it is lack of education and knowledge in their personal lives, I need support to turn this situation around and ensure that they have

the skills to have healthy eating habits themselves and promote these in the children's lives they are effectively having a huge impact on. Do you have any information that I can use to include in the staff newsletter relating to child size portions for meals and how often children should be eating? This is for a child care centre caring for children 3 months to 11 years. Additionally we are then wanting to also provide a training session to staff on childhood obesity, are you able to recommend a company or facilitator who could assist in providing this training? ⌨

The ensuing telephone conversation with Rita revealed her concerns about several staff members, who she described as overweight and divulged that she believed they were encouraging the children to overeat. For example, she had received reports from other staff at the service that children were allowed to eat up to twice the recommended serve of breakfast cereal, and their food costs were much higher than the other three centres (in proportion to the number of children attending). The researcher agreed to provide some training about serve sizes for children, based on the revised Australian Dietary Guidelines, but pointed out to Rita that the staff at the centre in question might feel 'singled out' so she agreed that a combined training session for both metropolitan centres would be appropriate.

One of the activities facilitated during the presentation provided participants with a leaflet entitled 'Healthy Eating for Children' (NHMRC, 2013), together with a worksheet. They were asked to identify the appropriate serve size for each of the examples representing a food group, using the leaflet provided. Whilst not testing their ability to source this information, it did give them the opportunity to scrutinise the information in the leaflet and note the appropriate serve sizes. Food models were used to demonstrate what actual serve sizes looked like, a useful tool to reinforce this message. This was concluded by discussing the recommended daily number of serves

in each food group for a child aged 2-4 years, with a reminder that the guidelines recommend child care centres should provide at least 50% of the recommended serves for each food group whilst the child attends the service.

A background and an overview of the SNAC website was then provided, and staff were encouraged to register and introduce themselves to other SNAC members, with the incentive of the chance to win a $50 gift card. One attendee was distinctly underwhelmed by the offered incentive, saying she thought the prize might be a car! A question and answer session ended the presentation, but staff seemed reluctant to ask questions in front of the group, and several approached me individually afterwards. Of the 20+ attendees, only three registered for SNAC, none of them actually introduced themselves, despite a number of reminders sent to the centre directors.

This reiterates the point made previously about staff not engaging with the presentations, and also that staff did not see the need to engage with the intervention or value the information. This is despite the researcher explaining how it could help them promote a healthy eating environment, benefit the children and themselves and offering a monetary incentive, albeit not a car! Many of the women at this presentation were overweight and the researcher sensed that they were quite uncomfortable about the topic, and might have not chosen to attend if not required to do so by their managing director. Reasons for this apparent discomfort could result from the stereotypical attitudes obese and overweight workers face from employers, reported by Puhl and Heuer (2009), and perhaps the participants felt a sense of 'blame' for overfeeding children at the centre. Furthermore, Australian research has revealed the term 'obesity' is unpopular among individuals living with the condition (Thomas, Hyde, Karunaratne, Herbert, & Komesaroff, 2008). Whilst the presentation did not focus on the nutritional

status of the child care staff, the long-term implications of childhood obesity were outlined, and in hindsight, this could have contributed to their discomfort.

Therefore, the level of choice accorded to child care staff in their own personal development, could be indicative of better learning outcomes, as demonstrated by the comparison between the Picasso Cow competition, and the training offered at A & P. Child care staff could *choose* whether or not they engaged with the Picasso Cow competition, and for those who did, they seemed to appreciate using the resources provided to educate the children in their care. Conversely, the staff at A & P could not choose whether they attended the training; they were required to attend as part of their paid roles. Hence, it may be that when members are encouraged to participate through novel approaches rather than being obliged to participate, they are consequently exposed to authentic experiences that reveal new values and benefits that may otherwise have not been realised.

Summary

Motivating participation and engagement within online communities is often continuous and laborious. Some members may continue to participate online for reasons different to those that prompted them to join initially, whilst others discover it was not what they desired or required, and never return (Lampe et al., 2010). Despite utilising best-practice netnographic strategies (Bonniface, 2009; Kozinets, 2010), the SNAC community had not yet fully evolved, indicative of the challenges around engaging professional audiences, as opposed to the consumer-oriented audiences of sites like HeartNET, Beyond Blue and BubHub. This study demonstrated that the 'netnographic slog' which often precedes the emergence of vibrant communities is vital and illustrates that ongoing, hands-on 'active' netnographic approaches are needed to drive sustainability of such sites (Wallace, Costello, & Devine, 2015).

Having presented the various demographic profiles of the SNAC community, and the effectiveness of the various recruitment and engagement strategies utilised, the following sections now considers how SNAC members' engaged with the website, and outlines the motivators and barriers to their participation.

How Was SNAC Used?

This section presents the netnographic data in the form of the posts and comments made on the SNAC site. It also identifies how SNAC members were categorised by their level of interaction with the site, and how they used specific sections of SNAC.

Given that this was a netnographic study, the comments and conversation threads made on the SNAC website were one of the main sources of data. Firstly, the difference between posts and comments on the SNAC website is clarified. ***Posts*** are entries created and displayed on SNAC and essentially form the 'content' of the website. For example, this content included news articles, fact sheets, recipes and other relevant resources or information, and ***comments*** could be left by members about these posts. All SNAC ***posts*** (287) were created by the administrator (researcher) as it was important that this content was professionally developed in the early stages of the community (Resnick et al., 2011). At the time of writing, there were 333 comments made in response to 287 posts, which form part of the netnographic data (▤).

Conversation threads constructed on the forums, that were established to facilitate networking, sharing of ideas and social support for SNAC members, and mostly initiated by the researcher, also formed part of the netnographic data (Appendix 21). The discussion boards were organised into five main categories, and included 183 topics of conversation, attracting 846 comments. Table 6.10 (▤) illustrates the number of comments made per topic of conversation, up to the 5th March, 2015.

The majority of visits (71%) to the SNAC website were direct log ins, that is, the user had the web address and accessed the website via www.snacwa.com.au. Organic searches on search engines such as Google accounted for 16.5% of visits to SNAC, and referrals from other organisations such as Care4Kids and Early Childhood Australia accounted for 10%. The remaining 2.5% of traffic was acquired via Facebook.

Table 6.10 Total comments per forum and topic

FORUM	TOPIC	COMMENTS
Activities to support healthy eating	42	306
Ask the nutritionist	27	110
Discussions about recipes and menus	41	231
General (introduce yourself, hot news topics, anything goes)	70	193
Technical support	3	6
TOTAL	**183**	**846**

Of the 1045 SNAC members, 94 (9%) have made comments on SNAC at least once. From this cohort of 'active' members (n=94), 9.5% (n=9) could be considered 'regulars' (10+ comments), 8.5% (n=8) semi-regular (5-10 comments) and the remainder are intermittent (n=77, 82%) who have made five or less comments (Table 6.11 🖫). Almost half those classed as 'active members' (n=44, 47%) only ever made one comment, considerably more than the Usenet study that reported 27% of their members only posted a single message (Nielson, 2006).

Of the entire SNAC cohort (n=1045), the regular and semi-regular members (*active*, n=17) represent 1.5%, intermittent members (*low-activity*, n=77) represent 7.5% (Figure 6.11) and the remaining 91% (n=951) *appeared* to be inactive. However, further interrogation of these members, revealed that whilst they appeared to be inactive as they did not contribute to discussions or leave comments, they did visit the website, utilise resources and read the forums. These are known as "passive active*"* (van Varik & van Oostendorp, 2013, p. 456) members (n=837) and represented 80% of the total cohort. The researcher also identified 114 members (11%) who did not return to the site at all after their initial registration (Figure 6.11, 🖫).

Table 6.11 *Active SNAC member cohort*

Membership	Number of comments (at 05/03/2015)	n	%
Regular activity	10+ comments	9	9.5
Semi-regular activity	5-9 comments	8	8.5
Intermittent activity	1-5 comments	77	82
TOTAL		**94**	**100**

Typically, only a small number of those who visit online communities will become active members (Preece, Nonnecke, & Andrews, 2004; van Varik & van Oostendorp, 2013). Similar to our findings, Nielson (2006) reported that 9% are expected to become intermittent contributors, and only 1% will be very active members. He referred to this phenomenon as "participation inequality" (2006, p. 2), noting that 1% of active members cannot be representative of the wider community, making it imperative that the views of less active members were also garnered. So, whilst the number of *active*

SNAC members was not substantial when compared to other more active sites, such as HeartNET or Beyond Blue, the distribution between passive-active members (80%), low-activity members (7.5%) and active members (1.5%) on SNAC is comparable to the 90-9-1 rule for participation inequality described by Nielson (2006). The reasons for these different levels of participation, together with motivators and barriers to participation are examined later in this chapter.
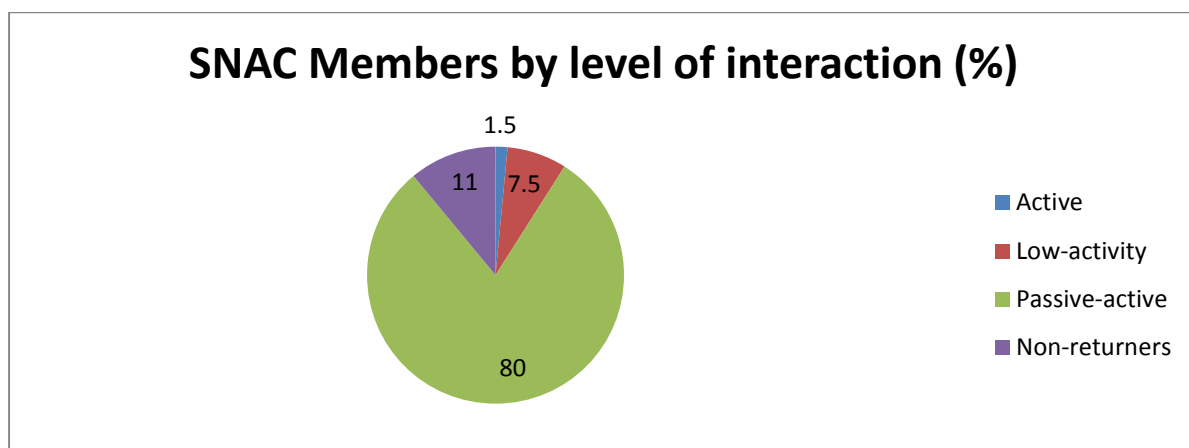

Figure 6.11 SNAC members categorisation by engagement (n=1045)

In response to these low participation levels, an audit of other applicable sites was carried out to determine if there was any direct competition to SNAC. Two other online communities of practice, specific to the child care industry were identified. The first, operated by Early Childhood Australia, was the 'National Quality Standard Professional Learning Program' online forum (2015), based on the seven NQS Quality Areas. This website hosted four robust, active forums dating back to 2012, although I was unable to locate any discussion about food, nutrition or healthy eating in any of them. The Aussie Childcare Network is a privately owned, commercial Australian website designed for "child care educators and students to help and support each other in early childhood education and learning" (2015), established in 2009, currently hosting almost 20,000 members. The website houses active forums where members discussed many child care

related topics. Only one forum regarding food was located on this website, where a new member asked for ideas for cooking with children. Although these two forums had considerably higher member numbers than SNAC, and these members appeared to be more active, neither was specific to healthy eating. Whilst the 'busy-ness' of these two sites suggested that child care staff appeared to be comfortable in an online environment, they demonstrated that they were less so on the SNAC forums. It was therefore, important to understand the areas of SNAC (Support, Nutrition, Activities, Community) that were most frequently visited, to better understand how to structure future strategies.

Google Analytics provided data about the percentage of page views each section of the SNAC website received, demonstrating the resources that were utilised most by members (Figure 6.12). The section with the highest percentage of page views (31.5%) was *nutrition*, the section hosting recipes, specifically designed for the child care setting. A food coordinator reported:

> I haven't been doing the job for very long, so I logged on to look at recipes and quantities, servings and the menu guide list, and I found it very useful, I can't really think of anything to improve it (Denise, ✏).

The second highest numbers of page views were recorded for the *community* section (27%), home to the community forums (Figure 6.12, 🖫). This demonstrated that passive-active SNAC members were reading the conversations, even if not contributing. A director commented:

It's just not something I normally do I just like to have a look at what everybody else is doing, it's the same on Facebook, I just go on Facebook to see what everyone else is up to, I'm a stalker, I don't make comments and stuff like (Jackie, ✎).

Thirdly, the *support* section acquired 21% of page views. This section hosted many resources such as fact sheets, healthy eating activities, menu planning tools and links to other relevant organisations. Many SNAC members reported printing resources and creating their own collection for their centre, thus reducing their need to revisit this section of SNAC, which could explain the lower percentage of page views in this area.
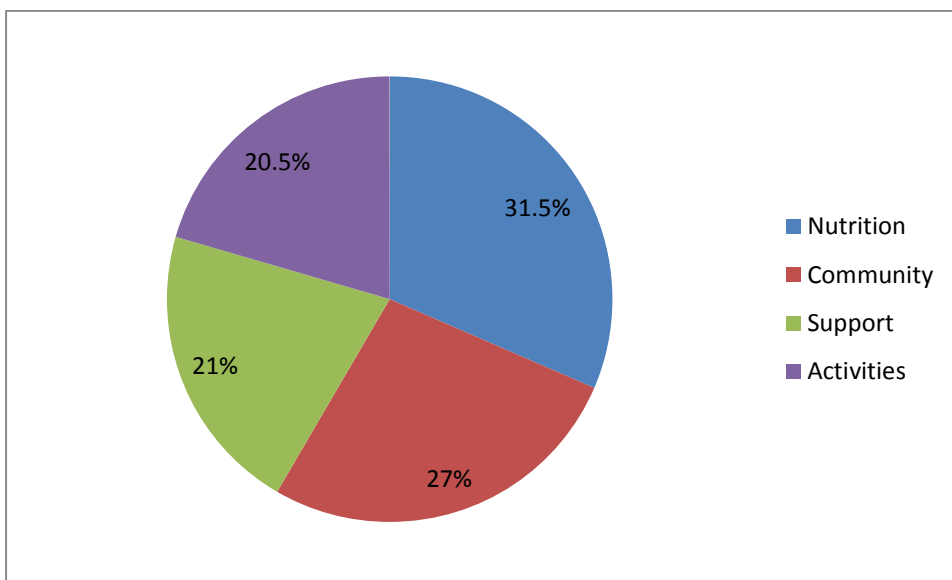

Figure 6.12 Percentage of page views per section of the SNAC website

The activities (videos and quizzes), attracted the least page views (20.5%). This was despite a certificate of completion being offered for members' professional development once the activities were completed. Whilst these resources appeared to have been underutilised (Table 6.12, ⊟), the feedback was positive:

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Yes, I think the clear delineation between child and carer roles helps to take away that sense of pressure we can feel as carers around young children's eating patterns. Really clear and useful video resource (Claire, Educator, 🖥).

Table 6.12 *Number of video views and quiz attempts*

	Video views	TOTAL	Quiz Attempts	TOTAL
Fussy Eaters	128	**128**	17	**17**
Menu Planning		**190**		**30**
• Part 1	92		0	
• Part 2	46		0	
• Part 3	14		19	
• Part 4	17		3	
• Part 5	21		8	
Nutrition		**70**		**15**
• Calcium	25		6	
• Fat	11		2	
• Iron	9		2	
• Protein	11		2	
• Vitamin C	8		2	
• Zinc	6		1	
Food labels		**36**		**3**
• Nutrition claims	15		0	
• Food labels	21		3	
TOTAL		**424**		**65**

Whilst the total number of registrations and the level of interaction with the forums has been disappointing, members who have engaged provided positive feedback and indicated that the website was valuable to them:

> I really like the fact that you are promoting healthy eating and things like that (Hope, ✎).

> Well, I liked the idea of someone else being able to give me references and links, so I didn't have to go hunting for them myself. I liked the breadth of what was being offered, it wasn't just recipes and I did think the forums sounded good from where I am [country VIC], it's good to hear about other peoples practice (Libby, ✎).

Others appreciated the style of SNAC, and that it was *not* a Facebook site:

> That was probably the other thing that appealed, is that I am not a Facebook person, I don't have that, so I'm often looking for something that's not Facebook, I know quite a few people who are a bit like that (Tameeka, ✎).

However, a number of attendees at the presentations discussed earlier, had asked if there was a Facebook page for SNAC and promptly noted that the site should have been developed as a Facebook site. For reasons discussed in Chapter Five, a Facebook site was not considered appropriate as the main vehicle for this project, which is, to a degree supported by Tameeka's comments. Although over half of the SNAC cohort were aged above 46 years and Facebook might not have seemed an appropriate tool, recent research from the Pew Research Centre revealed that between 60-70% of online adults in this age bracket were active users (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). In light of this, a Facebook page was established in January 2014 as a conduit to divert traffic to the SNAC website rather than a site where discussion was promoted. To date, the SNAC Facebook page has received a total of 366 likes and has been useful in creating allegiances and alliances with other like-minded organisations and

individuals, such as the 'Seeds for Schools' and 'Move Well Eat Well' programs. Whilst only 2.5% of website traffic was acquired via Facebook, people who are 'following' the SNAC Facebook page, but have not registered for the website, are still exposed to the important healthy eating messages, and are also able to access the e-newsletter.

While this section has documented the ways that members used the SNAC site and their level of engagement with it, the following sections interrogate the motivators and barriers that might explain the various levels of engagement identified.

Examining the Motivators and Barriers to Engagement with SNAC

A lack of engagement can significantly affect the success of an online community developing (Ren et al., 2012), therefore it was essential to understand the motivators and barriers of the SNAC cohort towards engaging with the site. It has already been established that the majority of activity in the SNAC community was conducted by a small proportion of its members, a typical distribution in new or emerging communities (Raban & Rabin, 2009). Therefore, relying solely on feedback from active members, and the comments they posted does not accurately reflect the opinions of the remaining, less participative or non-participative cohort. It was therefore, important to consider the actions of the passive-active and non-active members, alongside active members, to build a true representation of how SNAC was utilised.

In terms of motivating factors, Wenger's (2000, p. 229) discussion of communities of practice as "social containers" that defines competencies in a particular environment are of particular importance here. That is, SNAC members are able to peer into this social container as a benchmark for their professional practice; supporting their competencies

and providing examples of evidenced-based resources. Cara, a food coordinator and regular member of SNAC commented:

> Hi Ruth and SNAC team, just wanted to share my thoughts on the fantastic SNAC site, so far I have added many recipes to our menu from here, downloaded copies of the many resources to our new healthy and active resource folder in our centre for educators and families. We add snippets to our newsletter and as I don't get on as often as I would like (as you know it's a busy world) I do enjoy perusing all the info here. I value all the input and sharing of information this provides our service and would like to say Thank-you! (⌨).

This tacit style of learning available through a site like SNAC might eventually enable Cara and her colleagues to improve their reputation, seek responsibility and increase their confidence and knowledge about food and nutrition (Baran & Cagiltay, 2010). Whilst competence can either be determined by legislation (such as the NQF), or less formally, by company guidelines, it is ultimately ratified through daily interaction with colleagues and this might be facilitated through SNAC membership.

Conversely, reasons such as not wanting to demonstrate a lack of knowledge, fear of being criticised by others (Baran & Cagiltay, 2010) or being shy about posting (Preece et al., 2004), may have inhibited some members' engagement with the forums as a means of increasing their knowledge and confidence. Peta, the compliance officer for a small chain of child care centres in WA, revealed she thought her staff might find the forums intimidating:

To me it would most likely be a nervous thing, you know, putting it out there and you know, I know a lot of child care workers don't like to promote and show so much of what they do because they're so used to 'oh well you're just a child care worker, you're just a babysitter' (✎).

As suggested by Preece et al. (2004) some members revealed they felt they had nothing to offer, and as demonstrated by Baran and Cagiltay (2010) others did not want to repeat what had already been said:

I don't see the point of contributing where others have already posted a similar thing. I only post when I have something I feel is worth saying! (Suzie, ✎).

Others felt that their specific role at the centre meant SNAC had limited value to them that led them to believe they also had nothing to offer. For example, two food coordinators (from separate centres) both believed that SNAC was directed more at educators, despite more than 50 recipes, sample menus and menu planning tools being available:

As a resource yes, I think it's very good and if more chefs could engage with it, but a lot of it I think is directed at the educators and it's that bridge between the educators and the chefs that's the issue (Holly, ✎).

On the contrary, staff holding different roles believed that the food coordinators should make better use of SNAC. Katie (a director) commented:

Great site by the way, very useful and informative. I just wish the staff would make better use of it! My cook especially! (🖥).

Cassie, a family day care educator, with many years previous experience in a long day care setting, also commented:

I'd say that if I was working in that food preparation role I'd be making an awful lot of use of the recipes and things like that because I think they're just great, some of them are fantastic (🖉).

Seeking information from a community of practice can offer multiple benefits to some, but conversely can prevent others from accessing this, due to their fears about showing a lack of knowledge (Baran & Cagiltay, 2010). However, some believed that SNAC would provide little or no benefit for them, a barrier that explained their reluctance to access the site.

It may also be that environmental factors (useability, internet access) can be influential, acting as both a motivator and barrier (low IT skills, poor internet access) to accessing the SNAC website and the forums. The quality of the tools available, such as website design and available resources (Baran & Cagiltay, 2010) were identified early in the project as key issues and were carefully constructed to ensure easy use (Chapter Five). Stage 1 data confirmed that the majority of child care staff who gave interviews had access to both the internet and a device either in their workplace or at home, enabling access to SNAC. This is supported by data that reported there were 12,691,000 internet subscribers in Australia at the end of 2014 (Australian Bureau of Statistics [ABS], 2015), with 87% of these subscribers using the internet regularly (Australian Communications and Media Authority [ACMA], 2009). However, despite these statistics, there were still IT problems reported that may have acted as a barrier to engaging with SNAC. For example, some centres reported internet accessibility issues, also experienced at some centre presentations, which may have limited their interaction with SNAC. Katie explained:

We're just right on the fringe of everything and if the [internet] towers get overloaded we get bumped off [the internet], and there is nothing I can do,

absolutely nothing. Well I can, I can put a $10,000 aerial up, but I'd rather spend that $10,000 on the kids. So that limits us a little bit (✎).

Several SNAC members indicated their lack of IT skills, which could also act as a barrier to engagement:

I have tried to upload these photos but I do own up to being not very computer savvy (Kelly, 2IC, 🖥).

I'm sort of an older person not a younger person, so I haven't grown up with computers, if you know what I mean. I'm not one of these super-duper computer whizz kids you know (Vicky, Educator, ✎).

Both the members quoted here are older than 50 years, and whilst internet use is increasing amongst the middle-aged (Willis & Tranter, 2006), their reported level of use is still considerably lower than the younger generations. Moreover, internet use has been found to be lower in those with lower levels of education and income, typical demographic features of the early years industry (Jovanovic, 2013) and similar to the demographics reported here.

When reviewing web analytics data to identify members' level of engagement, it became apparent that there were a significant group of passive-active members who had viewed multiple pages on SNAC but had not posted any comments themselves. Passive-active members are described by some as 'lurkers' (Preece et al., 2004) and used the SNAC community in a different way to active members. Typically, they visited SNAC, accessed resources and community (by reading posts) but did not post comment themselves, thus their engagement differed significantly, especially in their willingness to share information and social support (Ridings, Gefen, & Arinze, 2006). Preece et al. (2004) stressed the importance of understanding passive-active members

reasons for their chosen level of participation, so as to improve the online community experience for all members.

One such reason reported by Preece (2004) is that some participants are happy to use the website but have chosen not to post comments in the forums, having no intention of posting from the outset. However, a director explained that she does not post comments on *any* forums, and it is not specifically the SNAC forums she wanted to avoid:

> No, but I don't do that with any site, so it's not just your site, it's just, I don't know, I'm just not one of those people that normally does that (Jackie, ✏).

This relates to Stage 1 data, where only 22% of participants (n=10) stated they regularly used forums, although conflicting with Weigel et al.'s (2012) study where approximately 50% of educators reported using forums regularly. Preece et al. (2004) suggested that some members were happy to read and digest the comments posted but did not feel a need to contribute themselves. This was confirmed by a director who described herself as a 'stalker':

> The forum? I haven't really written anything in it, it doesn't mean I don't read it, I mean that's just my personality. I'm more a reader than a writer, usually I reflect and it gets you thinking about something or look into a different avenue (Ellie, ✏).

This 'stalking' or 'lurking' behaviour may have provided "vicarious support", in that members experienced enjoyment through their imagined participation in others experiences (Preece et al., 2004, p. 203), without the need to "put themselves out there". Liu et al. (2014, p. 273) described these passive-active members as having "weak ties" within the community, characterised as being more interested in content than in other members. Preece (2004), noted that this type of membership is not necessarily a

problem if the community is very active. Furthermore, Liu et al. (2014) stated that if they find the benefits valuable, they may be more likely to revisit the website. However, if there is little or no posting, the community may be at risk of becoming a "digital ghost town" (Preece et al., 2004, p. 221), hence the numerous engagement strategies employed to stimulate activity on SNAC discussed earlier.

There were 114 non-active members (11%) who registered for SNAC but did not return after their initial registration. These members were viewed as a natural comparison group so it was essential that their attitudes, confidence and sense of community (the subject of proceeding chapters) were compared with the members who did engage with the website more frequently. The process of contacting these non-active members to arrange interviews revealed their reasons for non-engagement, which included various types of leave, changes in employment, the belief that they *were* using SNAC and being time poor.

Other members reported their reason for not returning to SNAC as being on sick leave, maternity leave or long service leave. Some members used the centre email address to create one SNAC profile for all staff at that centre, so if they had not informed other staff of the log in details when their employment ceased, this profile would remain unused. At least six non-active members had left the service that they had worked at the time of registration, explained by the high staff turnover typical of the child care industry, often due to poor wages and associated benefits (Wagner et al., 2012).

In earlier sections of this chapter, it was revealed that some child care centres were sharing one log in for the SNAC site: hence their individual log in appeared inactive. While this was discussed in terms of the difficulty in analysing individual behaviours online, it also indicated that users had the tendency to maladapt technology to suit their

own needs, similar to those reported in the HeartNET study on building online community (Bonniface et al., 2006). So whilst the researcher envisaged multiple staff within one centre creating and using their own individual SNAC profiles, members adapted how they engaged with SNAC, adopting a more collective approach to best suit their own needs and those of busy centres.

Time poorness was offered as an explanation of the limited activity on SNAC, even for those members who were considered active. Non-active members stated simply forgetting they had registered for SNAC and cited being time poor as a reason for not returning. Similarly, active and passive-active members also cited time poorness issues, thus it is imperative to understand why some members seem to be more motivated or able to 'find the time' to access the site than others.

It is conceivable that the burden of the NQS assessment places heavy workloads on staff and this may be a significant barrier to their engagement on SNAC. Centres receive approximately six weeks' notice for an impending assessment (ACECQA, 2015), and in that time they need to prepare and submit a Quality Improvement Plan (QIP) three weeks prior to assessment. The development of the QIP is an ongoing task and work on this will have commenced long before the notice of assessment is received. However, a director explained her recent absence from the fora, citing their recent NQS assessment as the reason:

> Hello Ruth have been super busy lately we've been going through assessment and rating, yay we got exceeding. Will be back soon cheers (Jane, 🖥).

However, Jane did not re-engage with SNAC, and it appears from this example and others, that once the impetus to engage with the website was lost, they were also lost as

community members.

The time of year can also affect how 'busy' a service is, with November and December typically very busy in the lead up to Christmas and children 'graduating' to 'big' school, followed by an influx of new children in January, who together with their families, need to be 'settled into' the centre. Page views (Figure 6.3) and number of comments (Figure 6.6) illustrated the decline in activity during these months.

Whilst both active and passive-active members cited time poorness as a reason for limiting their participation with SNAC, it is important to consider how the job role held by the member may influence participation. For example, an educator will typically spend most of her day with the children, leaving little time for other activities:

> I only get educational leader time [time for planning, documentation, etc] once a week so it's usually a really full on day and some days I don't even get to SNAC (Chloe, 🖉).

Similarly, food coordinators do not usually have time allocated during their normal working hours, to search for recipes or resources:

> I guess it comes down ….to a time thing, like the cook she works from 9am to 2pm, she has limited hours and between those times she is go, go, go, she doesn't get much time to herself, she gets a little bit of time to do some online ordering for food (Maureen, 🖉).

In contrast, directors and staff in 'other' roles, such as compliance officers, training officers and so on, tended to have more autonomy over how they manage their time, enabling them to engage with SNAC more actively, if they choose to do so. Indeed, some of the most active members were directors or those in 'other' roles, although a food coordinator (Sasha) was also a very active member. Given that food coordinators are not usually allocated developmental time during working hours, it could be assumed

that Sasha had more altruistic reasons for engaging with SNAC in her own time. Some of her posts and personal emails have indicated that she is passionate about providing a healthy eating environment and holds the health and welfare of the children at heart. For example,

> Hi Ruth, what are your thoughts on OT's [occupational therapists] suggesting to parents that they just bring in a Vegemite or honey sandwich for their children when they attend child care. We are trying hard to encourage all children to eat the menu which we provide but find it difficult when certain children are allowed to eat sandwiches every day. Both children are full time and we feel they are missing out on the nutrition they are needing (Sasha, 🖥).

Sasha was motivated to seek this support online, taking responsibility for these issues at her service, and seeking to increase her knowledge and confidence, suggested by Baran and Cagiltay (2010) as a motivating factor for participation in online communities. However, directors also have many demands on their time, therefore the motivators to participation with SNAC, could be multi-dimensional. They may have had a genuine interest in the topic, or be seeking to increase their reputation, knowledge and confidence. More altruistically, some may have had a genuine desire to assist others in the industry do a good job in order to impact the long-term health of the children in their care. For example, Sam (a director) had a query about mealtimes:

> Hi Ruth and SNACWA members, I am currently the director of a Long Day Care Centre that currently provides Morning Tea, Lunch, Afternoon Tea and a late snack, in accordance with the Start Right-Eat Right Recommendations. Could you please advise me of the recommended maximum time between meals, before the next one is offered? Would also be interested in finding out what times meals are offered at other centres? Quite often the Nursery request lunch early as the children are showing

signs of being tired. I am reflecting on our current practice, considering if it would be in the best interests of the children to meet the sleep needs first then give them lunch later upon awaking (⌨).

Here, Sam was both seeking expert advice but also searching for support and shared experiences in order to adopt the best practice for the children in her care. Indeed, many people who engage less actively with online communities seek maximum benefit for minimum effort (Baran & Cagiltay, 2010). Therefore, it could be concluded that the active SNAC members engaged with the community for more altruistic reasons or professional development, despite their own 'busy-ness'.

Summary

This important *a-priori* chapter has set the scene about the growth and utilisation of the SNAC website as a precursor to examining sense of community in the proceeding chapter. The demographic profiles of the whole SNAC cohort, the SNAC members who gave an exit interview, and the SNAC members who completed the quantitative survey (pre- and post-intervention) were presented in order to familiarise the reader with the participants in this study.

This was followed by introducing the concept of online communities of practice and an examination of the recruitment and engagement strategies undertaken during the entrée phase. SNAC usage was presented through netnographic data, and the levels of interaction SNAC members had with the site. Web analytics demonstrated the sections of the SNAC website that were most utilised by members and Google Analytics data illustrated how the SNAC community grew in terms of increasing member numbers, page views and session duration. The motivators and barriers to engagement with SNAC were also considered to ensure that a true representation of usage was presented.

The following chapter examines whether or not a sense of community emerged on the

SNAC site before presenting the findings in relation to nutrition knowledge, attitudes

towards and confidence about providing a healthy eating environment in Chapter 8.

CHAPTER SEVEN:

EMERGING SENSE OF COMMUNITY

Introduction

The previous chapter presented the demographic profile of the SNAC community and examined the recruitment and engagement strategies utilised as part of the entrée technique needed in a netnographic study. The way that SNAC was used by the members was presented, and the motivators and barriers to participation were also considered, as an important pre-cursor to this chapter, which examines the extent to which a sense of community emerged.

The first part of this chapter will provide an overview of sense of community and the sense of community index used to measure this concept quantitatively. The raw scores from the Sense of Community Index (SCI-2) as well as correlation data are also presented. Qualitative evidence of the antecedents of community participation, from the perspective of individual SNAC participants, are presented and linked to the four sense of community constructs. The identity of all participants is protected by the use of pseudonyms rather than actual names.

Measuring Sense of Community

Although some of the more seminal definitions of community provided by the likes of Rheingold (1993) have been cited in Chapter Two, the following definition of sense of community is particularly useful in this thesis because its authors have proposed a quantitative measure of what has previously been a highly subjectified and argued-over concept. Of course, a qualitative thesis like this was not driven by the need for quantitative scales, but the fact that they provide both a subjective definition and a

quantitative measure was beneficial. McMillan and Chavis (1986, p. 9) defined sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together". Their corresponding sense of community index (SCI) was developed in 1986 and has been used extensively by scholars investigating sense of community (Talo et al., 2014). In more recent years, this index has been extended as the SCI-2 in response to criticisms and limitations (Chavis et al., 2008). The SCI-2 has been used to measure many types of community, including virtual or online (Abfalter et al., 2012). The modern emergence of online communities are defined as "the human experience of a community feeling in a virtual environment" (Tonteri et al., 2011, p. 2216). The SCI-2 scale included the four constructs of 1) membership, 2) influence, 3) fulfilment of needs (also cited as reinforcement of needs) and 4) shared emotional connection (Chavis et al., 2008). This scale was used in the post-intervention survey distributed to SNAC members and the results are presented next. It is important to point out, however, that while this thesis has, so far, relied upon a qualitative 'voice' to communicate the netnographic story that has underpinned the research, the following sections necessarily adopt a more objective voice in order to present the SCI-2 data in quantitative terms.

Sense of community index (SCI-2) 🗐

One hundred and eighty-three respondents completed the 25 item survey pertaining to their perceptions of a sense of community with SNAC. Descriptive statistics including the means, ranges, medians and standard deviations were obtained. Reliability analysis was performed to ascertain a Cronbach's α score for each construct and the total sense of community in relation to SNAC. A Pearson's correlation test was used to establish if there was a significant relationship, or inter-reliability, between participants' responses

to the first main sense of community question and each of the four constructs. Multiple linear regression modelling was used to determine the significance of the four constructs (jointly) on sense of community. Partial correlations are additionally presented. Statistical significance is achieved if $p < 0.05$.

Table 7.1 SCI-2 subscale scores (n=183)

Subscale	Range	Mean	Median	Standard Deviation	Cronbach's Alpha
Membership	0-18	9.72	10.00	4.94	0.92
Influence	0-18	10.10	10.00	4.41	0.91
Fulfilment of Needs	0-18	11.49	12.00	3.88	0.93
Shared Emotional Connection	0-18	10.34	11.00	4.75	0.93
TOTAL Sense of Community	**0-72**	**41.65**	**43.00**	**16.45**	**0.93**

The range for total sense of community was 0-72, with a mean 41.65 (±16.45) and a median value of 43 (Table 7.1) such that a higher score is indicative of a greater sense of community. These results are similar to Phipps' (2012) study of community amongst college students that reported a total range of 5-72, with a mean score of 37.50 (±13.56) and a median value of 37. Reliability analysis of the four constructs resulted in Cronbach's alpha scores ranging between 0.91-0.93, indicating medium to high internal

consistency. Reliability analysis of the total sense of community resulted in a score of 0.93, comparable to the reliability analysis conducted by Chavis et al.(2008).

Raw construct scores all ranged between 0-18, and higher scores reflect a greater sense of community within each individual construct. The mean scores were 9.72 ($\pm$4.94) for Membership, 10.10 ($\pm$4.41) for Influence, 11.49 ($\pm$3.88) for Fulfilment of Needs, and 10.34 ($\pm$4.75) for Shared Emotional Connection (Table 7.1), again similar, though marginally higher than those reported by Phipps' (2012) (8.77 ($\pm$3.71), 8.89 ($\pm$3.77), 9.96 ($\pm$3.42), and 9.89 ($\pm$4.18) respectively.

In the survey, participants were also asked: '*How important is it to you to feel a sense of community with other community members?*' The majority of respondents confirmed that they felt it either important (n= 82, 45%) or very important (n=77, 42%) to feel a sense of community with other community members (Figure 7.1, 🗒).
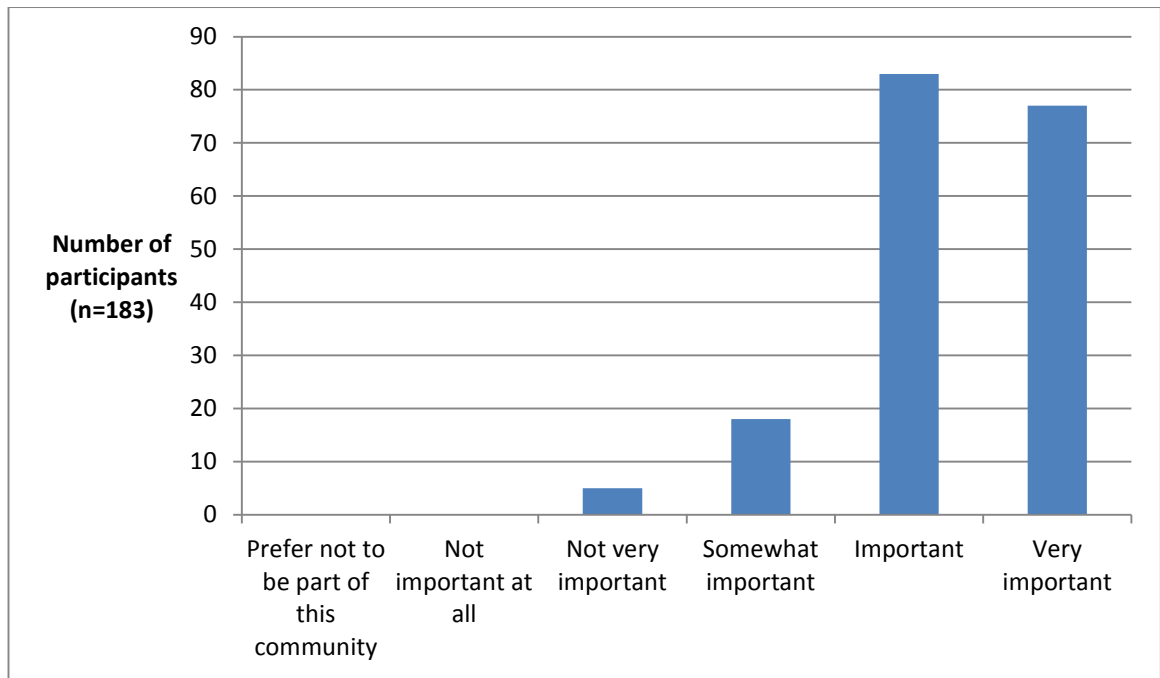
Figure 7.1 Responses to overarching sense of community question

Chavis et al. (2008) suggested that the response to this overarching community question correlates well with the four constructs of sense of community, though the details of the analysis were not provided. To investigate this, correlation and regression analyses were performed. For this study, there was a significant degree of positive association ($p<0.001$) between the initial question and each of the four constructs with the correlations (Membership r = 0.48, Influence r = 0.46, Fulfilment of Needs r = 0.278, Shared Emotional Connection r = 0.51). These medium to high scores indicated that participant responses to the survey were constant, thus assuring the internal consistency of the survey.

Partial correlations between the overarching community statement and the four constructs of the SCI-2 scale are presented in Table 7.2 (▤). After adjustment for the other constructs, the partial correlation for *shared emotional connection* was the only construct that was statistically significant ($p = 0.007$), indicating that the most important aspect of online community is the emotional connection shared by the members. Whilst

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not statistically significant at the 5% level, there was some evidence that the construct of *fulfilling needs* was also important ($p = 0.086$). The other two constructs of influence and membership were statistically insignificant (Table 7.2, 📄).

Table 7.2 Overarching sense of community

Construct	Partial Correlation	*p*-value
Membership	0.97	0.196
Influence	0.010	0.893
Fulfilment of needs	-0.128	0.086
Shared emotional connection	0.199	0.007

These results are discussed later in this chapter. For now, the four constructs of SCI-2 are outlined to provide a recap of the benefits a member could experience from feeling a sense of community on the SNAC website.

Membership relates to a member feeling that they are a part of the SNAC community, and measured concepts such as personal investment in the SNAC community (Talo et al., 2014) and personal relatedness (McMillan & Chavis, 1986). *Influence* provides opportunities for individuals to make their own contributions to the SNAC community and to perceive the impact of these contributions on the collective community (Talo et al., 2014). *Fulfilment of needs* (otherwise known as reinforcement of needs) describes the benefits that SNAC members derived from their membership, and the extent to

which the SNAC community helped individual members meet their personal and group needs (Talo et al., 2014). Finally, *shared emotional connection* measured the quality of social ties attained through sharing significant events, histories (Talo et al., 2014), time together and similar experiences (McMillan & Chavis, 1986).

While the four constructs – membership, influence, fulfilment of needs, shared emotional connection – are used to calculate an average (shared) community score (as was the case with SCI-2), it has also been suggested that sense of community can be constructed and calculated as an *individual* construct (Tonteri et al., 2011). When an average community score is calculated, there could also be a corresponding loss in the finer details such as how individuals experience community. In order to capture these finer details, work published by Tonteri et al. (2011) has been used to describe the antecedents of community from the perspective of SNAC members. These antecedents include cognitive, social-integrative, personal integrative and hedonistic. While these belong to the body of literature around uses and gratification, (for example, Nambisan & Baron, 2007)) Tonteri et al. have specifically connected them to community participation.

The following sections provide qualitative evidence of the antecedents of community participation – from the perspective of individual SNAC participants – and then links these to the four constructs of shared community described by McMillan and Chavis (1986).

Antecedents to Sense of Community

Community participation and sense of community are interlinked and help increase understanding of members' engagement with their community (Talo et al., 2014). A strong sense of community is thought to indicate increased community participation,

which is purported to increase quality of life, enhance social wellbeing, reinforce social capital, foster social empowerment (Talo et al., 2014) and life satisfaction (Farrell, Aubry, & Coulombe, 2004). In terms of community organisations (which may also include child care centres), sense of community can also enhance one's sense of control (Hughey, Peterson, Lowe, & Oprescu, 2007) and increase social cohesion (Wilkinson, 2007). In the case of the SNAC participants, establishing a strong sense of community may be an important precursor to community engagement; particularly as healthy eating should be considered a community concern.

Cognitive benefits

Many modern online communities are building significant archives of content (Liu et al., 2014). Therefore, SNAC members could expect to receive cognitive benefits such as gaining and developing personal knowledge and improving learning opportunities (Tonteri et al., 2011), as well as seeking factual and experiential information (Nambisan & Baron, 2007) about food, nutrition, and providing a healthy eating environment.

Members accessed a wide variety of resources from the SNAC website, such as fact sheets, videos and forums that provided factual information and learning opportunities on topics such as menu planning, serve sizes, recipes, and food intolerances. The forums were also a useful source of experiential information as SNAC members often provided details of their own experiences, that could be read by many other members. For example, a discussion about progressive mealtimes at early years services prompted a lively debate in which SNAC members relayed their own positive and negative thoughts and experiences about this issue, thus providing important insights into others' beliefs, opinions (Herring, 1996), and practices. By using the forums for story-telling and sharing common problems (Nambisan & Baron, 2007), a sense of belonging started

to emerge that may have resulted in increased feelings of ***shared emotional connection*** (one of the SCI-2 constructs).

Some SNAC members posted specifically to seek information from other SNAC members or the moderator, to build their own knowledge, or access 'expert' advice, which Lampel and Bhalla (2007) suggested are common benefits sought by individuals accessing online communities. For example, an educator (Fiona, 🖳) posted a query on the 'ask the nutritionist' forum seeking information about the current fad for 'squeezy yoghurts'; she was concerned about the dental and speech implications of these products on children. However, only the moderator replied to this post, which posed the question of whether members considered this reply sufficient, or whether they would have preferred to see more input from other SNAC members. A director described the low number of comments made in response to her own query positively, indicating the quality of the information was more important to her than the quantity:

> it would be good to get more people to put comments up,…but then you
> don't want 50 posts or something either because it's a bit unmanageable, it's
> a balance between getting a nice group of comments (Tameeka, ✎).

As discussed in Chapter Six, information overload is a common problem and many individuals may face difficulty recognising quality information when faced with numerous posts (Benselin & Ragsdell, 2015), thus fewer, but higher quality posts could be considered a benefit to educators who often have busy and demanding roles (Jovanovic, 2013). Therefore, even if there is only one response (from a professional moderator), this may fulfil the need for 'expert' advice (Lampel & Bhalla, 2007) and means that important content has been generated that might also benefit other members. Another director confirmed she also used SNAC to access expert advice:

it has been really helpful in that regard, what's current and what is the most
up to date and you know, obviously someone who's specifically trained in
that area, that's where we would be going ……if we've got specific issues
in that area (Alana, ✍).

Furthermore, it was also important to SNAC members that the required information was provided quickly, as demonstrated by a director who posted a comment asking for afternoon tea ideas. She appreciated that, even if other SNAC members did not respond, she was certain that the moderator would provide the required information quickly:

you know that when you actually put a question or something there you get
an answer fairly quickly, you know sometimes when you can actually send
queries and things and you're waiting ages to get a response back so the
response time is really quite quick [on SNAC] which is good, because
sometimes when you need to know, you kinda need to know now
(Cassie, ✍).

Passive-active members, who do not contribute to the forums, have described the ways that they used SNAC resources to increase their own knowledge and subsequently created learning opportunities to share with other educators and children. For example, Peta, a compliance officer for a small chain of child care centres in Perth, used the 'I can eat a Rainbow' resources posted on SNAC to create a healthy eating activity pack, consisting of the 'I can eat a Rainbow' book, a cauliflower plush toy and an exercise book. This pack was sent home with a child to read with their parents, and to record the colours that were on their plate that evening in the exercise book. Peta commented:

it's working really well, we get a lot of positive feedback from parents because they've seen a difference with their children and the staff are discussing that concept with them at mealtimes (✏).

So although Peta is a passive-active member, she has accessed information and resources available on SNAC and has used them in her role as a gatekeeper of information at the seven services she is responsible for, to promote a healthy eating environment thus adding value by extending their reach beyond the online community (Liu et al., 2014). Although Peta had previously expressed that the discussion boards could be intimidating for some child care staff (discussed in Chapter Six), by remaining anonymous she was able to experience the benefits of using SNAC, and shared these benefits with others without 'putting herself out there'.

The cognitive benefits experienced by SNAC members is consistent with other research. For example, it had the potential to fulfil needs through the sharing of knowledge and by providing learning opportunities (Talo et al., 2014), to seek and acquire expert advice (Lampel & Bhalla, 2007) and to gain insights into fellow educators beliefs and opinions (Herring, 1996). There are signs that by sharing information and knowledge on SNAC, members could *influence* (an SCI-2 construct) others' practices or behaviours or indeed, be *influenced* themselves by others reported practices or behaviours.

Social integrative benefits

Social integrative benefits have been described as the social ties that are established and developed over time in online communities (Tonteri et al., 2011). For this study, the ties established between SNAC members are seemingly evident in the sense of belonging or *membership* to the group. Although the survey data did not produce significant scores

for this construct (r=0.97, *p*= 0.196, Table 7.2), the qualitative data provides an indication of this:

> I think so definitely on the forums, I think sometimes even when I'm commenting there's you see a bit of banter between services, like they ask someone, there's been a post once or twice, and then they've asked someone else something, and then kind of effect, which I think is great, because that is something that has been on our agenda for a few years like, just before the kitchen, to have a network of support with other local centres, which never kicked off the ground (Maureen, ✎).

It is conceivable, therefore, that SNAC members might be able to leverage these ties to engage in greater networking and communication within the community over a longer period of time. Even though the passive-active members might not have built robust one-on-one relationships with other SNAC members (at the time of writing), some did seem to indicate a broad connection with the SNAC community, which may develop into stronger ties and participation at a later stage. For example, Tameeka explained that participants were "all people who've got similar perspectives and similar interests", consistent with what Liu et al. (2014, p. 273) described as an "abstract sense of community", that is, readership ties exist with the overarching community, but strong personal ties between individuals do not.

However, there is evidence that strong relationships were forged between the researcher and some of the members on SNAC. For example, Holly a food coordinator in an inner Melbourne child care centre, referred to the researcher as her "kindred spirit" (✎), recognising their shared interest in child nutrition. Another cook, Sasha, based in regional WA, often posted queries on the 'ask the nutritionist' forum, seeking advice on issues such as the amount of food to provide a baby and reducing the sugar content of baked goods. Other SNAC members felt obliged to inform the researcher when they

had a change of personal circumstance that resulted in them no longer accessing the website. For example, the "kindred spirit" food coordinator (Holly) emailed the researcher when she secured a new position and was no longer in child care, as did an educator Cassie who decided to take a career break and travel. Cassie not only emailed the researcher personally, but also posted the news of her departure on SNAC, which indicated her commitment to the researcher and the wider SNAC community:

> Unfortunately, I will be leaving my service this year as I am taking a year off work to travel and home school my daughter. I am going to take the opportunity to try and promote a healthier lifestyle both for my daughter and myself….I have been working on a series of support visits for the educators in my service, focussing [sic] on different areas of the National Quality Standards, and have included information about this site [SNAC] into the one for nutrition. Hopefully in my own small way, I will be able to leave a legacy of nutrition education behind when I leave (Cassie, 💻).

Alternatively, some SNAC members preferred to contact the researcher via email or telephone when they required assistance or advice, rather than posting their query on the SNAC forums. This has been discussed in the previous chapter under 'motivators and barriers', and could be due to IT issues or a lack of confidence. For example, a centre director (Tracy) who believed the food budget at her service was too low, telephoned the researcher to seek advice before approaching the owner of the service. The researcher created a post to seek input from the wider SNAC community and some useful information was shared, providing Tracy with details of others experiences and opinions. These shared experiences can increase knowledge and confidence (Wasko & Faraj, 2000), thus enabling Tracy to approach the owner regarding an increased food budget. Therefore, whilst she was reticent about posting her queries personally on the forums, perhaps for fear of being identified or demonstrating a lack of knowledge, the

moderator was in a position to facilitate this, which also meant that other members could contribute to and benefit from the shared information and support. By seeking help through SNAC (albeit indirectly) Tracy later reported that she was able to approach the owner with greater confidence about her concerns. Although these examples provide some evidence of community emerging, there is little evidence of any meaningful social ties being established between individual members. During the exit interviews, some members reported recognising the names (or pseudonyms) of others, but several regular members reported that they felt little or no connection with other individual SNAC members.

> I probably don't have the sense of connecting with individual educators so much, I think because there's a 1000 people [members] you're not necessarily going to get that (Tameeka, Director, ✎).

This lack of connection may be indicative of some members' preference for face-to-face contact. In fact, some SNAC members were more interested in promoting SNAC's healthy eating messages in their local communities, rather than in an online community. For example, Tabitha, a centre director in the Northern Perth suburbs, invited me to deliver a healthy eating presentation at a staff meeting, attend an open day to interact with families, and also attend a Children's Week event at the service. This event was also attended by senior management of the centre. Tabitha's interest in SNAC (or at least SNAC's health-promoting purpose) may have been driven by the lack of commitment she receives from others in the industry:

> there are seven early learning centres within a 4 km radius, and I think we need to network more, I don't know if it's just sometimes the initiation is only there from a couple, and others either don't have the time or can't be bothered, I'm not sure of their reasons but I feel……I'm the only one in this

particular area, so I don't feel a sense of community around this particular area and there should be (✎).

Although this demonstrated Tabitha's expressed need for a child care community in her geographical area, she might not have fully recognised the role that SNAC could play in supplementing or even complementing such a community. She did, however, point out that SNAC would be more successful if more members interacted:

there's a couple of times I've had responses on there, or I've put a question out for support, but I feel it could be bigger……..and I think if we had a more robust community around us, I can't speak for other areas [geographical] but I think other things would just roll on as well, particularly with SNAC (✎).

As Bateman et al. (2011) noted, online communities are "voluntary structures" (p. 841) and participants are at liberty to decide how and when they will participate. For Tabitha, the level of participating on SNAC was insufficient, a known barrier to community development (van Varik & van Oostendorp, 2013). However, it could be argued that she was helping to extend the reach of the SNAC community, by creating action externally through using information or knowledge gained through SNAC on the 'outside' environment (Takahashi, Fukimoto, & Yamasaki, 2002).

Notwithstanding a perceived lack of individual social ties, many SNAC members appreciated the value of SNAC, whether they posted regularly or were passive-active members who read, but did not make posts.

Vicky, an educator with many years' experience in the role, who does not contribute to the forums but does read the content stated:

I think they [the forums] would be quite valuable if you had the time to sit down and do this. It is just the time factor really Ruth, but most definitely, exchanging thoughts and ideas, most definitely valuable (✎).

Another passive participant (Ingrid) did not feel any need to engage with others, but she did seem to view SNAC as a place to access resources. In contrast, Ellie, a director who was also a passive-active member, was asked if she found the content of the forums useful:

oh yes, I definitely do, that's why I feel bad sometimes because I don't participate, so I know I let the team down a bit that way, but I still find them valuable (✎).

Although Ellie expressed disappointment with her lack of engagement, her sentiments about letting the 'team' down indicates some sense of connection with or responsibility for the SNAC community.

A centre director who was a regular contributor herself believed that a SNAC community did exist, regardless of the number of contributors:

The fact that different people respond to questions and post comments in the 'community' feature of the website shows that there is a community of interested people. It might not be a big community but communities come in all shapes and sizes (Layla, ✎).

Bateman et al. (2011) identified that individuals will interact with online communities to meet their own particular needs, which will vary according to their motivation to visit the website, whether it be for reasons of self-interest or more altruistic in nature. However, these members are still of value to the SNAC community as they can create activity externally by sharing resources with other staff and families (Liu et al., 2014).

Experiencing social integrative benefits can lead to feelings of membership in a community (Talo et al., 2014), and as SNAC members experienced these benefits to some degree, this could lead to them feeling like a part of the SNAC community. Whilst social ties between individual members were not apparent, story-telling and sharing common problems provided a broad sense of belonging and thus increased the feeling of *shared emotional connection* – an important construct used in the SCI-2 scale to measure community that was introduced at the outset of this chapter.

Personal integrative benefits

Personal integrative benefits are another antecedent to sense of virtual community and include strengthening credibility, status and confidence (Nambisan & Baron, 2007), the ability to influence members social collective, and boosting personal status and reputation (Tonteri et al., 2011). A lack of confidence was discussed in the previous section, in relation to a members' (Peta) reluctance to use the SNAC community forums, as she reported them to be "intimidating" (✐). This section however, focuses on members using the SNAC community and resources to increase confidence levels, both in an online setting, but also extending out to members wider communities.

A number of SNAC members have reported increased confidence as a result of interacting with the SNAC website and community. For example, Serena, the director of an independently owned service in regional WA, used SNAC to source information about lactose intolerances. As a result, she felt more comfortable discussing this with the parents of a lactose intolerant child attending her service. When asked if accessing these resources gave her more confidence, she replied:

> we have had a lot of parents label their children as lactose intolerant but
> without advice from a doctor or nutritionist or dietitian so I think that was

really important information….it did, it did [increase her confidence], obviously you've still gotta respect the families and understand that….they do know their child….when their child doesn't respond to certain foods and that, but just speaking to them about building up that tolerance ….minimising it instead of cutting it out altogether (Serena, ✎).

Other SNAC members have noted that sharing information and experiences provides a number of opportunities. Reflecting on others' practices, challenging pre-set ideas, providing new ideas or receiving confirmation that you are 'doing the right thing', or at least the same as others, also increased confidence to provide a healthy eating environment. For example, Tracy, the director of an outer regional centre, shared her thoughts about the progressive mealtime discussion:

I like the aspect that you can put a question up and you can get ten different responses. Someone else can put an idea up and you can provide some ideas, its information sharing, that's a really good resource. There were questions about what time people have their meals and it's sort of like 'oh well, maybe that could work differently, maybe that could be a thought, could it work?' (✎).

Another personal-integrative benefit experienced by SNAC members was influencing the surrounding social collective, for instance other staff at their service, but also the families of the children at their service, other early years' professionals and even their own families. In the previous section, the example of Tabitha demonstrated that the lack of activity on the SNAC forums 'put her off' using them more often, and subsequently she was not forming a strong 'online' relationship with other SNAC members. However, she was engaged with SNAC to the extent that she used the information, knowledge and resources gained on SNAC to influence her surrounding social collective, which was also demonstrated by other SNAC members.

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A common theme emerging from the forums, exit interviews and other data sources, was that SNAC members were keen to share the website with their colleagues and actively encouraged others to create their own profiles. Several directors wanted to see staff be more proactive in their own personal development by creating individual SNAC profiles, enabling them to build their own confidence and autonomy in the workplace, thus reducing their reliance on the director for this information:

> I have been getting the staff to join the website. We have an RTO [Registered Training Organisation] on site and our students are currently doing the food module. I am mentoring several students and part of their current module they need to develop a menu. I have directed them to SNAC website and several students have signed up (Nola, 🖥).

SNAC members were also keen to share resources with the children's families, and achieved this by including SNAC materials in family newsletters, or by publishing them on their service website or Facebook page:

> Thank you so very much for the lovely Christmas Cook Book. We LOVE it! I have posted the link on our Facebook page to share with our families. Hope you don't mind (Katie, 🖥).

They also printed off resources and made them available to parents in the foyer of their service:

> We printed off the pumpkin book [The Great Little Pumpkin Cookbook], we put it in the foyer for the parents to have a look at, to show them we're in it, that was really exciting (Cara, ✎).

Some also reported using SNAC recipes at home:

I made some of your strawberry snowmen on the weekend and they were a HUGE success (gobbled up very quickly) (Katie, 🖥).

Whilst some shared other resources with their own families:

I actually even on like a personal note printed off stuff for my daughter 'cos she's got a 12 month old baby, ….there was something about teething….and eating for infants and toddler things like that, yeah so I find your articles really interesting (Chloe, ✏).

In Chapter Six, it was noted that some directors or educational leaders were creating one member login and profile that all staff shared. Interestingly, one of these directors did not perceive any need to engage with the online community and simply directed her staff to use specific resources. This may have inadvertently withheld the opportunity for other staff to interact and gain personal benefits from the site, which could in turn have influenced their desire to engage with the community more proactively. Still, when a profile had been created for all staff to share, or one staff member acted as the 'gatekeeper', it was reported that resources were often printed and placed in a folder for staff to access:

I've actually made, from the SNAC website, I have taken some of the activities and recipes and put them into a teacher resource folder, which is in our planning room, so when the girls are looking at what other ideas they can incorporate into the program or into the curriculum, they can actually go and look at that (Sasha, ✏).

Hence, while these staff missed out on opportunities to interact with others, they may have received personal benefits from the resources and information obtained from SNAC and placed in these 'shared' folders. The various methods of sharing valuable information with colleagues and families described in this section, demonstrated how

the reach of SNAC extended beyond the online community thus influencing the surrounding physical community (Tonteri et al., 2011).

Another need fulfilled by SNAC members by sharing information and knowledge, appeared to be in increasing their personal status and reputation, both in the online community and further afield. The brief case study below presents Katie's story, the director and owner of an independent long day care service in the southern Perth metropolitan area. She is also a committee member of a professional child care organisation, and has more than 20 years' experience in the industry.

Katie agreed to participate in Stage 1 of this study, and gave an interview as part of the formative evaluation on which SNAC was based. It was apparent that she was extremely disgruntled at receiving the rating of 'working towards' NQS Quality Area 2, rather than meeting or exceeding this standard. Katie was so confident that her centre was meeting standards that she applied for her service to be a 'pilot' centre, and therefore one of the first to be assessed in Western Australia. However, she was very disappointed both with the process and the end result:

> This service has been here for twenty five years or something. I've worked here for eighteen, with a couple of breakaways and come-backs. I bought the service three years ago. It has always, always had the highest quality standards in the old system. All of a sudden they [the NQS assessors] walked in – you can't have this, you can't do that, this is no good, that's no good. It's like, where are these things written down in rules and regulations? Well, that's what this section means. And I say "no, it doesn't" (✎).

Katie clearly regarded herself as very experienced and an expert in the industry, disagreeing with many of the 'interpretations' made by the assessors:

> We had much higher standards to go by [a food safety review carried out by an independent auditor, a local government requirement for businesses supplying food on their premises], and yet the review people [assessors from ACECQA] came in and just tore strips off that. Things like children not being allowed to sit on the grass and have their afternoon tea or a picnic because they put their hands on the grass and then they pick up their piece of fruit and stuff like that. And I just get really concerned that we're getting too precious about this sort of thing (✎).

Katie was a very active member of SNAC, had supported the project from the outset and was a prolific poster of comments – she not only replied to almost every post made by the moderator, but usually responded to other members' posts, and created several posts herself. Moreover, these were 'quality' posts, offering advice, information and insights into the practices at her centre. It could therefore, be surmised that Katie was reclaiming her position as an 'expert', following the disappointing NQS assessment, and reasserting her status and personal reputation within the early years industry (Lakhani & von Hippel, 2003).

However, Katie may also be more altruistically motivated. Bateman (2011), for example, noted that "helping others" (p.842) has been reported in the literature to explain why people join and contribute to online communities generally, which in turn may help to ensure communities thrive (Wasko & Faraj, 2000).

In Katie's case, sharing information on the discussion board was something she had "always advocated" (✎). Even though she acknowledged that others do not always reciprocate, she felt strongly about the need to do this despite her misgivings. Given that Katie was such an engaged SNAC member and a major contributor of content, it was apparent that even if she did have concerns about non-contributing members, it was

important to her that the SNAC community thrived and she demonstrated her commitment and support of the project through regular contributions.

Taking this concept further, parents often look to child care staff as the experts in child developmental issues (Fothergill, 2013), although many may feel uncomfortable in this role (Lynch & Batal, 2011). SNAC supported educators in this role, and increased staff confidence, by providing current, reliable resources, information and advice. For example, Maggie, an educational leader, dealt with parental concerns about limiting discretionary foods:

> Some parents expressed concern that by limiting the intake we are generating a predilection for the treats (i.e. when exposed to treats the children indulge to excess because they are less frequent) but we argued that because we present the centre food as fun (and thanks to SNAC for such inspiring ideas) and model appropriate servings, with appropriate supervision the children will learn, with time, appropriate portion control for themselves (Maggie, ✐).

Conversely, some parents were reported as viewing child care staff less positively and not welcoming advice or discussions about their child (Fothergill, 2013). For example, Riley, the director of a community-based centre in regional Western Australia, found it extremely difficult to confront a parent who was insisting that their child be allowed to drink cordial from a bottle, which is in direct contravention with the centre's food and nutrition policy and the Australian Dietary Guidelines:

> I think the worst parent I ever had and it was a couple of years ago now, was they didn't want their child drinking water while they were here because there is no nutritional value in water [according to the parent], so the child always had to have, if they were going to have a drink, it had to be with orange juice or something like that in it, and the child only lasted two weeks because we couldn't come to an agreement about it, because she wanted this

child to walk around with a juice in a bottle and it's not something we encourage at all, so that was just one battle no-one won (✎).

Riley found this parent very difficult to deal with: "she was so difficult this lady, she was actually scary" (✎), and concurred that being able to access additional information and support would have been helpful at the time. Others have also reported misgivings about the impact of parental influence on children's dietary behaviours (Moore et al., 2005).

Experienced personal-integrative benefits may have increased the capacity to strengthen credibility, status and confidence (Nambisan & Baron, 2007), and resulted in SNAC members having the confidence to confront difficult parents and to influence the social collective, in this case within the SNAC community and their own networks. Personal status and reputation was also boosted by sharing valuable knowledge, and members gained satisfaction from enhancing their status as experts in their field. In terms of the SCI-2 constructs, this may have enabled members to *influence* others, *fulfil needs* through enhanced reputation, (Tonteri et al., 2011) and therefore increase their feelings of *membership* within the SNAC community.

Hedonistic (affective) benefits

Hedonistic benefits are thought to provide pleasurable experiences for members (Tonteri et al., 2011) and activities that offer mental or intellectual stimulation (Nambisan & Baron, 2007). The competitions, introduced in Chapter Six as strategies to increase early engagement with the site, are also noteworthy here because they provided enjoyment to members. Members described the competitions as "good fun" (✎) and found that they both stimulated activity on SNAC, as well as providing ideas for activities that would, in turn, stimulate the children's learning. For example:

The children really enjoyed painting the [Picasso] cows and the staff used it as an opportunity to discuss where milk comes from and how healthy it is for us. It was a great experience (Riley, 🖥).

Similarly, other members enjoyed the experience of contributing recipes for the cookbooks (The Great Little Pumpkin Cookbook and the Christmas cookbook 'For Santa's Little Helpers – which were also used to stimulate early engagement in Chapter 6) and sharing the end product with others:

yes, and then you can kind of, you know, see people's individual ideas, put it together, move on, and then use it and share it, it's good fun (Tameeka, 🖊).

Intuitively, the overarching impression of the researcher towards the interaction with the posts created to stimulate engagement, was that the 'fun' items attracted more attention, and SNAC members were much less likely to engage with more 'serious' posts, such as those of a political nature. For example, the competitions usually received a good response, as did posts requesting recipes, or examples of healthy eating activities for a particular event such as Children's Week. However, posts about the government withdrawing funding, "male child care workers under scrutiny" (🖥), or changes to the required early years qualifications would attract little, if any activity. This could be a reflection of their heavy workloads (Jovanovic, 2013) meaning staff tended to focus on the downstream factors that filled their day-to-day working lives, such as providing healthy meals, over which they felt they had some control. Conversely, SNAC members may have felt they had little or no influence on upstream factors such as funding, politics or changes in legislation, which although also impacting their working lives, they chose not to interact with this content on the website.

Providing activities that SNAC members enjoyed engaging with and found mentally stimulating, suggested that the *need* for information or shared experiences had been, at least partially, *fulfilled*, leading to increased feelings of *membership* in the SNAC community. Again, these two constructs form part of the SCI-2 index.

The preceding sections were specifically constructed around the antecedents of community participation to underscore the importance of individual 'voices' (Tonteri et al., 2011). Where appropriate, the SCI-2 measures were integrated into these sections in order to tease out which of the antecedents might have related to the aggregated (shared) sense of community score presented earlier.

Fitting The Pieces Together

The following sections return to the SCI-2 constructs –membership, influence, fulfilment of needs and shared emotional connection - in order to reveal how the quantitative sense of community scores (i.e., the aggregated/shared data) compared to the qualitative interpretation discussed so far.

Membership

Membership relates to a member feeling that they are a part of the SNAC community, and measured concepts such as personal investment in the SNAC community. The SCI-2 score for membership was the lowest at 9.72 ▤ (Table 7.2) and it was clear that feelings of membership were less apparent. Some members maintained there must be a community merely by virtue of people visiting the forums, albeit not a very big community. Others reported they did not have a sense of connecting with other individuals but did feel a 'broad' connection with the wider community, described as an "abstract sense of community" (Liu et al., 2014, p. 273). The partial correlation test for this construct was not statistically significant (Table 7.2).

Influence

The influence construct provides opportunities for individuals to make their own contributions to the SNAC community and to perceive the impact of these contributions on the collective community. SNAC members experienced cognitive benefits by seeking expert advice through the 'ask the nutritionist' forum, and were able to satisfy this through the use of resources anonymously. Personal integrative benefits were experienced by SNAC members who shared resources and information with others, enabling them to influence their social collective. There was a sense of the more active members seeking influence over their social collective, either in the online environment or in their physical geographical environment. However, even members who were not active online, still utilised SNAC resources and their connection with the SNAC community to influence those around them. Again, this is supported by the SCI-2 score for the influence construct, the second highest at 10.10 (Table 7.2). However, the partial correlation test for this construct was not statistically significant (Table 7.2).

Fulfilment of needs

Fulfilment of needs is the construct that alludes to the benefits that SNAC members derived from their membership and the extent to which the SNAC community helped individual members meet their personal and group needs. SNAC members were able to fulfil their needs through experiencing personal integrative benefits, which saw them both seeking and gaining knowledge and enhancing their reputation as an 'expert'. SNAC members used the website to fulfil their own needs, those of their service, other staff and families, through active members engaging with the forums to enhance knowledge, confidence and reputation. Less active members also fulfilled their needs by accessing resources and reading the forum content, enabling them to share

experiences, albeit without offering any reciprocal benefits to other members. Fulfilment of needs was also satisfied through hedonistic benefits, such as their participation in the competitions.

The mean SCI-2 score (11.49), the highest of the four constructs (Table 7.1) suggested a strong indicator that fulfilment of needs had been met. The partial correlation test between the overarching sense of community statement and the four constructs revealed that, whilst not statistically significant, there was some evidence that fulfilment of needs is also important (r(178) = -0.13, p = 0.086), after adjustment for the other three constructs (Table 7.2).

Shared emotional connection

Shared emotional connection is a construct that is used to measure the quality of social ties obtained through sharing significant events, histories (Talo et al., 2014), spending time together and sharing similar experiences (McMillan & Chavis, 1986). SNAC members fulfilled their shared emotional connection to some extent, through experiencing cognitive benefits; sharing stories, information and experiences such as those offered by the progressive meals discussion.

Social integrative benefits also experienced by SNAC members fulfilled their personal needs by enabling the sharing of information on the SNAC website. However, social ties, an important aspect of shared emotional connection, appeared to be lacking between individual SNAC members, although they were strong between the researcher and a number of individual members. For example, the researcher shared some significant events with several services, such as attending special morning teas, celebrations, and a number of members attended Nutrition Australia's AGM in 2014, where preliminary SNAC results were presented, in support of the researcher. SNAC

members did, however, share their experiences with each other and the researcher via the forums, and this is reflected in the higher than expected SCI-2 score for this construct; the second highest of the four constructs (Table 7.1).

The mean score for this construct (10.34) is comparable to others' work. For example, Phipps (2012) used the SCI-2 in her study of university students' participation in intramural sport and produced similar scores for emotional connection. While Phipps did not collect any qualitative data in her study for triangulation, the qualitative data in this thesis produced contrasting results. From this perspective, emotional connection seemed to be one of the weakest aspects of community. That is, having spent two years building and being immersed in the SNAC community there was limited evidence for emotional connections being established. However, it may be that members were still able to feel connected to a community without having shown much emotion on SNAC itself. Moreover, when examining the correlation between this construct and the overarching sense of community construct, shared emotional connection w significant result (r (178) = 0.20, p = 0.007) after adjustment for the other three constructs (Table 7.2).

Summary

Firstly, sense of community and sense of virtual community were defined, and followed by quantitative survey data that presented the results of the SCI-2 index completed by 183 respondents.

The antecedents of community participation - cognitive, social-integrative, personal integrative and hedonistic, were used to create a framework supported by the four constructs of sense of community (shared emotional connection, fulfilment of needs, influence and membership). This framework was subsequently employed to describe

the antecedents of community participation from the perspective of SNAC members, and to what extent this influenced a developing sense of community. While sense of community does appear to be evident for some members and emerging for others, some constructs were stronger than others and qualitative and quantitative data offered different perspectives.

The following chapter presents more netnographic findings around the individual and social constructs of knowledge, attitudes and subsequent behaviours. These findings are interwoven with survey findings and other quantitative data, and also consider other organisational and policy influences on the provision of a healthy eating environment.

CHAPTER EIGHT:

KNOWLEDGE AND ATTITUDES

Introduction

The aim of this study was to assist child care staff promote and provide a healthy eating environment. The examination of staff knowledge about food and nutrition and their attitudes towards providing a healthy eating environment was a precursor to understanding behaviours. While there are numerous influences affecting health behaviours across multiple levels, the ecological approach, which underpinned this study, helped broaden the understanding of how individuals related to their personal, social and work environments. In particular, it is generally understood that motivating individuals to build the capacity to facilitate behavioural change may not be effective if their environment and a lack of influential policies thwart these efforts. Therefore, whilst this chapter focuses on individual attitudes towards the provision of a healthy eating environment, it also acknowledges the significant influence the work environment may have had on these attitudes.

This chapter also examines SNAC members' knowledge of nutrition concepts by reviewing various topics that have emerged over the course of the study, such as menu planning, role modelling and fussy eating. The attitudes of child care staff towards healthy eating and their perceptions of how a healthy eating environment is represented in the child care setting are also interrogated. It should be noted that whilst behaviour change was not a measured outcome of this study, reflections are provided on any observed behaviours as indicators of actual behaviours. Again, participant confidentiality is assured through the use of pseudonyms rather than actual names.

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Provision of a Healthy Eating Environment

The objective in the following section of this chapter was to examine the nutrition knowledge demonstrated by child care staff, both SNAC members and non-members, and if this supported the provision of a healthy eating environment. A holistic definition of a healthy eating environment, which acknowledged the many and varied influences, means that this was not limited to the provision of nutritious food, but also considered other important factors such as effective role modelling and the quality of planned learning experiences about food and nutrition. Attitudinal concepts will also emerge which are summarised in later sections of this chapter. The first section deals with the types of nutrition information sourced by SNAC members

How do they know what they know?

A key finding to emerge from Stage 1 of this study was the reliance of child care staff on internet searches to seek nutrition information, and the limited awareness of the resources recommended by the NQS. These findings informed the development of the SNAC website, and subsequently a raft of accurate and current nutrition resources was hosted, of which member's use was examined in Chapter Six. However, as these members often reported using SNAC alongside other materials, it was also useful to establish where these additional sources of nutrition information were sourced as a means of understanding the level of knowledge acquired.

It appeared that staff in more senior roles or who had higher levels of education, were more likely to use professionally developed materials and websites. Government websites, such as Eat for Health (Australian Dietary Guidelines) (NHMRC, 2013) and Get Up and Grow (DoHA, 2013) were cited, alongside health promotion programs such

as 'Move Well Eat Well' (Tasmanian Department of Health and Human Services, 2011) in Tasmania. Others reported using Nutrition Australia to access menu review services. Holly, a food coordinator in central Melbourne, who has a Masters of Education degree that examined food literacy in teenagers, disclosed that whilst she is a qualified chef, she had not received specific nutrition training, and used Nutrition Australia services to ensure the centre menu met the dietary guidelines:

> No, I'm not professionally trained in nutrition but I think the stuff supplied by Nutrition Australia in Victoria is really very good….we've just submitted our menu in the last month or two for approval by them, following the long day care dietary guidelines between 0-5 years, so we're just waiting to get it back and see how compliant we are, we're pretty close I think, I don't think there is much we have to do, and then hopefully we get that tick [from Nutrition Australia] (✎).

So whilst Holly is a qualified chef, and well educated, she acknowledged the shortcomings in her own nutrition knowledge and was confident and comfortable enough to engage professional services to confirm the quality of the menu.

As reported in Stage 1, child care staff sought assistance from other staff members if they had a nutrition query they could not answer. For example, Ellie, one of the 2ICs at a Perth long day care centre, described how her initial contact, in this instance, would be with the 'chef':

usually my first port of call is our chef [food coordinator]….half the time I do trust in what she's saying and hope that she's right….we do have quite a lot of you know, questions or she comes up to me with questions sometimes and I'm like oh I don't know, I'm not trained in this area, I don't know, you tell me (✏).

This statement implies there were circumstances where none of the staff were sufficiently knowledgeable or qualified to answer a nutrition query, and further sourcing of information may be a less reliable source. Research has indicated that many child care staff relied on newspapers, magazines or food company brochures for information about nutrition, and few considered approaching a reliable source, such as a dietitian (Gibbons et al., 2000). Moreover, Stage 1 data revealed that knowledge and use of the Australian Dietary Guidelines and Get Up and Grow resources to which child care staff are directed was limited. This is not surprising given it has been reported that "broad recommendations" (such as the Australian Dietary Guidelines and Get Up and Grow resources) may be "difficult to implement" (Geoffroy et al., 2013, p. 757).

In contrast, however, a director from rural Tasmania who was an active SNAC member, acknowledged her nutrition knowledge was "basic" and noted how she would approach her colleague who had completed a nutrition education course for specific advice. Tameeka noted:

one of our staff, she did a 'family food patch program' which is like a food educator program [provided by Child Health Association, Tasmania through funding from the Crown, and the Department of Health and Human Services], so I'm kind of reasonably confident around basic food groups and different things that children have at different ages and that kind of stuff, but if it was anything really super specific then I would probably get them to talk to Millie [pseudonym] because she's really got quite a particular interest in it (✐).

Therefore, Tameeka was supported by a colleague who was adequately trained in community nutrition issues and provided important support. However, non-active SNAC members reported being more likely to use Google to search for resources and recipes and their reasons for this limited engagement with SNAC and the available resources are detailed in Chapter Six.

Quality of menu plans

The quality of the nutritional resources and information sourced by child care staff is crucial to providing well-balanced menus in child care centres, a key component of the overarching healthy eating environment SNAC strived to promote. Whilst the purpose of this study was not to offer a menu review service, a number of SNAC members requested assistance with menu planning and I was able to offer broad guidance in terms of overall menu balance. These menus, and others posted by centres on their websites or Facebook pages, were a useful means of evaluating the level of nutrition knowledge demonstrated compared to their interaction with the SNAC website. Although these menus often lacked specific detail and recipes were not provided, it was possible to assess the level of variety, balance and number of discretionary food items offered. Prior to presenting the analysis of these menus, a brief background to effective menu planning in child care is provided.

A child should be offered one-half to two-thirds of their daily dietary intake needs if attending a child care centre for more than 8 hours per day (Gubbels, Kremers, Stafleu, Dagniele, et al., 2009; Radcliffe, Cameron, & Baade, 2002), across the five core food groups (Appendix 22). The Australian Dietary Guidelines (2013) advise that discretionary foods (high in total fat, saturated fat, added sugar, sodium and offering low dietary fibre) should *not* be offered to children attending child care, and moreover, the Get Up and Grow manual states: "sound menu planning incorporates foods from the basic food groups in each meal and snack and *does not include discretionary choices"* (DoHA, 2013, p. 33).

The use of a menu planning tool is recommended to ensure that a nutritional 'balance' is achieved over a two week (or longer) period (Matwiejczyk et al., 2007), which ensures the provision of sufficient nutritious and varied foods from each of the five core food groups. A set of menu planning tools were made available on the SNAC website, sourced from the Nourish cook book, and based on the 'Start Right-Eat Right' (SRER) resources, considered reliable and appropriate tools. As described elsewhere in this thesis (Chapter One, p. 9; Chapter Two, p. 31, 34), SRER was a nutrition accreditation scheme, which successfully improved the nutritional quality of the food offered at participating centres through nutrition training for directors and food coordinators, facilitated by the use of a menu planning checklist (Golley et al., 2012).

Under the auspices of the NQS, child care centres are guided to the Get Up and Grow manual for guidance around the provision of nutritious and varied food (DoHA, 2013), although data from both stages of this study indicated this resource is not well known or utilised. This manual provides menu planning guidance, sample menus and recipes, but there are no menu planning tools, such as checklists, food group calculators and

templates, which would facilitate what many staff may find to be a difficult task (Zuercher et al., 2011).

The following section provides a summary of the SNAC members' nutrition knowledge demonstrated from a review of various menu plans, and is considered alongside the guidance provided by the Get Up and Grow manual, and members' level of interaction with SNAC.

Use of menu planning tools

Some SNAC members confirmed they did not use menu planning checklists (on SNAC or otherwise), but one member described a menu development mechanism involving her colleagues, other centres and parents:

> We do it in house, again it's something that we'd share between the centres [there are three in this group] to try and make sure that we, obviously the staff give their feedback, parents have their input and then the coordinators give theirs and we kind of put it all together, then we tick off what we make sure what we've got on, all the dietary things we need to and then we share it amongst ourselves and we usually do one cycle and then we review it again, like we kind of do 4 weeks and then go the kids liked this, didn't this, parents had feedback on this, and then we try to finalise it, so a bit of a process but it works (Ellie, 2IC, ✎).

Whilst this approach demonstrated an inclusive process for menu development, which involved staff, parents and children, and Ellie appeared to be confident that their menu was well-balanced and nutritious. However, on review there were a number of concerns. Although the menu was varied, it was not balanced, offered many discretionary food items across the week, and the foods offered to babies did not include a rich source of iron. Despite the shortcomings of this menu, this centre received the rating of 'excellent' during their recent NQF assessment, which illustrates that the

assessment process is perhaps not designed to identify inadequacies in menu plans, and demonstrated the need for professional assistance, such as that offered by the SRER scheme.

Quality of menu plans

The overall quality of the reviewed menus highlighted a number of concerns; not only about the nutritional content, but also about the type of foods offered (i.e., sweet or salty) that could lead to children developing preferences for these types of foods. Many of the reviewed menus lacked variety, that is, the same food items were offered repeatedly as demonstrated by a long day care centre in Perth, where a fruit platter was offered at *every* morning tea. Menus also lacked 'balance', that is, they did not offer the correct number of red meat, white meat, fish and vegetarian meals across a two week period.

Iron

Importantly, many vegetarian meals did not appear to offer a suitable meat alternative, such as eggs or tofu, nor were they offered with a rich source of iron, often low in vegetarian meals, or vitamin C, essential for the absorption of non-haem iron. Furthermore, it appeared that babies were often provided with food that did not appear to be rich in iron. Other studies have also highlighted inadequate levels of iron being consumed by children at child care (Soanes et al., 2001). This was concerning as an iron deficiency can lead to delayed psychomotor development, impaired cognitive function and impaired immunity (NHMRC, 2006), impaired behaviour, and the effects of iron deficiency anaemia on intelligence quota may be permanent (Mira et al., 1996). Given that it is not known what, if any, iron rich foods are offered to children and infants outside the child care environment, it is essential that child care staff responsible

for menu-planning receive adequate nutrition training and are aware of this important dietary need.

Fruit fixation

Fruit is often over-provided in child care, sometimes at every meal or snack opportunity, although the recommendations state that a half serve per day (75g) of fruit (NHMRC, 2013) should be provided whilst the child attends child care. Fruit, of course, is a nutritious food and a rich source of vitamins, minerals, antioxidants and fibre. It is, therefore, encouraging that, according to the most recent Australian Health Survey, more than 90% of children aged 2-8 years are meeting the recommended guidelines (ABS, 2014). However, if centres are overproviding fruit, other core food groups could be displaced, as demonstrated by research that revealed meat and meat alternatives, dairy and vegetables were underprovided at child care centres (Sambell et al., 2014; Soanes et al., 2001). This could have important implications on the long term nutritional status of children, as well as their food habits and preferences. Again, data from the Australian Health Survey supports this supposition, as it is reported that only 50% of children aged 2-3 years consumed the recommended serves of vegetables, decreasing to less than 10% in the 4-8 age group. However, the sample menus in the Get Up and Grow manual also appeared to over-provide fruit, as it is often featured two or three times a day, and omitted important, specific detail, such as serve sizes. Therefore, centres who refer to the Get Up and Grow manual could easily misinterpret these guidelines.

Some child care staff insisted that children were allowed to bring fresh fruit *only* for their morning tea:

…unfortunately it doesn't work if parents pack a piece of fruit and then some biscuits and cheese or yoghurt – the children eat less fruit because they want to have the other things as well. Many adults don't seem to believe that fruit can be enough to get children through until lunch time (Libby, 🖥).

Here, Libby is insisting that the children only consume fruit, whereas the cheese and yoghurt (provided it had no added sugar) supplied would also have been an acceptable and healthy alternative, or to supplement the fruit.

Fruit is also often offered to seemingly negate less healthful foods offered to children at child care. Many services reported that fruit was offered either before, or alongside a discretionary food, such as cake:

All our children know they must have at least one piece of fruit before their afternoon treat too (Katie, Director, 🖥).

This particular centre offers fruit at morning *and* afternoon tea, and also offers the 'treat' (typically cake or other baked items) described above every day, thus it would seem likely that other important food groups, such as vegetables, could be displaced. These examples demonstrated a lack of knowledge about the nutritional profile of the core food groups and discretionary foods, and a lack of understanding about why it is important to provide foods from each core food group in the serve sizes recommended.

Discretionary foods

The provision of discretionary foods was perhaps one of the most concerning issues that emerged from the menu reviews, as well as their extensive use in planned learning experiences (discussed later in this chapter). Some discretionary foods that make a regular appearance on child care menus included (but were not limited to): ham, bacon,

sausages and other processed meats, some types of crackers, spreads such as jam and Vegemite ™, and baked items such as cakes, muffins and biscuits.

Although the Australian Dietary Guidelines very clearly states that discretionary foods should not be offered at child care (NHMRC, 2013), the Get Up and Grow manual (DoHA, 2013) is more ambiguous and offers conflicting advice. For example, a statement concerning menu planning stated discretionary choices should not be included, although other statements throughout the guide refer to 'limiting' or not offering on a 'regular' basis (DoHA, 2013). These terms are open to interpretation and can have different meanings to different people (Fayet-Moore & Pearson, 2015), so for those centres who do refer to the Get Up and Grow manual, this could add another layer of confusion. For example, an individual might consider the term 'limiting' or 'not on a regular basis' to mean that discretionary foods are not offered at every meal, but believe it is acceptable to offer them once a day, as in the example of Katie provided above.

To another individual, these terms might be interpreted as offering discretionary foods once a week, the sentiment shared by a director from QLD:

> A good question is how often is sometimes? Some parents at my centre believe that a treat should be given at every meal where I think that it is at birthday parties or other social/special times (Winnie, 💻).

Others believed that discretionary foods do have a place in the child care setting 'occasionally', to help teach children about the 'balance' between healthy and less healthy choices. A director from NSW commented:

> I believe that if the children are receiving their healthy dietary intake on a daily basis, 'sometimes' food has a place in the children's diet occasionally. I believe it's a balance…it's about education and it's about helping children understand the importance of healthy eating (Oonagh, 🖥).

Laurie, a 2IC in NSW agreed:

> I agree that discretionary foods should be just that – foods which are only to be consumed occasionally (🖥).

However, the menu reviews and observations made at site visits revealed that discretionary food items were offered frequently, and in many cases, daily. The Australian Health Survey reported that children aged 2-3 years obtained 30% of their daily energy needs from discretionary foods (ABS, 2014). This is concerning as these foods are displacing other important food groups such as vegetables, supported by data from the same survey that reported less than 50% of children aged 2-3 years met the recommended guidelines for this food group. It is well documented that the food served in the child care setting may lack key nutrients vital for optimal child growth and development (Ball et al., 2007; Jennings et al., 2011; Pollard et al., 1999) and energy dense, nutrient poor foods that are over-provided in this setting, could contribute to childhood obesity and chronic diseases later in life (Waters et al., 2011). Moreover, the marked decrease reported in vegetable consumption between children aged 2-3 years and 4-8 years (ABS, 2014) supported the ideal that promoting nutrient dense foods as opposed to energy dense foods whilst children are young, can promote the development of healthy food preferences that remain through adulthood (J. Skinner, Carruth, Bounds, & Zielger, 2002).

The regular provision of discretionary foods could be due to a lack of knowledge about what discretionary food items actually are, illustrated by a number of child care staff at

presentations who were dismayed to discover that sausages were classified as such. SNAC members (both active and semi-active) defended the provision of sausages as part of a balanced meal or menu plan:

> Sausages…yes, why not? As long as they are lean and gourmet rather than cheap and full of fat! (Oonagh, 💻).

Moreover, it appears that some child care staff many not understand the long term impact such discretionary foods can have on a child's developing food preferences and their long term health. For example, jam and Vegemite ™ are the 'go-to' choices of spreads in child care centres, but due to their high sugar and sodium content, are classified as discretionary foods. Whilst these foods do tend to be offered in small amounts, the intense sweet or salty taste could lead to children developing a predisposition for such foods (Fildes et al., 2014), which could increase the risk of chronic disease in later life. However, although some child care staff *know* that these are not the best choices, they may be foods that have become culturally entrenched; making the habit of not providing them too hard to break. For example, Sasha a regular SNAC member and food coordinator, understood that these spreads were not the best choice, but explained that it is what the children expected and what she knew they would eat. Similarly, Lynch and Batal (2011, p. 193) reported child care staff being unwilling to try new foods with the children, because they were: "stuck in our ways with our snacks because we know what we're doing works". In other words, these staff were resorting to 'go-to' food choices, regardless of the nutritional value, knowing that the children would eat them. Moreover, at a staff presentation, when I suggested Vegemite™ be used as sparingly as once a week, the staff were quick to voice their apparent disagreement:

"It's only a smear, what harm is it going to do them?"

"They like it, what else am I supposed to give them?"

These statements demonstrate a direct contrast in this centre's feeding practices to those recommended by Satter (2014), and discussed in Chapter Five (p. 147). These practices are known as the "division of responsibilities" and state that it is the carers (i.e., child care staff) responsibility to offer a selection of *healthy* food choices, but the children's responsibility to decide *which* of the offered foods they will eat, or *how much* they eat. However, many staff were more concerned that children eat *something*, regardless of the nutritional value. This is expressed by a director:

> It seems the healthier the food the more resistance (or stubbornness) there is to eating it. So, do we serve discretionary food items sometimes, or just keep serving healthy food which is picked at or not touched at all? (Layla, 💻).

There is also an alarming trend for staff to present discretionary foods as 'fun' foods, when offered on special occasions. For example:

> At DGK child care centre [pseudonym] we value children's choices and to help them make the best choices we continually talk about maybe, sometimes and anytime foods….Our sometimes foods are the 'FUN' foods we have for special occasions like parties – chips, lollies and chocolate as well as juice and fizzy drinks (Katie, Director, 💻).

The positive inference created by associating discretionary foods with 'fun' is problematic from a nutrition education or health promotion perspective (Petrunoff, Wilkenfeld, King, & Flood, 2012). Children are being exposed to subliminal messages that healthy eating cannot be fun, and special occasions must be celebrated with

unhealthy food. In contrast, however, a SNAC member demonstrated her determination to provide a healthy eating environment:

> I am a believer in making healthy food so enjoyable that children start to appreciate that healthy food is not only good for you but tasty to eat as well. I think it best too that children do not develop a taste for sweet, salty and/or fatty foods (Winnie, 🖥).

Considering these opposing opinions towards discretionary foods in the child care setting, it appears that the use of these foods is also associated with child care staff's personal opinions, as well as their knowledge and understanding of what constitutes a discretionary food and their reliance on a number of 'go-to' choices that they can be sure the children will eat (Lynch & Batal, 2011).

It should be noted that a complete menu plan has never been posted by a SNAC member on the website, and those seeking assistance with menu planning have always done so through private emails with the researcher. However, SNAC members were more willing to provide individual recipes on the website and seemed to enjoy doing so:

> We use many of the recipes and it would be hard to choose a favourite….we really appreciate the chance to share recipes and discover new ones (Katie, 🖥).

Recipes are obviously an important component of menu planning and provided another source of evidence that allowed further assessment of the levels of nutritional knowledge held by child care staff.

Recipes

By 31st December 2014, more than 50 individual recipes had been posted by SNAC members, often in response to competitions such as the Pumpkin or Christmas

Cookbooks. SNAC members were asked to contribute recipes following a theme such as "fabulous healthy Christmas food ideas for kids", but no specific nutrition criteria were stipulated. The recipes were not policed on the forums, as it was important to avoid a 'big brother' approach in an arena such as SNAC, which could erode the emerging sense of community and potentially discourage SNAC members from engaging with the forums.

Although it was important that the policed dynamic was avoided, it was imperative that nutritional standards were maintained. Therefore, prior to publication, recipes high in fat, sugar or other discretionary food ingredients were modified in line with Get Up and Grow recommendations: "choose recipes that include foods from the basic food groups, and avoid those that include ingredients with large amounts of fat, sugar and salt" (DoHA, 2013, p. 51). Of course, the term 'large amounts' is open to interpretation, but there were available resources and recipes on the SNAC website to offer guidance.

It was encouraging that three quarters of the recipes posted did not require modification, and that these SNAC members seemed to have engaged with the healthy eating messages promoted by SNAC. However, 25% of the recipes did require modification, and especially telling were some of the recipes provided for the Christmas Cookbook. The request for 'healthy' Christmas themed food ideas seemed to present a quandary to the regular SNAC members. For example, an active member commented:

> Wow!! How sad is that I can't immediately think of a healthier Christmas
> cooking activity. This made me realise how much of celebrating Christmas
> is about treat foods. Will have to give this some more thought though
> (Cassie, 💻).

Cassie did return to SNAC the next day and posted two food ideas; zucchini chips and 'Grinch' kebabs made from fresh fruit, with only the zucchini chips requiring modification to substitute salt with herbs and spices.

Other regular SNAC members also provided healthy Christmas food options, such as watermelon Christmas trees, strawberry snowmen and fruit candy canes, but some of the sweet or cake ideas posted, were very high in added sugar. These members tended to post healthy food ideas, followed by other food ideas that they acknowledged were not so healthy. For example, Cara (food coordinator and active SNAC member) posted two very sweet recipes, based on marshmallows, condensed milk and white chocolate, but followed this up with four fruit based ideas.

Special occasions such as Christmas are important to children, their families and the child care staff, and many use food to celebrate, as reported by Lynch and Batal (2011). The Get Up and Grow manual also provided guidelines for the use of celebration foods: "promote healthy eating by using nutritious foods prepared and presented in special ways, rather than relying on discretionary choices" (DoHA, 2013, p. 44). Blake and colleagues explained that certain foods may have a different meaning to the same person in a different context (Blake, Bisogni, Sobal, Devine, & Jastran, 2007). For example, a director who does not usually allow discretionary items to be served, may decide it is appropriate to provide a cake as a Christmas celebration food due to her own upbringing and cultural beliefs, and those of the children, their families and the staff. Some regular members who posted their Christmas food ideas have demonstrated

exactly that; the majority of food will remain healthy with a few discretionary items included to acknowledge the cultural importance of the celebration.

In light of the quality of the menu plans and recipes reviewed, it is also important to reflect on the survey data concerning the perceptions of healthy foods and snacks served at child care centres. Almost all participants either 'Agreed' or 'Strongly Agreed' that '*healthy food is served to children*' both pre- (94.7%) and post-intervention (97.9%). This trend was repeated when asked if '*meals and snacks meet NQS requirements*' (93.7%, 97.4%, $p = 0.008$), which is somewhat arcane given that the parameters outlined in the NQS are broad, and illustrated they are open to individual interpretation, as demonstrated by these menu and recipe reviews.

When considering the concept of healthy food being served to children, the majority of respondents 'Agreed' or 'Strongly Agreed' that '*nutritious foods are provided for all meals and snacks*' pre-intervention (85.5%), and there was a significant increase post-intervention (93.4%, $p=0.002$). '*Children receive healthy snacks on a daily basis*' also recorded a significant increase between pre- and post-intervention mean scores (92.5%, 95%, $p=0.039$). Whilst the scores were high pre-intervention, there was a significant positive shift, and respondents were answering these questions following their participation on the SNAC website. This interaction with SNAC could have resulted in an increase in nutrition knowledge and the subsequent ability to assess and renovate menu plans and/or recipes, and their interaction with the discussion boards could have increased the levels of social desirability to provide a healthy eating environment. It could, therefore, be argued that members' interaction with the website had influenced the significant increase in the proportion answering these questions positively (Appendix 23).

The food budget, in terms of dollar value, is another factor that can influence the nutritional quality of the food offered at child care, and is addressed in the following section.

Food budgets

The food coordinator is required to develop a balanced, nutritious menu, but is often restricted by the available food budget, which can also impact on the nutritional quality of the menu. The following excerpt from the researcher's journal outlines a query received from a staff member at a long day care centre near Perth, WA:

> *Joelie [psuedonym] telephoned today to ask if there is any information available about what a child care service's budget should be. They are struggling to manage on the budget they have ($1.30 per child/per day) as they are expected to include cleaning materials and arts and crafts materials in this budget as well. Nor do they get any extra budget allowance when they have extra children, e.g., vacation care. Joelie told me that she and the staff feel like the children are not getting enough to eat because the budget is stretched so tightly, and she wanted to get some evidence before approaching the owner.*

SRER guidelines from 2011 recommended a minimum food budget of $1.45 per child/per day (Government of South Australia, 2010), and allowing for an increase of 15% in food costs since 2011, this would equate to a minimum food cost of approximately $1.70 per child/per day in 2015. Centres have reported widely varying food budgets from as little as $1.40 per child/per day to $2.50 per child/per day (🖳), whilst others reported not being constrained by a budget (usually privately owned). Factors such as non-food items being included in the 'food' budget, whether staff

expected to be provided with a full meal or a 'taste' whilst they sit with the children at mealtimes, and where food coordinators are 'permitted' to shop, are all influential factors that affect the budget. For example, Betty (a food coordinator and non-SNAC member) worked at a privately owned, long day care centre, and reported she was struggling with her budget of $1.60 per child/per day. She was only permitted to purchase groceries from Woolworths online, so was unable to take advantage of 'specials' elsewhere, or of cheaper produce available at large warehouse style fruit and vegetable outlets. She was also expected to provide a full meal for 10 staff. In contrast, the owner of a privately owned long day care centre in Perth, reported much greater autonomy:

> I have worked out that we would spend roughly $1.40 per child per day….it requires a lot of forward planning and purchasing items that are on special that may not immediately be required. We have a freezer for meat as well as two fridges for fruit, veg, milk, etc. I buy most produce from Spudshed [a large warehouse style fruit and vegetable outlet in WA] and only shop once a week. I am not saying this store is the only place to offer good prices, but have found it to be the best in my area for my needs. This figure DOES NOT include cleaning products, but DOES include herbs, sauces, ingredients for play doh (Katie, 🖥).

The contrast between these two examples demonstrated that, despite the difference in the food budgets, the level of autonomy a food coordinator has over food purchases can influence how far they can 'stretch' this budget. However, it is also important to consider the skills of the food coordinator to plan ahead and buy food items when on special, as well as having adequate storage space, such as freezers and cupboards. Some centres supplement their food budgets by growing their own vegetables and herbs, and also receive donations, usually fruit, from parents. It appears that the mandatory training does not include teaching these important budgeting skills with

many food coordinators hired on the premise that they have raised a family themselves and the assumption that there 'must' be some accompanying food budgeting skills, which of course, may not be the case.

This evidence presented under menu and recipe reviews and food budgets has reinforced the concept that menu planning is a complex task (Romaine et al., 2007; Zuercher et al., 2011), and that even experienced, well trained child care staff struggle to complete this task well. It is appreciated that only a relatively small sample of menus have been reviewed, which have not been rigorously assessed in terms of complete nutrient profile. However, this appraisal, supported by other evidence, demonstrated a lack of quality that could compromise the long term health and development of the children attending child care centres. If training alone is not an effective measure to increase the nutritional profile of menus, then professional guidance, such as that offered gratis by the Victorian Healthy Eating Advisory Service and the Tasmanian Department of Health and Human Services, should be extended Australia wide so every centre receives equitable access to sound nutrition advice.

As well as the intricacies of menu planning and the provision of nutritious food, another means of assessing the levels of nutrition knowledge held by SNAC members, was how child care staff dealt with the common issue of children's fussy eating.

Fussy eating

The issue of fussy eating was raised as a significant barrier to the centre being able to provide a healthy eating environment in Stage 1 of this study. It is acknowledged that fussy eating or food neophobia peaks in children aged 2-6 years old (Dovey et al., 2008), and the role of the carer is reported as 'critical' in overcoming this issue and influencing the development of future food preferences (Benton, 2004).

Given the iterative nature of this study, and in keeping with the action research elements of the STAR model (Figure 2.1, Chapter Two), resources were designed and loaded to SNAC to assist child care centres with this difficult issue. The 'How to deal with fussy eating' video was the most popular of the 'activities' on the SNAC website, and on the website forums, SNAC members entered into several discussions where they discussed various strategies for dealing with fussy eating at their centre.

The most common strategy reported was to offer the child an alternative food or meal if they could not be persuaded to eat the meal provided. These alternatives were typically a sandwich, usually cheese and vegemite. Some would offer fruit and vegetables, or a drink of milk. Other services would separate the ingredients in the meal, and allow the children to serve themselves with what they liked. For example, the meat would be served separately from the vegetables, or the sauce separate from the pasta. Some surmised that fussy eating usually occurred when the child was new to the service:

> At the beginning of the year, when all was new for many of the kids, we had a fair bit. I think a lot of food refusal at first was simply not being comfortable with our environment yet….and by respecting that little bit of autonomy we actually gave the kids the ability to choose to try the new things on offer with enthusiasm when they decided they were ready (Maggie, Support Officer, 💻).

Others acknowledged that it often takes repeated attempts for the children to accept a new food, and it is well documented that vegetables in particular, are often a food that children refuse to accept. Survey data also revealed that both pre- and post-intervention (97.8%, 98.9%), participants encouraged children to try new food items (Question 29, Appendix 23). This is supported by Caton and colleagues' research, that suggested that repeatedly offering new or rejected foods, between 5-15 times, may promote eventual acceptance (Caton et al., 2014).

In contrast, the director of a long day care centre explained how some of her educators did not persevere with foods that had been refused and often resorted to a 'quick fix':

> I've got a couple of picky eaters at the moment, in my toddlers [room], I've got one little boy who, and I think it stems from his food here, the girls in the nursery turn around and started just giving him yoghurt and custard 'cos he wouldn't eat anything else and now at home he'll only eat yoghurt and custard (Narelle, ✐).

The educators Narelle described were not SNAC members, and the extent or recency of their food and nutrition training is unknown. Unfortunately, their apparent lack of knowledge may have caused the child to develop a predilection for sweet foods, demonstrating the important role carers play in the development of a child's food preferences (Benton, 2004).

The following excerpt from the researcher's journal details a telephone conversation with a director, where a harsher food refusal policy was revealed:

> *Tracy talked about their policy if a child refuses food as "they can't be doing 20 different meals a day". She stated that if the child tries the food but doesn't like it, they will be offered a sandwich. If they won't even try it [the meal], all they will be offered is some rice crackers (☏).*

The Get Up and Grow manual has very clear guidelines about the appropriate use of food: "At no time should staff or carers use food as a reward or deny it as a punishment for behaviour. Praise and encouragement are what children need from adults". (DoHA, 2013, p. 40). I urged Tracy to review this practice, and guided her towards the fussy eating resources available on SNAC. Fortunately, this practice seemed isolated, and

similarly, other research has indicated that only 13% of early years' staff in a European study reported engaging in such practices (Gubbels et al., 2015).

The overwhelming majority of comments and posts, however, regarding this issue were positive, with staff respecting and supporting children in their choices, and demonstrating their knowledge and confidence to deal with this issue effectively. It is noteworthy that these posts were made by regular SNAC members, of whom the majority were more senior and experienced in the industry. The yoghurt and custard scenario described by Narelle above, demonstrated how less experienced, junior staff (non- SNAC members) might deal with fussy eating, and highlighted the need for support and education, such as that provided by SNAC, to deal effectively with this important developmental issue.

Role modelling and planned learning experiences

Child care staff also play an important role in modelling appropriate healthy eating behaviours and providing opportunities for children to learn about healthy eating through structured curriculum activities. Planned learning experiences is a term used to describe the activities that child care staff use to engage children with healthy eating at their centre, and the majority of staff used the example of role modelling at mealtimes to describe these activities. This section, therefore, will examine the issue of role modelling and also consider what other planned learning experiences are offered to the children in their care.

In recent decades, child care centres have largely replaced the home as the environment where children learn about food and nutrition and develop their food habits and preferences, and child care staff behaviours therefore have a significant influence on the children in this environment (Birch et al., 2007). As reported in Stage 1, most SNAC

members talked about role modelling healthy eating at mealtimes by eating the same food as the children, talking about the food, how it was prepared and how it is presented, as well as what it does for the body. For example:

> We always talk about food at mealtimes, extending conversations….if we are talking about cows for example, it will be 'oh gosh, what do cows do', extending on those, oh cows give us nice milk and calcium for bones….we prompt discussion with the children (Charlotte, Director, ✎).

Recent European research has described how staff eating and sitting together with children at mealtimes, talking about foods and healthy eating is viewed as a favourable practice and could help increase children's dietary intake (Gubbels et al., 2015). However, child care staff can often find mealtimes challenging, and one of the most difficult times of the day (Lynch & Batal, 2011). A former compliance officer, talked about how the educators dealt with mealtimes at her centre:

> I must say there were times when I was absolutely shocked the way the children would sort of deal with the food, or waste it…. messy and like you'd end up with more food on the floor than in their mouths and things like that where I think, it's probably partly to do with the fact that staffing is at a minimum…. there wasn't really a lot of time to sit with the children and model even good eating practices and so on (Beryl, ✎).

Whilst it appeared that the number of staff present at mealtimes was a factor in poor role modelling, Beryl also suggested that the relative inexperience of the staff was another contributing factor:

> There were a lot of young staff too and probably, possibly, potentially brought up with like TV meals so to speak, you know on your knee in front of the TV and possibly fast food….I think they needed mentoring and training and teaching in that area [healthy eating] themselves, and I guess

that would have been my encouragement where possible to try to help them to see (Beryl, ✏).

Again, this demonstrated the need for support and adequate training around effective role modelling, especially amongst younger, less experienced staff. More than 95% of survey respondents 'Agreed' or 'Strongly Agreed' that staff role modelled appropriate mealtime behaviours (Question 6, Appendix 23), contrasting with Beryl's observations. However, when asked if staff were *trained how to* role model healthy eating behaviours (Question 13, Appendix 23), pre-intervention 25.3% 'Disagreed' or 'Strongly Disagreed', although there was a positive and significant shift, and only 16.6% answered this statement negatively post-intervention ($p=0.016$). It could, therefore, be surmised that the SNAC website, although not designed or intended to deliver 'training' per se, has contributed to this significant increase in staff perceptions of role modelling training, through staff exposure to the relevant role modelling resources and discussions on SNAC.

Findings from Stage 1 reported little evidence of children being provided with planned learning experiences about healthy eating concepts (Chapter 4). The NQS states that these experiences should "incorporate discussions and activities about healthy eating and caring for their bodies into children's everyday experiences" (ACECQA, 2012, p. 61). Therefore, one of the aims of the study was to provide accurate and current nutrition education resources to child care staff to facilitate these activities, and numerous educational resources have been signposted for SNAC members, including the Picasso Cows and Seeds for School programs, which focus on healthy eating concepts.

A typical planned learning experience at child care centres, other than role modelling at mealtimes, often involved children in the act of cooking. SNAC promoted food

activities focusing on healthy foods, such as the 'banana dolphins' and bread making resources, which integrated other curriculum elements, such as science and mathematics. However, the 'go-to' choice for many centres was typically cakes, muffins and other sweet foods, thus missing the opportunity to promote healthy eating and perhaps inadvertently encouraging children's natural preference for sweet foods. For example, UHE [pseudonym], is a privately run website for child care staff, and their forum about 'cooking experiences with children', suggested only sweet baked items, such as rocky road and caramel slices. Indeed, the moderator herself (a non-member) recently posted a cooking activity idea with a recipe comprising only of white chocolate chips, premade strawberry frosting and pecan nuts. This demonstrates an alarming lack of nutritional knowledge as two of these items are highly processed, discretionary foods high in fat and sugar, whilst nuts are usually prohibited in child care centres for allergy reasons.

Centres also posted details of their food or cooking activities on Facebook, and again, there seemed to be a predilection for sweet items, such as biscuits and fairy bread, although sandwiches also appeared frequently. However, these centres still seem to be missing the opportunity to use these activities as a way of promoting healthy eating, especially given their focus on predominately sweet foods. For example, a centre in Perth (*not* SNAC members) posted on Facebook:

> Recently in the pre-school room in EFG centre [pseudonym] we decided that we would make our own sandwiches for lunch. We had a buffet style set up on the table and the children came in in small groups and made their own lunch. The children were able to use whatever they wanted on their sandwiches, which led to some pretty interesting concoctions and mixes which they all devoured. This was a great experience for the children which

gave them the opportunity to choose and to be in charge of what they were eating (paraphrased, 🖥).

Whilst the children learned fine motor skills through constructing their own sandwiches, and had autonomy over their choice of filling, it was the responsibility of the carers to provide *healthy* choices (Lohse et al., 2014). However, the accompanying photographs showed the choices of filling provided were jam, chocolate spread, polony, butter and tomato sauce, all discretionary items that guidelines state should not be offered in a child care centre setting (NHMRC, 2013).

Disappointingly, one of the centres closely involved with SNAC has also posted poor examples of cooking activities with children on their Facebook site. For example, their toddler's room made biscuits with sprinkles, and whilst the post described how they weighed and measured ingredients, detailing the equipment used and so on, it failed to mention any nutrition concepts that could have been discussed with the children. Survey data that revealed if nutrition education was being provided to children (Question 45, Appendix 23) demonstrated that more than 90% of respondents (n=170) answered this positively both pre- and post-intervention. Considering these data alongside the Facebook posts further demonstrated a disparity between reported and observed behaviours.

Given there is evidence to support the concept that teaching children about the nutrients in their food may increase their consumption of healthy food choices (Gripshover & Markman, 2013), it appeared that child care staff were missing important opportunities to promote a healthy eating environment in the early years' setting.

Difference in Knowledge According to the Level of Interaction with SNAC

During the course of this study, many menus were reviewed and whilst improvements were suggested for all, the level of improvement required largely depended on the level of interaction with the SNAC website. For example, Sasha, an experienced food coordinator and an active SNAC member, produced a good quality, balanced menu plan using reliable menu planning tools and only minor revisions were suggested. In contrast, Tabitha, a director and an active SNAC member, who has been supported to provide a healthy eating environment on a number of occasions, emailed a menu plan that had been developed by her food coordinator, requesting it be reviewed. The menu was repetitive, unbalanced and contained many discretionary items. Whilst the food coordinator had registered for SNAC she had not returned to the site since, thus it is uncertain what, if any resources she had used to develop this menu. The menu required significant amendments to ensure it was balanced, and offered a variety of nutritious food.

Ellie, a passive-active member and 2IC, posted her centre's menu on their website, and during the exit interview confirmed that no menu planning tools were used in its development. Again, this menu was not balanced, with numerous discretionary foods offered, and significant changes were required. Finally, a non-SNAC member posted a two-week menu on Facebook that was of poor quality. Whilst this menu was varied, it was unbalanced and discretionary items were offered several times daily. Of concern was that many of the child care staff who responded to this Facebook post agreed that this was a good menu, reporting it to be similar to that offered at their own centre, and seemingly unaware of the discretionary food items offered. Therefore, it appears that

the level of interaction with SNAC can influence the quality of the centre menu's in some, but not all cases.

Summary

In this section, the level of knowledge demonstrated by child care staff, both SNAC members and non-members has been examined through constructs such as from where they obtain their knowledge, the provision of healthy food, effective role modelling and offering planned learning experiences. The following section reviews the attitudes of child care staff towards healthy eating in general, and more specifically, interrogates their perceptions of how a healthy eating environment is or should be, represented in the child care setting.

ATTITUDES

Attitudes are described by Ajzen (2005, p. 3) as "a disposition to respond favourably or unfavourably to an object, person, institution or event". In the case of the SNAC study this could be members' attitudes towards other people, such as their colleagues, the children they care for and the families, or more broadly speaking, towards the provision of a healthy eating environment. The attitudes held by an individual are pivotal to decision making about health behaviours (Jones, 2003), thus observing those held by SNAC members was important as an indicator of their intention to make changes. It is also important to understand the intrinsic link between perceptions and attitudes, an important element of the Theory of Reasoned Action (Fishbein & Ajzen, 2010). An individual uses their senses to understand their surroundings (perception) that in turn informs the actual way they feel or think about something (attitude). Therefore individuals from different social backgrounds, who have varying roles within the child

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care industry, are likely to hold varying perceptions or beliefs, which in turn may influence their attitude towards providing a healthy eating environment.

The following section examines the attitudes reported by or observed in child care staff across the duration of the study. These include staff attitudes towards providing a healthy eating environment, and to parents.

Attitudes towards providing a healthy eating environment

Stage 1 data revealed child care staff had positive attitudes towards providing a healthy eating environment, acknowledging that the child care setting played an important role in supporting the development of children's food habits and preferences (Chapter Four). This trend continued in Stage 2, with many members displaying positive attitudes via the posts made on SNAC, and when directly asked (during the exit interviews) if they believed it was important to provide a healthy eating environment. A director commented:

> Definitely so in regards to our situation. Our service is located in a low socio economic area where nutritious meals for a lot of families come low on the list of priorities. However, we know that while the children are attending preschool they are being provided with nutritious food (Layla, ✐).

However, there are certain nuances that appeared, which could suggest these positive attitudes are being undermined by societal factors. For example, Libby, an experienced director from rural Victoria, whilst acknowledging it was important to teach nutrition concepts and provide an appropriate eating environment, reported she was becoming tired of the persistent effort it demanded. She referred to being perceived as a 'killjoy' if she did not allow bacon to be served, and as 'the police' for insisting that children have fresh fruit for morning tea:

You know, I have occasionally told a parent that we gave them an apple and sometimes I don't even tell the parent, it just depends on how strong I feel about the ongoing discussion which frankly, as I said, just gets a bit tedious (Libby, ✎).

While discretionary foods were discussed in the preceding sections in relation to knowledge, they are also discussed here in terms of conflicting attitudes. For example, a compliance officer stated:

The 'sometimes' food is for a treat at home or on a special occasion, not for us to provide in a child care environment. I am about to review our centre menus and am really looking for healthier options than the sometimes food that is currently on our menus (Peta, 🖥).

This is in direct contrast to a director who believed that it was not possible to teach children to make healthy choices, if both healthy and discretionary foods were not offered (Katie, 🖥). Her opinion is similar to those expressed by Australian parents in Petrunoff's (2012) study, who allowed their children to consume discretionary foods, providing they were also eating healthy foods. Parents justified these choices by indicating they were keen to avoid over-restrictive parenting practices that they believed could result in their children becoming focused on certain foods. However, as noted in the previous sections, the Australian Dietary Guidelines clearly state that discretionary foods should not appear on the menu in an early years setting (NHMRC, 2013).

Holly, a food coordinator and a qualified chef with a Masters degree in education, demonstrated a positive attitude towards the importance of providing a healthy eating environment. She opined that the provision of food should be embedded into all aspects of the curriculum and facilitated by developing a specific 'healthy eating coordinator' role within a service. She stated:

Also, you know, unfortunately, it's [healthy eating environment] just seen as the food, it's not central to their [the children's] wellbeing when in fact it should be the absolute crux of what they get (Holly, ✎).

So Holly believed that by developing a specific 'healthy eating coordinator' role, that a more holistic attitude toward providing a healthy eating environment would be generated, and encompassing a 'whole of centre' approach would result in more favourable outcomes.

Survey data also revealed very positive attitudes towards providing a healthy eating environment (Appendix 23). For example, the question '*it is considered important by all staff that healthy food is served to children*' was answered positively by 98.5% of respondents' pre-intervention and 99.5% post-intervention (n=189). However, given the mixed responses illustrated above, it is surmised that individual attitudes towards providing a healthy eating environment can vary widely. Moreover, how this is actually facilitated in a child care setting is also reliant on the level of nutritional knowledge staff have.

Staff and parental attitudes

It was apparent that child care centres endeavoured to offer the best environment possible for the children in their care, and as many are parents themselves, an empathetic approach to families was often displayed. For example:

You know, having been a single parent, and a full time working Mum and everything else, I know how valuable child care is, I know how hard it is to leave your kids with someone else to look after, and so I want to be able to provide the best place for them to be, according to what I would have wanted my children to have had (Katie, Director, ✎).

Reflective of findings from Stage 1 of the study, some staff reported that parents are often more concerned *if* their child has eaten, more so than *what* they have eaten:

They're [referring to parents] more interested in that they're being cared for, and ….if they've had a great day and that's the end of it (Charlotte, Director, ✎).

Children with special dietary needs or preferences can be a source of conflict between service providers and families. Of course, if the child has a medically diagnosed food intolerance or allergy, services are mandated to provide appropriate foods and actively encourage parents to communicate these special dietary needs. This was corroborated in the survey, where all participants agreed or strongly agreed parents were encouraged to communicate their child's allergies and special diets (Questions 23, 35, Appendix 23). However, some parents requested special diets as a matter of preference. A director explained:

We can meet anybody's needs I suppose….like they want us to follow certain things here [special diets] but they don't actually do it at home….well that's a bit rough, you know, why should my cook have to do all this and you don't do it at home? (Charlotte, ✎).

The attitudes expressed by some staff towards parents who were perceived to allow their children to eat unhealthily were less positive. During the course of a SNAC presentation, an educator stated:

Surely it's all down to the parents, if they don't care, what does it matter what we do? (Olga).

This opinion was not shared by her colleagues at the presentation, but similar attitudes have been reported elsewhere. For example, Lynch and Batal (2011) described child care staff who held negative attitudes towards providing a healthy eating environment if they perceived that parents were allowing their children to eat unhealthily outside the service.

Pre-intervention, formative data demonstrated child care staff believed it was important to offer nutritious food at the centre *because* they perceived some parents were allowing their children to eat unhealthily. Post-intervention, SNAC members reported similar beliefs, although the director quoted below presented this positively and in terms of offering a service to busy parents:

We like the fact that children have a wholesome meal at lunchtime so the parents don't have to stress too much for dinner, they can pick their battles a little bit (Tabitha, Director, ✐).

Other staff also reported offering parental support:

So we do try and work with the parents, it is a little bit more difficult because that's more touchy for a parent, you know you don't want them to feel like you're criticising the parent who's trying very hard in these very busy times (Peta, Compliance Officer, ✐).

Of the attitudinal/perceptions questions posed in the survey, those regarding parental involvement, whilst still overwhelmingly positive, leant a little more towards a negative response than other questions. However, scores did significantly improve post-intervention (Table 8.1).

Table 8.1 Parental attitudinal/perception questions

Question	Pre-(n=189)		Post (n=189)		p-value*
	Disagree	**Agree**	**Disagree**	**Agree**	
Parent partnerships established to promote healthy eating	15.6%	84.4%	9.1%	91.9%	0.024
Parents are involved with healthy eating activities in the centre	34.4%	65.6%	25.2%	74.8%	0.049

*Wilcoxon signed-rank test

The only exception was question 10, '*parents participate in healthy eating promotional events*'. There was no significant difference pre- and post-intervention, although negative responses (disagree and strongly disagree) decreased from 37.2% pre-intervention (n=70) to 27.8% (n=52) post-intervention (Appendix 23). These responses support findings from a US study where it was reported that child health specific presentations were poorly attended by the parents (Fothergill, 2013).

To some extent, other survey data supported this negative stance, as over one third of responses to the questions pertaining to parental involvement in healthy eating activities at the centre were negative (Questions 10, 20; Appendix 23). Question 22, '*nutrition education sessions are offered to parents*' was answered negatively by 60.7% of respondents (n=114). This could be due to a lack of funding, or because it is not on the directors' agenda, but as suggested by Kim et al. (2011), child care staff could be missing the opportunity to deliver important health promotion messages to parents.

Summary

In this chapter, the level of knowledge demonstrated by child care staff, both SNAC members and non-members, has been examined through the constructs of the provision of healthy food, effective role modelling and planned learned experiences. Examining the provision of healthy food reinforced the concept that menu planning is a very complex task, and even well-trained, experienced staff may experience difficulties.

Discretionary foods were offered frequently, perhaps due to a poor interpretation of the guidelines or entrenched food habits and 'go-to' choices. Reported role modelling practices were mostly positive, although it was demonstrated that less experienced staff may require better training and mentoring to be able to effectively role model healthy eating behaviours. Planned learning experiences were underutilised as a means of teaching children important nutrition concepts, and reported activities relied heavily on discretionary foods.

A mostly positive attitude towards providing a healthy eating environment was noted, as were staff attitudes towards parents, acknowledging their need for assistance and support. There were varied attitudes reported regarding the provision of discretionary foods in child care centres. This is an important factor, as senior staff who allow more discretionary foods to be served in their centre, could negatively influence their staff, and ultimately impact on children's long term health.

It is clear from these differing attitudes that personal beliefs can significantly impact the provision of a healthy eating environment within the child care setting. Furthermore, how an individual staff member defines a healthy eating environment is open to interpretation, and may differ between individuals according to their circumstances, and the various influences on their personal and working lives.

CHAPTER NINE:

EFFICACY

Introduction

Chapter Nine is the final chapter to deal with the findings in this thesis. The previous chapters were organised according to the overall aims and objectives of the research. For example, Chapters Six and Seven presented data in relation to how SNAC members used the website to determine whether or not a sense of community emerged between members. Chapter Eight focused on any changes in the attitudes and knowledge of child care workers in relation to nutrition and healthy eating that may have been attributable to their participation on SNAC. This chapter examines the efficacy concepts that may have influenced the capacity of child care staff to provide a healthy eating environment.

The chapter is framed by the three efficacy concepts – self, outcome and collective efficacy, developed by Albert Bandura in 1977. These three concepts form the basis of Social Cognitive Theory, which provides an explanation of behaviour change by examining the relationship between an individual and their environment (McAlister et al., 2008), but also recognises knowledge is a precursor to behaviour change, enabling individuals to perceive the effect their lifestyle has on their personal health (Bandura, 1998). For example, when an individual belongs to certain groups, their membership in the group can influence their own sense of identity, the way they define and perceive their role in the group and the nature of social support they receive from the group (Glanz & Rimer, 2005). Therefore, self-efficacy, outcome-efficacy and collective-efficacy concepts are explored in the following sections of this chapter, through the analysis and discussion of qualitative data from the community forums, the exit

interviews and observations, triangulated with data from the pre- and post-intervention survey. Pseudonyms have been used to protect participant confidentiality.

Self-Efficacy

Self-efficacy is a concept that describes the level of confidence held by an individual to perform a particular behaviour (Bandura, 1986). In terms of nutrition behaviour, those who have a greater sense of self-efficacy have also been reported as being more likely to make healthier food choices (Anderson, Winett, & Wojcik, 2007). Some SNAC members reported high levels of self-efficacy, although their reported and observed behaviours did not necessarily support the premise that they had adequate levels of nutrition knowledge to appropriately implement healthy eating environments. It is well documented that whilst perceived self-efficacy is an important factor in human health behaviours, it can occur independently of basic skills (Bandura, 1986). Conversely, it is also reported that high levels of knowledge do not always correlate with having sufficient confidence to overcome barriers to healthy diet provision (Worsley, 2002), and these two important concepts are discussed in the following paragraphs.

In this thesis, survey data indicated that for some of the self-efficacy questions, the proportion of respondents who either 'Agreed' or 'Strongly Agreed', increased during the SNAC intervention (Table 9.1). For example, Question 49 –*how confident are you that you have received adequate training to be able to teach healthy eating to children?* – the proportion of respondents (n=189) who 'Agreed' or 'Strongly Agreed' increased significantly post-intervention (pre 82.6%, post 93.8%, $p=0.004$, Table 9.1). Similarly, those responding favourably to Question 51 – *how confident are you that you have the skills to teach healthy eating concepts effectively*? – also increased significantly post-intervention (pre 88%, post 92%, $p=0.043$, Table 9.1).

Table 9.1 Self-, collective- and outcome-efficacy results

Q	CONSTRUCT	PRE (n=189)[a]		POST (n=189)[a]		
	SELF EFFICACY	D	A	D	A	*P*-Value
49	Adequate training to be able to teach HE[b] to children	17.4	82.6	6.2	93.8	0.004
50	Understand HE concepts well enough to teach them to children	10.3	89.7	6.8	93.2	0.290
51	Skills to teach HE concepts to children effectively	12	88	8	92	0.043
52	Ability to answer children's questions relating to HE effectively	7.6	92.4	5.1	94.9	0.407
53	Ability to answer parents questions relating to HE effectively	9.2	90.8	9.1	90.9	0.338
54	Knowledge of ADG[c]	24.5	75.5	19.4	80.6	0.006

55	Knowledge of core food groups	15.7	84.3	8.6	91.4	0.005
56	Knowledge of balanced diet and ability to teach to children	11.4	88.6	8.6	91.4	0.265
57	Knowledge of key nutrients per ADG	25	75	19.4	80.6	0.033
	COLLECTIVE EFFICACY					
58	Adequate training to be able to teach HE to children	34.7	65.3	16.5	83.5	<0.001
59	Understand HE concepts well enough to teach them to children	26.6	73.4	17.2	82.8	0.005
60	Skills to teach HE concepts to children effectively	26.6	73.4	19.4	80.6	0.004
61	Ability to answer children's questions relating to HE effectively	22.3	77.7	17.2	82.8	0.053
62	Ability to answer parents questions relating to HE effectively	25.6	74.4	19.4	80.6	0.072

63	Knowledge of ADG	38	72	29.7	70.3	0.004
64	Knowledge of core food groups	31	69	15.5	84.5	0.021
65	Knowledge of balanced diet and ability to teach to children	26.6	73.4	13.2	86.8	0.038
66	Knowledge of key nutrients per ADG	36.6	61.4	29.7	70.3	0.033
	OUTCOME EFFICACY					
67	Self-confidence to interest children in eating healthily	11.4	88.6	8.6	91.4	0.057
68	Colleague confidence to interest children in eating healthily	20.6	79.4	15.5	84.5	0.192
69	Self-confidence to do a good job teaching HE concepts	13.1	86.9	8.6	91.4	0.044
70	Colleague confidence to do a good job teaching HE concepts	18.5	81.5	13.2	86.8	0.047

^a Disagree and strongly disagree added together to form one % score (D), agree and strongly agree results added together to form one % score (A) and compared within subjects using a Wilcoxon signed-rank test

^b Healthy eating

^c Australian Dietary Guidelines

*shaded rows indicate statistically significant results

Post-intervention there was an increase in the proportion of respondents who answered the self-efficacy questions positively, an encouraging result that could be attributed to their engagement with SNAC. However, these results should be viewed with caution given it is not possible to accurately measure the *level* of engagement with SNAC for several reasons. Firstly, measuring the level of engagement was not included as a feature of the web analytics, but was a subjective process applied by the researcher to interviewees and SNAC members who posted content on the forums. Secondly, survey respondents were de-identified, therefore it was not possible to link their level of engagement (even if available objectively) to their survey responses. In any case, it was difficult to assess an individual member's level of engagement subjectively, as this was masked by the tendency of some directors to create a single member profile shared by all staff members at the centre.

So whilst these survey results are encouraging, they also raise concerns that are addressed in the following sections. For questions 49 and 51 discussed above, the reported high levels of confidence raised the issue of firstly, where the training (*to be able to teach healthy eating to children*) was obtained, and secondly, how the skills (*to teach healthy eating concepts effectively*) were acquired. These questions are posed as qualitative findings from Stage 1 revealed that mandatory qualifications included little nutrition training, and that ongoing opportunities for nutrition training were limited. This was confirmed by a director in WA who had been unsuccessful in seeking nutrition training for her food coordinator:

> It's really hard to find where to send them nowadays for that [food coordinator nutrition training] because when I did it, it was the whole Start Right-Eat Right, years ago you know, and I've had to teach her about the

amount of food that you're supposed to be giving children and all this sort of thing (Paula, ✐).

In light of this lack of available training, when asked if the food coordinator might be less knowledgeable or confident about nutrition issues than the director, Paula replied: "most definitely".

In this example, Paula is lamenting the lack of nutrition training available in Western Australia (WA) and the subsequent impact on herself and the food coordinator, clearly demonstrating a clear need for child care specific nutrition training (especially in WA). Whilst menu planning training has been available in WA in recent years, there is little, if any, nutrition training currently available for child care staff. This is in contrast to other states such as Victoria and South Australia, where Nutrition Australia currently offers regular nutrition education and menu planning workshops specifically designed for child care. Although SNAC is an important tool readily accessible to child care staff, it is important to remember that the aim of SNAC was not to offer training per se, but to offer 'information wrapped in support', and that it was intended to add value to, rather than replace, the NQS mandated training child care staff are required to complete.

In addition to querying from where the skills to teach children about nutrition were obtained, the questions on the pre- and post-intervention survey attaining to the lowest proportion of 'Agree' or 'Strongly Agree' responses, were to respondent's knowledge of the Australian Dietary Guidelines (Table 9.1, Questions 54, 64 and 66). This raised further concerns about the quality of the nutrition concepts being taught to children at child care.

The positive responses to all three questions significantly increased post-intervention (Table 9.1), suggesting participant engagement with SNAC had increased confidence in their knowledge of these nutrition concepts, an important finding as only 10% of Stage 1 participants reported utilising the Australian Dietary Guidelines. However, as participants reported feeling less confident in their knowledge about the Australian Dietary Guidelines, core food groups and key nutrients than in other efficacy areas, the accuracy of the healthy eating concepts being taught to children attending child care remains uncertain and thus results need to be interpreted carefully. For example, post-intervention almost 30% of participants (n=56) still 'Disagreed' or 'Strongly Disagreed' with Question 66 - *I am confident that I understand the key nutrients for each food group as detailed in the Australian Dietary Guidelines*. These results suggest that further interpretation is necessary, and have generated some significant questions. If 30% of staff are teaching children about key nutrients but are not confident in their knowledge of the subject matter, how accurate is the content they are teaching to the children? Or do 30% of staff simply avoid teaching children about key nutrients because of their lack of confidence in their nutrition knowledge? Either way the implications are important, as children are potentially being taught incorrect nutrition information or none at all.

Although knowledge, as discussed above, is only one of many factors that can influence self-efficacy, social conditioning and environmental factors (Contento, 2008) may also be especially relevant to the child care setting. Social conditioning factors could explain the entrenched food habits of some child care staff, who resort to the usual 'go-to' food choices, often discretionary foods, because they lack the confidence and/or knowledge to challenge the 'status quo'. Influential environmental factors are numerous and include children's preferences, parental influence and organisational issues such as

policies, food budgets and access to resources. One study, for example, that examined the knowledge and self-efficacy of trainee teachers to teach reading found that contextual factors such as available resources contributed to high self-efficacy beliefs (Leader-Janssen & Rankin-Erickson, 2013). Therefore, the availability and accessibility of the SNAC resources may have influenced the reported high self-efficacy scores from SNAC members.

Despite these concerns, which warned against over optimistic interpretations of the survey data, during the course of exit interviews, some regular SNAC members reported feeling confident in their work, and felt comfortable discussing healthy eating concepts with parents, other staff and the children in their care. When asked if she was confident enough about her own nutrition knowledge to teach children basic nutrition concepts, a director replied:

> Too right! Over the years my determination to teach the children about the importance of good nutrition has paid off. The children now inform their parents about what food they should be eating; so consequently if the children arrive eating breakfast on-the-go, it is usually a piece of fruit they are munching on. Children who were told by their parents 'never drink water', now only drink water or milk 'because it is 'healfy' [sic] (Layla, ✐).

It was reassuring that some SNAC members displayed high self-efficacy as research has indicated this is associated with healthy dietary patterns. For example, a US study revealed female participants were significantly more likely to consume fruits and vegetables when they were efficacious at reading nutrition information labels (Robles, Smith, Ponce, Piron, & Kuo, 2014). Another US study mirrored these results following an online intervention designed to increase dairy intake amongst college students (Poddar, Hosig, Anderson, Nickols-Richardson, & Duncan, 2010). So given that SNAC is also an online intervention, the members displaying high self-efficacy could be

expected to demonstrate behaviours conducive to providing a healthy eating environment. Furthermore, in a study of parents of primary school children, higher levels of self-efficacy were also associated with increased parental age and levels of education (Hart, Herriot, Bishop, & Truby, 2003). These traits are comparable to the SNAC cohort as older, more senior staff have higher levels of education. However, whilst high levels of self-efficacy have been associated with improved dietary habits by some, Hart et al., (2003) also reported that high self-efficacy did not necessarily correlate with actual knowledge, as parents often relied on inappropriate or out dated advice. This is similar to findings of this study reported in Chapters 4 and 8, where participants reported unfamiliarity and limited use of the recommended nutritional resources. So, on the one hand, confident child care staff could practice better dietary habits, which should, in theory, reflect in the quality of the menus and their positive role modelling at their centre, but conversely, confidence does not necessarily correlate with actual knowledge if inappropriate or obsolete information is accessed.

In contrast to the survey data and the positive example of Layla discussed above, there were active SNAC members who were early adopters and well known to the researcher, who displayed low self-efficacy. The following example demonstrates how adequate levels of knowledge underpin self-efficacy concepts in health behaviours, and how high levels of self-efficacy are required to facilitate the use of this knowledge on a regular basis (Bandura, 1998).

Tabitha, the director of a long day care centre in Perth, WA, indicated her low self-efficacy by expressing how difficult she found menu planning, avoiding discretionary foods on the menu plans and catering for children with allergies, acknowledging her nutrition knowledge was poor. Knowledge of the foods to include and restrict in the diet for good health is a component of food literacy that many individuals lack (Vidgen

& Gallegos, 2014), and in the case of Tabitha, could explain why discretionary foods were served at her centre on a regular basis. At this juncture, it is important to remember that knowledge is a precursor to behaviour change, which enables individuals to understand how their lifestyle affects their personal health (Bandura, 1998), and in this case, the health of the children attending the centre.

One of the precursors Tabitha already held was sufficient knowledge about the *importance* of providing a healthy eating environment to the children in her care. However, the second precursor required to provide this environment was an *adequate level of nutrition knowledge*, which Tabitha did not demonstrate despite her engagement with SNAC and the support offered therein. Thirdly, it was more important that she believed in her ability to make changes to a behaviour (or environment), than merely understanding it needed to change.

Indeed, Tabitha clearly understood the need for the environment to change and displayed high outcome-efficacy by stating she believed healthy eating was important in the child care setting, demonstrating this through her regular engagement with SNAC. However, despite this high outcome-efficacy, her self-proclaimed low levels of nutrition knowledge, combined with low self-efficacy, resulted in an unsuccessful attempt to effect changes to the menu plan at her centre. Tabitha demonstrated her lack of confidence by passing the responsibility for menu planning to the food coordinator, who also lacked nutrition knowledge and menu planning skills. Subsequently, this resulted in a poor quality menu plan that contained numerous discretionary foods continuing to be offered at the centre.

In summary, although self-reported self-efficacy is high, this finding should not be interpreted in isolation from other data, as interviews, forum posts and observations

revealed examples of both high and low levels of self-efficacy. Knowledge is an important pre-cursor to self-efficacy, but it appeared that some SNAC members, whilst reporting high self-efficacy, did not demonstrate the levels of nutrition knowledge required to support this confidence. However, these high self-efficacy results could be indicative of future change and putting this new found confidence into action (i.e., translation into actual behaviour change) could take longer, as it is well documented that effecting behaviour change takes time (Allen, 2010). SNAC can play a critical role in the up skilling of the child care industry by continuing to coach its members to increase their confidence through support, but also to increase their nutrition knowledge by sharing resources and having access to accurate and current information.

Outcome-Efficacy

When making a decision about whether to engage or continue with a behaviour, individuals also consider the personal value of the outcome, which can be a motivating factor (Young & Kline, 1996). In the case of SNAC, the outcome was providing a healthy eating environment at the centre, which could result in children developing their own lifelong healthy food habits, reducing their risk of chronic disease and improving their long-term health prospects.

The overwhelming response from participants throughout both stages of the study was that providing a healthy eating environment was very important to them, thus demonstrating high outcome-efficacy. This positivity could be attributed to social desirability, that is, "the desire to present oneself in a socially desirable way" (Fisher & Katz, 2000, p. 107). However, the prevalence of childhood overweight and obesity in relation to child health are very topical and media coverage is abundant, and it appeared that the desire to overcome this public health problem was genuine. In fact, it is

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reported elsewhere that child care staff believed helping children to develop healthy eating behaviours was one of their most important responsibilities (Booth, Booth, Wilkenfeld, Pagnini, & King, 2007).

Supporting these positive attitudes towards providing a healthy eating environment, the majority of participants who completed the pre and post-intervention survey answered the outcome-efficacy questions positively (Table 9.1). There was a significant increase in the proportion of respondents who 'Agreed' or 'Strongly Agreed' with Question 69 '*self-confidence to do a good job teaching healthy eating concepts*', as the proportion increased from 86.9% (n=164) pre-intervention to 91.4% (n=172) post-intervention (p=0.044) (Table 9.1).

However, SNAC members' interpretations of what represents a healthy eating environment (i.e., their nutrition knowledge), could be questioned, based on the evidence presented in this and previous chapters about the provision of appropriate food, adequate menu planning skills, and the quality of planned learning experiences. So whilst high self-efficacy and high outcome-efficacy, reported as the "ideal environment for active performance" (Young & Kline, 1996, p. 1), have been reported by SNAC members, they may still lack the appropriate skills (or knowledge) to translate and provide a truly authentic healthy eating environment. Furthermore, it may be that inactive SNAC members had low self-efficacy and low outcome-efficacy, resulting in their non-participation. Recall from Chapter 6 my reflections of the disappointing response of some child care staff to the SNAC recruitment and engagement presentations:

> *At one centre, the staff did little to hide their disinterest, did not engage with*
> *me at all, and it was left to the director to ask questions at the end of the*

presentation. At another, a staff member fell asleep during my presentation,
another came in late, others checked their telephones, openly yawned and
so on, and again it is the director who is the most interested and engaged
with the presentation, perhaps because she has arranged it.

Given many child care staff work in the industry for altruistic reasons (Thorpe, Ailwood, Brownlee, & Boyd, 2011), it seemed reasonable to expect staff to have an interest in the study and in the resources that SNAC provided. However, the relatively low rates of pay and long hours of work (Wagner et al., 2012) may have acted as a disincentive for some to do more in addition to their normal workload, as they believed it would do little to enhance their pay or status (O'Connor et al., 2014). Furthermore, healthy eating may simply not have been of interest to them personally, it may not be a priority for the director, or they may have already received a satisfactory rating under the NQS, thus believe there is no need to change their current practices.

From an altruistic stance, and assuming individual child care workers have an interest in supporting a healthy eating environment, when they decide to engage with a supporting behaviour (such as role modelling healthy eating behaviours) they will consider the personal value of the outcome (Young & Kline, 1996). This can be a motivating factor, as can the confidence of child care staff to perform this desired behaviour. Therefore, if staff believe they can be an effective role model, they have high self-efficacy. Moreover, if they believe children will develop healthy eating habits as a result of their positive role modelling, and this is a desirable outcome for them, they also have high outcome-efficacy.

Conversely, if an individual child care worker has little interest in food and nutrition or supporting a healthy eating environment and insufficient training to believe that they

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could be an effective role model, they would have low self-efficacy. Furthermore, if the outcome was perceived as undesirable, i.e., an increased workload with little impact on their pay or status, this combination of low-self-efficacy and low-outcome efficacy could result in junior staff lacking the confidence to perform the behaviours conducive to a healthy eating environment. As previously mentioned, this highlights the need for effective nutrition training and mentoring to ensure that future generations of child care staff are well-equipped and motivated to provide and promote a healthy eating environment to the children in their care.

Collective-Efficacy

Given that many desired outcomes can only be achieved when individuals 'act' together (McAlister et al., 2008), it was also important to consider confidence in a collective sense. In the case of SNAC members, this related to confidence in their fellow child care staff to 'help' provide a healthy eating environment. This 'collective-efficacy'; a concept also coined by Bandura, was evident among some SNAC members. For example, at a long day care centre in rural WA, the director and food coordinator clearly worked very closely together to provide a healthy eating environment, and demonstrated a mutual respect for the each other's efforts:

> I have the utmost confidence in Sasha, she's been here a long time, a lot longer than I have and I don't have anything to do with the food, food preparation….so I leave that up to Sasha to organise (Charlotte, ✐).

However, others were less positive and noted a lack of involvement from other staff at their service:

Sadly, from what I have experienced, it seems most educators expect me to do all the research and then present it to the team. This applies to all topics, not just nutrition (Layla, Director, ✎).

This lack of confidence in their colleagues' abilities is also demonstrated by the director of a long day care centre, who was not a SNAC member. In an acrimonious post using an open Facebook group page, Hazel berated the food coordinator at her centre as 'lazy', indicating that she was either unwilling or unable to make the required menu revisions. In protest, Hazel posted a two-week menu she had developed herself (based on another centre's menu plan) and attempted to seek approvals and feedback from her peers and colleagues. Although Hazel clearly had little confidence in the food coordinators abilities, she was confident enough in her own abilities to both post the menu in a public forum, and publically criticise the food coordinator for failing to make the required revisions. However, perhaps not surprisingly, the menu Hazel posted was of poor quality and demonstrated a lack of basic nutrition knowledge and menu planning skills. Although the food coordinator stands accused in this example and her voice cannot be heard, it may still indicate a lack of support available for enthusiastic workers seeking to make a difference even when those who are supposed to care, apparently do not.

However, providing a healthy eating environment must extend beyond the child care setting itself, and should be considered the joint responsibility of parents and child care staff (Briley et al., 1999; Moore et al., 2005). The old African proverb 'it takes a village to raise a child' is particularly relevant in this sense, however, Stage 1 findings indicated there was little parental response to requests for feedback about menus and policies, and findings from the Stage 2 exit interviews indicated a similar lack of interest:

I put it on our Facebook page and hoped that we would get some parents sort of participate in it [feedback on the new menu], but I know from experience unless you are going to offer parents something at the end of it they won't participate….it can't just be a $5 scratchie, its gotta be….something quite significant to get them to participate in it (Katie, Director, ✐).

Hence, the confidence that child care workers express about the abilities of parents and the broader community to support the provision of a healthy eating environment was also important in this study. Canadian child care staff articulated their reservations about perceived parental influence on children's dietary habits, believing that, as parents allowed their children to eat unhealthily at home, it was impossible to promote healthy eating behaviours at the centre (Lynch & Batal, 2012). This is echoed by SNAC members reporting similar examples of low collective-efficacy in terms of collaborating with families and parents. The owner/director of a long day care centre in Perth stated:

What is the point of a child care service totally banning these types of food [discretionary foods], when we all know they go straight to Maccas and the like on their way home, have sweet juices, lollies, chips and other foods across the weekend (Katie, Director, 🖥).

While it may be disappointing that this active SNAC member is seemingly unaware of the need to uphold the no tolerance policy to discretionary foods in the child care setting, the issue highlighted here is that their (the child care centre's) efforts to 'do good' in the child care setting are thwarted by the lack of confidence that these good intentions will continue after parents have collected their children. Hence, this demonstrated low collective-efficacy may result in child care staff relaxing their otherwise positive healthy eating practices given that they perceive the collective effort to be undermined by parents.

Despite this, SNAC plays an important role as it continues to offer support and information to child care staff in the face of a lack of perceived interest from parents. Moreover, it provides child care staff the opportunity to gain new knowledge and ideas, support from their peers and guidance from experienced nutritionists, and others have suggested that this combination of resources and support should contribute towards improving their caregiving skills and subsequently increase professional confidence (Weigel et al., 2012).

However, despite these examples of negative staff attitudes, there were also positive reports of centres and families working together collectively. When asked if it was a struggle to get parents involved with health promoting practices, the director of a long day care centre in NSW, replied:

> Not here! No! It's been really, really good – under the assessment and ratings we actually got 'exceeding' with communities and families so our families do get really involved (Ingrid, ✐).

While it is unclear how the families in this centre were involved, there is an obvious upbeat and positive tone in the comment made by Ingrid. It may be that there are socio-economic differences between centres that underpin how and to what extent parents get involved and/or feel able to get involved. Moreover, the leadership style of the director is emerging as an important factor in increasing the quality of child care, and whether the director adopts an autocratic or democratic leadership style (Davis, 2012) could influence the extent to which parents feel able to be involved with the centre. Hence, although Katie's comments earlier indicated a complete lack of confidence in parents' abilities to provide the healthy eating context required after the children leave the centre, there may be broader determinants at play. While socio-economic profiling of parents and/or centres, or determining the leadership styles of directors was beyond the

scope of this study, the differences in attitudes and confidence expressed by child care workers about parents' warrants further investigation. It may be that lower socio-economic centres require different strategies to strengthen staff-parent relationships, or that directors need to reflect on their leadership style, to effect enhanced collective efficacy. In fact, SNAC now has the potential to support this effort, having recently been funded by a Healthway Grant to extend the services to be provided to parents and provide a channel of communication between them and the child care staff. The available resources for child care staff will embed a food and nutrition curriculum across a range of learning areas that map to the Early Years Learning Framework and provide integrated activities for parents so learning can extend from the centre to the home environment.

For some SNAC members, efforts to uphold the importance of providing a healthy eating environment appears to be paramount, perhaps even viewed as a part of their corporate culture. For example, the compliance officer for seven long day care centres in Perth stated:

> My staff are so passionate about encouraging healthy eating that this is a continuous part of our curriculum (Peta, 🖥).

While this may be more reflective of the role a compliance officer *should* play or what she might be expected to say – and therefore may be overstated – it may also demonstrate a feeling that precedes or underpins a strong sense of collective efficacy in the child care industry. That is, a sense of pride and passion for their industry and the important role they play may be needed before workers believe that their efforts are worthwhile, even if parents do drive through 'Macca's' after collecting their children from child care.

It may be that some dedicated child care leaders recognise a weakness in the perceptions of the child care industry. A long day care centre in WA secured independent funding and collaborated with other centres to present two mini-conferences for child care staff in 2014. Although this had a broader child care focus rather than being specifically oriented towards health promotion or nutrition, I was invited to present information about SNAC at one of the conferences. Narelle explained why she felt this was so important:

> At the end of the day we need to increase the image of our industry …. yet we don't do anything to help ourselves, trying to get people to attend PD [professional development] is like pulling teeth ….yet any other industry they just do it because it's just that culture whereas early childhood is totally different – 'I don't want to do anything on my own time!' (Narelle, ✎).

It is conceivable that the need to enhance the image and identity of the industry might precede a strong sense of collective-efficacy. For this thesis, however, it may also precede or be preceded by a sense of community. In the comment below, Narelle specifically mentions the sense of community that is lacking in the industry. She described the purpose of the mini conferences as:

> Growing a community of leaders in early childhood education and care, so it's a forum for the community to get together to discuss and just meet with each other, we don't have that sense of community between centres, and I think it's really, it's important and it's vital (Narelle, ✎).

The fact that Narelle refers to the missing community is central to the very aim of SNAC. In this case, if SNAC can continue to grow the sense of community reported in Chapter 7, it may also provide the mechanism to enhance collective-efficacy over a longer term.

A further example demonstrates a lack of collective-efficacy within the industry. The director of a kindergarten in rural Victoria expressed her frustration at the nutrition practices adopted by the (only other) long day care centre in their small country town:

> Well the trouble is they [the children] go to child care and they're allowed to take anything they like and they do, including cordial….and it annoys the heck out of me that they also claim to be healthy and are in the same health promoting program that I'm in….the messages that I am giving parents are being undermined by the quite clear basic advice that [this] child care provides to the parents not to worry….so it's really hard for the parents, they're getting very mixed messages (Libby, ✎).

Although Libby was frustrated that the other child care centre was contributing to these mixed messages about healthy eating, it did not diminish her own confidence and intention to continue promoting a healthy eating environment at her centre. Both Libby and Narelle demonstrated high levels of self-efficacy in their determination to promote healthy eating in the child care setting, thus contributing to a sense of collective-efficacy, vital for successful outcomes, whether achieved individually or by individuals working collectively (Bandura, 1998).

The pre and post-intervention survey data also demonstrated that individuals' beliefs in their colleagues' abilities around healthy eating, were less positive than the self-efficacy or outcome-efficacy constructs. However, positive responses to the collective-efficacy questions significantly increased post-intervention, with the exception of Question 63 *'I am confident in my colleagues' ability to answer parents' questions relating to healthy eating effectively'*. Although not a significant difference, the negative responses ('Disagree' and 'Strongly Disagree') to this question decreased from 25.6% (n=48) pre-intervention to 19.4% (n=36) post-intervention.

Although the majority of respondents answered the efficacy questions positively, it was interesting that their perceptions of their colleague's confidence to perform these tasks were less positive than their own reported self-confidence (Table 9.1). The majority of SNAC members, survey respondents and interviewees were directors, who were on average older, with higher levels of education, so it could be surmised that they were responding to these questions with junior, younger, less educated and experienced colleagues in mind. As suggested by Bandura (2000), when considering the collective-efficacy of a team, these directors may have considered the range of experience of their team including how well their junior staff performed their duties, which may reflect the lower survey responses. Given approximately 10% of directors involved with SNAC were older than 56 years, and likely to retire in the next ten years, this is an important finding that informs future personnel planning and centre succession planning. It is, therefore, vital that junior staff receive adequate nutrition training and mentoring to enable them, as the next generation of child care directors, to promote important healthy eating messages in the child care industry.

Summary

High self-reported self-efficacy was reported by SNAC members, and although this was not necessarily underpinned by adequate levels of nutrition knowledge, this newly established confidence could be indicative of future change.

Outcome-efficacy was also high, as expressed by SNAC members' beliefs that providing a healthy eating environment was a key part of their role as child care staff. However, it is important to mentor younger generations of staff to ensure that they are motivated to grow a holistic and 'whole of centre' culture of healthy eating.

Positive and negative accounts of collective-efficacy were reported, both within and between centres and the wider child care industry. Child care staff were concerned about the apparent lack of parental involvement towards providing a healthy eating environment, which highlighted the need for a whole of community approach to education and care, and in particular, to providing a healthy eating environment for children.

This is the last of the findings chapters, and the final chapter presents some concluding comments, researcher reflections, and the strengths and limitations of the study. Finally, recommendations for improving the provision of a healthy eating environment in this setting are discussed, together with suggestions to secure the long term availability and sustainability of the SNAC community.

CHAPTER TEN:

CONCLUDING COMMENTS AND REFLECTIONS

This study has identified child care settings as having potential to offer multiple opportunities to influence children's' food habits and preferences, and consequently optimise their growth, development and lifelong health, with child care staff in particular, playing an important and influential role. However, their ability to fulfil this important role was dependent on their attitudes and beliefs towards providing a healthy eating environment, the extent of their nutrition knowledge and their actual desire to do so. Their self-confidence and collective confidence (in their colleagues, parents of children at the centre and the wider child care community) to promote a healthy eating environment were also significant factors, as was the organisational context in which they worked, particularly because of the current National Quality Framework legislation (ACECQA, 2012).

Considering these multiple levels of influence on child care staff and their work environment, the multi-faceted approach adopted for this study was a web-based, food and nutrition focused initiative offering resources, information and support, which was designed, implemented and evaluated using a qualitative, netnographic approach, with quantitative techniques utilised to triangulate and strengthen the results. In view of the interpretivist epistemological lens adopted for this study, the ideal of a single truth or reality was rejected. Reality was a concept considered subjective due to the active involvement of the researcher, and socially constructed by presenting participants viewpoints of their own realities. A qualitative approach was therefore appropriate, as it allowed the participants and researcher to express authentic social realities.

Given the multi-faceted approach adopted for this study, the Spiral Technology Action Research (STAR) model (H. Skinner et al., 2006) was considered an appropriate project management tool, guiding the development, implementation and evaluation of this intervention. This model incorporated elements of participatory action research, which allowed for the deep investigation demanded by the study and supported continuous collaboration between the researcher and participants. This in turn allowed glitches in website design and useability to be identified quickly, thus facilitating the production of user-friendly solutions appropriate to the child care environment. Furthermore, the STAR model supported the ecological model of health behaviour that formed the theoretical framework for this study by reinforcing the premise that behaviour both affects, and is affected by multiple levels of influence, and that behaviour shapes, and is shaped by the social environment (Sallis et al., 2008).

In light of the online nature of this study, the STAR project management tool was especially useful, as it was important to consider an iterative process to management intervention. Netnography was the natural choice, and in particular, an 'active' netnographic approach was adopted. That is, the website was constructed specifically for this project with recruitment and engagement strategies being implemented to attract members to the community forums, and I actively participated as a community member and researcher. This approach contrasts with 'passive' netnographic studies conducted by many online community researchers, in which observational analyses of forum content are performed, omitting any interaction with or stimulation of the online communities from the researchers (Kozinets, 2010).

Furthermore, this research incorporated an adaptation of a 'pure' netnographic approach, that is, a blend of netnography and ethnography, through the combination of

online and offline research techniques (Kozinets, 2010). It is noted that, as technologically mediated communications are being integrated into many parts of everyday life, the difference between offline and online communities is fast becoming obsolete (Garcia, Standlee, Bechkoff, & Cui, 2009). Garcia et al. (2009, p. 53) cited the need for researchers to "alter their research techniques to accommodate these social changes", thus supporting the increasing use of 'blended' netnographic methods in the research world (Kozinets, 2010), and in this study.

If a 'pure' netnographic approach had been adopted, and only online data were analysed, the many influences that affect the day to day operations of a child care centre, such as staff shortages and a lack of training, which can subsequently affect the development of a healthy eating environment, may not have been apparent. Much of the qualitative data was gathered online via the SNAC discussion boards, which were constructed as "verbally articulated behaviours" (Kozinets, 2010, p. 66). The interpretation of this online data was enriched through the physical observations made during site visits, which demonstrated the usefulness of the 'blended' netnographic approach in two ways. Firstly, this approach was adopted as a means of authenticating or testing the truthfulness of the stories SNAC members posted online, but was also, as Orgad (2009, p. 41) explained, based on "the perceived need to add context, to enhance information, and to yield insights into aspects that would otherwise remain invisible, but that maybe consequential to the research". For example, the site visits revealed vast differences in kitchen facilities centre to centre, from those that were well-equipped, modern and purpose built, to others converted from a domestic setting, which were small, cramped and ill-equipped. These physical differences in facilities would not have been revealed in an online environment, especially as food coordinators were

unrepresented in this study. Therefore, offline observations have captured and added an important contextual aspect to these findings.

Further to the explanation of the methodology underpinning this study, the following sections in this chapter critically address and reflect on the key discussion points identified but not discussed in previous chapters, as these are emerging issues separate to the research questions posed in Chapter One. SNAC members' nutrition knowledge, attitudes and confidence are examined further through the presentation of an 'exemplar', and my reflections on a site visit, which led to the theory that SNAC was being used as a 'tick box, and questioning the robustness of the NQS assessment process. Two issues concerning sense of community are also discussed, namely that of critical mass and the question of whether sense of community on SNAC was emerging or contrived.

Recommendations for future programs and policy changes that support change within the industry, and ensure the longer term sustainability of this project, are interwoven throughout the following sections. Finally, the strengths and limitations of this study are presented together with a summary of this chapter.

Influence of SNAC on Nutrition Knowledge, Attitudes and Confidence

This first section presents a discussion about the extent to which SNAC influenced the nutrition knowledge, attitudes and confidence of child care staff to promote a healthy eating environment. A summary of evidence is presented, which is followed by a case study, outlining issues such as the importance of a sound underlying (nutrition) knowledge base as a precursor to both increasing self-efficacy and bringing about changes in behaviour (or the environment). This section also presents my reflections about the use of SNAC, by some members at least, as a 'tick box', and on the NQS assessment process specific to food, nutrition and the provision of a healthy eating

environment. As in the preceding chapters, the confidentiality of participants and their place of work has been protected by the use of pseudonyms.

Summary of evidence

As reported in previous chapters, participants reported positive attitudes towards the importance of providing a healthy eating environment to the children in their care. High self-efficacy and outcome-efficacy was also reported, although participants were less confident in their colleagues' ability to provide a healthy eating environment. SNAC members also reported that they found the SNAC website useful, and used it in conjunction with other resources to supplement their mandatory training and support the healthy eating practices at their centre.

Nutritional knowledge was assessed against the Australian Dietary Guidelines (NHMRC, 2013) via materials accessed by the researcher, such as menu plans or recipes, discussions about healthy eating posted on SNAC, and examples of planned learning experiences involving food or cooking posted on public forums such as Facebook. The extent of the demonstrated nutrition knowledge varied widely, not only between SNAC members and non-members, but also within the 'active' SNAC member group. This demonstrated the importance of personal beliefs, entrenched personal and organisational habits and ambiguous national legislation, all of which influenced the quality of the healthy eating environment offered at child care centres.

Moreover, for some non-participating staff, their reasons for not engaging with SNAC, and therefore not benefitting from exposure to the 'information wrapped in support', could be explained by their level of seniority and their working conditions. An influential factor was that child care staff were asked to engage with an intervention designed to assist them provide a healthy eating environment for the children in their

care, rather than one which focused on their own health. Relatively low rates of pay and long hours of work (Wagner et al., 2012) may have acted as a disincentive for some to do more in addition to their normal workload, as they did not believe their pay or status would be enhanced. However, many child care staff work in the industry for altruistic reasons (Thorpe et al., 2011), and it seemed reasonable to expect an interest in the long term health of the children they cared for, as demonstrated by many SNAC members. On the contrary, even active and committed SNAC members demonstrated nutrition behaviours that did not support the provision of a healthy eating environment at their centre, reflecting a disparity between their positive attitudes towards healthy eating and high self-efficacy, and their observed nutritional knowledge. The following case study provides a scenario that highlights this apparent disparity.

Exemplar

Katie was an SNAC member with a long-standing interest in healthy eating at child care, being involved with the original Start Right-Eat Right project in the late 1990's, and the Nourish cookbook project in 2011/12. Katie has over 25 years' experience in the child care industry and is the owner/director of a long day care centre operating in a low SES suburb in the Perth Metropolitan area.

Katie and the staff at her centre were involved in Stage 1 of the project, providing interviews and testing the new website. Once the website was operational, Katie was an early member and always responded to posts, competitions and other activities. She actively encouraged her staff to register for and use the site as well. I had been a regular visitor at the centre, providing presentations, appearing in a community newspaper article about healthy eating that featured the centre, attending a 'special morning tea', and also attending an annual celebration as a 'community partner'. However, presented

below is an excerpt from my journal written after attending this celebration, which illustrates my frustration at how SNAC's healthy eating practices were seemingly disregarded, also leading me to reflect on other practices at the centre I had witnessed during my visits:

Whilst at the centre for the celebration, I stuck my head around the corner to say hello to the girls in the kitchen. I must admit that I didn't like what I saw – the food coordinator sprinkling on the topping for fairy bread, red sausages and party pies, ham sandwiches, potato chips, red and blue cordial. There was a fruit and a salad platter as well but this was for the guests and didn't get offered to the children. Yes, I know it's a party, but does there have to be SO much discretionary food on offer??? I was shocked and amazed by the amount of poor food choices offered. Whilst not wanting to appear to be the food police, I would have liked to have seen a better balance – for every discretionary item, a healthy option could have been provided. I don't accept that it would have been too time consuming – there were three girls in the kitchen preparing this party food and they were flat out. It appears to me that this is a case of 'this is what we've always done' and little thought went into the foods on offer. I actually felt a little bit cross as I was driving home – here we are, almost 2 years after my first contact with Katie and the centre, her many and varied protestations about healthy eating and what a poor job the parents do and what a great job she does, and they invite me to a sometimes food fest! It slowly dawned on me that I (and SNAC) represented a 'tick box' for the centre – yes, they are engaging with a healthy eating intervention, yes they are engaging with others in wider community, but they are not actually putting the intended

habits/behaviours into practice at the centre and there is a big disconnect

between their own personal behaviours and what should be practiced.

On reflection, there are a number of other examples/instances that led me to

forming this theory. The monstrous bars of chocolate offered as raffle

prizes throughout the year (posted on FB), some of Katie's comments on

SNAC about 'sometimes' foods being fun foods, ridiculing the LiveLighter

healthy eating Christmas message, the staff meeting food (sausage rolls and

party pies), the raffle prizes, the food offered at the celebration. As a former

SRER centre I am a little surprised at the level to which discretionary foods

are offered.

Reflections

There are a number of points for reflection. Firstly, my role as a (public health) nutritionist, rather than that of an unbiased researcher, has clearly influenced my reaction to the food offered at DGK centre on this occasion. However, it is important to include my reactions as a finding, as it caused me to reflect on my other interactions with Katie and the staff at her centre. These reflections led me to the conclusion that, despite previous involvement in other health promotion initiatives, and Katie's extended involvement with SNAC, there remained a predilection to offer discretionary food items on a regular basis, possibly because of long standing personal beliefs and a tendency to rely on 'go-to' food choices.

Efficacy and change

As outlined in Chapter Nine, a combination of high self-efficacy and high outcome-efficacy are thought to provide the ideal environment for change (Young & Kline,

1996). Katie had previously articulated her positive attitude towards providing a healthy eating environment and appeared to be self-confident enough to do so, also believing the outcome to be worthwhile. However, the food provided at the celebration demonstrated a lack of nutrition knowledge and/or beliefs about the type of food that should be provided on these special occasions. Allen (2010) noted that providing [nutrition] information alone rarely results in behaviour change [offering healthy instead of discretionary food], and that attitudes towards the behaviour need to be considered. Although it was not intended to measure behaviour change in this study, it was expected that *intention to* change might have been visible. That Katie has continued with the same dietary choices at her centre demonstrates Allen's (2010) thoughts; that behaviour change is complex and takes time.

Katie was interviewed again by my colleague at a later date for a different study that is nested within the SNAC project, and again, the topic of discretionary foods being offered at child care was raised. Katie affirmed her belief that this practice is acceptable at child care, and that she was proud to offer discretionary foods on special occasions because it is something that only happens a few times a year at her centre.

There are several observations I have made that directly contradict Katie's statement. Firstly, discretionary food items appear frequently according to the menu published on the centre's website, which is supported by some of Katie's posts on SNAC, for example, "the children know they have to have fruit with their afternoon treat" (indicating that these 'treats' are offered daily), rather than the few times a year stated above. This could be interpreted as a lack of knowledge about what constitutes a discretionary food, but given Katie believes that 'sometimes' foods are *needed* for celebrations, reveals personal beliefs or entrenched behaviours that are not necessarily

conducive to a healthy eating environment. It could be useful at this juncture to reflect on certain elements of Fishbein and Ajzen's Theory of Reasoned Action (TRA) (2010) that states the behaviour of interest (in this case, healthy eating) be clearly identified. Given Katie's continued involvement with SNAC as a prolific member, it would be reasonable to surmise that she was aware of the ultimate study goal, i.e., providing a healthy eating environment. The TRA theory also highlighted the importance of considering the beliefs that individuals hold about these behaviours, and to consider if these could have been shaped by personal experiences, level of education or the way that they seek, obtain, interpret and remember information (Fishbein & Ajzen, 2010). It appears from this example that Katie fervently believed that discretionary foods were a necessary part of celebrations at the centre, and given there are many other similar examples from others noted during this study, highlights the need for ongoing education and policy change around this often contentious topic.

It was encouraging that during some of the discussions about the provision of discretionary foods at child care, there were staff who believed these foods should not be on the menu, or at least should be heavily restricted. SNAC has played an important role in bringing these 'sometimes' contentious issues to the surface and encouraging healthy debate. It could be surmised that these discussions at least encouraged members to reflect on their choices and challenged some long held beliefs, and knowing that behaviour change is complex, time consuming and often fails, it is important that SNAC continues in this vein.

On that note, it is encouraging to report that further funding has been secured via a starter grant from Healthway (the Western Australian Health Promotion Foundation), demonstrating the credibility of SNAC as a valuable resource for the child care

industry. This funding has facilitated the development of a 'snap-on' project, 'SNACPlus', in which nutrition specific curriculum resources to support nutrition education in children aged 3-4 years are being developed and piloted in Western Australian child care centres. These curriculum resources have been mapped to the Early Years Learning Framework and are based on resources developed by the RefreshED project (http://www.refreshedschools.health.wa.gov.au/), which aimed to support nutrition education in schools through the delivery of curriculum based materials, a joint project between Edith Cowan University and the WA Department of Health. Once testing is complete, these newly developed resources will then be made available to the wider SNAC population, thus increasing the value of the website to its members, and assuring further long term sustainability.

SNAC as a 'tick box'

However, as noted in my reflections, my disappointment about Katie's menu choices, together with my other observations, led me to theorise that, to some extent, SNAC was being used as a 'tick box' exercise to demonstrate (presumably for the purposes of future NQF assessments) that the centre is engaging with both a healthy eating initiative and a community partner, but without actually making any meaningful changes. This idea was reinforced by my reflections on the presentations given at centres as a recruitment/engagement strategy. Of the twenty SNAC presentations I delivered, all but one of the centres provided discretionary foods for the staff at these meetings. Staff often joked about this, for example: "at least there are vegetables on the pizza!" As a researcher, my role was to observe these behaviours in their natural setting, thus it was not within my remit to enter into any discussions about their choice of food. However, from a nutritionist's perspective, this demonstrated a lack of thought about the content of the presentation (i.e., nutrition and healthy eating) and reinforced my theory that

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SNAC was being used as a 'tick box' exercise, to demonstrate centres are a) providing professional development for their staff, and b) fulfilling the requirements for the National Quality Standard 6, Element 6.3.1, which states: "links with relevant community and support agencies are established and maintained" (ACECQA, 2013).

Given the reported success of the Start Right – Eat Right (SRER) accreditation scheme, this could be a suitable vehicle to repurpose nutrition standards at child care. Research has demonstrated that the SRER program was successful in improving the quality of nutrition policies (Matwiejczyk et al., 2007), the nutritional quality of menus (Tysoe & Wilson, 2010), resulted in higher frequencies of positive staff role modelling (Golley et al., 2012) and was effective in improving children's dietary intake, in particular grains, fruit, dairy and meat (L. Bell et al., 2015). Moreover, children who attended SRER centres were also more likely to have healthier diets at home (Tysoe & Wilson, 2010).

SRER could be reinvented in a modern setting, offering nutrition training to directors and food coordinators, and working with centres to produce high quality, nutritious menus that comply with the Australian Dietary Guidelines. However, the training and menu development could be facilitated via an online medium such as the SNAC website, minimising the need for site visits. An additional feature could be the introduction of nutrition education training for educators, around topics such as effective role modelling and offering planned learning experiences that focus on healthy eating activities for children. Furthermore, if such a program were housed on the SNAC website, the additional feature of the community forums would add a layer of support and further networking opportunities. The previous SRER accreditation scheme adopted a rigorous approach to the nutritional standards expected at their accredited

centres, and the 'repurposed' scheme would follow in a similar vein, thus providing a meaningful award and avoiding similar 'tick box' exercises.

NQS Assessment process

As detailed elsewhere in this thesis, under the auspices of the NQF, each service will undergo an assessment of their quality every three years. The NQF came into effect in 2012, and each state and territory has a regulatory body responsible for conducting these assessments. Evidence gathered across the course of the study has also highlighted concerns about the NQS assessment process in relation to the extent the centre is assessed under National Quality Standard 2.2.1, which states: "Healthy eating is promoted and food and drinks provided by the service are nutritious and appropriate for each child" (ACECQA, 2013). A number of SNAC members have shared their experiences of the NQS assessment process in relation to the provision of nutritious food and drinks, and the overarching theme to emerge was that assessors did not review the centre's menu plan to a depth that could provide a meaningful analysis. For instance, at a Perth long day care centre, the director reported that the assessors sighted the menu planning folder that contained the menu plan, the checklist used to develop this menu plan and a copy of the Australian Dietary Guidelines. Although the assessors saw these documents, they did not perform any further checks that could verify the quality of the menu plan in place. For example, they did not check if the menu plan was balanced, cross check it to the menu planning checklist, or assess if the quantity of food offered was sufficient to provide adequate nutrients across all five core food groups. Another Perth long day care centre, who had already been assessed under the NQS and received a rating of 'exceeding', published their menu on their website. This menu revealed discretionary food items being offered on a daily basis, and raised concerns

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about the iron sufficiency of the foods offered to babies, somewhat concerning given the centre had received an 'exceeding' rating.

Whilst it is apparent that other important aspects of providing a healthy eating environment are assessed, such as observing role modelling behaviours at mealtimes and questioning the food coordinator about food allergies, it appeared that an in depth assessment of menu plans is not within the remit of the regulatory body assessors. An informal telephone conversation with a senior assessor at the Education and Care Regulatory Authority in WA (the regulatory body responsible for NQS assessments in WA) revealed that menus are checked for balance, variety, freshness and that there is ample food provided, but that they do not refer to a menu planning checklist or any other tool. Although this is anecdotal evidence, it does raise concerns about how a meaningful menu check can be achieved in the limited time available to the assessors, especially without the use of an appropriate tool. Many SNAC members continue to find menu planning a difficult task, even with the support of a nutritionist and numerous resources, illustrated by the menu examples discussed in Chapter Eight, and it is well-documented that menu planning is considered a complex task (Romaine et al., 2007). Therefore, the evidence presented here raises the question of how effective the NQS assessment process is in ensuring the food and drinks served at child care are indeed sufficiently nutritious, varied or adequate, and are meeting the Australian Dietary Guideline recommendations.

Given the quality of the menus reviewed as part of the SNAC evaluation and the extent that discretionary foods appear to be offered on a daily basis, a more robust system is necessary to ensure child care menus meet the requirements of the Australian Dietary Guidelines. In the short term, this will ensure that children attending child care are able

to concentrate and be active learners (Parletta, 2014) and in the longer term will reduce the risk of chronic disease and contribute to the health of children in later life (Birch et al., 2007).

Whilst the guidelines for short term health measures such as food safety and hygiene, and other cleanliness issues, are rigorously imposed and legislated, it appears that the provision of healthy and nutritious food, a concept misinterpreted by many child care staff, is under regulated despite the potential impact on the long term health of children attending child care. Therefore, it is paramount that a more structured approach regarding the provision of nutritious food in the child care setting is implemented. As there are now more than 600,000 children attending child care centres (DSS, 2015), more rigorous approaches would play an important role in improving the current trends of child overweight and obesity in Australia, and by instilling good food habits and preferences in future generations.

Egger et al. (2013) proposed that the strongest health promotion strategies are those that target upstream, population-level policies and legislation, modify the environment and do not rely on individual behaviour change. With this in mind, a possible method of ensuring a healthy eating environment is provided consistently across the Australian child care spectrum is a standalone accreditation system, similar to the now defunct Start Right – Eat Right (SRER) program. This could be (re)introduced to replace the NQS guidelines under QA.2.2, as the Food Act (2008) and Food Regulations (2009) have done for food hygiene and food handling in many states, and which would reprioritise the significant issue of child nutrition from other guidelines.

However, it is acknowledged that driving policy and legislative change is often difficult to achieve and time consuming for health promotion practitioners (Egger et al., 2013).

Thus, if it is not possible to influence policy and/or legislation, a voluntary scheme could be introduced to repurpose nutrition standards at child care, as discussed earlier in this chapter.

Influence of SNAC on Sense of Community

Having reviewed the apparent disparities between high self-efficacy and attitudes towards providing a healthy eating environment, this section now addresses the final research question. That is, whether or not SNAC members believed the intervention promoted a sense of community within the child care setting, and if this was valued as an additional means of support. Issues of critical mass are presented first along with reflections of the efforts required to build and sustain the SNAC community. Finally some discussion is given around the authenticity of community and whether or not it was real or contrived.

Critical mass

It is widely accepted that achieving critical mass in an online community is essential for the sustained success of that community (Raban, Moldovan, & Jones, 2010). However, *how* critical mass is measured remains contentious, and there are differing opinions about how this concept can be operationalised (Raban et al., 2010; Solomon & Wash, 2014). Establishing whether critical mass has actually been achieved is often difficult, and many researchers have used their "*subjective perceptions* of critical mass as a construct for estimation" (W. Lim, 2014, p. 271). My reflections about the 'netnographic slog' (Wallace, Costello, et al., 2015) required to build a critical mass of members was also a subjective one, and one that could only be measured as a product of the blood, sweat and tears I invested on a daily basis:

Having been immersed in the SNAC community for almost 2 years now, and given the participatory nature of my membership as a moderator and administrator, it is imperative that my views on critical mass establishment are heard from an internal perspective. I propose that critical mass has been achieved to some extent, and that SNAC can be described as an 'emerging' community. Whilst there is a relatively healthy member base (>1200), and the website is being used by members to access resources and read comments, the majority of content is provided by me rather than other SNAC members. The term 'netnographic slog' (Wallace et al., 2015) seems wholly appropriate in terms of the amount of effort which has been exerted in cajoling, persuading, pleading and offering incentives to members to actively participate. During March to June 2014, I had a sense that the community was starting to 'buzz', although this activity still had to be stimulated through competitions and other incentives. However, as soon as I took my finger off the proverbial pulse – there were technical issues with the website in July, and I was on sick leave in August– the activity waned and despite my concerted efforts the level of activity achieved during this period (in terms of posting comments) has not been repeated. As I have been fully immersed in the community since inception, I cannot help but feel that this emerging sense of community is somewhat contrived, as the sheer effort to get members chatting and interacting has been so intense. However, whilst members are not active (at least to the degree I would like them to be!) I appreciate that they are still fulfilling their own important needs by being able to access the resources on SNAC. I certainly get a sense that SNAC is important to a number of members, as although not keen

to share their thoughts on SNAC, they are happy to contact me by telephone

or email if they need help. So the question remains, is SNAC still emerging,

is it stagnant or is it OK???

The subjectivity around critical mass is easily recognised in my comments above. For example, the 'buzz' I referred to seems to imply busy-ness in numbers, but it can also imply excitement or engagement, as suggested by Bateman et al. (2011). Moreover, my reflections demonstrate the laborious nature of building up a critical mass of members; indeed it might have been easy to surrender and admit defeat in this regard, by concluding that a critical mass was too difficult to achieve and ultimately unsustainable. However, it is important to remember SNAC's uniqueness, in that it is the only food and nutrition oriented online resource and community of practice specifically designed for the child care industry. It would therefore, be inequitable to measure SNAC's success alongside other sites such as HeartNET, Beyond Blue and BubHub, given they service lay populations affected by unique circumstances or interests rather than professional audiences (i.e., child care staff). With this in mind, the following sections discuss the various means of assessing critical mass and their applicability for a site like SNAC.

Oliver, Marwell and Teixiera (1985, p. 523), the social scientists who originally developed critical mass theory in the mid-eighties, described it as "the threshold of participants or actions that must be crossed before a social movement can come into being". Later, they (excluding Teixiera), noted that it is equally important to consider the complex contextual relationship between member participation and contribution (Oliver & Marwell, 2001). More recently, in their study of member contributions to Wikiprojects, Solomon and Wash (2014) queried what critical mass actually is, and

debated which components of online communities should be measured to establish if critical mass has been achieved. They described the components of online communities as *people* (members), *content* (for example, posts and comments), *activity* (for example, making posts and comments), and *participation* (in the community, by reading or posting), so a key question is therefore, which of these key elements should be measured, to determine the critical mass of communities and how should it be undertaken? Is there a desired combination of elements enabling the community to become critical or self-sustaining? Indeed, if critical mass were measured by the number of active members alone, there would be many online communities considered unsuccessful (van Varik & van Oostendorp, 2013). It has therefore, been suggested that the aims and objectives of the project should be at the forefront when deciding which elements best measure critical mass (Solomon & Wash, 2014). The key focus of this project was to influence the nutrition knowledge, attitudes towards and confidence to provide a healthy eating environment amongst child care staff, and to establish whether a community of practice could provide a means of support. So, although the number of members and their levels of activity were important factors to consider if critical mass had been achieved on SNAC, the fulfilment of child care staff needs by providing accurate and current nutrition resources (i.e., the content) was of utmost importance.

This concept is supported by Raban et al. (2010), who posit that the *quantity* of members alone is inefficient in both describing a community and predicting its sustainability. They maintain that measuring community cannot be a mere count of members, especially as member contributions may not be equal. This was evident within the SNAC membership, where only 1% of members were active (in terms of regularly posting comments). However, earlier measures of critical mass on computerised conferencing systems did rely on numbers alone (Hiltz & Turoff, 1985).

These authors maintained that groups of less than 8-12 active members would not be able to achieve critical mass and that members would stop using the group or migrate elsewhere. More recently though, Solomon and Wash (2014) posited applying a linear model to the complex relationships between member populations and member postings may not present a true picture of how interaction occurs within online communities.

In light of these contrasting opinions, albeit some 30 years apart and perhaps reflective of how online communities have evolved, it is critical to contemplate the patterns of activity on SNAC in terms of community success. It has been previously reported in this thesis (Chapter Six), that a few active SNAC members produced the majority of the comments and posts. However, the interaction between active members, inactive members and the researcher provided content that was accessed or *read* by the whole community. At this juncture, it is useful to consider the 'write-once read-many' (WORM) information technology concept, originally adapted for use in the online community setting by the Breast Cancer Click Research Team, and defined as:

> "WORM" storage technology permits data to be written only once on a particular location of a storage medium. The contents cannot be altered, but can be read as often as required. Because of these characteristics, WORM storage is very appropriate for archival purposes. (Lasher, Ives, & Jarvenpaa, 1991, p. 555).

This concept illustrates that although the majority of content was being provided by the minority of SNAC members, there was only a need for it (the content) to be 'written' once, as it could be 'read' by many. Indeed, web analytics revealed that the discussion boards were the second most frequently visited part of the SNAC website (Figure 6.12, Chapter Six), indicating that many members were reading the content therein, and

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SNAC members have also reported that they valued other members' input and sharing information was useful to them. Moreover, some SNAC members indicated that they did not see the need to contribute when other members had already responded, or did not want to repeat what had already been said. Recall Suzie's comments in Chapter 6:

> I don't see the point of contributing where others have already posted a similar thing. I only post when I have something I feel is worth saying! (Suzie, ✍).

This demonstrates the efficiency of busy child care professionals in managing their time, and how the contributions to the SNAC website, even if made by only a handful of active members, remained valuable and contributed towards meeting their needs in an online community of practice.

However, given that numbers alone might not be an accurate indication of success, it was essential that other important influential factors key to both achieving and assessing critical mass on SNAC were assessed. Concepts such as the *information overload paradox*, the *power-law distribution theory* and the *heterogeneity of online groups* were considered and are presented in the following section.

The information overload paradox proposed that as communities grow larger, by attracting more members and increasing numbers of posts, members are less likely to participate in *public* discussions, showing less commitment to larger online groups and contributing less to them (Raban et al., 2010). Moreover, other researchers reported higher volumes of communication resulted in a lower number of received responses, so it could be inferred that online communities need only minimum volumes of message traffic to attract and retain members (Arguello et al., 2006). Thus, this paradox explains how excessive volumes of communication could actually deter participation but that, conversely, if the volume of communication is insufficient, it could be difficult to

maintain the community responses needed for effective interaction. When considering this paradox in relation to SNAC, it could be argued that it was less important to have large numbers of *active* members, and more important for active members (including the researcher) to maintain their level of active engagement (posting comments and materials), which would meet the needs of the broader community, reinforcing the WORM concept discussed earlier in this section. Understanding that support is given and received through these interactions; it is essential that online communities maintain an appropriate level of interactivity (through posting and reading), to ensure that members are not forced to seek it elsewhere (van Varik & van Oostendorp, 2013).

Still, the influence of active SNAC members may have impacted on the dynamics of the SNAC community. For example, a theory known as the 'power-law distribution' explains that 'power-users' are often the minority who make the majority of contributions (Lampe et al., 2010; Raban et al., 2010; Raban & Rabin, 2009; Solomon & Wash, 2014). Indeed, SNAC had a small group of active or 'power-users' who were responsible for delivering most of the discussion board content, and as the researcher on this project I also adopted this role, constantly seeking and posting content to stimulate discussion and ensuring member comments/queries were replied to immediately. This meant that *relevant* content that was valuable to the whole community was accumulated, a community building strategy recommended by Solomon and Wash (2014).

So, although SNAC's power-users may have been responsible for delivering most of the content and therefore, value to other members, the value of this strategy has been questioned by others, such as Solomon and Wash (2014). For example, when SNAC had a surge in membership during March and April 2014, there was a corresponding increase in comments (Figure 6.6, Chapter Six), but these were made by existing

members rather than by these 'newbies'. Whilst these 'power users' (including myself) may have increased their activity to maintain the community and make it attractive to the 'newbies', these efforts might have been better directed towards attracting new members who actually made contributions themselves, however small. This is explained by Solomon and Wash, (2014, p. xx) who, in their study of member contributions to Wikiprojects found that "to encourage smaller levels of participation from more different people .... is more likely to be successful for building critical mass and creating a sustainable and productive community". Although SNAC is not a Wikiproject and was intended to offer an online community of practice to child care professionals, this does tell us that the patterns of activity demonstrated on SNAC inform the need for a balance between recruitment strategies to attract new members, and engagement strategies that stimulated activity amongst new and existing members.

Finally, the level of heterogeneity in online groups may also be an important element of critical mass. The critical mass theory developed by Oliver et al. (1985) posits that the level of heterogeneity and relationships between resources within an online community can contribute to collective actions, thus predicting its future sustainability. Moreover, it is well established that online communities should provide the benefits and experiences sought by its members if they are to "survive and thrive" (Arguello et al., 2006, p. 959). Therefore, diverse groups with more varied access to resources or information are more likely to lead to accelerated growth. Solomon and Wash (2014) concurred, noting that this desired heterogeneity would allow contributions to be made by members that complemented each other and generated greater value for the whole group to utilise and fulfil their needs. The implications to SNAC were considering whether the level of heterogeneity was appropriate, in terms of member roles, member access to resources and information and their desire to share this with others, which

subsequently provided relevant and valuable content to meet the needs of the SNAC community. However, there was a tendency amongst directors to create one SNAC profile that was shared amongst staff at a centre, so it was difficult at times to establish exactly who was contributing, thus masking the true level of heterogeneity to some extent.

To summarise, the number of participants' *alone* does not necessarily predict the success of an online group (Raban et al., 2010; van Varik & van Oostendorp, 2013), and in the case of SNAC, it is perhaps more important to build up a bank of resources and information that members find valuable, rather than building up member numbers, especially if those members are not going to contribute anyway. However, it is also important to maintain a balance between attracting new members and stimulating activity amongst these new members as well as existing members. In terms of heterogeneity, the balance was not ideal, as food coordinators and younger child care staff were underrepresented. This may, in part, be explained by them not valuing SNAC as much as their colleagues, or being limited by time and access, or details of their access were not captured due to one generic centre login.

It is, therefore, important to consider potential strategies that could be implemented to ensure new members continue to register for SNAC, that the content provided is updated regularly and that existing members are stimulated to continue or increase their contributions. As such, a concept known as the 'living laboratory' has been suggested at Edith Cowan University, as such environments are often promoted as a means of engaging communities in "mutually beneficial learning" (Hakkarainen & Hyysalo, 2013, p. 16). SNAC, together with other online communities, would become a 'training ground' for undergraduate students, thus providing an environment in which students could develop and implement the required strategies to ensure the longer term

sustainability of SNAC, whilst also gaining important work experience and developing skills relevant to the current health promotion workforce. Edith Cowan University and Nutrition Australia (WA Division) are currently negotiating funding with Lotterywest to facilitate this project.

Sense of community – emerging or contrived?

While critical mass is one way of determining the success of an online community, another is measuring a 'sense of community', as is discussed in the following section. In spite of my misgivings, and bearing in mind the 'netnographic slog' (Wallace et al., 2015) described above, it was apparent from the evidence presented in Chapter Seven that a sense of community was beginning to emerge and had the potential to flourish. In theory, this should lead to greater community participation (Bateman et al., 2011), whether online or in face-to-face communities, as illustrated by members' willingness to share resources, stories and support. Quantitative data supported this premise as the overarching sense of community question was answered positively, and 87% of respondents confirmed it was 'important' or 'very important' for them to feel a sense of community with other SNAC members (Figure 7.1, p. 225). Moreover, evidence presented in Chapter 7 also demonstrated how each of the four sense of community constructs –*membership*, *influence*, *fulfilment of needs* and *shared emotional connection*, were fulfilled. A strong sense of shared emotional connection was established between individual members and the researcher, rather than between individual SNAC members, and this was the only construct that significantly correlated with the overarching Sense of Community question (Table 7.2, p. 228). There was a trend in data that suggested member needs were fulfilled, supported by the raw SOC score which was the highest of the four constructs (Table 7.1, p. 225).

From a qualitative perspective, it was also apparent that 'influence' was an important factor to SNAC members; being able to influence others, not just within the SNAC community but also in their wider, face-to-face, social collective. Survey data did not reflect this qualitative finding and was not significantly correlated with the overarching SOC question (Table 7.1, p. 225). The difference in the qualitative and quantitative results for this construct could be explained as follows. Although the survey was completed by 189 participants pre- and post-intervention, only a small proportion of this group were active members. The qualitative evidence for this construct was gathered from a small active cohort, well-known to me, who posted on the discussion boards and used the website on a regular basis. This qualitative data provided a rich, descriptive and in-depth explanation of the benefits that supported the construct relating to influence - if the community continues to grow, a follow-up study of this would be worthwhile.

Whilst it is suggested that sense of community can increase quality of life (Farrell et al., 2004), this might not be considered applicable in the case of SNAC members *own* quality of life, given that the website was designed to support child care staff to provide a healthy eating environment for the children in their care, rather than for their own well-being. However, it appears that the SNAC community did make a difference to SNAC members, as well as that of their immediate family, and the children in their care, as many have reported using SNAC resources for their personal use as well as in their work environment. It is also reported that sense of community can increase organisational empowerment (Hughey et al., 2007), and there is evidence to support this premise on SNAC. For example, information was sought and provided about budgeting, which could have empowered SNAC members to secure a more realistic food budget for their centre.

At the time of writing this thesis, SNAC is still developing as a valuable online community of practice, which remains informed by the engagement of SNAC members, and makes the site authentic and relevant, as it is the only online community in Australia that supports child care staff to provide a healthy eating environment. SNAC members have expressed their limited available time to access the website, due to their numerous and demanding roles, yet they have developed ways to utilise the available resources and support to meet their needs within the time constraints they face, which perhaps is a measure of critical mass and thus indicates the success of SNAC.

Child care centres are busy environments bound by many legislative requirements, including the NQS, the Food Safety Act, Child Protection legislation, amongst others. Time poorness was often cited by child care staff as a reason for not engaging with SNAC or other health promotion programs. However, as there are defined roles within the child care sector, such as 'educational leader', and this suggests that there are opportunities to develop similar roles to drive the quality of healthy eating practices higher. Developing the role of a 'healthy eating champion' and adopting a 'whole of centre' approach towards nutrition literacy (Parletta, 2014), would improve the nutritional content of the menu plans in conjunction with the food coordinator, and develop, implement and enforce food and nutrition policies for the centre. A 'whole of centre' approach would also ensure that planned learning experiences appear regularly on the curriculum and that they promote healthy eating activities. This concept could extend to cover other centre activities such as fund-raisers, community events and special occasions and celebrations. A health promotion program could be developed (perhaps in conjunction with the Start Right – Eat Right program proposed earlier in this chapter), to recruit, train and support these 'champions', whilst establishing methods to ensure long term program sustainability.

So, whilst SNAC may not have been the 'buzzing' community I had envisaged at the outset of the project, it is encouraging that the members who have engaged with the website have developed ways to use it in a way that accommodated their busy schedules, which met their specific needs. Considering the subjective perceptions presented in this chapter, together with the qualitative interpretations of the data presented in previous chapters, it can be surmised that SNAC is considered useful by its members and they value the information and support it offers them in their busy working lives.

Strengths and Limitations

The main strength of SNAC is that it is unique, as it is the only food, nutrition and healthy eating website, specifically designed for child care, which offers 'information wrapped in support'. SNAC is not limited to the provision of resources alone, but also provides discussion boards where child care staff can share information and offer support, whilst accessing 'expert' advice from a qualified nutritionist (the researcher). The credibility of the SNAC project is assured as it is a university backed project, and is supported by an experienced research team. It is sustainable in the longer term as ongoing running costs are relatively low, site maintenance is minimal, and as an online intervention, the reach of the project extends Australia wide and beyond.

SNAC has also contributed to the body of knowledge in this important public health issue through several publications, both academic and industry related. For example, a presentation entitled "Evaluation of an online nutrition intervention for early years' educators" (Wallace, Devine, Costello, & Lo, 2015) was delivered at the recent Early Childhood Education and Care Conference in Perth, Western Australia. Posters were presented at the Annual Qualitative Methods Conference in 2015 (Wallace et al., 2015),

and at the Public Health Association of Australia conference in 2014 (Wallace, Devine, Costello, & Lo, 2014a, 2014b). Furthermore, an article entitled "Find your SNAC(k) online" (Wallace, 2013), was published in the industry journal, *Belonging Early Years* in 2013, and articles have appeared in other industry publications such as "PreSchool Matters (Early Learning Association of Australia, 2014) and Child Times (Child Australia, 2015).

The representativeness of the study sample is the main limitation. Across all points of interaction (SNAC cohort, survey respondents, interviewees), the sample was skewed towards senior staff, such as directors, 2IC and 'other' roles, whilst food coordinators were underrepresented. The majority of participants were older than 36 years, thus the younger age groups (younger than 25 years) were also underrepresented. Approximately 10% (n=105) of the SNAC cohort are aged 56 years or older, and as this group could be expected to move into retirement within the next decade, it was important to engage with the younger staff who will replace them, to foster the desire to provide a healthy eating environment, and build the capacity to do so. Moreover, whilst this older cohort has many years of experience in the child care industry, they may hold entrenched ideas about children's health and nutritional needs. It is, therefore, imperative that the younger cohort, an important target group, are engaged to promote healthy eating, to dispel the less desirable, culturally entrenched dietary habits currently observed at some child care centres.

A further limitation was the measurement of SNAC member's level of interaction with SNAC. The original research proposal stated that sense of community, knowledge, attitudes and confidence were to be compared amongst SNAC members according to their level of interaction with the website, and that a natural comparator group would

emerge. However, many centres created a single member profile to enable all staff at that centre to access the website easily. Whilst busy child care staff adapted their use of the intervention to suit the demands of their roles, this is not necessarily how the website was originally designed to be used, and subsequently it has been difficult to assess an individual's engagement with the intervention. However, it was possible to ascertain a limited level of interaction from the SNAC members who provided interviews, thus limited comparisons were possible. Strategies to address these limitations have been presented throughout this chapter.

Summary

This chapter has provided an overview of the underlying methodological approach to this study and discussed how netnography was utilised to ensure that rich, contextual data was collected and analysed. The key points from the findings chapters were then presented, together with recommendations for the longer term sustainability of the SNAC project. Finally, the strengths and limitations of SNAC were discussed.

The disparity between positive attitudes and high levels of self-efficacy were examined alongside the levels of nutrition knowledge displayed. It was surmised that even though high self-efficacy and high-outcome efficacy are usually conducive to behaviour change, the provision of knowledge or information alone does not usually result in change. It was acknowledged that behaviour change is complex and takes time, and the underlying, long-standing beliefs of some SNAC members demonstrated the need for continued support in this important area of child health.

The dilemma of what constitutes critical mass was examined, with consideration given to whether this is dependent on people, activity, participation or fulfilment of needs, or whether there is a particular combination that successfully ensures critical mass is

achieved. Importantly, the 'subjective perceptions' of the researcher are considered, as presented in the reflections about the 'netnographic slog' and an emerging community. There followed a discussion about the emerging community and whether a sense of community was indeed real or contrived. It appeared that a valuable community of practice was developing, and whilst not the buzzing community hoped for at the outset, members had adapted their use of the SNAC website and discussion boards to meet their needs and fit in with their busy working lives.

This research has demonstrated that changes in public health policy are needed to refocus the importance of providing a healthy eating environment in Australian child care services. These changes are essential as optimal nutrition in the early years of life is vital for future health and wellbeing. However, changes to high-level policies take time and are often difficult to police. Furthermore, they need to be underpinned by shorter term behaviour-based strategies in order to promote acceptance and adherence. In this study, the demonstrated disparity between reported and observed knowledge and behaviours highlights the need for shorter, more focused strategies to achieve meaningful and sustained change. For SNAC, despite the netnographic slog required to build a community of practice, it is regarded as a unique resource valued by the child care industry. It now presents an ideal platform from which to advocate higher-level policy changes, while ensuring that those at the coal face are heard and supported.

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APPENDICES

Appendix 1 – Stage 1 Interview Guide

INTERVIEW QUESTION GUIDE

- welcome and thank for participating
- ensure consent received
- ask if information letter received, read and understood – any questions?
- brief explanation of study – AIM
- will take about 30 minutes to complete
- will be audio-recorded for ease of transcription
- if there are questions you don't want to answer, you are not obliged to do so
- confidentiality
- has demographic data been captured? Check prior to commencing interview – ask questions if not already submitted via Qualtrics

QUESTIONS

FORMATIVE NEEDS

- can I get you to think about what resources you are aware of that are already available to guide the provision of nutritious foods and promote healthy eating to children in LDCC?
    - e.g.,GUAG, SRER, AGHE (only use as prompts if can't think of any)
- which, if any, of these resources do you use?
- how often do you use them? how do you access them? What particular part of the resource are you using?
- what makes these resources easy or hard to use?

TRAINING

- Do you have a childcare qualification?
    - YES – ask questions below
    - NO – how would you describe your nutritional knowledge, ability to role model healthy eating to children, confidence about nutrition?
- If you have a childcare qualification, how did it improve your nutrition knowledge?
- Did it equip you to demonstrate healthy eating role modelling to children? If so, how? Can you give an example?

e.g., dealing with fussy eaters, your own food and drink habits whilst on the premises, encouraging kids to eat their fruits and veggies (use as examples if interviewee unable to think of anything)

- How confident are you with your nutritional knowledge in light of the training you have received as part of your qualification? How has this helped you to recognise and/or provide healthy foods?
- What prevents you from getting more training, if you feel you need it?

ATTITUDES

- To what extent do you think the food served at LDCC is nutritious? (not just your centre, but centres across WA)
- To what extent do you believe it is important that the food served at LDCC is nutritious?
    - Why do you think it is/is not important?
    - do you believe the provision of nutritious foods is the responsibility of the parents?

SOCIAL

- To what extent do you believe it is important to work together as a team within the centre rather individuals working alone?
- To what extent do you work in conjunction with other LDCC?

ORGANISATIONAL/POLICY

- How will the new NQF legislation affect you?
    - have you had any extra training or taken on a different role?
    - how will it impact the overall running of the LDCC? Have additional or different staff been employed? Have any action plans been implemented?
    - Do you know what the nutritional requirements of the NQF are?

        food hygiene

        nutritious and varied

        meet specific dietary needs, e.g., dietary or religious

        drinking water readily accessible

        menu displayed

- To what extent do you have any concerns about meeting the nutritional requirements of the NQF?
- Where is the food and nutrition policy displayed in your centre?
- Can you give me some idea of what the policy includes, *e.g., drinking water freely available,*
- Did you or any other staff have any input in the development of this policy?
- Are you aware of any restrictions it places on you as a staff member?, *e.g., not allowed to bring soft drinks onto the premises*

INFORMING THE DEVELOPMENT OF THE STAGE 2 INTERVENTION

We are planning to develop a website package which incorporates downloadable resources, links to other resources and activities, online activities and a discussion board

I would like to ask you a series of questions about how useful you might find this, and what you would like to see included

- what websites do you use regularly at present, for work or personal use, e.g., *online shopping, social media, news*
- keeping those sites in mind, what is it that you like or dislike about those sites?
    - what works?
    - what doesn't work?
    - *e.g., resources hard to find, site unresponsive, links broken*
- If you only had one website that you could access to help you do your job, what would it include?

ONLINE COMMUNITIES

- what online forums/discussion boards/chat rooms do you use, both in your personal life and for work? e.g., *Facebook, Twitter, chatrooms, ACECQA*
- how useful or necessary do you find online communities to be? What are the drawbacks?
- Do you think a work based nutrition related online discussion board would be for you in your current role – *explain about sharing ideas and recipes with other centres, offering mutual support, being able to put ideas out there which will be moderated*

WEB-BASED TRAINING/ACTIVITIES

- do you use online training in relation to your job already, e.g., *food safety and hygiene (I'm Alert), First Aid?*
  - how accessible are the modules? Can you do them at work or at home?
  - how easy are they to complete?
  - what are the advantages or disadvantages of this sort of training?
- Imagine online activities that were brief but relevant, available 24/7, accessible from either the work computer or your home PC – how would this make you feel about engaging in these more often? Do you think it would add value to the training you are obliged to do under the NQF?
  - what is a realistic amount of time for you to spend on one activity?
- what sort of topics around nutrition and healthy eating do you think would be useful to increase your knowledge and confidence in these areas?

Those are all of the questions I have for you today – is there anything else you would like to add to our discussion today?

Thank you very much for your participation today

Appendix 2 – Qualtrics Stage 1 Demographic survey

The aim of this research is to establish a nutrition focused website with downloadable resources and information for Early Childhood Education and Care Centres, together with online activities and a discussion board. Your input is essential to guide the development and implementation of this website and its content, hence the invitation to attend a focus group or partake in a telephone interview.

Please read the following statement carefully.

I understand that:

1. I am not obliged to participate in this study
2. I have been informed of this study by way of an information letter
3. The purpose of this study and that I have the right to ask any questions before or during the study
4. The information collected from me for this study will be used for health research purposes
5. Any information collected from me will not be revealed to any third party without my permission
6. Focus group discussions and telephone interviews will be audio-recorded for transcription purposes
7. I have the right to withdraw my consent to the use of information collected about me at any time
8. I do not need to give reasons for withdrawal from this study nor fear prejudice or negative consequences
9. Research data gathered from the results of this study may be published, but my name or identity will not be revealed
10. I agree to participate in this study as outlined to me

○ I AGREE

○ I DO NOT AGREE

Which age group are you?

○ < 18 years

○ 19-25 years

○ 26-35 years

○ 36-45 years

○ 46-55 years

○ 56 years +

What is your gender?

○ Male

○ Female

Is English your first language?

○ Yes

○ No

What is the postcode of the childcare centre at which you work?
(If you work at more than one centre, please provide the postcode for the centre where you usually work the most hours)

What is your current job description?
(If you hold more than one role, please tick the box that represents the role you have for the majority of your working hours).

- ○ Manager/director/owner
- ○ Early years teacher
- ○ Food and nutrition coordinator
- ○ Food preparation/cook
- ○ Second in command
- ○ Group leader
- ○ Cert IV Assistant
- ○ Cert III Assistant
- ○ Junior Trainee

How many years have you worked in the childcare industry?
Years
Months

On what basis are you employed in your current role?

- ○ Full time - permanent
- ○ Part time - permanent
- ○ Full time - fixed term contract
- ○ Part time - fixed term contract
- ○ Casual

What is the highest level of education you have achieved?

- ○ Year 10 High School
- ○ Year 11 High School
- ○ Year 12 High School
- ○ TAFE
- ○ Apprenticeship
- ○ Undergraduate degree
- ○ Postgraduate degree
- ○ Trade Certificate

Do you hold a qualification relevant to the Early Childhood Education and Care sector? For example, a Certificate III in Childcare Services or an Early Years teaching degree.

- ○ Yes
- ○ Working towards qualification
- ○ No

How often do you use the internet to access social media sites? For example, Facebook.

○ Never

○ Less than Once a Month

○ Once a Month

○ 2-3 Times a Month

○ Once a Week

○ 2-3 Times a Week

○ Daily

What is the MAIN purpose that you use social media for?

○ Communication

○ Entertainment

○ Peer support

○ Information

○ Exchanging ideas and opinions

○ Sharing items such as photographs, videos and news articles

○ I don't use social media

How often do you use the internet to access discussion board sites?

○ Never

○ Less than Once a Month

○ Once a Month

○ 2-3 Times a Month

○ Once a Week

○ 2-3 Times a Week

○ Daily

What is the MAIN reason that you use discussion boards?

○ Communication

○ Entertainment

○ Peer support

○ Searching for information

○ Exchanging ideas and opinions

○ Sharing experiences

○ I don't use discussion boards

At which location would you prefer to complete online training for your work?

- ◯ At the centre
- ◯ At home
- ◯ On a mobile device (e.g., mobile phone or tablet)

What childcare qualification do you hold? (Please tick how ever many apply)

- ☐ Certificate III in Childcare Services
- ☐ Certificate V in Childcare Services
- ☐ Diploma of Childcare Services
- ☐ Early Years Teaching degree
- ☐ Other Teaching degree

Does the childcare centre at which you work have a computer and/or internet connection?

- ◯ Yes
- ◯ No

Do you have access to the centre's computer and internet connection during your working hours?

- ◯ Yes
- ◯ No

How often do you use the internet to download resources or find information in relation to your employment?

- ◯ Never
- ◯ Less than Once a Month
- ◯ Once a Month
- ◯ 2-3 Times a Month
- ◯ Once a Week
- ◯ 2-3 Times a Week
- ◯ Daily

Do you have access to a computer and internet connection at home?

- ◯ Yes
- ◯ No

How often do you use the internet for personal use?

- ○ Never
- ○ Less than Once a Month
- ○ Once a Month
- ○ 2-3 Times a Month
- ○ Once a Week
- ○ 2-3 Times a Week
- ○ Daily

Do you have access to the internet through a mobile device such as an iPhone, iPad, smart phone or other device?

- ○ Yes
- ○ No

On which mobile device would you usually access the internet?

- ○ iPad
- ○ iPhone
- ○ SMART phone
- ○ Other tablet
- ○ Laptop

Appendix 3 – Stage 1 Informed Consent Document

Informed Consent Document

*Developing an online nutrition intervention for long day care staff to support healthy eating for children – **Stage 1***

I understand that:

1. I am not obliged to participate in this study

2. I have been informed of and understand the purposes of this study

3. I have the right to ask any questions before or during the study

4. The information collected from me for this study will be used for health research purposes

5. Any information collected from me will not be revealed to any third party without my permission

6. I understand that focus group discussions and telephone interviews will be audio-recorded for transcription purposes

7. I have the right to withdraw my consent to the use of information collected about me at any time, without giving reasons, and without fear of prejudice or negative consequences

8. Research data gathered from the results of this study may be published, but my name or identity will not be revealed

9. I agree to participate in this study as outlined to me

Name of participant (please print):_____

Signature of participant:_____

Date:_____

_

Name of witness (please print):_____

Signature of witness:_____

Date:_____
_

Appendix 4 – Stage 1 Information Letter

SCHOOL OF EXERCISE & HEALTH SCIENCES

For all queries, please contact:

Ruth Wallace

Phone: 6304 3827

Mobile   0408 097190

Email: ruth.wallace@ecu.edu.au

Information Letter to Participants

Developing an online nutrition intervention for long day care staff to support

healthy eating for children – Stage 1

Invitation to participate in a study which aims to promote a healthy eating environment

within the long day childcare setting

This project seeks to develop a website portal which will assist long day childcare

centre (LDCC) staff to provide and promote an environment in which children's healthy

eating practices and behaviours, food habits and preferences can be developed and

maintained. This study also aims to assist LDCC to meet or exceed the specific

healthy eating requirements of the new National Quality Framework (NQF, 2012)

through their participation in this project.

You are invited to participate in this study, but are under no obligation to accept this

invitation and you should ensure that you have read and understood all the information

on this sheet before agreeing to take part.

If you have any questions, please contact the coordinator for this study, Ruth Wallace (0408 097190) or Associate Professor Amanda Devine (6304 5527), both from the School of Exercise and Health Science (Faculty of Computing, Health & Science). This research project is being undertaken as part of the requirements of a PhD at Edith Cowan University.

Why is this study important?

Childhood nutrition is of vital importance for optimal physical, social and emotional development and whilst most Australian children are thriving there are concerns about issues such as overweight and obesity, nutrient deficiencies, dental caries and food safety. Furthermore, the food habits and preferences developed in childhood remain through to adulthood and can affect health in later life.

Under the new National Quality Framework (NQF) all LDCC staff are required to hold or work towards a relevant childcare qualification which does incorporate some elements of nutrition training. However, it appears that the focus of this training is food hygiene and preparation, with little emphasis on nutrition knowledge and role modelling skills. Thus this study aims to add value to the statutory training by helping LDCC staff improve their nutrition knowledge and skills so that a healthy eating environment for the children in their care may be promoted, developed and maintained.

What does this study entail?

This study will be conducted in 2 stages. This information letter describes the first stage of the study. If you subsequently agree to take part in the second stage of the study, you will be supplied with a separate information letter and consent form.

For this first stage of the study, you will be invited to attend a focus group or take part in a telephone interview, depending on your geographical location. Both will take approximately 30-60 minutes and will be audio-recorded for transcription purposes.

Focus groups will be arranged at a location as close to your workplace as possible, and telephone interviews will be arranged at a convenient time for you, and can be conducted at either your workplace or at home.

You will also be asked to complete an online demographic questionnaire, which collects basic data such as age, qualifications and years of experience in the industry. You will be e-mailed the link, asked to complete the questionnaire and submit it. This should take approximately 5 minutes to complete.

As a gesture of appreciation for attending a focus group or giving an interview, you will be entered into a draw to win a healthy eating/cooking book. Your centre will also be entered into a draw for a piece of cooking equipment.

Benefits of participation

By taking part in the first stage of the study, you are able to voice your opinions, have a say in how the intervention will be developed and what content will be included.

Are there any risks?

There are no known risks associated with this study.

Results from Stage 2 of the research study

The results from the first stage of this study will be used to inform and develop stage 2 of the study, an online intervention comprising a website, online activities and a discussion board, in consultation with key stakeholders.

Voluntary participation

You are a volunteer and do not have to agree to take part in focus groups or telephone interviews. No explanation or justification is required if you choose not to participate and the decision not to participate will not disadvantage you, or involve any penalty.

Withdrawing consent to participate

You are free to withdraw your consent to further involvement in the research project at any time or withdraw your consent to allow us to use any information or material that has already been collected.

Confidentiality

Your privacy and confidentiality about the information you provide and the questionnaire, focus group and interview data will be respected at all times. You will be allocated an identification number that will remain confidential to the Chief Investigator and research team. These data will be recorded using this identification number. All data, including names and codes, will be stored in a locked room in a locked filing cabinet at the School of Exercise and Health Science, Edith Cowan University and will be destroyed five years after the research is completed.

Questions and/or further information

If you have any questions or require any further information about the research project, please contact: Associate Professor Amanda Devine on 6304 5527, or Dr Leesa Costello on 6304 5459.

Approval by the Human Research Ethics Committee

This project has been approved by the Edith Cowan University Human Research Ethics Committee (HREC approval number 8727).

Independent contact person

If you have any concerns or complaints about the research project and wish to talk to an independent person, you may contact:

Research Ethics Officer

Edith Cowan University

270 Joondalup Drive

JOONDALUP

WA 6027

Phone: (08) 6304 2170

Email: research.ethics@ecu.edu.au

If you wish to proceed with this study, please complete the Consent Form and return it

to the study coordinator.

Appendix 5 – Stage 1 Invitation to participate

Ruth WALLACE

From:	Ruth WALLACE
Sent:	Thursday, 1 August 2013 11:06 AM
To:	Ruth WALLACE
Subject:	SUPPORTING NUTRITION FOR AUSTRALIAN CHILDCARE - THE LAUNCH OF AN EXCITING NEW WEBSITE!!!!
Attachments:	flyer_03.pdf
Importance:	High

Welcome to SNAC!

This is an invitation to participate in an exciting study which aims to promote a healthy eating environment within the early years education and care setting.

REGISTER NOW AT www.snacwa.com.au

This new research project means that you, as an early years educator, will have exclusive access to an exciting new website called *SNAC* (Supporting Nutrition for Australian Childcare). This website provides recipe ideas, tools and resources, nutrition information, online activities and discussion forums. The *SNAC* website will also help you to connect with other early years educators from other centres, share ideas, learn from others experiences and to seek help when it might be needed.

1

Appendix 6 – Stage 1 Flyer

Edith Cowan University
School of Exercise and Health Science

ECU
AUSTRALIA
UNIVERSITY
EDITH COWAN

INTERESTED IN CHILDREN'S NUTRITION?

Want to have your say?

TAKE PART IN THIS EXCITING NEW RESEARCH PROJECT!

I would like to invite childcare staff at all levels to either attend a focus group or take part in a telephone interview.

Your input is extremely valuable and will guide the development of a website which aims to support the provision of nutritious food and the promotion of healthy eating within the early years setting.

IF YOU ARE INTERESTED IN PARTICIPATING, PLEASE CONTACT:

RUTH WALLACE
Mobile: 0408 097 190
E-mail: ruth.wallace@ecu.edu.au

As a token of my gratitude, you will be entered into a draw to win a set of healthy eating cookbooks and resources.

The childcare centre will also be entered into a draw to win a piece of cooking equipment.

Appendix 7 – Stage 2 Interview Guide

Question Guide Exit Interview

RESEARCH QUESTIONS

1. To what extent does a web-based nutrition education intervention influence the nutrition knowledge, attitudes and confidence of early years educators? Does this intervention add value to existing mandatory training and is there a difference in knowledge, attitudes and confidence according to the level of engagement with the intervention?

- Welcome and thank you for agreeing to participate

2. To what extent do educators believe the intervention promoted a sense of community within the early years sector and to what extent is this valued by educators? Is there a difference according to the level of engagement with the intervention?

- Brief explanation of topics to discuss
  - o Use of SNAC
  - o Increased knowledge and confidence, healthy eating environment provided
  - o Online community – value, use,
- Will take approximately 60 minutes to complete
- Will be audio-recorded for ease of transcription
- If there are questions you would prefer not to answer, you are not obliged to do so
- Confidentiality assured

INTRODUCTION

PLEASE DESCRIBE YOUR ROLE WITHIN YOUR SERVICE

WHAT DAY TO DAY ACTIVITIES

USE OF SNAC

HOW WOULD YOU DEFINE YOURSELF AS A USER OF SNAC

Allow interviewee to describe their use (use examples below if no answer given)

Regular user – often visits the site, looks at a number of different pages, posts comments or uses discussion boards.
Intermediate user – often visits the site, but has not ever posted or used discussion boards.
Non-user – registered for the site, but has never or rarely revisited the site.

HOW DID YOU HEAR ABOUT SNAC?
What was it about SNAC that appealed to you and encouraged you to register?

What features of SNAC can you recall?

What features do you use regularly? Why?

What particular features do you like/dislike about SNAC?

Have you ever posted or commented on SNAC? What drives you to leave a post or contribute to the discussions?

Why do you choose not to/what could have motivated you to post or comment more?

What prevented you visiting the SNAC website at all/more often?

Do you have your own personal log in or do you share a user name and password with others at your centre?

Did you encourage your colleagues to register and use SNAC?
What might prevent them from doing so?

KNOWLEDGE, ATTITUDES AND CONFIDENCE

WHAT DOES THE TERM 'HEALTHY EATING ENVIRONMENT' MEAN TO YOU?

How would you rate your confidence about your nutrition knowledge?

Are you confident enough with your nutrition knowledge to discuss nutrition concepts with parents?

Are you confident enough with your nutrition knowledge to teach children basic nutrition concepts?

Which resources from the SNAC website have helped you to increase your nutrition knowledge and/or your confidence to discuss/teach nutrition concepts?

Do you believe that it is important that the food served at childcare is nutritious? Why/why not?

Do you believe that the food served at your centre is nutritious? Why/why not?

Do you believe that it is important to focus on building an overarching healthy eating environment, as much as providing healthy food for the children? How would you do this?

Which features/resources of the SNAC website have helped you to promote and provide a healthy eating environment at your centre? HOW?

What are the barriers to promoting and providing a healthy eating environment at your service?

ONLINE COMMUNITY

WHAT DOES 'COMMUNITY' (IN ANY CONTEXT) MEAN TO YOU?

To what extent do you believe that there is an actual SNAC community?

To what extent do you believe that belong to the SNAC community?

To what extent is it important for you to be a part of the SNAC community?

To what extent do the discussions or others posts persuade/dissuade you from using the resources available on SNAC?

To what extent do you believe that being part of the discussions did/could have supported you to provide a healthy eating environment?

What are the enablers/barriers to your participating in the online discussions or making posts?

Do you think there are any other strategies that could be utilised to promote greater use of the discussion boards?

Appendix 8 – Pre-post intervention survey

Demographics

Please read the following important information:

It is important that you complete this survey as a registered user of www.snacwa.com.au. By doing so, you are helping us to understand the unique needs of early years educators and to assess the success of the SNAC website.

Please know that there are no right and wrong answers - it is more important to know what you really think and do. As such, please answer all questions in this survey as honestly and accurately as possible. Your responses will remain completely confidential and will not be shared with anyone outside of the research team.

This survey should take approximately 20 minutes to complete.

Thank you for your assistance!

Demographic information

What is your gender?

Male	Female
○	○

To which age group do you belong?

○ <18
○ 18-24
○ 25-34
○ 35-44
○ 45-54
○ 55-64
○ 65+

What is the highest level of education you achieved?

Year 10	Year 11	Year 12	Vocational/TAFE	University	Other
○	○	○	○	○	○

Which early years qualifications have you obtained?

☐ Certificate III in Childcare Services

☐ Certificate IV in Childacre Services

☐ Diploma in Childcare Services

☐ Advanced Diploma in Childcare Services

☐ Teaching degree

☐ Other degree

Block 2

What is the name of the centre at which you work?

[   ]

What is your current employment status?

Part-time casual	Part-time permanent	Full-time	Volunteer	Other
○	○	○	○	○

Is English your first language?

☐ Yes

☐ No

PERCEPTIONS

To what extent do you agree or disagree with the following statements about the practices in the centre that you currently work at:

	StronglyDisagree	Disagree	Agree	Strongly Agree
It is considered important by all staff that healthy food is served to children	○	○	○	○
Healthy food is served to children	○	○	○	○
The meals and snacks served to children meet the requirements of the National Quality Framework (NQF)	○	○	○	○
Age appropriate serving sizes of food are provided	○	○	○	○
Age appropriate educational activities that promote lifelong healthy eating behaviours are utilised	○	○	○	○
Educators model appropriate mealtime behaviours	○	○	○	○
Nutrition education is provided to children	○	○	○	○

Educators provide information to parents to promote healthy eating	O	O	O	O
Educators support healthy eating activities and special events involving the early years community	O	O	O	O
Parents participate in early years centre events that promote healthy eating	O	O	O	O

AVAILABILITY OF RESOURCES AND THE DEVELOPMENT OF PARTNERSHIPS

To what extent do you agree or disagree with the following statements about the availability of resources and the development of partnerships:

	Stongly disagree	Disagree	Agree	Strongly Agree
Training is provided to educators on healthy eating issues	O	O	O	O
Resources are available to teach children about nutrition	O	O	O	O
Educators are trained how to model healthy eating behaviours	O	O	O	O
Educators seek resources to support healthy eating activities	O	O	O	O
Partnerships are established with other child related orgnaisations, e.g., Child Australia, to facilitate healthy eating practices	O	O	O	O
A food and nutrition policy is in place	O	O	O	O
Early years managers/directors network for creative ways to maintain a healthy eating environment	O	O	O	O
Educational materials are provided to parents on their role in supporting healthy eating	O	O	O	O

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	Strongly Disagree	Disagree	Agree	Strongly Agree
Partnerships are established with parents to promote healthy eating behaviours	O	O	O	O
Parents are involved with healthy eating related activities promoted in the centre	O	O	O	O
Partnerships are established with community organisations to promote healthy eating related activities	O	O	O	O
Nutrition education sessions are offered to parents of young children	O	O	O	O

HEALTHY EATING ENVIRONMENT

To what extent do you agree or disagree with the following statements about the healthy eating pratices at your centre?

	Strongly Disagree	Disagree	Agree	Strongly Agree
Parents are encouraged to communicate children's allergies and special nutrition needs	O	O	O	O
Children are receiving healthy beverages (water or milk) throughout the day	O	O	O	O
Children are encouraged to eat fruits and vegetables	O	O	O	O
Nutritious foods - fresh, unprocessed foods low in added sugar, salt and saturated fat, are provided for all meals and snacks	O	O	O	O
Children receive healthy snacks, e.g., fruit or vegetable platter with low fat yoghurt or dairy based dip, on a daily basis	O	O	O	O
Children are allowed adequate time to eat and enjoy their meals and snacks	O	O	O	O

	Strongly Disagree	Disagree	Agree	Strongly Agree
Children are encouraged to try new food items	○	○	○	○
Steps are taken to ensure that a healthy eating environment is provided	○	○	○	○
Educators respond to the needs of children who arrive at the centre hungry	○	○	○	○
Portion sizes are age appropriate	○	○	○	○
The mealtime environment encourages healthy eating, e.g., tables are visually appealling, cutlery and utensils are manageable	○	○	○	○
Educators, food coordinators, cooks and managers/directors are trained to prepare healthy meals	○	○	○	○

TRAINING NEEDS

To what extent do you agree or disagree with the following statements regarding training needs to create a healthy eating environment?

	Strongly Disagree	Disagree	Agree	Strongly Agree
The needs of children with special food and nutrition requirements (e.g., religious, cultural, dietary) are met	○	○	○	○
The nutritional needs of children with disabilities are met	○	○	○	○
Nutrition education information is communicated to parents	○	○	○	○
Information and resources to perform healthy eating activities are assessed and utilised	○	○	○	○
There is effective communication between centres and parents about healthy eating	○	○	○	○

issues

Appropriate food is prepared for children with special food and nutrition needs	○	○	○	○
Child development issues which affect healthy eating behaviours are identified and addressed	○	○	○	○
Parents and children's concerns related to healthy eating are addressed	○	○	○	○
Nutrition education is provided to educators, food coordinators, cooks and managers/directors	○	○	○	○
The healthy eating needs of early years centres with culturally diverse populations are addressed	○	○	○	○
Nutrition education is provided to the children in your care	○	○	○	○
Children are taught about food safety and hygiene	○	○	○	○
Food safety and hygiene practices are implemented in your centre	○	○	○	○
Safe food handling practices are implemented in your centre	○	○	○	○

CONFIDENCE

To what extent do you agree or disagree with the following statements regarding your confidence about healthy eating, and regarding your colleagues confidence about healthy eating?

	Not at all confident	A little confident	Confident	Very confident
I am confident that I have received adequate training to be able to teach healthy eating to the children at this centre	○	○	○	○
I am confident that my colleagues have received adequate training to be able to teach healthy eating	○	○	○	○

to the children at this centre				
I am confident that I understand healthy eating concepts well enough to teach them to the children at this centre	○	○	○	○
I am confident that my colleagues understand healthy eating concepts well enough to teach them to children at this centre	○	○	○	○
I am confident that I have the necessary skills to teach healthy eating concepts effectively	○	○	○	○
I am confident that my colleagues have the necessary skills to teach healthy eating concepts effectively	○	○	○	○
I am confident in my ability to answer children's questions relating to healthy eating effectively	○	○	○	○
I am confident in my colleagues ability to answer children's questions relating to healthy eating effectively	○	○	○	○
I am confident in my ability to answer parents questions relating to healthy eating effectively	○	○	○	○
I am confident in my colleagues ability to answer parents questions relating to healthy eating effectively	○	○	○	○
I am confident about my knowledge of the Australian Dietary Guidelines	○	○	○	○
I am confident about my colleagues knowledge of the Australian Dietary Guidelines	○	○	○	○
I am confident about my knowledge of the core food groups stated in the Australian Dietary Guidelines	○	○	○	○
I am confident about my colleagues knowledge of the core food groups stated in the Australian Dietary Guidelines	○	○	○	○
I am confident that I know what represents a balanced diet and can teach this to the children in my care	○	○	○	○
I am confident that my colleagues know what represents a balanced diet and are able to teach this to the children at this centre	○	○	○	○
I am confident that I understand the key nutrients for each food group as detailed in the Australian Dietary Guidelines	○	○	○	○
I am confident that my colleagues understand the key nutrients for each food group as detailed in the Australian Dietary Guidelines	○	○	○	○
I am confident that I can interest children in eating healthily	○	○	○	○
I am confident that my colleagues can interest children in eating healthily	○	○	○	○
I am confident that if I do a good job teaching healthy eating concepts, the children at this centre will want to eat healthy foods	○	○	○	○

I am confident that if my colleagues do a good job teaching healthy eating concepts, the children at this centre will want to eat healthy foods	○	○	○	○

SENSE OF COMMUNITY

The following questions about community refer to: **SNAC** (Supporting Nutrition for Australian Childcare)

How important is it to you to feel a sense of community with other community members?

Prefer not to be part of this community	Not important at all	Not very important	Somewhat important	Important	Very important
○	○	○	○	○	○

How well do each of the following statements represent how you *feel* about this community?

	Not at all	Somewhat	Mostly	Completely
1. I get important needs of mine met because I am part of this community.	○	○	○	○
2. Community members and I value the same things.	○	○	○	○
3. This community has been successful in getting the needs of its members met.	○	○	○	○
4. Being a member of this community makes me feel good.	○	○	○	○
5. When I have a problem, I can talk about it with members of this community.	○	○	○	○
6. People in this community have similar needs, priorities, and goals.	○	○	○	○
7. I can trust people in this community.	○	○	○	○
8. I can recognise most members of this community.	○	○	○	○
9. Most community				

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members know me.	○	○	○	○
10. This community has symbols and expressions of membership such as clothes, signs, art, architecture, logos, landmarks, and flags that people can recognise.	○	○	○	○
11. I put a lot of time and effort into being part of this community.	○	○	○	○
12. Being a member of this community is a part of my identity.	○	○	○	○
13. Fitting into this community is important to me.	○	○	○	○
14. This community can influence other communities.	○	○	○	○
15. I care about what other community members think of me.	○	○	○	○
16. I have influence over what this community is like.	○	○	○	○
17. If there is a problem in this community, members get it solved.	○	○	○	○
18. This community has good leaders.	○	○	○	○
19. It is very important to me to be a part of this community.	○	○	○	○
20. I am with other community members a lot and enjoy being with them.	○	○	○	○
21. I expect to be a part of this community for a long time.	○	○	○	○
22. Members of this community have shared important events together, such as holidays, celebrations, or disasters.	○	○	○	○
23. I feel hopeful about the future of this community.	○	○	○	○
24. Members of this community care about each other.	○	○	○	○

Appendix 9 – Pre-post intervention survey development

QUESTIONS OMITTED OR ADAPTED

Creating and maintaining a wellness environment in child care centres participating in the Child and Adult care Food Program (CACFP) (Lofton & Carr, 2010).

Section 1. Perception Statements		
Question #	Omitted	Amended
1	Physical activity	
3	Safety	
4		Refers to Australian recommendations
5	Safety	
6	Friendliness	
7	Physical activity	
9	Physical activity	
11, 13, 14		Refers to educators rather than staff
Section 2. Resources and Partnerships Practice Statements		
3, 4		Refers to educators rather than staff
5		Changed to an Australian context
6		Changed to refer to food

		and nutrition policy rather than 'wellness plan'
7	Not relevant to Australian context	
8	Wellness plan not appropriate to Australian context	
11		Health related amended to healthy eating related
Section 3. Healthy Environment Practice Statements		
2		100% juice excluded – water and milk are the recommended drinks
4		'Nutritious' foods defined with examples
5		'Healthy snacks' defined with examples
8		'healthy environment' amended to 'healthy eating environment'
9		Refer to educators rather than staff
10	Physical activity	
12		Examples given of what a healthy eating environment looks like

13		Refer to educators rather than staff
Section 4. Training Statements		
1, 7	Not appropriate to the Australian context	
11	Refers to illness	
15, 17		**Safety and sanitation amended to food safety and hygiene**
16, 20	Physical activity	
18	Effective communication	

Development and testing of a nutrition-teaching self-efficacy scale for elementary school teachers (Brenowitz & Reeves Tuttle, 2003).

Section 1. Efficacy Expectations		
Question #	Omitted	Amended
1, 2, 3, 4		Nutrition amended to healthy eating
5, 6		Food Guide Pyramid amended to Australian Dietary Guidelines
10, 12, 13		Merged into one question about balanced diet
9	Food safety	
Section 2. Outcome Expectations		

1,5		Nutrition amended to healthy eating
2, 3, 4, 5	About changing children's behaviours – not being measured in this study	

NOTE: Each efficacy and outcomes expectations question was replicated to include a statement about their colleagues, e.g.,

"I am confident in my ability to answer children's questions relating to healthy eating effectively"

AND

"I am confident in my colleagues ability to answer children's questions relating to healthy eating effectively".

Appendix 10 – Website Terms and Conditions

Terms and Conditions

1. I acknowledge that the nature of this website has been explained to me and that it is being used to inform a research project being conducted by Edith Cowan University and supported by Nutrition Australia (WA Division).
2. Any questions I have asked about the nature of this research have been answered to my satisfaction.
3. I understand that I may also contact the research team at any time if I have any ongoing questions about the research project.
4. I agree to participate in this study, realising that I may withdraw at any time.
5. I agree that research data gathered for this study may be published provided I am not identifiable.
6. I understand that this research project will run for approximately 12 months and that I will be asked to complete two questionnaires and I may be invited to participate in other research activities such as focus groups or interviews.
7. I understand that any interviews and focus groups that I agree to attend will be audio recorded; this recording will be erased once the interview is transcribed and my identity will not be disclosed in any publication of the research. I may also choose not to participate in any of these activities.
8. The **snac.** website is provided as a means of communication between people employed at Early Years Education and Care Services or Child Care Centres, and as a general information service.
9. Any advice given by members of the **snac.** website or information contained and posted on the website does not constitute professional advice and is in no way considered to be complete or accurate, nor does it take into account individual circumstances.
10. Any menu planning or healthy eating advice that the **snac.** website members might seek to rely on, should be considered in terms of their normal practices.
11. The opinions expressed on the **snac.** website are solely those of their author.
12. Whilst due diligence will be exercised to moderate this dialogue, this will be carried out at intervals by volunteers and researchers and there will be times when the **snac.** website contains dialogue which may not be moderated.
13. There is no Web Manager paid to take charge of the **snac.** Website.
14. Users of the **snac.** website agree to exonerate **www.snacwa.com.au**, ECU, all researchers, volunteers and fellow users from any liability arising from the operation of **www.snacwa.com.au.**

15. As a member of the **snac.** website you agree not to post messages that defame, threaten, solicit, offend, harass, embarrass or impersonate any other person. You also agree not to post messages that violate any persons' privacy or other rights. In particular, you agree not to make slanderous comments by disclosing the name of your co-workers. If you wish, you can make comments by referring to 'my colleague' in general.
16. You also agree that the **snac.** research team can make use of your comments on the website.
17. As a member of the **snac.** website you understand that all website activity is logged and IP addresses are recorded against each forum post made. Only the administrators can view this information for research and management purposes.
18. Members are not permitted to copy or publish any content or postings externally from the **snac.** website without the express permission of the Administrators.
19. You understand that by using the **snac.** website, you may be exposed to content that is offensive or objectionable. In this instance, you agree to exonerate**www.snacwa.com.au**, ECU, all researchers and volunteers from any liability arising from this exposure.
20. We reserve the right to withdraw or modify access rights at our sole discretion in the interests of more efficient and/or harmonious conduct of the website.
21. External links are provided for your convenience and for informational purposes only, but they are beyond the control of **www.snacwa.com.au** and no representation is made as to their content. Use or reliance on any external links and the content therein provided is at your own risk.
22. No hypertext links shall be created from any website controlled by you or otherwise to this website without the express prior written permission of an administrator of snacwa.com.au. Note that the **snac.** website will only allow links to the index page http://www.snacwa.com.au and not directly to and pages or content of the site.
23. These terms and conditions are subject to change and as such users of this site are advised to check them regularly.

Appendix 11 – Stage 2 Qualitative Analysis

Theoretical construct	Node	Sub-node
INDIVIDUAL	ROLES	
	KNOWLEDGE	Sources
		Role modelling
		Positive knowledge
		Poor knowledge
		Menus & Recipes
		Fussy Eating
		Fruit Fixation
		Discretionary foods
	BEHAVIOUR	Positive
		Negative
	ATTITUDES	Positive
		Negative
SOCIAL	SELF-EFFICACY	Low
		High
	COLLECTIVE	Low
		High
	OUTCOME	Low
		High
ORGANISATIONAL	RELATIONSHIPS	Supportive
		Unsupportive
	ALWAYS DONE IT THIS WAY	As a good thing
		As a bad thing
	PERCEPTIONS OF THE INDUSTRY	Internal
		External
POLICY	SNAC AS A TICK BOX	
	NQF A & R	
SENSE OF COMMUNITY	SOCIAL	Social ties
		Sense of belonging
		Networking/communicating
	PERSONAL	Status/reputation
		Social collective
		Efficacy
	COGNITIVE	
	HEDONISTIC	

Appendix 12 – Website Development Specifications Document

Appendix 2: SNAC Specifications Document

Geoffrey Chong

Nameless Nutrition

Specifications document

Table of Contents

1.0 Introduction

The project is to build a prototype website which will be used as part of Ruth Wallace's (the client) PhD study on "developing an online nutrition intervention for early years education staff to support healthy eating for children" (Ruth Wallace, 2012, p. 1).

¨The aim of this study is to firstly develop a website to assist early years education (EYE) staff to provide and promote an environment in which children's healthy eating practices/behaviours, food habits and preferences can be developed and maintained.¨ (Ruth Wallace, 2012, p. 5).

1.1 Project drivers

1.1.1 Team

Geoffrey Chong

Bch Sci Digital Media

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Amanjot Braich

Masters in Graphic Design

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1.1.2 Client

Ruth Wallace

BHSc, ANutr

PhD Candidate

Email: ruth.wallace@ecu.edu.au

1.1.3 Stakeholders

Leesa Costello

Email: l.costello@ecu.edu.au

Amanda Devine

Associate Professor Amanda Devine, *PhD, AN, RPHNutr.*

School of Exercise and Health Science.

Email: a.devine@ecu.edu.au

2.0 Project Scope

The proposed system will be an online platform for EYE staff to access childcare resources. EYE staff will be split into a control and research group where the research group will be given a social platform where they can share and discuss resources; and the control group will only be provided with a standard website of resources. The client will provide online activities in order to gauge the EYE staff's engagement with the content.

The online platform will provide a website which will enable the client to study the level of engagement of its users in 2 different scenarios:

- Informational website – The basic website will display a set of resources and links provided by the client. Primarily for the use of both control and research groups.

- Social forum – Users part of the research group are given an extra social forum with tools to share and discuss information and resources. The client will test the group's engagement in the form of activities (surveys, videos etc) on the forum.

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2.1 Functional Requirements

2.1.1 Invite-based registration

The system must only allow invited users to register. This is to prevent non-study related people from accessing the website and compromising the study.

2.1.2 Group restriction

The system must restrict the control group from accessing the research group's social platform. In order to have an accurate study, users in the control group should not be exposed to features in the research group.

2.1.3 Sharing content

The system must facilitate the research group members in contributing content (in various forms such as text, image, video, file attachments) for the reading of other research group members. The sharing of content will provide the research group with a more social experience towards the consumption of resources as well as a sense of community and social support.

2.1.4 Activities

The system must allow the client to post activities such as quizzes/surveys, videos, podcasts and tasks to research group members. In order to measure the research group's engagement with the shared content, activities are required.

2.1.5 Website

The system must have a website which allows both groups to access resources. This will be the central website which holds all the online resources available to the control and research group, however, the control group are restricted to only this website.

2.1.6 Engagement measure

The system must show statistics on various aspects of the website. Including (but not limited to) what pages users visit, what users answer in activities, and what users post. As the study relies heavily on numbers/statistics, this function is required in order to study the users.

2.1.7 Moderation

The system must provide a moderation tool for both the users (to flag inaccurate/inappropriate content) and the client (to remove content).

2.2 Non-functional requirements

2.2.1 Privacy

The system should keep all sensitive information private. No one but the user themselves and the client will be given access to their information.

2.2.2 Extensibility

The system should be extendable with extra features and customisations. Using a commonly known and supported coding language/platform (such as PHP) will provide room for future extensions.

2.2.3 Security

The system should be secure. No unauthorized users should be given access to the system. Users will be checked if they are logged in at every page and will be automatically logged out after a period of inactivity.

2.2.4 Legal

The system should only contain resources, tools and information provided by the researcher will be reliable and accurate and aims to assist Early Years Education and Care centres to meet or exceed the

nutritional requirements of Quality Area 2 of the National Quality Framework.

3.0 Assumptions

3.1 Content

All the written content (resources etc.) will be provided for use on the website.

3.2 Activities

The client provides all media required for activities.

Appendix 13 – Stage 2 Informed Consent document

Information and consent; Terms & Conditions

SCHOOL OF EXERCISE & HEALTH SCIENCES
For all queries, please contact:
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ABN 54 361 485 361 CRICOS IPC 00279B

Information Letter to Participants

Developing an online nutrition intervention for early years educators to support healthy eating for children – Stage 2

This is an invitation to participate in an exciting study which aims to promote a healthy eating environment within the early years education and care setting.

This new research project means that you, as an early years educator, will have exclusive access to an exciting new website called *snac* (Supporting Nutrition for Australian Childcare). This website provides recipe ideas, tools and resources, nutrition information, online activities and discussion forums. The *snac* website will also help you to connect with other early years educators from other centres, share ideas, learn from others experiences and to seek help when it might be needed.

The *snac* website will assist early years educators to provide and promote an environment in which children's healthy eating practices and behaviours, food habits and preferences can be developed and maintained and may also assist centres to meet or exceed the specific healthy eating requirements of the new National Quality Framework (NQF, 2012) through their use of this site.

While we hope you will participate in this study, you are under no obligation to accept this invitation and participation is entirely voluntary. If you do choose to participate, please read the details below and ensure that you understand the information provided.

If you have any questions, please contact the coordinator for this study, Ruth Wallace (0408 097190) or Associate Professor Amanda Devine (6304 5527), both from the School of Exercise and Health Science (Faculty of Computing, Health & Science). This research project is being undertaken as part of the requirements of a PhD at Edith Cowan University.

Why is this study important?

Childhood nutrition is of vital importance for optimal physical, social and emotional development and whilst most Australian children are thriving there are concerns about issues such as overweight and obesity, nutrient deficiencies, dental caries and food safety. Furthermore, the habits and preferences developed in childhood remain through to adulthood and can affect health in later life.

Under the new National Quality Framework (NQF) all early years educators are required to hold or work towards a relevant childcare qualification which does incorporate some elements of nutrition training. However, it appears that the focus of the training is food hygiene and preparation, with little emphasis on nutrition knowledge and role modelling skills. Thus this study aims to add value to the statutory training by helping early years educators improve their nutrition knowledge and skills so that a healthy eating environment for the children in their care may be promoted, developed and maintained.

What does this study entail?

This study is being conducted in 2 stages. This information letter describes the second stage of the study. If you took part in the first stage of the study (a face to face or telephone interview), you were supplied with a separate information letter and signed a separate consent form.

For this stage of the study, you are being invited to access the *snac* website and participate in any of its activities and resources that interest you. You will nominate your own user name and password, at which time you will gain access to all of the site's functionality, including any online activities, recipe databases and discussion boards.

Whilst the way in which you use the website is entirely up to you, we do request that you complete an online questionnaire which will be emailed to you after your first login. At the end of the project, after about 12 months, we will then ask you to complete another questionnaire. This is one of the most important aspects of our data collection because it will help us to determine if the *snac* website has been useful and what may be needed to provide more support to workers in early years education and care centres. These questionnaires should take no more than 20 minutes each to complete.

You may want to contribute to the discussion board on the website. Any discussions within the discussion board may be transcribed and analysed for research purposes. Any information we analyse in this way is kept highly confidential. If any of the comments you make on the discussion board are used in research publications, pseudonyms are used to protect your identity and conversation threads are often changed to protect any sensitive information. Web analytics will also be collected and analysed. Finally, you may also be invited to attend a focus group or take part in a telephone interview at the end of the study (approximately 12 months after commencement). These discussions will take approximately 30-60 minutes to complete and will be audio-recorded for ease of transcription.

Benefits of participation

By taking part in the second stage of the study, you will have access to the *snac* website and associated resources as well as online activities and the discussion board. This will benefit you by giving you networking opportunities and the chance to chat with people who share your professional interests. You will also be able to learn from others experiences and be able to share yours to help others. There will be a multitude of recipe resources for you to tap into, as well as access to easily accessible online activities which will refresh your nutrition knowledge.

Access to the discussion board will enable you to take part in conversations about nutrition issues (and other topics) with staff from other early years education and care centres. The site will be moderated to ensure that content and conversations are ethical and responsibly managed. This means that the website will be a safe and secure environment where you will be able to exchange ideas, gain support and increase your knowledge. The website, online activities and discussion board will be available 24/7, and are freely available on the worldwide web to you as a participant in this study.

Are there any risks?

There are no known risks associated with this study.

Results from Stage 1 of the research study

The results from the first stage of this study have been used to inform the development of an online nutrition intervention comprising of a website, online activities and discussion board, in consultation with key stakeholders.

Voluntary participation

You are a volunteer and do not have to agree to take part in focus groups or telephone interviews, complete the questionnaire or use the website and its associated resources. No explanation or justification is required if you choose not to participate and the decision not to participate will not disadvantage you, or involve any penalty.

Withdrawing consent to participate

You are free to withdraw your consent to further involvement in the research project at any time or withdraw your consent to allow us to use any information or material that has already been collected.

Confidentiality

Your privacy and confidentiality about the information you provide and the questionnaire, discussion board, focus group and interview data will be respected at all times. You will be allocated an identification number that will remain confidential to the Chief Investigator and research team. Your data will be recorded using this identification number. All data,

including names and codes downloaded from the website, will be stored in a locked room in a locked filing cabinet at the School of Exercise and Health Science, Edith Cowan University and destroyed five years after the research is completed.

Questions and/or further information

If you have any questions or require any further information about the research project, please contact: Associate Professor Amanda Devine on 6304 5527, Dr Leesa Costello on 6304 5459 or Dr Johnny Lo on 6304 5027.

Approval by the Human Research Ethics Committee

This project has been approved by the Edith Cowan University Human Research Ethics Committee (HREC approval number 8727).

Independent contact person

If you have any concerns or complaints about the research project and wish to talk to an independent person, you may contact:

Research Ethics Officer
Edith Cowan University
270 Joondalup Drive
JOONDALUP
WA 6027
Phone: (08) 6304 2170
Email: research.ethics@ecu.edu.au

I understand that:

1. I am not obliged to participate in this study

2. I have been informed of and understand the purposes of this study

3. I have the right to ask any questions before or during the study

4. The information collected from me for this study will be used for health research purposes

5. Any information collected from me will not be revealed to any third party without my permission

6. I understand that focus group discussions and telephone interviews will be audio-recorded for transcription purposes

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7. I have the right to withdraw my consent to the use of information collected about me at any time, without giving reasons, and without fear of prejudice or negative consequences

8. Research data gathered from the results of this study may be published, but my name or identity will not be revealed

9. I agree to participate in this study as outlined to me

10. I understand that if I am not an early years educator and subsequently am allocated read only access rights, I do not form part of this research study, and do not need to provide informed consent. I do, however agree to be bound by the terms and conditions applicable to this website.

☐	**I HAVE READ AND UNDERSTOOD THE INFORMATION AND CONSENT TO TAKING PART IN THIS RESEARCH STUDY**

Terms and Conditions

1. I acknowledge that the nature of this website has been explained to me and that it is being used to inform a research project being conducted by Edith Cowan University and supported by Nutrition Australia (WA Division).
2. Any questions I have asked about the nature of this research have been answered to my satisfaction.
3. I understand that I may also contact the research team at any time if I have any ongoing questions about the research project.
4. I agree to participate in this study, realising that I may withdraw at any time.
5. I agree that research data gathered for this study may be published provided I am not identifiable.
6. I understand that this research project will run for approximately 12 months and that I will be asked to complete two questionnaires and I may be invited to participate in other research activities such as focus groups or interviews.
7. I understand that any interviews and focus groups that I agree to attend will be audio recorded; this recording will be erased once the interview is transcribed and my identity will not be disclosed in any publication of the research. I may also choose not to participate in any of these activities.

8. The *snac* website is provided as a means of communication between people employed at Early Years Education and Care Services or Child Care Centres, and as a general information service.

9. Any advice given by members of the *snac* website or information contained and posted on the website does not constitute professional advice and is in no way considered to be complete or accurate, nor does it take into account individual circumstances.

10. Any menu planning or healthy eating advice that the *snac* website members might seek to rely on, should be considered in terms of their normal practices.

11. The opinions expressed on the *snac* website are solely those of their author.

12. Whilst due diligence will be exercised to moderate this dialogue, this will be carried out at intervals by researchers and volunteers and there will be times when the *snac* website contains dialogue which may not be moderated.

13. There is no Web Manager paid to take charge of the *snac* website.

14. Users of the *snac* website agree to exonerate www.snacwa.com.au, ECU, all researchers, volunteers and fellow users from any liability arising from the operation of www.snacwa.com.au.

15. As a member of the *snac* website you agree not to post messages that defame, threaten, solicit, offend, harass, embarrass or impersonate any other person. You also agree not to post messages that violate any persons' privacy or other rights. In particular, you agree not to make slanderous comments by disclosing the name of your co-workers. If you wish, you can make comments by referring to 'my colleague' in general.

16. You also agree that the *snac* research team can make use of your comments on the website.

17. As a member of the *snac* website you understand that all website activity is logged and IP addresses are recorded against each forum post made. Only the administrators can view this information for research and management purposes.

18. Members are not permitted to copy or publish any content or postings externally from the *snac* website without the express permission of the Administrators.

19. You understand that by using the *snac* website, you may be exposed to content that is offensive or objectionable. In this instance, you agree to exonerate www.snacwa.com.au, ECU, all researchers and volunteers from any liability arising from this exposure.

20. We reserve the right to withdraw or modify access rights at our sole discretion in the interests of more efficient and/or harmonious conduct of the website.

21. External links are provided for your convenience and for informational purposes only, but they are beyond the control of www.snacwa.com.au and no representation is made as to their content. Use or reliance on any external links and the content therein provided is at your own risk.

22. No hypertext links shall be created from any website controlled by you or otherwise to this website without the express prior written permission of an administrator of snacwa.com.au. Note that the *snac* website will only allow links to the index page http://www.snacwa.com.au and not directly to and pages or content of the site.
23. These terms and conditions are subject to change and as such users of this site are advised to check them regularly.

☐   **I AGREE TO THESE TERMS AND CONDITIONS**

Appendix 14 – Example of resource

snac.

NEW LIFE ON LEFT OVER VEG

Veggie pesto sauce for pizza bases or pasta sauce
Add basil or spinach, parmesan cheese and pine nuts then blitz with a small amount of oil (olive or canola)

Frittatas
Grate those left over veggies into an egg mixture, add herbs for flavour and bake in muffin tins or cake tins (can be frozen)

Vegetable pie
Use a gravy or cheese sauce, mix with the left over veggies, place in an oven proof dish, and cover with a few layers of filo pastry.

Veggie soup
Cook off an onion and a couple of cloves of garlic, add left over veggies and reduced salt vegetable stock. Cook through, then blitz with a stick blender.

Vegetable stock
Use firm leftover vegetables such as pumpkin or potato. Cut an onion in half, add a bay leaf and a small handful of peppercorns. Place leftover vegetables in a pot and fill with water, slowly bring to a simmer (but do not boil) and leave until the water tastes like vegetables.

Arancini balls
Cook off some rice to a sticky consistency. Chop or mash the leftover veggies. Place a bed of rice on the palm of your hand, then place vegetables in the middle of the rice. Form the rice into a ball around the veg and coat with breadcrumbs. Spray with a little oil and bake in the oven.

Roast vegetable pasta with minted yoghurt dressing
Cook off some wholemeal pasta. Warm the leftover veggies and mix through the pasta. To make the dressing, chop some mint and stir through natural yoghurt - pour the yoghurt dressing over the pasta mix.

Appendix 15 – Stage 2 flyer

Ruth Wallace
BHSc (Hons), ANutr
PhD Candidate
ECU Joondalup
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0408 097 190

Appendix 16 – Recruitment and engagement strategies

RECRUITMENT/ENGAGEMENT STRATEGIES

CENTRE VISITS/PRESENTATIONS (TO NOVEMBER 2014)

DATE	CENTRE	PURPOSE
29.06.2013	Nourish menu planning workshop and training forum	Highlight imminent website launch, collected expressions of interest.
10.08.2013	Wind in the Willows, Bassendean	Present prize
17.08.2013	Cloverdale CCC	Present prize
27.09.2013	Goodstart East Perth	Meeting with manager – site features
14.10.2013	Sudbury House, Mirrabooka	Staff presentation
17.10.2013	Magic Cottage, Geraldton	Telephone meeting site orientation
28.10.2013	Goodstart East Perth	Presentation to families – fussy eating
29.10.2013	Nourish menu planning workshop, Joondalup	Promoted SNAC
30.10.2013	Kids Corner, Munster	Staff presentation
19.11.2013	Play & Learn, Southern River	Staff presentation/training
28.11.2013	Family Day Care Association	Presentation at coordinators meeting

	WA, Cannington	
15.01.2014	Noranda CCC	Meeting with director
28.01.2014	Craigie CCC, Beldon ELC, + Great Beginnings – joint function	Staff presentation
28.04.2014	Goodstart Merriwa	Staff Presentation
02.05.2014	Goodstart Merriwa	Open Day – Nutrition Australia information stall and food
20.05.2014	Carewest Quarterly Directors meeting, Bassendean	Presentation to directors
24.06.2014	Goodstart Early Learning Seeds for Change conference, Mandurah	Presentation
10.10.2014	Goodstart Merriwa	Families Week – Nutrition Australia information and food
28.11.2014	Maragon ELC, Mirrabooka	Staff presentation

EMAILS/NEWSLETTERS (TO JULY 2014)

31/07/2013	VIP invitation to Nourish attendees	

01/08/2013	Emailed invitation to all WA centres	
05/08/2013	Follow up to VIP invitation Consultancy group circulate flyer	
06/08/2013	VIP individual email invitation to educators who gave Stage 1 interview	
15/08/2013	New users welcome	
29/08/2013	SNAC update	
13/09/2013	SNAC update	
13/09/2013	Emailed ECA and ARACY re distributing/publishing flyer	
16/09/2013	PD sessions flyer emailed to users	
27/09/2013	Repeat VIP invitation to Nourish attendees	
03/10/2013	Picasso cow *competition* launch	
16/10/2013	Picasso cow flyer emailed	
29/10/2013	Nourish workshop	
30/10/2014	Emailed attendees SNAC invitation Presentation at Kids Corner, Munster	
05/11/2013	Reminder to all users sent a Picasso cow	

06/11/2013	Newsletter	
20/11/2013	Follow up email to Play & Learn presentation Emailed managers with slides	
20/11/2013	Follow up Nourish workshop	
20/11/2013	Newsletter Invitation to register	
21/11/2013	Meeting with Maria Bernhagen	
25/11/2013	Chased up missing cows	
25/11/2013	Chased Play & Learn	
26/11/2013	Menu review for Play & Learn Newsletter	Mailchimp
29/11/2013	Emailed Stage 1 interviewees not already registered	
02/12/2013	User poll	
06/12/2013	Newsletter	Looking for champions
11/12/2013	Reminder to Play & Learn Newsletter	

18/12/2013	Christmas newsletter	User poll
20/12/2013	Picasso cow winner	
07/01/2013	Play & Learn reminder	
08/01/2014	Newsletter	New recipes and resources
22/01/2014	Newsletter Recruitment email to WA centres	Seeds for Schools
11/02/2014	Newsletter	Thank you SNACers
19/02/2014	Newsletter	Introduce yourself
25/02/2014	Newsletter	Food myths busted
05/03/2014	Newsletter	Pumpkin season
06/03/2014	Recruitment email WA centres	
12/03/2014	Newsletter	Nutrition videos launched
19/03/2014	Newsletter	Upload your avatar
24/03/2014	NAWA AGM invitation	
25/03/2014	Newsletter	Cultural food traditions
02/04/2014	Newsletter	Children's birthdays
08/04/2014	NAWA AGM	

09/04/2014	Newsletter	Healthy Easter alternatives
15/04/2014	Newsletter	Creative Easter Ideas
30/04/2014	Newsletter	Healthy book list
01/05/2014	Recruitment email WA centres	
06/05/2014	Newsletter	Very Hungry caterpillar
09/05/2014	Regulars plea	
13/05/2014	Newsletter	National Families Week
14/05/2014	Recruitment email SA centres	
20/05/2014	Newsletter	National Families Week
27/05/2014	Newsletter	LDCPDP
03/06/2014	Newsletter	Favourite SNAC recipes
10/06/2014	Newsletter	Favourite SNAC recipes
13/06/2014	SNAC recipe competition	
17/06/2014	Recruitment WA & SA centres	
18/06/2014	Eat a rainbow competition	
25/06/2014	Newsletter	I'm having a rainbow for dinner

02/07/2014	Newsletter	Nutrition activities for educators

Appendix 17 – Member survey

SNAC feedback survey

Q1 This is a brief survey about the 'Supporting Nutrition for Australian Childcare' (SNAC) website, which has been designed specifically for early years educators and other early years staff. In order that the website can be improved and continue to offer you the tools and resources to provide a healthy eating environment for children, please complete the following survey. Please answer all questions honestly, remembering that there are no right or wrong answers and that the information you provide will remain confidential.   You can access the website at www.snacwa.com.au

Q2

_____ How familiar are you with the SNAC logo? (1 being not very familiar; 10 being very familiar) (1)

Q3 Thinking specifically about the SNAC website, how likely are you to:

	Very Unlikely (1)	Unlikely (2)	Undecided (3)	Likely (4)	Very Likely (5)
Revisit the SNAC website on a regular basis? (1)	○	○	○	○	○
Recommend the SNAC website to another early years professional? (2)	○	○	○	○	○

Q4 How did you hear about the SNAC website?

○ I was emailed an invitation (1)
○ From a colleague (2)
○ From another early years organisation, e.g., Early Childhood Australia, Child Australia (3)
○ Through a search engine, e.g., Google (4)
○ Followed a link from another website (5)
○ Other (6) _____

Q5 How often do you visit the SNAC website?

○ Daily (1)
○ 2-3 Times a Week (2)
○ Once a Week (3)
○ 2-3 Times a Month (4)
○ Once a Month (5)
○ Less than Once a Month (6)
○ Never (7)

Q6 How would you rate the following resources and tools available on the SNAC website? www.snacwa.com.au

	Excellent (1)	Very Good (2)	Good (3)	Fair (4)	Poor (5)
Support - fact sheets, links to other sites (1)	○	○	○	○	○
Nutrition - recipes (2)	○	○	○	○	○
Activities - videos, quizzes (3)	○	○	○	○	○
Community - discussion boards, forums (4)	○	○	○	○	○

Q10 Are there any particular nutrition or healthy eating issues at your centre?   (Please write your answer below)

Q11 Are there any healthy eating topics of interest to you, that you would like to see covered on the SNAC website? (please write your answer below)

Q13 Is there anything about the SNAC website that makes it difficult for you to use? (Please write your answer below)

Q12 Thank you for taking the time to complete this survey.   If you would like to enter the draw to win a $50 Coles/Myers gift card, please enter your name and email address below.   Otherwise, please click end to finish this survey.

Appendix 18 - Publications

Feb 2013	Early Childhood Australia, Webwatch newsletter	Seeking participants for stage 1
Sept 2013	CAWA E-newsletter	Website promotion
Oct 2013	Early Childhood Australia, Webwatch e-newsletter	Website promotion
Oct 2013	ABC Goldfields, radio interview	Website promotion
Oct 2013	Joondalup Times Community Newspaper, Guest columnist	Website promotion
Nov 2013	Cockburn Gazette Community Newspaper, article about centre visit	Website promotion
December 2013	Belonging Early Years Journal, Australian Childcare Alliance	Article
February 2014	Belonging Early Years Journal, Australian Childcare Alliance	Recipe
March 2014	Early Childhood Australia , Webwatch e-newsletter	Website promotion
March 2014	Early Childhood Education & Care QLD, share on FB	
March 2014	Family Day Care Matters, weekly newsletter	Website promotion
April 2014	Secretariat of National Aboriginal and Islander Child Care (SNAICC), E-newsletter	Website promotion
April 2014	Care4Kids, Childcare Industry news	Website promotion
June 2014	Early Childhood Australia, Tasmania Branch, Newsletter	Website of the month
June 2014	NSW Family Day Care Association, Resource sheet in newsletter	Website Promotion
June 2014	Childcare Association of WA (CAWA), Childcare Insight (newsletter)	Website Promotion
December 2014	Dietitian Connection DAA Newsletter	E-newsletter
December 2014	PHAA Newsletter In Touch	E-newsletter
February 2015	Child Times, Child Australia	Article

Appendix 19 – Example Newsletter

Go Bananas!

For a child's mind and body to develop to its full potential, it's vital they are energised with nutritious snacks. With five million being eaten each day, the banana is the most popular energy snack in the country!

The natural fruit sugars found in bananas provide sustained energy for toddlers, keeping both their mind and body active. After digestion, the glucose becomes the main fuel for muscles and the brain throughout the day.

Bananas are also a good source of folate, vitamin B6, fibre, vitamin C and potassium. These vitamins contribute to the normal growth and development of toddlers; with B6 needed for healthy blood cells and nerves, vitamin C for immune function and bone growth, and folate which is incredibly important in producing new brain and muscle cells.

And, of course, with none of the added fat, salt and sugar found in many commercial snacks – that makes the banana one seriously healthy morning or afternoon tea!

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Appendix 20 Picasso Cow Competition Flyer

Appendix 21 – Discussion board topics and posts

ACTIVITIES TO SUPPORT HEALTHY EATING					
Date	**Creator**	**Topic**	**Voices**	**Comments**	
24/06/2013	RW	Ideas for activities	4	4	
24/06/2013	RW	Menu Planning	1	1	
20/08/2013	RW	Food Safety Training	1	1	
07/10/2013	RW	Picasso Cows	10	41	
27/08/2013	RW	Treasure Boxes	1	1	
05/09/2013	RW	Nourish Interactive	1	1	
13/09/2013	RW	Seasonal fruits and veggies	1	1	
25/09/2013	RW	SNAC Orientation	2	4	
13/01/2014		Healthy Weight Week	2	2	
09/12/2013	RW	New Fact Sheets	2	2	
29/01/2014	RW	Craigie Childcare Centre	1	1	
29/01/2014	RW	Craigie Childcare Centre	2	2	

17/02/2014	RW	Early Sprouts	1	1	
06/12/2013	RW	Celery painting	5	10	
11/03/2014	Member (KS)	The vegetable basket	2	2	
10/02/2014	RW	Encouraging children to eat vegetables	4	6	
31/03/2014	Member (GM)	Fruit and Veg week	2	2	
24/03/2014	RW	How to make every bite count	2	3	
24/03/2014	RW	Tot it up App	1	1	
09/04/2014	AVR	Healthy alternatives to chocolate this Easter	8	16	
09/05/2014	RW	Very Hungry Caterpillar activity	3	3	
28/05/2014	AVR	Healthy Booklist	7	13	
01/04/2014	AVR	How do you celebrate your children's birthdays?	19	14	

Date		Title			
26/05/2014	RW	Professional development fund – are you applying?	4	3	
02/07/2014	RW	Nutrition activities for educators	1	1	
01/07/2014	RW	Grow a little happiness	2	3	
11/06/2014	RW	What is your policy if a child refuses their meal?	7	11	
18/06/2014	RW	COMPETITION! I'm having a rainbow for dinner	11	21	
03/09/2014	RW	Fruit & veg September	1	1	
05/09/2014	RW	RefreshEd	1	1	
12/09/2014	RW	Cook. Eat. Enjoy	1	1	
08/01/2014	RW	Plant Investigators	2	3	First reply not until September 2014
30/09/2014	AVR	Spring into Action	3	4	

14/10/2014	AVR	Celebrating Children's week	6	12	
14/10/2014	AVR	Halloween the healthy way	3	3	
20/08/2013	RW	Power of Mushrooms	3	7	First reply not until Jan 2014
27/08/2014	RW	Building unbeatable bones with dairy foods	6	20	
12/11/2014	RW	Roy Royce – making healthy choices	6	10	
26/11/2014	AVR	SNAC Christmas Cookbook	30	8	
23/02/2015	AVR	Nutrition Resource pack for parents	11	10	
16/05/2014	RW	Seeds for Schools update	5	2	
03/03/2015	AVR	Role playing to support food literacy in 4-8 year olds	3	3	

ASK THE NUTRITIONIST					
24/06/2013	RW	Milk	2	2	
24/06/2013	AD	Lactose Intolerance	2	2	
22/08/2013	RW	Teach kids about nutrition! Get them to eat more veg!	2	3	
22/08/2013	RW	Questions about childhood nutrition?	1	1	
22/08/2013	RW	Allergies	1	1	
05/11/2013	RW	Gluten and dairy free recipes	4	6	
09/10/2013	RW	Are avocados a fruit or a veg?	5	3	
13/09/2013	RW	Beat Vitamin D deficiencies with mushrooms	2	3	
19/11/2013	RW	Sugar and sweeteners	8	5	
19/12/2013	RW	Pocket guide to food choices	1	1	

22/01/2014	Member GSM	Cereal nutritional value	3	3	
19/02/2014	RW	Food label reading	1	1	
25/02/2014	RW	Food myths busted	6	12	
19/03/2014	RW	Coeliac awareness week	1	1	
01/04/2014	Member SMC	Times of meals in childcare	13	8	
05/04/2014	RW	Ask the nutritionist	1	1	
09/05/2014	RW	Is it OK to eat the wax on apples	2	2	
20/06/2014	Member OBWW	Bruising	2	2	
20/06/2014	RW	Does an apple a day keep the doctor away?	3	2	
25/07/2014	RW	Peanuts	1	1	
31/07/2014	RW	Did you know avocados could be frozen?	2	6	

03/11/2014	RW	Apple and cheese after a meal	4	4	
12/01/2015	RW	WATER	1	1	
19/11/2013	RW	Ask the nutritionist	11	4	
06/02/2015	RW	Would you like your recipe/meal checked?	1	1	
DISCUSSIONS ABOUT RECIPES & MENUS					
19/07/2013	RW	Bean hotpot	1	1	
15/07/2013	RW	Sultana Scones	2	2	
13/09/2013	RW	More new recipes	4	2	
13/10/2013	RW	Cheesy tuna and vegetable bake	2	2	
13/10/2013	RW	Vegetarian recipes	1	2	
13/10/2013	RW	Easy recipes	2	2	
13/10/2013	RW	Wholemeal blueberry muffins	1	1	
09/07/2013	RW	New recipes	3	5	
19/11/2013	RW	New recipes loaded	2	3	

19/11/2013	RW	More new recipes loaded!	1	2	
19/12/2013	RW	New recipes	1	1	
19/12/2013	RW	New zucchini slice recipe	2	3	
09/12/2013	Member JB	Passionfruit cake	3	3	
19/02/2014	RW	Chicken and pumpkin couscous	1	1	
10/02/2014	RW	Food for Easter	3	5	
10/02/2014	RW	Vegie dots	2	3	
26/11/2013	RW	Chocolate and zucchini muffins	7	4	
21/02/2014	Member BCC	Breakfast options at a daycare service	6	3	
21/02/2014	RW	Banana toasties	4	3	
19/03/2014	RW	Slow cooker chicken noodle soup	1	1	
24/06/2013	test	Menu planning	12	28	Last post

					11/04/2014
24/03/2014	AVR	Cultural food traditions	11	8	
20/04/2014	Member KS	Thanks for last nights session	2	2	
05/03/2014	RW	Give us your favourite pumpkin recipes	10	26	
25/04/2014	Member CS	Cheese themed mini book suggestion	2	3	
25/05/2014	RW	Ideas for morning and afternoon tea	1	1	
19/05/2014	RW	Allergies	3	4	
14/07/2014	RW	Oranges and mandarins in season	3	4	
08/01/2014	RW	New recipes!	5	14	
01/06/2014	AVR	Most loved SNAC recipes	8	15	
27/06/2014	RW	Passionfruit in season	1	1	
27/07/2014	RW	Moroccan meatballs and vegetable couscous	1	1	

Date	Author	Title	Col1	Col2	
01/05/2014	RW	Menu reviews – a short video	2	3	
21/07/2014	RW	Go bananas!	4	15	
24/08/2014	Member TG	Healthy drinks	2	4	
13/10/2014	Member KS	Warm chicken salad	2	3	
03/10/2014	RW	Morning and afternoon tea ideas after school care	5	14	
14/10/2014	AVR	Strawberries in season	3	5	
12/02/2015	RW	Discretionary food items	1	1	
20/01/2015	RW	Food budgets	8	4	
GENERAL – INTRODUCE YOURSELF					
01/08/2013	RW	Hi! My name is Ruth	1	1	
13/08/2013	Member MCC	Hi	2	2	
01/08/2013	AD	Hello everybody	1	1	

01/12/2013	Member KS	Gluten free	2	2	
15/01/2014	Admin	Hey!	2	2	
15/01/2014	RW	Growing the SNAC community – upload an image	1	1	
02/12/2013	RW	Growing the SNAC community	2	4	
20/11/2013	RW	Play & Learn Introduce yourself	25	12	
26/02/2014	RW	And the winner is…	5	2	
18/03/2014	RW	Introducing myself	8	13	
GENERAL – HOT NEWS TOPICS					
01/08/2013	RW	Record number of children attend Australian childcare	1	1	
01/09/2013	RW	$450 million promised for before and after school care	1	1	
01/09/2013	RW	CEO of Goodstart calls	1	1	

		for cash boost to fund childcare workers pay rise			
01/09/2013	RW	Talking to children at mealtimes boosts their confidence	1	1	
01/10/2013	RW	ACECQA announce new education and care qualifications	1	1	
01/10/2013	RW	Food myths – the real truth	1	1	
09/10/2013	RW	National Nutrition Week 2013	2	3	
13/09/2013	AD	Jamie Oliver's new show	8	4	
01/11/2013	RW	Bananas in season	1	1	
01/11/2013	RW	Nudge children to eat more veggies	1	1	
19/12/2013	RW	WA childcare centres get the lowest rating	2	3	

19/01/2014	RW	Coalition to axe pay rise for 30,000 childcare workers	2	3	
19/02/2014	RW	Push to increase numbers of children attending childcare	1	1	
19/03/2014	RW	Mealtimes family style teaches children to recognise hunger cues	2	3	
19/03/2014	RW	Why kids don't like veggies and how to change it	1	1	
27/11/2013	RW	Do you have breakfast every morning?	7	16	
18/03/2014	RW	Harmony Week	2	4	
19/05/2014	RW	National families week	5	9	
12/06/2014	RW	Giving children a taste for veggies often and early	2	3	
26/06/2014	RW	Healthy food star rating system	1	1	

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19/07/2014	RW	Lunchtime is more than eating	2	3	
08/09/2014	RW	Early Childhood Educators Day	1	1	
01/09/2014	RW	RU OK day	1	1	
20/10/2014	RW	Male childcare workers under scrutiny	1	1	
07/11/2014	RW	Healthy Fundraising ideas	1	1	
20/11/2014	RW	How much should you let a child eat?	1	1	
19/12/2014	RW	FESTIVE GREETINGS	1	1	
04/03/2015	Member KS	Nana's Berries	2	3	
GENERAL – ANYTHING GOES					
01/09/2013	RW	Welcome	1	1	
01/09/2013	RW	Please share this website with your colleagues	1	1	

01/10/2013	RW	Welcome to Monday	1	1	
01/10/2013	RW	Strawberries in season	1	1	
01/11/2013	Member	Our Cow	2	2	
01/12/2013	RW	Christmas is coming	2	3	
01/12/2013	RW	Anaphylaxis e-training	1	1	
20/12/2013	RW	Merry Christmas1	1	1	
12/01/2014	RW	Happy New Year	1	1	
19/01/2014	Member	Creamy sauce made easy	2	2	
25/01/2014	RW	Happy Australia Day	1	1	
20/02/2014	Member	Thank you	2	2	
20/02/2014	RW	User poll	1	1	
20/02/2014	RW	Have a great weekend	1	1	
12/08/2013	RW	Welcome to SNAC	3	5	
19/03/2014	RW	Have a great weekend	1	1	
19/03/2014	Member	Games	2	2	
19/03/2014	RW	The winner is	3	2	

19/03/2014	RW	COMPETITION!	1	1	
26/03/2014	Member	Lunchboxes	2	2	
26/03/2014	RW	Avatar Winner	1	1	
23/04/2014	RW	Anzac day	5	3	
01/05/2014	RW	Healthy eating- whose responsibility?	5	3	
02/05/2014	RW	Happy Mother's Day	1	1	
10/05/2014	RW	Nutrition Education	1	1	
25/05/2014	RW	I found this great website	2	2	
25/06/2014	RW	Welcome to SNAC	3	2	
25/07/2014	RW	I need your help!	1	1	
12/11/2014	RW	Onions make me cry	1	1	
19/11/2014	RW	Eating with chopsticks	2	2	
19/01/2015	RW	Chickens	2	2	

Appendix 22 – Child daily food serves recommended whilst at child care

FOOD GROUP	DAILY SERVES REQUIRED AT CHILD CARE[a]	EXAMPLE OF ONE SERVE[b]
Grains, cereals (mostly wholegrain)	2 serves	1 serve = 1 slice bread, ½ cup pasta or rice (cooked), 3 crispbreads, 1 small muffin
Vegetables (and legumes/beans)	1.25 serves (approximately 95g)	1 serve = 75g 1 cup salad vegetables, ½ cup cooked vegetables, ½ potato
Meat/meat alternatives	1 serve	100g raw meat or poultry 115g raw fish 2 large eggs 1 cup cooked/canned legumes/beans
Dairy	0.75 serve	250ml milk 40 g hard cheese 200g yoghurt
Fruit	0.5 serve	1 serve = 150g (e.g., 1 apple,

		banana, orange, pear) 1 cup canned fruit
Other foods – unsaturated spreads and oils	0.5 serve	5g polyunsaturated or monounsaturated spread, 3.5g olive or canola oil
Discretionary foods[c]	Foods high in total fat, saturated fat, added sugar, sodium, low in fibre	Should not be offered as part of the normal menu

(National Health and Medical Research Council [NHMRC], 2013)

Appendix 23 – Pre-post intervention survey results

Q	PERCEPTIONS	PRE-INTERVENTION %				POST-INTERVENTION %				N	p-value*
		SD	D	A	SA	SD	D	A	SA		
1	Important that healthy food served to children	.5	1.0	28.8	69.6	0.0	0.5	22.5	77.0	191	0.059
2	Healthy food is served to children	.5	4.7	42.9	51.8	0.0	2.1	38.7	59.2	191	0.058
3	Meals and snacks meet NQF requirements	.5	5.8	44.5	49.2	0.0	2.6	37.2	60.2	191	0.008
4	Age appropriate serves of food are served	1.0	5.8	42.4	50.8	0.0	2.1	40.8	57.1	191	0.042
5	Age appropriate nutrition education activities are utilised	.5	7.9	54.5	37.2	0.0	3.7	46.6	49.7	191	0.004
6	Educators role model appropriate mealtime behaviours	1.0	5.2	44.0	49.7	.5	2.6	43.5	53.4	191	0.267
7	Nutrition education is provided to children	1.0	7.9	52.9	38.2	0.0	4.7	42.4	52.9	191	0.005
8	Healthy eating information is provided to parents	1.6	12.6	50.8	35.1	1.0	4.7	47.1	47.1	191	0.002
9	Healthy eating activities and special events supported in community	1.0	15.2		33.0	1.0	7.3	48.2	43.5	191	0.009
10	Parents participate in healthy eating promotional events	3.7	33.5	44.5	18.3	1.6	26.2	51.3	20.9	191	0.107
	RESOURCES/PARTNERSHIPS										
11	Training is provided to educators on healthy eating issues	2.7	20.4	52.2	24.7	.5	15.6	50.0	33.9	181	0.016
12	Resources are available to teach children about nutrition	1.6	6.5	62.4	29.6	.5	6.5	52.7	40.3	181	0.061
13	Educators are trained how to model healthy eating behaviours	2.2	23.1	47.8	26.9	.5	16.1	47.8	35.5	181	0.013
14	Educators seek resources to support healthy eating activities	1.1	11.3	60.8	26.9	.0	6.5	56.5	37.1	181	0.010
15	Partnerships are established with other child relates organisations	2.2	25.8	41.9	30.1	.5	19.4	43.0	37.1	181	0.051
16	A food and nutrition policy is in place	.5	3.2	36.6	59.7	.0	3.2	28.5	68.3	181	0.081
17	Directors network for creative ways to maintain a HE environment	1.1	21.0	46.2	31.7	.0	12.4	45.2	42.5	181	0.004
18	Parents are provided with healthy eating educational materials	1.1	16.7	53.8	28.5	.0	7.0	55.9	37.1	181	0.005
19	Parent partnerships established to promote healthy eating	1.1	14.5	61.8	22.6	.0	9.1	59.7	31.2	181	0.024
20	Parents are involved with healthy eating activities in the centre	1.6	32.8	49.5	16.1	.5	24.7	53.2	21.5	181	0.049

21	Partnerships are established with community organisations to promote HE	1.6	33.9	45.7	18.8	.0	24.2	47.8	28.0	181	0.007
22	Nutrition education sessions are offered to parents	3.2	57.5	29.0	10.2	3.8	44.1	33.9	18.3	181	0.018
	PRACTICES										
23	Parents encouraged to communicate children's allergies and special diets	0.0	0.0	11.8	88.2	.0	0.0	12.2	87.8	175	1.000
24	Children are receiving healthy beverages throughout the day	0.0	0.0	17.2	82.8	.0	.6	16.7	82.8	175	0.895
25	Children are encouraged to eat fruits and vegetables	0.0	0.0	18.8	81.2	.0	0.0	15.6	84.4	175	0.376
26	Nutritious foods are provided for all meals and snacks	1.1	13.4	39.8	45.7	.0	6.7	32.8	60.6	175	0.002
27	Children receive healthy snacks on a daily basis	0.0	7.5	36.0	56.5	.0	5.0	26.7	68.3	175	0.039
28	Children are allowed adequate time to eat and enjoy snacks and meals	0.0	.5	29.6	69.9	.0	0.0	23.3	76.7	175	0.138
29	Children are encouraged to try new food items	0.0	2.2	34.9	62.9	.0	1.1	30.0	68.9	175	0.202
30	Steps are taken to ensure a healthy eating environment is provided	0.0	1.6	36.0	62.4	.0	.6	31.1	68.3	175	0.284
31	Educators respond to the needs of children who arrive at the centre hungry	.5	2.2	41.4	55.9	.0	1.1	35.0	63.9	175	0.199
32	Portion sizes are age appropriate	0.0	5.4	45.2	49.5	.0	1.1	42.2	56.7	175	0.129
33	The mealtime environment encourages healthy eating	.5	8.6	39.8	51.1	.0	4.4	38.9	56.7	175	0.224
34	Staff are trained to prepare healthy meals	1.6	13.4	40.9	44.1	.6	8.9	36.7	53.9	175	0.039
	TRAINING										
35	Special food and nutrition requirements of children are met	.0	.5	34.4	65.1	.0	.6	23.3	76.1	175	0.035
36	The nutritional needs of children with disabilities are met	0.0	0.0	46.2	53.8	.0	.6	32.8	66.7	175	0.029
37	Nutrition education information is communicated to parents	.5	11.8	54.3	33.3	.0	5.0	48.3	46.7	175	0.002
38	Information/resources to perform HE activities are assessed and utilised	1.6	13.4	56.5	28.5	.0	8.9	52.8	38.3	175	0.010
39	There is effective communication between centres and parents about HE	1.1	14.0	58.1	26.9	.0	6.7	56.1	37.2	175	0.004
40	Appropriate food is prepared for children with special food &nutrition needs	1.1	2.7	40.9	55.4	.0	2.2	37.2	60.6	175	0.347
41	Child development issues affecting HE behaviour are identified & addressed	.5	8.1	50.0	41.4	.0	3.9	46.1	50.0	175	0.042
42	Parental and child concerns related to healthy eating are addressed		2.7	55.4	41.9	.0	2.8	42.8	54.4	175	0.079
43	Nutrition education is provided to staff	3.2	12.4	49.5	34.9	.0	10.6	43.3	46.1	175	0.021
44	The HE needs of EY centres with culturally diverse populations are addressed	1.1	9.1	51.6	38.2	.0	3.3	52.8	43.9	175	0.050
45	Nutrition education is provided to the children in your care	1.1	7.5	55.4	36.0	.0	3.9	42.8	53.3	175	0.001
46	Children are taught about food safety and hygiene	0.0	5.9	46.8	47.3	.0	1.1	38.3	60.6	175	0.003

#	Item									N	p
47	Food safety and hygiene practices are implemented in your centre	0.0	0.0	36.6	63.4	.0	.6	27.2	72.2	175	0.091
48	Safe food handling practices are implemented in your centre	0.0	.5	35.5	64.0	.0	0.0	26.1	73.9	175	0.026
	SELF-EFFICACY										
49	Adequate training to be able to teach HE to children	2.2	15.2	44.0	38.6	1.1	5.1	46.9	46.9	168	0.004
50	Understand HE concepts well enough to teach them to children	.5	9.8	45.7	44.0	.6	6.3	46.3	46.9	168	0.290
51	Skills to teach HE concepts to children effectively	1.1	10.9	50.0	38.0	.6	7.4	46.3	45.7	168	0.043
52	Ability to answer children's questions relating to HE effectively	0.0	7.6	46.2	46.2	.0	5.1	46.9	48.0	168	0.407
53	Ability to answer parents questions relating to HE effectively	.5	8.7	51.1	39.7	0.0	9.1	45.7	45.1	168	0.338
54	Knowledge of ADG	2.2	22.3	50.0	25.5	3.4	16.0	44.6	36.0	168	0.006
55	Knowledge of core food groups	1.6	14.1	54.9	29.3	0.0	8.6	48.0	43.4	168	0.005
56	Knowledge of balanced diet and ability to teach to children	1.6	9.8	48.4	40.2	.6	8.0	49.7	41.7	168	0.265
57	Knowledge of key nutrients per ADG	3.8	21.2	49.5	25.5	3.4	16.0	44.6	36.0	168	0.033
	COLLECTIVE EFFICACY										
58	Adequate training to be able to teach HE to children	5.4	29.3	47.3	17.9	3.4	13.1	53.1	30.3	168	**<0.001**
59	Understand HE concepts well enough to teach them to children	3.8	22.8	52.2	21.2	1.7	15.4	53.7	29.1	168	0.005
60	Skills to teach HE concepts to children effectively	4.3	22.3	54.9	18.5	1.7	17.7	52.0	28.6	168	0.004
61	Ability to answer children's questions relating to HE effectively	1.1	21.2	53.3	24.5	.6	16.6	49.7	33.1	168	0.053
62	Ability to answer parents questions relating to HE effectively	1.1	24.5	52.7	21.7	1.1	18.3	53.1	27.4	168	0.072
63	Knowledge of ADG	7.1	31.0	49.5	12.5	4.0	25.7	50.3	20.0	168	0.004
64	Knowledge of core food groups	4.9	26.1	53.8	15.2	.6	14.9	53.1	31.4	168	0.021
65	Knowledge of balanced diet and ability to teach to children	3.8	22.8	53.8	19.6	.6	12.6	50.9	36.0	168	0.038
66	Knowledge of key nutrients per ADG	6.0	32.6	47.8	13.6	4.0	25.7	50.3	20.0	168	0.033
	OUTCOME EFFICACY										
67	Self confidence to interest children in eating healthily	0.0	11.4	53.8	34.8	.0	8.6	48.0	43.4	168	0.057
68	Colleague confidence to interest children in eating healthily	1.6	19.0	52.7	26.6	.6	14.9	53.1	31.4	168	0.192
69	Self confidence good job teaching HE concepts	2.2	10.9	54.3	32.6	.6	8.0	49.7	41.7	168	0.044
70	Colleague confidence good job teaching HE concepts	2.2	16.3	54.9	26.6	.6	12.6	50.9	36.0	168	0.047

*Rows shaded blue indicates significant result