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# **Online healthy lifestyle support in the perinatal period: What do women want and do they use it?**

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# **Online healthy lifestyle support in the perinatal period: What do women want and do they use it?**

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**Abstract:**

Unhealthy weight gain and retention during pregnancy and postpartum is detrimental to mother and child. While various barriers limit the capacity for perinatal health care providers (PHCPs) to offer healthy lifestyle counselling, they could guide women to appropriate online resources. This paper presents a project designed to provide online information to promote healthy lifestyles in the perinatal period. Focus groups/interviews were held with 116 perinatal women and 76 PHCPs to determine what online information perinatal women and PHCPs want, in what form, and how best it should be presented. Results indicated women wanted Smartphone applications (apps) linked to trustworthy websites containing short answers to everyday concerns; information on local support services; and personalised tools to assess their nutrition, fitness and weight. Suggestions for improvement should be practical and tailored to the developmental stage of their child. PHCPs wanted evidence-based, practical information, presented in a simple, engaging, interactive form. The outcome was a clinically-endorsed website and app that health professionals could recommend. Preliminary evaluation showed 10.5% of pregnant women in Western Australia signed up to the app. Use of the app appeared to be equitable across urban and rural areas of low to middle socio-economic status.

**What is known about the topic?**

Young mothers are e-technology savvy and actively seek health information online. Virtual resources promoting healthy perinatal lifestyles thus offer a convenient option to address service and geographical barriers.

**What does this paper add?**

This paper adds knowledge of the content and form needs and uses of online information for perinatal women related to healthy weight and lifestyle.

## **Introduction**

Evidence regarding the close link between excessive weight gain during pregnancy (Wilcox, Cambell et al. 2011) and postpartum years (Nehring, Schmoll et al. 2011) on mother and child health (Wrotniak, Shults et al. 2008; Koepf, Dahl-Jorgensen et al. 2012) is perturbing. Currently some 46% of Australian women of childbearing age are overweight (Australian Bureau of Statistics 2012), with figures indicating 20% of pregnant women are obese (Cnattingius, Villamor et al. 2012). Transition to parenthood represents a time when women actively seek information (Plantin and Daneback 2009), and are more receptive to advice (Joyce and Hutchinson 2012). Whilst perinatal health care providers (PHCPs) increasingly acknowledge the importance of healthy maternal weight, in practice barriers such as time, remuneration, skills and capacity hamper their engagement of mothers on issues of healthy weight (van der Plicht, Campbell et al. 2011; Wilcox, Campbell et al. 2011). Nevertheless, PHCPs could play an active role in guiding women to appropriate, quality-assured online resources.

This paper outlines the findings of a study aimed at determining the opinions of women and PHCPs about what online information is needed, in what form and how best this could be presented to promote healthy lifestyles during the perinatal period. It also provides preliminary data on use of a clinically-endorsed website and Smartphone application (app) developed based on the findings of this study. Furthermore, the paper examines how online resources can offer PHCPs with a cost-effective option for reaching women across socio-economic and geographic barriers.

## **Context**

Over 90% of Australian households have home internet connection (Nielsen 2012), with 86% of women aged 18-24 years and 73% of women aged 25-34 years having access to household broadband during their prime age of pregnancy (Australian Bureau of Statistics 2012). In June 2012 there were 16.2 million Smartphone owners in Australia. Mobile wireless internet is the fastest growing internet technology, with the greatest acceleration of use amongst young women (Neilson 2012).

For the purposes of this paper, perinatal relates to preparation for pregnancy, during pregnancy, and the first twelve months after birth. PHCPs include GPs, midwives, obstetricians, maternal and child health nurses and allied health

care providers. PHCPs have provided healthy lifestyle information to perinatal women through consultations, educational pamphlet, antenatal classes and new mothers' groups. (Gagnon and Sandall 2007). But today online resources offer women a more convenient source of information and support (Larsson 2009; Lagan, Sinclair et al. 2011). Websites provide perinatal women with access to health related information 24-hours a day, instant answers to their concerns, and diverse advice from which mothers can choose what suits them (Hearn and Miller 2013). With many women returning to paid employment, together with the reduced family size, dispersed living arrangements, geographic isolation, and shortage of maternal and child health service staff, the influence of online resources for perinatal women is unlikely to diminish in the future (Cowie, Hill et al. 2011; McDaniel, Coyne et al. 2011).

## **Review of literature**

Use of online resources and particularly mobile devices shows significant promise for supporting health behaviour change (Fjeldoe, Miller et al. 2010; Webb, Joseph et al. 2010; Cugelman, Theolwall et al. 2011; Noar, Harrington et al. 2011). Not only do online resources provide users with access to health information, along with Smartphone apps, they enable collection of ongoing personalised data and cueing of the user's behavioural information according to their goals and stages of change. In this way, individual messages can be tailored to the user's needs while directing them to suitable support (Lustria, Cortese et al. 2009; West, Hall et al. 2012). Research shows that such personalised online information with tailored messages is more effective in bringing about behaviour change than static information (Lustria, Cortese et al. 2009; Webb, Joseph et al. 2010; Cugelman, Theolwall et al. 2011). Likewise, evidence suggests it leads to longer lasting behaviour change through inclusion of interactive components that enhance the user's experience and support their achievement of behavioural goals (Noar, Harrington et al. 2011). Online information provides a cost-effective approach to reaching broader audiences in many locations (Noar, Harrington et al. 2011; West, Hall et al. 2012) and online resources have been successfully used to promote health messages related to issues such as physical activity (Fjeldoe, Miller et al. 2010), nutrition (Neville, O'Hara et al. 2009), smoking and alcohol cessation (Obermayer, Riley et al. 2004) and diabetes management (Chomulate, Fernandez-Luque et al. 2011).

Yet, there are conflicting claims about the effectiveness of the internet and other electronic media for changing mothers' behaviour. Some research claims that online resources can empower women through online information

exchange (Hall and Irvine 2009), while others claim it merely builds on consumerism and negatively influences new mothers' feelings of stress, competency and adjustment to parenting (Pitts 2004). Research has shown that new mothers find it useful to have their own thoughts, feelings, parenting issues, and lifestyle affirmed online as normal, especially if they are young and isolated (Evans, Donelle et al. 2012; Lowe, Powell, et al. 2009). Moreover, the majority of new mothers find online resources useful for information when they feel isolated and restricted by their newborn's schedule (McDaniel, Coyne et al. 2011). Whilst not all new mothers have access to the internet (Wen, Rissel et al. 2011), increasing evidence reports diminishing socio-economic status (SES) differences in internet access (Plantin and Daneback 2009), and accelerated use of Smartphone apps among young women (Nielsen 2012).

Despite the high potential for use of the internet to reach perinatal women, little research has been conducted to identify what online healthy lifestyle information and support women feel is most needed, in what form, and how best it should be presented (Madge and O'Connor 2006). Policy makers and health providers have emphasised the need for 'clinically-endorsed' online information that would thereby permit GPs, obstetricians, midwives, child health nurses and child care providers to refer women to the online resource. However, the information needs to be presented in a form that is appealing to and usable by the women who need it most (Hearn and Miller 2013).

## **Case study**

The Starting Childhood Obesity Prevention Earlier (SCOPE) project engaged key perinatal primary health care stakeholders from 19 government and non-government organisations in Western Australia (WA) in the development of an evidence-based online healthy lifestyle resource for perinatal women, endorsed by the WA Department of Health. Focus groups and interviews were conducted with 120 perinatal mothers and 76 PHCPs to determine what information women and PHCPs felt is needed, in what form, and how best it should be presented online to promote healthy lifestyles in the perinatal period. To enhance our understanding of equity issues related to use of online technology, data collection focused on women and PHCPs from health services in areas of low to medium socioeconomic status (SES) and included both urban and rural areas (See Table 1). Ethics approval for the study was obtained from relevant university and health service ethics committees.



Table 1 near here

Detailed findings are provided in Tables 2 and 3. In summary, the results indicated that perinatal women frequently turned to the internet for healthy lifestyle information. Whilst they could name favourite websites they usually used search engines like Google to access information on specific topics and may access several sites searching for consistent information. They wanted a trustworthy website providing parent-focused short answers to everyday pregnancy and family lifestyle concerns including diet, activity, weight, sleep and emotions; with links to further information if desired, and details of local support services. Interactive and personalised formats were preferred, with tools to assess their nutrition, fitness and weight and practical advice for improvement tailored to the developmental stage of their child. Health care providers confirmed high maternal use of online information and advice but expressed concern at the variable reliability of existing resources. They wanted an evidence-based, clinically-endorsed, user-friendly website they could confidently direct parents to use.

Tables 2 and 3 near here

Gap analysis of perinatal women's favourite online resources compared to desired characteristics indicated that while websites generally scored high for quality and quantity of information, they scored low on parent focused and family friendly advice, recommendations concerning healthy gestational weight gain, and on connecting people to events and resources in their own localities. Also, with the exception of the popular WA-based Ngala website, quality-assured sites were often not considered to be user-friendly. Consequently, the pragmatic outcome of the project was enhancement of the Ngala website with appropriate clinically-endorsed *Healthy You, Healthy Baby* (HYHB) healthy lifestyle information. An accompanying Smartphone App was also developed which provided assessment of lifestyle behaviours and weight, tailored advice, links to website information, tracking of progress and tailored emails. To sign on, users entered their postcode thus providing the researchers with information on their geographic location. With the goal of reaching users across WA, the resources were launched with media coverage and mail-out to service providers, with sustained promotion intended via routine maternal contacts with PHCPs. Support from the WA Department of Health allowed all GPs, obstetricians, midwives, and child health nurses to refer mothers to use the newly developed resource.

Resource usage data obtained from Google Analytics over the first six months of intervention showed an average sign up rate for the app of 62 new users per week. With approximately 30,843 births per year in WA, and 40% of these being first births (Joyce and Hutchinson 2012), this extrapolates to 10.5% of WA women pregnant during the period and 26% of first time mothers signing up to the app. App self-assessments were completed at a rate of 259 per week, with an average of 4.2 assessments per person and one quarter using the weight tracker. Highest App lifestyle self-assessment was in the first two trimesters of pregnancy and in the first three months post-birth, times when change is greatest and new information is most needed (see Figure 1). Regional use of the App mostly reflected the distribution of annual births, but was lower in very remote areas (Table 4). Website views per week for lifestyle information averaged 313 for the antenatal section and 257 for the postnatal section. Most views in both sections were for nutrition (35-39%) and weight (28-36%). Over a third (36%) of users came directly to the URL [www.ngala.com.au/hyhb](http://www.ngala.com.au/hyhb), suggesting that promotion of this address via the media and health professionals enhanced use.

Figure 1 & Table 4 near here

### **What can be learned?**

Our results highlighted that the majority of antenatal and postnatal women sought lifestyle information online mainly with their first child or after a long gap between children, to find facts or practical solutions to everyday concerns; to clarify or confirm their current knowledge; and/ or to reassure themselves that their experiences and/or feelings were normal. Confirming previous research (Lagan, Sinclair et al. 2010), women wanted credible, evidence-based, trustworthy information, yet few were aware of which websites represented quality information. Trust was highest in Government or university websites, but commercial sites and forums were also accessed for ideas and user-friendliness. Women often checked and compared information from several sites and, when information conflicted, they usually sought clarification from experienced friends or family before health professionals. Whilst expressing reluctance to visit health professionals about everyday healthy lifestyle concerns, nearly all pregnant women interviewed were keen to use websites recommended by their PHCPs. Given also the concern of PHCPs about the reliability of online information, the needs of both groups would best be served by their specific recommendation of quality-assured websites.

Mothers also highlighted that they wanted hands-on 'parent-focused' rather than 'child-focused' interactive materials including personalised, learning activities that would assist them to become role-models for healthier family lifestyles. To achieve this, they wanted user self-assessment tools, ongoing tracking of their progress, Smartphone Apps, instructional video clips, monthly up-dates on local events and activities in their area, e-newsletters, and information tailored to the developmental stage of their child. Growing interest in more personalised, interactive online resources is supported in the literature (Lustria, Cortese et al. 2009; Webb, Joseph et al. 2010; Cugelman, Theolwall et al. 2011; McDaniel, Coyne et al. 2011; Noar, Harrington et al. 2011; West, Hall et al. 2012), as is evidence indicating that healthy eating and physical activity behaviours are learned and reinforced in the family (Tyler and Horner 2008). Not only do parents want quick, easy to read online answers to their concerns, they want practical suggestions on how they can encourage behaviour change at the family level. Yet, our study of currently available websites highlighted that this type of online information is notably absent.

Our online information and Smartphone App were designed to meet maternal and health provider criteria and preliminary usage data showed modest response in the first six months. Access to the App appears to be equitable across geographic regions of WA with the exception of extremely remote areas where internet access is not available. We do not have SES data on resource users and our results may not be applicable to all women. However, population data quoted above suggest broad and increasing access to online technologies across all social groups, and the antenatal clinics and playgroups participating in the research to guide development were selected to represent urban and rural areas of low to middle SES. Whilst women were excluded if they did not speak English and rural Aboriginal participation was low, health care providers suggested that these groups would require specialised content to meet literacy needs.

Promotion of the resources is a critical aspect of their successful adoption by women. Direct entry to the website URL is one indication that promotion of this address via the media and health professionals has enhanced use. PHCPs are intended as the main source of referral. Process evaluation of implementation is planned to provide more understanding of the role that PHCPs are playing and how this can be increased to promote engagement of women with the quality-assured HYHB resources.

## **Conclusion**

Whilst numerous websites and apps are emerging to reach pregnant women and new mothers (Fjeldsoe, Miller et al. 2010; McDaniel, Coyne et al. 2011) rarely has the design and planning of these online resources been driven primarily by research on parents' content and format needs, nor have they targeted existing gaps in online information required by parents to improve their healthy lifestyles.

The Ngala *Healthy You, Healthy Baby* website information and Smartphone App developed as a result of this research provide a low-cost intervention delivered equitably across most geographical areas without additional demands on health service staff. The tailored, personalised, clinically-approved content addresses perinatal women's desires for access to reliable healthy lifestyle-related information when needed. Promotion of the online resources to women by trusted health care providers is essential to their increased and sustained use. Given the modest uptake of the resources, there is need to better understand which health professional groups could recommend the resources especially to low SES, culturally and linguistically diverse and geographically remote users, and how they are promoted within existing services for antenatal and postnatal women.

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**Table 1: Characteristics of participants**

	Method	Participant numbers	Recruitment
Perinatal health care providers (PHCPs)	Interviews & focus groups	76 WA PHCPs	<ul style="list-style-type: none"> <li>15 hospital-based PHCPs (GPs, obstetricians, midwives)</li> <li>48 child health nurses</li> <li>13 allied health care providers</li> </ul>
Perinatal women	Intercept interviews	56 pregnant women	<ul style="list-style-type: none"> <li>49 women attending antenatal clinic at a low SES urban hospital</li> <li>7 women attending antenatal clinic at a medium SES rural hospital</li> </ul>
	Focus groups	64 postnatal women	<ul style="list-style-type: none"> <li>5 low SES urban focus group</li> <li>2 medium SES urban focus group</li> <li>2 low-medium SES rural focus groups</li> </ul>

**Table 2: Internet usage and preferences of perinatal women**

	Internet usage and preferences of antenatal and postnatal women
Internet usage	<ul style="list-style-type: none"> <li>Widely used for pregnancy/early childhood-related information, especially if first pregnancy</li> <li>Frequently use Google to find information on topics of interest</li> <li>Like online forums and Facebook for range of ideas and practical information</li> <li>Sign-up to websites to receive regular information related to stage of pregnancy</li> <li>Many sites on pregnancy and raising children but sometimes hard to find information needed</li> <li>Not particularly loyal to one site although could name favourites</li> <li>Drawn to commercial sites by user-friendliness, competitions for prizes, stage related information</li> <li>Like apps for convenience anywhere, anytime</li> </ul>
Trust in internet	<ul style="list-style-type: none"> <li>Mixed feelings regarding trustworthiness of internet sites</li> <li>Unsure which websites can trust- will check several sites for consistency of information</li> <li>Trust Australian government or university websites-perceive as updated and regulated</li> <li>Don't completely trust forums but use for ideas and advice from women with similar concerns</li> <li>Aware of industry motivations but value services offered like prizes and regular emails</li> <li>Don't just trust because claimed online to be health professional recommendations</li> <li>Would trust sites recommended by own health care provider</li> </ul>
Online information required	<p><b>Format</b></p> <ul style="list-style-type: none"> <li>Basic information with links to further reading</li> <li>Friendly but professional writing style</li> <li>Easy to read and navigate with engaging components like quizzes or questions and answers</li> <li>Regular communication via emails, app alerts which are relevant to stage of pregnancy/child development</li> <li>Individual tools to assess their current nutrition, fitness and practical ways to improve</li> <li>Reliable information on one central website</li> </ul> <p><b>Content</b></p> <ul style="list-style-type: none"> <li>Parent rather than child focused pregnancy information</li> <li>Answers to simple questions of immediate concern between healthcare appointments</li> <li>Reassurance about normality of their issues and emotions</li> <li>Information on quick, easy, low cost recipes</li> <li>Safe exercise ideas and plans that are flexible with children</li> <li>Information for their partners</li> <li>Data on what supports and activities are available in their local area</li> <li>Infant/toddler feeding guidelines</li> <li>Facts not opinions</li> <li>Tips to control their weight</li> </ul>

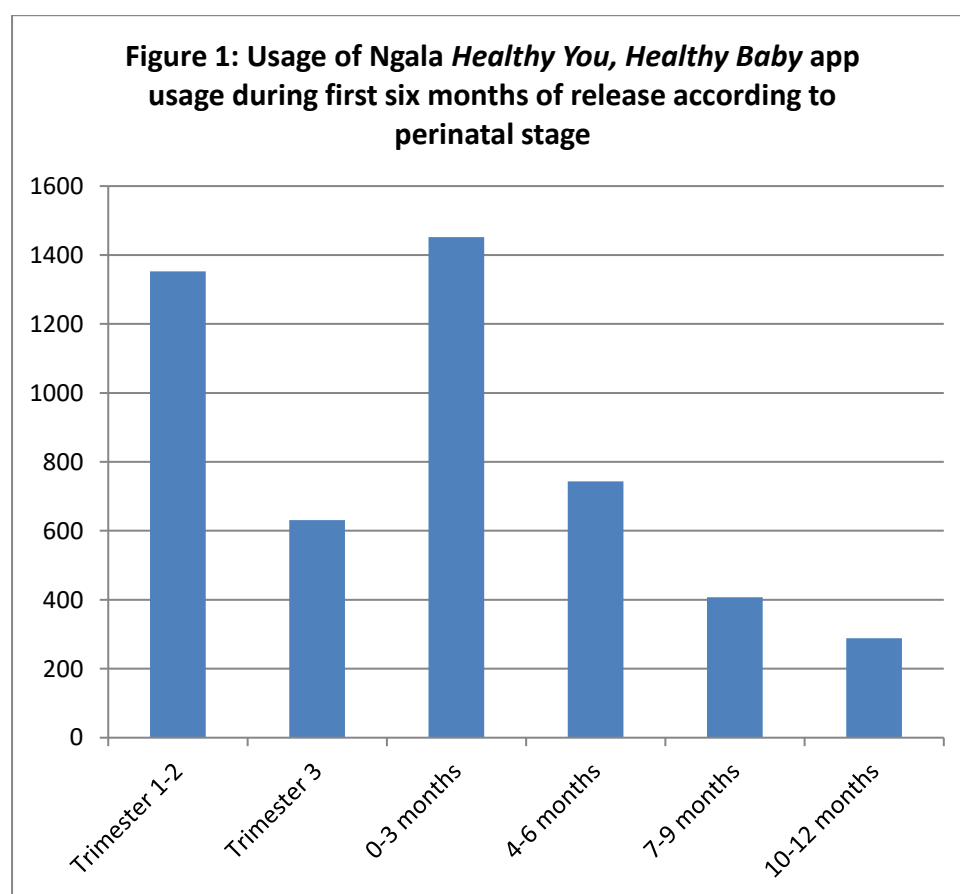
**Table 3: Health care provider views on women’s internet use and needs during the perinatal period.**

Topic	Key themes from health care providers
<b>PHCPs’ perceptions of women’s internet use</b>	<ul style="list-style-type: none"> <li>• Most women of childbearing age use the internet for healthy lifestyle information</li> <li>• Young women are highest users of internet and social media</li> <li>• Access may be limited for CaLD and rural Indigenous</li> <li>• Low SES unlikely to use websites but may access Facebook, Apps</li> <li>• Access is also available at libraries and community resource centres</li> <li>• Reliability of online healthy lifestyle information is variable</li> </ul>
<b>What PHCPs want on a website for perinatal women</b>	<p><b><u>Format</u></b></p> <ul style="list-style-type: none"> <li>• Easy reading, not too busy</li> <li>• Fun to read using language that would attract mothers</li> <li>• Key information in one place, quick to upload, easy to navigate.</li> <li>• Website that attracts parents with icons, animations, graphics, photos of celebrities</li> <li>• Interactive website information for different developmental stages, including videos &amp; animations</li> </ul> <p><b><u>Content</u></b></p> <ul style="list-style-type: none"> <li>• Positive information for parents, on what they can do, not what they shouldn't do</li> <li>• Importance of adopting lifestyle changes, listing benefits to parents &amp; child, and potential complications/risks if not adopted</li> <li>• Information about healthy eating options, intake of sugary drinks</li> <li>• Outline of diets that are easy to achieve and not too expensive</li> <li>• Nutritional supplementation in pregnancy and lactation</li> <li>• Role of depression in obesity - how to recognise and manage</li> <li>• What foods should be given to children and in what amounts</li> <li>• Importance of child exercise through play and sport</li> <li>• Ways to incorporate recommendations into busy &amp; demanding lifestyles</li> <li>• Information on how mothers can look after themselves, showing this is as important as looking after their children</li> <li>• Getting fathers involved in developing healthy family lifestyles</li> <li>• Local information on what support is available and where to go for this</li> <li>• Links to support</li> <li>• Monthly newsletters with links to further reading</li> </ul>

**Table 4: Number and percentage of app users and percentage of WA births per year by mother's region of residence.**

Region of WA	Number of app users in first 6 months since launch	Percentage of all WA users (n=1,349)	Regional residence as % all WA births, 2010 (n=30,843) <sup>1</sup>
Perth	1,104	81.8%	76.4%
Wheatbelt	38	2.8%	3.0%
Midwest	18	1.3%	3.1%
South West	88	6.5%	6.7%
Pilbara	40	3.0%	2.7%
Kimberley	9	0.7%	2.2%
Goldfields	27	2.0%	3.2%
Great Southern	25	1.9%	2.3%
<b>Total WA users</b>	<b>1,349</b>	<b>100%</b>	<b>100%</b>

<sup>1</sup>0.4% of mothers usually resident outside WA



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