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The sun safety attitudes of parents and the effects on their children

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The Sun Safety Attitudes of Parents and the Effects on their Children

Matthew Welch

A report submitted in Partial Fulfilment of the Requirements for the Award of

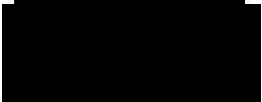
Bachelor of Arts (Psychology) Honours

Faculty of Computing, Health and Science

Edith Cowan University

October 2011

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The Sun Safety Attitudes of Parents and the Effects on their Children

Abstract

Parents are seen as the most important role models in the development of health practice behaviours, including sun safety for their children. The aim of the current study is to explore the experiences and sun protection knowledge, attitudes and behaviours of a parent of a child who has seen a UV photograph of both themselves and their child. By utilising UV flash photography, parents were able to see the damage done to their face and their child's face caused by overexposure to the sun. The study was conducted through a qualitative, phenomenological approach, with the data analysed through the process of thematic analysis. Four main themes emerged from the data: 'use of sun safety practices' refers to the parents reactions to both their child and their own photographs and how the photo may have influenced them to reassess their current sun safety practices, 'knowledge of sun safety' related to the amount of awareness and knowledge the parent had in relation to sun safety, 'tanning' which represented the different attitudes parents held concerning tanning, and 'parents expectations' refers to what the parents expect their child to do in the future in regards to application of sun safety and how they would like them to live their lives. The findings from the current study contribute to the existing body of knowledge around sun safety practices and establish that future investigation examining parents and their children in regards to their sun safety use and attitudes in more detail is required.

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- (iii) Contain any defamatory material; or
- (iv) Contain any data that has not been collected in a manner consistent with ethics approval.

Signed..... 

Dated.....20/12/11.....

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The Sun Safety Attitudes of Parents and the Effects on their Children

The sun protection behaviour of adolescents and children in Australia has been described as abysmal (Livingston, White, Hayman, & Dobbinson, 2007). Sun protection is a major issue for Australians because Australia receives a lot of sun and ultraviolet radiation (UVR) (Buller & Borland, 1999). The scientific literature from around the world generally regards UVR, which comes from the sun, as the biggest risk factor for skin cancer (Boldeman, Dal, & Wester, 2004; Buller & Borland, 1999). Australia has the highest incidence of skin cancer in the world, with Australians being four times more likely to develop some form of skin cancer than any other type of cancer (Australian Institute of Health and Welfare and Australian Association of Cancer Registries (AIHWAACR), 2010). In Australia, over 60% of the entire population will be at a high risk of being diagnosed with some form of skin cancer before they reach the age of 70 (Staples et al., 2006).

Due to the very high rates of skin cancer in Australia, many health promotion programmes have been established to inform the public about methods of reducing UVR exposure (Sinclair & Foley, 2009). There is evidence that the public health promotion strategies relating to the dangers and prevention of UVR exposure does increase the knowledge of the people exposed to the messages (Livingston, White, Ugoni, & Borland, 2001; Sinclair & Foley, 2009). Several studies, however, have found that, generally adolescents do not consistently apply sun protection practices (Buller, Buller, Beach, & Ertl, 1996; Livingston et al., 2007; Sinclair & Foley, 2009). The findings that adolescents do not consistently engage in sun protection behaviours is of great concern because many studies have found that the majority of UVR exposure occurs before the age of 21 and

that overexposure to UVR in childhood is the most major risk factor for skin cancer development (Buller et al., 1996; Milne et al., 2000). Many studies and programmes have focused on children due to their constant exposure to UVR and because they are more likely to change their behaviour, especially when they are young (Boldeman et al., 2004; Buller et al., 1996; Buller & Borland, 1999; Stanton, Chakma, O'Riordan, & Eyeson-Annan, 2000). The parents of children have also been of interest to researchers and are the target of some health promotion programmes because parents often control their children's environment and are influential role models for their children (Buller & Borland, 1999). Apart from increasing the risk of skin cancer, UVR leads to premature ageing of the skin, known as photoaging (Antoniou, Kosmadaki, Stratigos, & Katsambas, 2010).

Research that has been conducted relating to skin cancer has primarily adopted a quantitative methodology that primarily involves mass data collection through tools such as questionnaires (Buller & Borland, 1999). These studies mostly evaluate the effectiveness of mass media health promotional programmes or evaluate certain groups with a quantitative methodology (Buller & Borland, 1999; Bylund, Baxter, Imes, & Wolf, 2010). To date, few studies have investigated programmes with children and their parents together or examined the effect of parental influence over their children in relation to sun safety and skin cancer. The purpose of the present study is to investigate through a qualitative, phenomenological approach, the experiences of parents after they have seen an ultraviolet (UV) picture of both themselves and their child and notice the differences in damage to their skin. It is anticipated that the parents, upon viewing a UV image of themselves will elicit more rich data that is best suited with a qualitative approach rather than a quantitative approach. This paper provides a detailed overview of the effects of UVR,

further discussing both the benefits and consequences of UVR and the importance of maintaining a balance between having too little and too much UVR. An emphasis on skin cancer in relation to the consequences of UVR is discussed in detail. Sun safety campaigns are also discussed and both the parents and child's sun safety behaviour and the parents influence over their children's sun safety practices are examined. Finally, justification of utilising a phenomenological approach in the present study is discussed.

Effects of Ultraviolet Radiation on the Skin

Sunlight is a continuous source of electromagnetic radiation, which can be divided into three different wavelengths of light: UV, visible, and infrared (Soehnge, Ouhitit, & Ananthaswamy, 1997). The UV wavelength is considered to be the most important part of sunlight as it is responsible for causing photoaging and skin cancer (Soehnge et al., 1997). UVR can be further divided into three main types: Ultraviolet A Radiation (UVA), Ultraviolet B Radiation (UVB) and Ultraviolet C Radiation (UVC) (Narayanan, Saladi, & Fox, 2010). UVA is not filtered by the stratospheric ozone layer in the atmosphere and approximately 90-99% reaches the earth's surface (Narayanan et al., 2010; Soehnge et al., 1997). It is a long wavelength but has low energy, which means it can penetrate deeper into the skin (Narayanan et al., 2010). UVA is considered to be harmful if exposure is excessive or if there is long term exposure, which can cause ageing of the skin and adjust the pigmentation of the skin in some people to give a tanning effect (Narayanan et al., 2010).

UVB is carcinogenic and is much more effective at causing sunburns when compared to UVA (Miller, Hamilton, Wester, & Cyr, 1998). Unlike UVA, however, UVB is filtered by the stratospheric ozone layer with only 1-10% reaching the earth's

surface (Miller et al., 1998). UVC, unlike UVA, and UVB is fully filtered by the ozone layer before it reaches the earth's surface (Narayanan et al., 2010). It is mainly emitted by artificial sources such as lamps and tanning lights and can also cause burning, photoaging and skin cancer (Narayanan et al., 2010).

There are several factors that can influence the amount of UVR that reaches the earth's surface, including the ozone layer which acts as a shield in the atmosphere that protects people from some of the most harmful UVR wavelengths (Lautenschlager, Wulf, & Pittelkow, 2007). The ozone layer, however, has been decreasing steadily over time and it is estimated that a 1% decrease in ozone levels leads to a 1-2% increase in melanoma mortality rates, mainly due to the increase in UVB (Lautenschlager et al., 2007). The damage by UVA and UVB to the DNA of a person can lead to mutations and eventually skin cancer, which is why it is important that children be targeted because of their excessive exposure to UVR during childhood (Narayanan et al., 2010).

Another factor that can influence the amount of UVR that reaches the earth's surface is the time of day and season of the year (Felts, Burke, Vail-Smith, & Whetstone, 2010). Between 10 a.m. and 4 p.m. the sunlight has the least distance to travel between the sun and the earth resulting in higher intensity of UVR, particularly UVB (Felts et al., 2010). Outside of the critical 10 a.m. and 4 p.m. time during the day, sunlight hits the surface at an angle, greatly reducing the intensity of UVR and is the time when it is recommended people go outside and do outdoor activities rather than during the critical times (Felts et al., 2010). The seasons also affect the amount of UVR as the sun's angle varies depending upon the season, which varies the amount and intensity of UVR (Stanton et al., 2000).

Benefits and Consequences of Ultraviolet Radiation

Historically, sunlight was commonly used as treatment and prevention method for rickets by supplying vitamin D for bone development and treat neonatal jaundice (Albert & Ostheimer, 2002; Albert & Ostheimer, 2003; Hall, Jorgensen, McDavid, Kraft, & Breslow, 2001). While sunlight was being used as a treatment, however, skin cancer rates started to climb and eventually in 1970 became an epidemic which resulted in the use of heliotherapy, a treatment by sunlight for several conditions being ceased (Aladag, Filiz, Topsever, & Gorpelioglu, 2006; Albert & Ostheimer, 2003). It is now recommended for a person to acquire their recommended vitamin D levels through the use of supplements or dietary intake rather than through intentional expose to sunlight (Roelandts, 2002).

The consequences that can occur from overexposure to sunlight can range from simple accelerated ageing of the skin to death from skin cancer (Antoniou, et al., 2010). Normal ageing is simply a process that involves the slow deterioration of organs in the body due to the constant use and stresses of everyday life (Antoniou, et al., 2010). The skin is also subject to normal ageing but this process may be accelerated through overexposure to the sun which is called photoaging (Antoniou, et al., 2010; Berneburg, Plettenberg, & Krutmann, 2000). Photoaging is the result of chronic UVR induced damage and accounts for most age associated changes in skin appearance (Yaar & Gilchrest, 2007). These changes in skin appearance due to photoaging can be in the form of wrinkles, freckles and sun spots which may become present as the person ages (Antoniou et al., 2010; Berneburg et al., 2000).

The effects of photoaging are increased with both cumulative and intense UVR exposure (Berneburg et al., 2000). The effects of photoaging normally increases with age

with young people generally not having as much UVR damage on their faces because they would not have been exposed to as much sunlight due to their age and would not have as much cumulative UV damage when compared to older people (Berneburg et al., 2000). The effects of photoaging mainly occur on frequently sun-exposed areas of the body, such as the neck, face, arms, and hands (Berneburg et al., 2000). Parts of the skin that have been exposed to chronic UVR exposure without protection differ from other parts of the skin that have not been exposed because of the damage caused by the UVA and UVB waves (Berneburg et al., 2000).

UVA is reported to be the wavelength that plays the largest role in photoaging because it is more abundant than UVB and has a far greater, year and day round average in the sunlight that reaches earth (Yaar & Gilchrest, 2007). One of the most common preventive methods to attempt to block out the UVA and UVB waves that cause photoaging is the application of sunscreen, which adds a layer of protection on top of the skin (Berneburg et al., 2000). Sunscreen that is applied protects the skin by reflecting UV light and stopping the UVR from penetrating the skin of a person (Antoniou et al., 2010). While the effects of photoaging normally only appear at a later age in life, it is important that sun safety programs that target young children and their parents get across the importance of UVR protection (Berneburg et al., 2000).

Other consequences of excessive UVR exposure outside of photoaging can be the resulting sunburn that comes from excessive UVR exposure. Sunburn can lead to some forms of skin cancer, especially sunburn during childhood if children are not adequately protected from the sun (Wright, Reeder, Gray, & Cox, 2008). Harrison, MacLennan, Speare, and Wronski (1994) had conducted a study investigating sunburn in children and

found that those with a history of sunburn had a much higher count of melanocytic nevi, which is a major risk factor for melanoma. A more recent study conducted by Harrison, MacLennan, and Buettner (2008) also found the same result as Harrison et al. (1994) in that the amount and severity of the sunburns, particularly during childhood was significantly related to the presence of large amounts of melanocytic nevi. Excessive unfiltered sunlight that has UVB present is also a major risk factor for eye damage in the form of the development of cataracts which can lead to blindness (Abraham, Cox, & West, 2010; Gritz, 2001). The consequences reviewed are terrible conditions that can greatly impact a person's life and skin cancer remains one of the biggest and most known consequences of excessive UVR exposure (Black, Grise, Heitmeyer & Readdick, 2001).

Skin Cancer

It is well known that exposure to UVR, particularly natural sources of light that includes both UVA and UVB, is the main major factor in the development of both melanoma and non-melanoma types of skin cancer (Narayanan et al., 2010). Skin Cancer can be broken up into three different major types: melanoma and two non-melanoma types, basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) (Girschik, Fritschi, Threlfall, & Slevin, 2008). Non-melanoma skin cancers, particularly BCC and SCC are some of the most commonly diagnosed cancers, with Australia having the highest incidence in the world, however, due to BCC and SCC not having to be legally reported in Australia, there are only estimates as to the true number of people in Australia with the disease (AIHWAACR, 2004; AIHWAACR, 2010). While melanoma is rarer than non-melanoma skin cancers which are slow to develop and have a low mortality rate, melanoma accounts for the majority of skin cancer mortalities because it is

aggressive and can spread around the body (Narayanan et al., 2010; Soehnge et al., 1997). Even though melanoma is less common than the non-melanoma variants of skin cancer, it still ranks among the top five most diagnosed cancers in Australia (AIHWAACR, 2004).

Occasional intermittent exposure to a large amount of sunlight to cause sunburn is one of the major risk factors for the development of melanoma (Stanton et al., 2000). Many studies have examined the relation of being in high UVR outdoor areas to melanoma risk. Walter, King, and Marrett, (1999) had conducted a large case-control study which investigated whether the risk of melanoma increased with intense intermittent exposure in places such as beaches. Walter et al. found support for the hypothesis that melanoma risk increased with intense intermittent exposure. Holman, Armstrong, and Heenan (1986), however, had found that a case-control study of 507 matched pairs had shown that while some scenarios supported their hypothesis that melanomas are related to occasional bursts of recreational sun exposure in very high UV outdoor areas, there was little support for the hypothesis when recreational sun exposure was included as a proportion of total outdoor exposure.

The current literature has many studies that investigate the relationship between childhood UVR exposure and skin cancer (Buller & Borland, 1999). A specific area of interest in investigating this relationship between childhood UVR exposure and skin cancer is migrant studies which examine whether being exposed to UVR in a country during childhood and then migrating to a different country resulted in different skin cancer rates when compared against the new population (Oliveria, Saraiya, Geller, Heneghan, & Jorgensen, 2005). Oliveria et al. conducted a literature review on migrant

studies and had found that, generally there was an increase in the risk of melanoma for people who spent their childhood in a sunny location and a decreased risk of melanoma for older adults moving from a less sunny area to a more sunny location. These findings add even more support for the relationship between UVR exposure and skin cancer (Oliveria et al., 2005). While the view that those that are in a higher sun exposure area in childhood that move to a lower sun exposure area during their adult life are at a higher risk of skin cancer, Anaise Steinitz, and Hur, (1978) reported that those that who moved from Europe, which is considered to have low sun exposure had higher risk of melanoma than the high sun exposure population of the country they migrated to, which was Israel. According to Oliveria et al. however, those studies are in the minority.

While anyone can potentially get skin cancer, there are several risk factors beyond the amount of UVR exposure during childhood and adulthood that can influence the risk of acquiring skin cancer (AIHWAACR, 2010). Arthey and Clarke (1995) reported that Caucasians make up the majority of reported cases of skin cancer, suggesting that the colour of skin plays a role in skin cancer development. People with darker skin are at lower risk of developing skin cancer because they are able to produce more melanin than Caucasians which results in less UVR damage to the skin (Arthey & Clarke, 1995). These reports that colour of skin can influence development of skin cancer, match what was observed by Hinds and Kolonel (1980) in that melanoma was an uncommon form of cancer for people who are not Caucasian. Other risk factors outside of race can include occupation, as Suárez et al. (2007) had found that certain outdoor occupations can increase the risk of either BCC or SCC, through either constant UVR exposure or other factors. Those that have fair skin that has a tendency to burn easily and tans poorly, as

well as having a family history are also risk factors for skin cancer (Australian Institute of Health and Welfare and Cancer Australia, 2008; Cust et al., 2011). Clearly, engaging in behaviours to help minimise the risk of acquiring skin cancer in children is a parents' responsibility (Nelson, & Luczon-Peterman, 2001).

One of the main points of interest in regards to the consequences of overexposure to UVR is that all of the consequences are mostly preventable with the application of adequate sun safety practices, such as the application sunscreen, wearing of a hat, avoiding going outside between the hours of 10 a.m. to 4 p.m. or seeking shade during this time (Felts et al., 2010; Montague, Borland & Sinclair, 2001). Some people, however, disregard sun safety practices and deliberately expose themselves to the sun despite the potential consequences to achieve a tan.

Tanning

Skin and the pigmentation or colour of the skin, is a major issue for certain groups of people (Abdulla, Feldman, Williford, Krowchuk, & Kaur, 2005). Of concern in particular are people who deliberately expose themselves to harmful UVR through either natural or artificial light sources in order to achieve a tan (Abdulla et al., 2005). Tanning can influence the development of skin cancer through either increasing the person's cumulative UVR exposure or through intense, intermittent UVR exposure which may cause sunburn (Mayer et al., 2011). Those that choose to artificially tan generally go to tanning salons, which are considered to be poorly regulated and recommendations to improve safety are being ignored (Hornung, Magee, Lee, Hansen, & Hsieh, 2003). Several studies have found that those that go to tanning salons to acquire a tan exceed the recommended limits for UVR exposure and over one-third began tanning at the

maximum dose recommended for maintaining the tan (Abdulla et al., 2005; Hornung et al., 2003). Those who seek to achieve a tan put themselves at great risk to develop skin cancer and it has been found that people are mostly motivated by social goals, such as to conform to the bronzed Australian look or to acquire a perceived benefit of looking healthier (Abdulla et al., 2005; Lowe, Balanda, Stanton, & Gillespie, 1999).

A study by Mayer et al. (2011) surveyed the extent of tanning in adolescents aged between 14 and 17 years of age and their parents in many different cities the United States of America. It was found that over 17% of girls and 3% of boys had used indoor tanning within the last year and that there were several variables that seemed to predict use (Mayer et al., 2011). Variables that predicted tanning behaviour included being female, older and white with access to large deposits of money, parental use, and beliefs held of indoor tanning (Mayer et al., 2011). It was concluded that parents were a major factor in whether children use indoor tanning salons, which is in line with other research suggesting that parents are important role models for children and that their own behaviour and attitudes effects their children's current and future behaviour (Buller et al., 1996; Mayer et al., 2011).

Some studies that have investigated tanning have suggested that some people, the majority of who are teenagers, could be classed as having an addiction to tanning (Kourosh, Harrington, and Adinoff, 2010). Kourosh, et al. found that participants in their study had shown many symptoms related to the Diagnostic and Statistical Manual-IV substance abuse criteria in relation to their tanning behaviour. Barsh and Attardi (2007) seems to indicate that tanning addiction could be attributed not to social motivational factors, but to a protein release which gives a pleasurable sensation when the person tans

or has recently tanned. This, however, is still an early discovery and that more research is needed to indicate whether the release of a specific protein might be the explanation for addictive tanning (Barsh & Attardi, 2007).

Dennis, Lowe, and Snetselaar (2009) conducted a study that investigated the self-reported attitudes, motivations and knowledge of tanning behaviour among young students and found that the participants who felt that tanning was an important behaviour had sufficient knowledge as to the risks of sun exposure and tanning but still had a strong desire to tan frequently. This result demonstrates that knowledge alone is not sufficient enough to change a person's behaviour (Dennis et al., 2009). The findings from Dennis et al. also suggest that parents have a role to play in ensuring that not only are their children knowledgeable in regards to the consequences of UVR exposure but also ensuring that they actively engage in sun safety behaviours to prevent UVR damage. Therefore, ensuring that the knowledge and sun safety practices of children are high is of great importance to help reduce the consequences associated with overexposure to the sun.

Children's Sun Safety Practices

Children have been the focus of many studies into UVR exposure and prevention programmes for a variety of reasons (Buller & Borland, 1999). One of these reasons for focusing on children is due to the problem of changing adolescent's sun protection behaviour. Livingston et al. (2007) conducted a study investigating the influence of tan preference and skin type of Australian adolescents and how it influenced their sun protection behaviour during the period of 1993 to 2002. Students were assessed using the Australian Secondary Students' Alcohol and Drug questionnaire, which among other questions relating to drug use, had questions asking whether they employed sun

protection during peak UV hours (Livingston et al., 2007). Livingston et al. also found that the routine application of sun protective behaviours such as the wearing of hats, wearing of clothes and sunscreen use had significantly decreased among all students in the period of study. Livingston et al. also found that Australian adolescents know the most about the dangers of skin cancer and prevention, but are the age group who experiences the highest level of UVR exposure. The results suggest that young people, particularly adolescents have little motivation to change their sun safety behaviour and that new ways are needed to engage adolescents (Livingston et al., 2001).

Due to adolescent behaviour being difficult to modify through simple knowledge and awareness programmes of sun safety, the focus has shifted to children as being the primary targets of some sun prevention programmes because they are more malleable and adaptable to changing their behaviour than other age groups (Livingston et al., 2007; Loescher, Emerson, Taylor, Christensen, & McKinney, 1995). Loescher et al. found, however, that while those that were in Piaget's preoperational development stage (aged 2-7), which is part of Piaget's theory of cognitive development had some knowledge in regards to sun protection, they could not apply the knowledge they acquired because they were too young to utilise it. Therefore, it is believed that if behaviour change can be made towards sun protection behaviours in children, rather than pre-schoolers or adolescents, would have a positive effect on their behaviour as they grow older into adolescents and eventually into adulthood (Loescher et al., 1995).

Children have also been examined in relation to UVR exposure because childhood is considered to be a critical period for UVR exposure and that overexposure in childhood is a major risk factor for skin cancer development (Buller & Borland, 1999).

Stern, Weinstein and Baker (1986) investigated the benefits of using sunscreen and had found that regular use during the first 18 years of life could potentially reduce the lifetime incidence of BCC and SCC by 78%. Children are generally well protected against the sun as infants but Jarret, Sharp and McLelland (1993) had found that after children reach one year of age, protection against the sun decreases. Studies have found that children on average can spend up to 5 hours a day outdoors, most of them during peak UVR exposure times (Robinson, Rigel, & Amonette, 2000).

For children's sun safety programs to be successful not only do they have to inform the children and increase their knowledge but they must ensure that the knowledge acquired is applied and is used to protect themselves from the sun (Milne et al., 2000). A study by Wright et al. (2008) investigated UVR exposure in children and aimed to explore the relationship between knowledge, attitudes and behaviour relating to sun protection in primary school children. It was found that children were knowledgeable about the dangers of excessive UVR exposure, and that knowledge did increase with year group but as age increased, the higher year groups reported the most instances of sunburn (Wright et al., 2008). This was found to be due to the attitudes towards sun protection that the older children possessed, because the study had found that students generally had the knowledge of how to protect themselves against the sun but still did not apply the appropriate behaviour (Wright et al., 2008).

These results suggest that while children are knowledgeable and may practice sun protection in their early years of life, sun protection may decrease with increasing age (Wright et al., 2008). This is a major problem as while programmes aim to reduce UVR exposure during childhood, adolescence is still a critical period of UVR exposure and that

behaviour adopted during childhood changes as age increases which leads to more negative outcomes with regards to sun protective behaviour (Wright et al., 2008). One way to help ensure that sun protection behaviours, once established do not change is to investigate the parental influence over their children's sun safety practices.

Parental Influence over Children's Sun Safety Practices

Childhood and adolescence is a crucial period for establishing and continuing to develop healthy behaviours that can decrease the risk of disease and other health complications later in life (Bylund et al., 2010). Sun protection has been identified as a major health promoting behaviour, and one of the major sources for children to gain knowledge and adopt behaviours from are their parents (Bylund et al., 2010). Gritz et al. (2005) conducted a study that investigated the effect of an intervention that targeted both children and parents, and whether this resulted in better outcomes for the child. It was found that the intervention had some influence on both parents knowledge and behaviour in regards to sun protection and, in turn, influenced the children's use of sun protection positively (Gritz et al., 2005). It is, therefore, important that the parents of the children be knowledgeable about the appropriate sun safety practices for both themselves and their children and that they demonstrate the behaviour they want their children to adopt in the future (Gritz et al., 2005).

Nelson and Luczon-Peterman (2001) conducted a study that aimed to investigate the knowledge and behaviours related to sun protection among parents of children at community soccer games. The parents completed a questionnaire investigating both their and their child's sun protection knowledge and behaviours. It was found that the parents had quite sufficient knowledge and were familiar with sun protection habits, although

female parents were much more likely than male parents to practice sun prevention behaviour and encourage children to adopt sun protection methods such as sunscreen application (Nelson & Luczon-Peterman, 2001). The finding that parents were knowledgeable about sun protection is supported by an Australian study by Lowe et al. (2002) which investigated caregivers' protection of infants from the sun. Lowe et al. had found that the primary caregivers of the infant were knowledgeable in regards to sun protection but that the high degree of knowledge by the caregiver did not result into high levels of sun protection by themselves, only their infant.

The results from the studies conducted by Lowe et al. (2002) and Nelson and Luczon-Peterman (2001) were consistent with a similar study by Black et al. (2001) which aimed to investigate the sun protective practices of parents of preschool children through observing the UV appropriateness of the child's dress and questioning the parents of that child. Similar to Nelson and Luczon-Peterman, it was found the parents of the children were very knowledgeable regarding sun protection and skin cancer. In contrast to the findings of Lowe, et al. it was also found that the children being observed at the child care centres were not adequately being protected from the sun and that their clothing, which was provided by the parents, was not sufficient in reducing UVR exposure, despite the parents' knowledge of sun protection (Black et al., 2001).

The findings from Black et al. (2001), Lowe et al. (2002) and Nelson and Luczon-Peterman (2001) suggest that while the majority of parents are knowledgeable about sun protection methods, they generally do not apply the behaviours themselves or in some cases do not offer adequate protection for their children. This is a troubling result because

of the literature that suggests that childhood is a critical period of UVR exposure and that excessive UVR exposure or sunburn in childhood is a major risk for skin cancer.

Parents are important role models for children, especially during the early years of their life and their own behaviour and attitudes can influence their children's current and future behaviour (Buller et al., 1996). A study conducted by McGee, Williams and Glasgow (1997) aimed to investigate the UVR exposure in young children from New Zealand, with parents reporting to the researchers the amount of UVR exposure they receive and what, if any sun protection was being employed. One of the most important findings relating to the study was that the strongest predictor of children adopting sun protection behaviour was the use of protection by the parents, which supports the theory of parents being role models for their children (McGee et al., 1997). Children were reportedly four times more likely to wear a hat and nine times more likely to be applying sunscreen if the parent reported use of these behaviours (McGee et al., 1997). Even though, however, it has been established that parental knowledge of sun protection and potential damage of UVR is high (Lowe et al., 2002), the study also found that the parent's desire to have a tanned body was relatively high but it did not have a significant influence over the child's own sun protection.

The findings from McGee et al. (1997) seem to support the theory that parents can influence their children's own behaviour through exhibiting sun protection behaviour themselves. These results are further supported by results from O'Riordan, Geller, Brooks, Zhang and Miller (2003) who found that nearly half of the children and parents who participated had been sunburnt during the summer of 1999 and that children were more likely to have sunburn if their parents were also sunburnt (O'Riordan et al., 2003).

O'Riordan et al. also found that children were significantly less likely to be sunburnt if both they and their parents were both adopting sun protection behaviours. In contrast to the findings of McGee et al., O'Riordan et al. did find that the parent's attitude toward tanning significantly influences the child's sun protection behaviour, which suggests that more research on the topic is needed.

It has been shown through the findings of O'Riordan et al. (2003) and McGee et al. (1997) that there is a relationship between the parent's behaviour and their child's sun protection. Therefore, in order to ensure that parents are both knowledgeable and demonstrating sun protection behaviour, programmes should be designed to include a focus on parents and children. Buller and Borland (1999) had conducted an analysis of the existing literature regarding children's sun safety, which in part included parental influence over children programmes. It was found that programmes that aimed to increase the parents' knowledge and adjust their behaviours in order to protect both their children and themselves resulted in better outcomes for the entire family (Buller & Borland, 1999). The literature review indicates that little research has been conducted investigating parents and their children's attitudes towards sun safety practices and their use, with even less studies investigating sun safety practices utilising a qualitative methodology.

Phenomenological Design

There have been many quantitative studies that have investigated sun practices of the Australian population but few have provided in-depth and rich data, which is the reason why the current study will use the phenomenological approach to this qualitative project. The phenomenological approach allows the researcher to gain insight into the

participant's social world and the reasoning behind their decisions and attitudes based on their social constructions, which is an important part of the current study (Liamputtong & Ezzy, 2005). The current study aims to provide the parent with a view to understand the direct implications of overexposure to the sun (Liamputtong & Ezzy, 2005).

It is the belief of the researcher that this psychological insight into the experiences of the participants of the study when being asked questions relating to sun protection behaviour and reactions to seeing the UV photographs can be gained the most through the use of in-depth interviews and through collecting data that comes from their point of view. Collecting data through the participant's social world construct and being able to collect data through interviews to gain insight into their reasoning behind their behaviours in relation to sun safety will enable more understanding of why parents may or may not adopt sun protective behaviours and how they may perceive how their attitudes might impact on their children (Liamputtong & Ezzy, 2005).

Research Question

The literature has suggested that further research is needed to investigate parents and their children's sun protection behaviour and that qualitative research into the area is lacking which may provide more in depth information to the topic. It is vital that this area be fully explored in every method possible if it may help influence and embed sun protection behaviour in children and could help to reduce the overall skin cancer rate. Information that may be gained from a qualitative methodology may serve to inform future programme use that may target children and parents sun protection behaviour. The aim of this research is to investigate parents and their child's sun protection attitudes and behaviours. More specifically, the research question for this study is: What are the

experiences and sun protection knowledge, attitudes and behaviours of a parent of a child who has seen a UV photograph of both themselves and their child.

Methodology

Research Design

The present study involves a phenomenological qualitative research design. The phenomenological approach was adopted for the current study in order to examine participant's experiences of sun safety and their reactions to UV photographs taken of both themselves and their child (Liamputtong & Ezzy, 2005). A qualitative research design was chosen for the current study over a quantitative design for several reasons. One reason was that a qualitative design allowed the present study to have more freedom and flexibility with the use of semi-structured interviews which gave more deep and rich data beyond what a survey could provide within a quantitative design, in respect to answering the current research question. Another reason for employing a qualitative design was so that it could add to the little existing qualitative literature investigating sun safety which is an area dominated by studies that prescribe to a quantitative design. Finally, the qualitative research design was chosen over quantitative design methods because it allows for data analysis methods such as thematic analysis which allows data to be grouped together into main themes while working with rich qualitative data (Braun & Clarke, 2006).

Sample

Having received the appropriate ethics clearance, recruitment posters were posted on message boards both within the Edith Cowan University (ECU) Joondalup campus and various community centres such as the public library and community centres in the

surrounding suburbs of Perth. Interested participants contacted the researcher by either email or phone. Those who were interested were given a digital copy of the information letter explaining the project so that they fully understood the requirements of participating. The participants in the current study came from a variety of backgrounds, with some being university students, who were recruited at various universities across metropolitan Perth while others were members of the wider community. Emails were sent out to various potential interviewees, as well as recruitment flyers (Appendix A) posted around ECU inviting them to take part in a semi-structured interview that also involved them and one of their children aged between 4 and 12 years of age having their photo taken with a UV camera. The parents who participated in the study were aged between 28 and 41 years, with their children aged between 4 and 11 years. All of the parents who participated were female. Each parent had one child that participated in the study, with five children being male and five were female.

Interview Schedule

The interview questions (Appendix B) were designed to gain insight into the participants use and attitudes surrounding sun safety practices and other practices that might influence sun safety use, knowledge and attitudes including tanning. These questions were asked prior to the participant viewing the UV photographs of both themselves and their child. Once the participants had time to view the photographs they were asked questions about their experience of viewing the photographs which revealed UV damage and whether through seeing the photographs, had influenced the participants to reconsider their views on tanning and their current sun safety practices. For example, before the photos were shown, the question 'when going outdoors are you aware of

possible consequences of exposure to the sun or artificial light sources?' was asked of participants and then were asked subsequently to seeing the photos 'Do you believe that you are confident and informed enough regarding sun safety to protect yourself and your child from what caused the damage to your skin'. Thus the participants were asked about their sun safety practices prior to seeing the photographs and were then asked upon seeing the photo whether they reassessed any of their views on the use of sun safety practices. The majority of the questions asked of participants were open-ended, although when some questions provoked a yes/no response from some participants they were encouraged to expand on their answer and give more detail or background information surrounding the topic.

Ethics

The approval to undertake the current research project was granted by the School of Psychology and Social Science Ethics Sub-Committee on behalf of the Faculty of Computing, Health and Science at Edith Cowan University prior to the commencement the research. Informants were required to read an information letter (Appendix C) prior to signing a consent form (Appendix D) before the interview was conducted, indicating their willingness to partake in the research. The information letter that participants read outlined in detail what the study involved and the consent form stated that information gained from the interviews will remain confidential at all times. After the interview was conducted a small list of free 24 hour counselling services (Appendix E) was provided to all participants in case the course of the interview or the viewing of the photographs might have caused distress.

Procedure

Parents were asked to participate in an interview that would last approximately between 45 minutes and an hour, with up to 15 minutes also being required to take both the UV and black and white photographs of both themselves and their child. They were informed that the interview would ask them questions regarding their views and attitudes regarding sun safety and their reactions to the UV photographs which revealed damage caused by exposure to the sun. Data was collected over a one month period. The interview would either be conducted in a private room on the ECU campus or it would be conducted at the participant's residence depending on what most suited them and where they felt they would be most comfortable.

Participants gave their consent to participate with a consent form prior to the interview being conducted. Parents were assured that their participation was completely voluntary and that they could withdraw their participation from the study at any time without penalty. Participants were also informed that any data collected during the interview would be treated with confidence. Participants were advised prior to the interview that it would be recorded and transcribed at a later date. They were also told that the data that would be collected would be part of a research project and that their identity would be coded and given a pseudonym as part of the analysis and subsequent written thesis to protect their identity.

During the interview a camera with the capability to take normal black-and-white and UV, photoaged photographs was used as part of the interview process. The photoaged photographs were taken with a built in UV filter on the camera to reveal UV

damage caused to participants faces by exposure to the sun. The black-and-white photographs were taken by the camera with a normal light filter. Four photos were taken during each interview, with one UV and one black-and-white photograph of both the child and the parent. As described earlier, the photographs were used as a tool to engage participants and record their experiences of viewing the UV filtered aging images as part of the interview process. An example of both a UV and black-and-white photograph of a parent (Figure 1) can be seen below.



Figure 1. A parents' normal black-and-white photograph (left photo) and their UV damaged photograph (right photo) which shows sun spots, darkened skin, and more emphasis on visible wrinkles that was caused by overexposure to UVR.

Data Analysis

Recorded data was transcribed verbatim as soon as it was possible after the interviews were concluded so that the tone of voice, body language and movement of the participant could be added alongside the verbal transcript accurately (Liamputtong &

Ezzy, 2005). As a first step in the thematic analysis, the transcripts were read several times over to gain an overall feel for the data (Braun & Clarke, 2006). Main points were noted during this process and initial themes began to emerge. Significant points of interest to the researcher and points related to the research question in the data were highlighted.

Initial coding of the data was systematic in its approach, with attention being equally paid to each data set and interesting data items were noted that could form the basis of emerging patterns in the data (Braun & Clarke, 2006; Liamputtong & Ezzy, 2005). Once initial coding was complete, coded data extracts were sorted into potential themes. A thematic map was used as a visual representation to help set up initial themes and subthemes (Braun & Clarke, 2006). Themes and subthemes were then reviewed and refined with some themes merging with other themes and some subthemes were either merged with other subthemes or were discarded due to lack of data to support it as a separate subtheme.

Rigour in the study was established in part through the use of memo writing. Memos were taken to help assist the researcher in developing themes and as useful in documenting in writing the process of data analysis, specifically the coding of the data, interpretation of the data, and reviewing possible themes. The memos were made in different ways, with some being simple post-it notes, while others were kept in a notebook that contained the more in-depth and meaningful notes that were taken. The memos were constantly examined throughout the process of analysing the data as a way to reflect on the methods used.

Other methods to establish rigour included collecting data from specifically sampled participants and note observations during the interview that were interesting to the researcher that would not have been available through the audio recording. The reading of promotional and informative material on websites, pamphlets and magazines were read regarding sun safety and tanning, including material by the cancer council, sunsmart program, and even solariums to establish rigour. Interpretative rigour of the data analysis conducted was established through showing major themes and subthemes with coded data, with the supervisor to verify the interpretations made and by letting a trusted colleague to match coded extracts with initial and revised themes to determine the validity of the proposed themes and the interpretation of the coded data. Through using the above methods and processes, rigour of the research was ensured.

Findings and Interpretations

The perspectives of sun safety use, knowledge and attitudes from the variety of participants were wide-ranging. During the process of conducting the thematic analysis, four main themes were identified as being relevant to the research topic as well as several subthemes being developed for each of the four main themes. There were varying degrees of responses to the photographs taken in all different areas that were part of the analysis. These responses will be discussed and reviewed at a subtheme level, which make up the four main themes, which are presented in Table 1 below.

Table 1

Main Themes and Subthemes That Emerged From Parent Interviews After Viewing Both Normal and UV Photographs of Both Themselves and Their Child.

Main Themes	Subthemes
Use of Sun Safety Practices	Parent and Child Level of Protection
	Reassessment of Sun Safety Practices
Knowledge of Sun Safety	Parents' Knowledge as Child
	Present Knowledge and Awareness
	Skin Cancer Enhancing Awareness
Tanning	Use and Motivations to Have a Tan
	Views on Tanning
	Tanning as Part of a Youth Culture
Parents Expectations	Child as a Teen and Their Level of Protection
	Children and Protection from Future Damage
	Preference for Child to Live an Outdoor Life

Use of Sun Safety Practices

Many participants had reported use of a variety of sun safety practices, with participant's use of sun protection methods varying depending on certain conditions. This

theme was found to be able to be broken up into two subthemes, 'parent and child level of protection' and 'reassessment of sun safety use'

Parent and Child Level of Protection

The level of protection that was employed by both the parent and the child differed between the participants due to a variety of factors. All of the participants noted that their children do have a sun safety program at their school, most identifying it as the Sun-Smart program which involves a no hat, no play policy (Jones, Beckmann, & Rayner, 2008). Many parents reported that they had little hassle enforcing sun safety practices with their children because they knew the importance of it from places such as school and mass media campaigns. For Example, "*I think it's great that here you have that slogan of slip, slop slap... So when I fall down as an adult, then he remembers stuff like that. You know like 'mum I got to do that' which is cool*" (Rebecca).

At day care and they have a no hat, no play policy and that they are pretty big on sunscreen and stuff like that and I think that when you grow up with that... it's easier then we grew up and then they try to bring it in when you're like 40 (Ashley)

It should be noted when participants discussed their child's sun protection, many stated that they were not as strict with themselves in terms of sun safety practices, as they were with their children. This result is consistent with other studies investigating sun protection in parents and their children (Black et al. 2001; Lowe et al. 2002; Nelson and Luczon-Peterman, 2001). The following two quotes are an example of this.

I mean my parents... put zinc on us and stuff like that but we weren't as strict [with our sun safety] and therefore in my adult life I am not as strict with myself as I am with my children, but my children are and they are always protected as well as I know how (Courtney)

I seem to make sure they [children] have it on more than me. I don't know why that is. I think it is just a mum thing you know? You go and make sure that your

kids are done and then they go off and play in the pool or the beach and then you 'ah – what about me' and you kind of think about you after (Ashley)

Another participant expressed that while even after viewing the damage on her photographs she probably wouldn't increase her own sun safety practices but would for her child.

You know what I would... be fucking lying if I said 'ah yeah look I am devastated. Oh yeah I am going to change everything'. That would be an outright lie because there is a part of me that is thinking that it is too fucking late anyway. Having said that I am hoping that I will find it within me to actually be as pedantic for my son, more than I would be for myself... But yeah, I could not hand on heart say that I would do it for myself but now I would be more careful about it but I can hand on heart say that with my son I would (Rebecca)

Many parents reported that they used moisturiser or makeup which contained sunscreen to protect themselves from the sun during their day to day activities. Some parents, however, stated that they were using the sunscreen in their makeup as a replacement for regular sunscreen during some activities. For example,

I know my moisturiser in the morning has sunscreen... so she [her child] is putting it on her face as well. She puts sunscreen on her face before... she goes to school where as we never did that so. Even though she doesn't re-apply it, at least she has had something put on her face (Denise)

Other participants also commented on their makeup use and how they rely on the sun protection factor (SPF) sunscreen in their makeup to protect themselves from UVR damage, “*the sunburn cream in makeup... I think that's a great thing... I think that it is a real easy way of making sure you are protected against the sun while you are just getting out and about*” (Ashley), “*I mean it's funny – because I use, I have sunscreen in my foundation that and I always use it so yeah... it's amazing to be quite honest [the damage on the photographs]*” (Sarah).

There are possible dangers with parents seemingly relying on the sunscreen in beauty products to protect them against the sun. Séhédic, Hardy-Boismartel, Couteau, and Coiffard (2009) had conducted a study investigating the effectiveness of SPF in cosmetic products and found that many of the products tested were not effective in blocking out UVR in day to day activities. It is worrying if parents rely on SPF in beauty products to protect themselves from the sun during days of intense UVR exposure, especially since the makeup that contains the SPF is generally not reapplied often enough, if at all to help protect their skin during the day.

Reassessment of Sun Safety Practices

Many participants did not react strongly to their own photographs, with some having stated that they said that they almost expected the damage that was on their photographs because of poor sun safety practice use in the past. For example, *“I mean I realistically would have expected that ... I grew up here so I am sure that damage was mostly done when I was about John’s [child] age”* (Tracey). Another participant expressed her views on her own UV photograph and describes that it was when she was young that the damage on her photograph would have occurred.

With regards to myself... it is just the same old story when you mature you know what I mean? There is just so much shit that goes down when you were younger that you go ‘hey’. You just deal the best you can with whatever is left you know? (Rebecca)

Some of the participants looked to the future as to what they could do to prevent future damage for both themselves and their children, *“with mine I guess there... there is not much that I can do about what has happened, it is what I can do going forward and um I feel that we are doing sort of what we can going forward”* (Lucy).

Most of the participants, however, were more interested in their children's photograph than their own. Parents expressed a wide range of emotions at the damage they saw on their child's photo, "*I am a lot more interested in Tom's [UV photo] than in mine. Oh god... but yeah certainly a lot more spots across his nose and upper cheeks and on his chin too*" (Lisa), "*I feel sad [about damage in child's photo]. I think had I known something like this when he was two years old... I would have been more fierce with my practices and yes I did hear it here [pointing to her head] but not here [pointing to her heart/gut]*" (Rebecca), "*I guess it worries me a bit... you know about the whole skin cancer thing and the ageing badly*" (Ashley).

Upon viewing the photographs, many parents reassessed both their and their child's current sun safety practices and based upon the amount of damage they saw. Most parents expressed that they would apply more sun safety practices in the future to prevent further damage. "*I used to think that wearing foundation was um enough, like just normal foundation would be sunscreen so obviously it is not and I always will ensure there is a hat on the kids at the very minimum*" (Jade), "*Yeah I will be more pedantic [about sun safety practices], I will be more careful in ensuring that they are carried out... I can hand on heart say that with my son I would*" (Rebecca), "*After seeing mine I would make sure that I would always have sunscreen on but I always do make sure I have sunscreen on but yeah I would probably make sure I would apply it more often*" (Denise).

Knowledge of Sun Safety

Participant's knowledge and awareness of sun safety was varied, with three subthemes emerging from participant's knowledge and awareness. 'Parents' knowledge

as child,' present knowledge and awareness,' and 'skin cancer enhancing awareness' all emerged as subthemes.

Parents' Knowledge as Child

Many of the participants when asked about their current sun safety practices recalled their own sun safety practices as a child. Most of the parents reported that they had received little education and knowledge about sun safety practices for a variety of reasons. The reasons are outlined in the following comments, "*when I was growing up we rarely ever used sunscreen... we also didn't have very good knowledge back then and we were not very aware of what solariums and the sun can do to you*" (Jamie), "*as a kid it wasn't really that high on our list of priorities to lather ourselves up [with sunscreen] 20 times a day*" (Lucy), "*when I was brought up, we put lots of zinc on and at the time everyone wore zinc so we did have a lot of coverage on our face but the rest of our bodies, we didn't really worry about*" (Tracey).

Many parents also raised the point that at the time that they were children, the importance of sun safety was not emphasised to the same extent it is now because the parents of the participants interviewed had little to no knowledge of sun safety practices. This was most likely due to there being few campaigns that informed the mass public about the dangers of UVR exposure without sun protection during that time period and that the parents of the participants were mostly uninformed as to the damage that was caused (Buller, & Borland, 1999; Montague, et al., 2001). One participant commented on the specific messages that were in the media when she was younger but still wanted to tan at the time.

I really don't remember there being much education about sun safety in primary or high school and it was only sort of through the advertising from the council...

the sun council... the slip, slop, slap that I do remember. But that was at the time that I was about 16 and wanted to be cool and brown (Jade).

Many parents also mentioned that even when they were with family at an outdoor area such as the beach on a day with high UVR, sun safety practice was rarely used, “*I don't really remember them [her parents] sort of saying, well here, you should reapply it for it to continue working... it was just... you were out there and doing your thing. It wasn't, it wasn't in your head*” (Lucy). One participant had expressed the differences in the amount of sun safety practices applied between when she was a child and what she practices now with her own child.

Mine [photo] is a lot worse but I didn't... she [her child] would wear a hat and sunscreen and stuff If we were the same age I would think I would be far worse [UVR damage] than her. That is mostly because mum and dad did not emphasise sun safety. But that is because I think that they didn't know [the importance] either. We would put sunscreen on at the beginning of the day, go to the beach all day and then come home, whereas with her it is always, put some more on, put some more on. Whereas we never reapplied... we just wacked it on and that is it (Denise).

Present Knowledge and Awareness

The majority of participants had shown relatively average knowledge in regards to sun safety practices. Most of the participants stated that most of their information regarding sun safety came from mass media campaigns such as Slip, Slop, Slap (Montague, et al., 2001). For example, “*you are taught it [sun safety] more now, it's just everywhere. All the child's magazines when it comes around summertime it is all there on TV, everywhere you go*” (Denise). Another participant stated her awareness of the consequences of overexposure to the sun from the mass media.

Well I mean you just have to look at the melanoma and skin cancer ads on TV to see how dangerous melanoma is... I think now that um the people who did the slip slop slap campaign has probably succeeded and that is now more a part of our

culture, more so than tanning, you know especially with the younger generation (Courtney)

Nonetheless, even though most participants believed that they were knowledgeable about sun safety practices, many stated that they generally were not as strict with their own and their child's sun safety practices when it was not hot and sunny. The literature supports the view that UVR exposure during winter or during times when people expect there to be less risk to UV damage such as when it is overcast can still damage the skin of the human body (Stanton et al., 2000). Two different participants had commented on their knowledge and sun safety practices when it was not summer type conditions.

Not [as knowledgeable about sun safety] to the extent that I should be, I think I take more care when I know the sun is out there and it is really hot in the middle of summer but I am not too clued up on the other times of the year and what dangers there could be. Yeah, I am not very educated on that but I need to be (Jade)

I am quite happy for her [child] not to have sunscreen on when it is winter when the sun is not so strong and I know she is only out there for a shortened amount of time and that she has long sleeves and pants on at the same time (Lucy)

Another participant also expressed their knowledge and use of sun safety during times when it is not sunny, “*when we are walking, we put it on. You know it depends on what it is like [outside]. If it is overcast I know that you should still put it on [but] you're allowed a little bit you know what I mean?*” (Sarah).

Some of the participants, upon viewing the photographs felt that while they were knowledgeable, that they felt a sense of helplessness in not knowing other ways to protect their children. One participant commented on the damage they saw in their child's photograph and is worried that they are doing everything that they can and it still might not be enough to protect her child from damage.

I worry [about the UV damage] but if we are sort of doing everything that we can to stop it... becoming worse then there is not much that I can do about it... yes I am concerned and yes I am worried but I am not sure if there is anything more I can do and then if something happens, it happens... I mean to me we are doing the hats, we are doing the cream, we are doing the sunglasses so... if that is bad [the damage on the child's photograph] I don't know where else we can go other than letting her out of the house... (Lucy)

Other participants also commented on how they felt they were doing everything they reasonably could to protect their children, “*I don't know how much more as parents you can do to impress that on your kids other than just have it as one of those constant things*” (Lisa). One participant expressed how she felt she was doing everything that she felt she could to protect her child from damage but still felt that the damage was higher than what she expected.

After seeing what I see in the photographs, particularly the damage to Jane's [child] skin... I mean to be quite honest I mostly put sunscreen on her every single day I don't know. Like you know going to and from the car I don't know really many other ways to protect her I guess (Courtney)

Skin Cancer Enhancing Awareness

The majority of the participants who were interviewed had said that someone in their immediate family has had either skin cancers removed or has died as a result of skin cancer. One parent stated how her mother found out that she had a lot of damage on her face and that forced her mother to emphasise to her the importance of sun safety practices.

My mum was brought up in the Pilbara and she wasn't really educated in sun safety. As she went and got... her face checked and it came up that she had a lot of dark patches around her face and from finding that out she really started to enforcing with me to always wear sunscreen and be safe because her face had a lot of damage to it (Jade)

Another participant had commented on how her family has dealt with skin cancer and the emotions behind seeing it happen.

My step-father is currently very sick with melanoma and it's now gone through his entire body and we don't have very long with him and it is awful to watch him go through that. My mom has had a couple cut of her face and her hands and so has my dad. So yeah, obviously we have been close to it recently so yeah um, I hate to think that our children would have to go through that process, however, it is probably inevitable (Courtney)

Some of the participants had acknowledged that once it had become known to them that their relative had skin cancer, they had become more aware of their own sun safety practices. For example, “*Actually my dad ended up passing away from melanoma so we have all been having the checks and testing and things like that yeah... so really... it just made me more aware*” (Sarah). One participant related seeing skin cancers being removed to the level of awareness in the general community.

I have seen my parents and my Nanna and Pop, they have heaps [of skin cancers] removed, all the time and she's [child] seen that too. Whereas I never saw anyone have skin cancers removed so it was just this hypothetical thing that could possibly maybe happen but now that we see it more because people are more aware so they do [her children] get their skin checked all the time (Denise)

Tanning

The theme ‘tanning’ related to the different attitudes held concerning tanning and the use of tanning behaviours. Parents were asked questions relating to tanning and their views relating to the matter due to the prevalence of tanning in Australia and its association with the amount of sun safety used. The theme of tanning could be divided into 3 sub-themes; ‘use and motivations to have a tan’, ‘views on tanning’ and ‘tanning as part of a youth culture’ which will now be discussed.

Use and Motivations to Have a Tan

Many parents that were interviewed expressed many different views on whether they tan and the motivations for engaging or not engaging in the behaviour. Most parents reported that they do not currently tan either naturally or through the use of solariums,

however, most did report that they do use 'fake' artificial tans. For example, "*I think there are enough cosmetic means to get a tan and those who are willing to lie in the sun to get a tan is a fool*" (Lucy), and "*spray tans you know you can do what you want to because they are not going to hurt you*" (Jade). Tracey explained that back when she was young there wasn't "*any spray tans or ... any fake tans, so once they made those, I started using that*" and "*I use the cream stuff so I don't have to use the sun, because I don't tan*" (Denise).

Only a small number of participants mentioned that they had tanned artificially at a solarium but they had stopped long ago for different reasons. Some participants who had artificially tanned before described the experience by saying "*Honestly it was just like sitting in a coffin and then when you came out you could just feel yourself burning*" and now states "*I just avoid them if possible*" (Courtney) and another participant had visited solariums "*about 40 to 50 times' in her life when she was 'between 17 and 22'*" but now does not use them because "*I have learned everything about the dangers of solariums such as skin cancers and stuff*" (Sarah).

The motivations for having a tan, either fake, natural or artificial did vary among the participants although, social or media pressure and influence were one of the main reasons given as illustrated by the following comments: "*We had a farm and we had a pool and we used to lie out in the sun heaps...pretty much to get a tan... and also because everyone else was doing it*" (Ashley), "*I would use self-tanning lotion if I had to you know get in my bathing suit*" (Courtney), "*it's not even necessarily that people think it [a tan] is attractive, but it is more of a society thing*" (Tracey). One participant mentioned how she viewed tanning in Australia and how that view is influenced by the media.

I think the stereotype of the Aussie surfer prevails a lot with bleached long hair and the tanned skin... it is a quite unhealthy and unrealistic way to look at it but I think a lot of, especially young teenagers will try to follow that because of summer bay and home and away portrays that as attractive (Jade)

Views on Tanning

The perception of how a participant viewed a tan as either a negative or positive asset depended greatly on the degree to which someone was tanned and the age of the person that was tanned. Some parents had commented that someone who they viewed as being too tanned is unattractive. *“When I am walking around and I see someone that has obviously just been standing out in the sun and wrinkly and look like an old prune, no I don't find that attractive, no”* (Courtney), *“sometimes people just get too tanned and they look kind of horrid and then when they get older, and they're too tanned they kind of look like leather”* (Ashley).

Many parents knew that tanning was dangerous and viewed it as a negative behaviour. The following statements are examples of this: *“I wouldn't ever go out and sit in the sun ever again and tan...”* and stated that she stopped tanning because *“I just seemed to grow up and as you get older you get a bit wiser I suppose”* (Sarah), *“I think that tanning is just sun damage now, so when I see it I just think that if you know that they have been out in the sun”* (Tracey).

Many parents, however, when asked questions relating to tans for either children or adults generally said that slight tans suited children because it symbolised their healthy and active lifestyle. One participant commented twice on how she viewed tanning as an indicator of having a physically active lifestyle.

I have seen kids start their swimming school lessons like very white and like by the end of the two weeks they are really quite tanned and yeah, more olive

complexion. I think that just – just shows good outside activity and that natural kind of progression... (Lucy)

I think it was just that the tan usually came from being outdoors and outdoors meant you led an active, a physically active life and having a physically active lifestyle was a healthy lifestyle and the tan as a result of it was more of a reflection of the way you lived your life (Lucy)

Most parents were not concerned about tans on their children if it was achieved with them employing full sun safety practices. *“If it’s done like she has a tan but it is done naturally like even with sunscreen and all that on... it just happens and it does look nice’ and ‘whatever happens, happens with sunscreen on” (Denise), “I mean I think it is healthy if they are protected – you know so they do all the sun stuff and it is just indicative of a child having an outdoor life then I think yeah it’s great” (Rebecca).*

Tanning as Part of a Youth Culture

All of the participants that were interviewed had stated that they do not currently tan for various reasons such as knowledge of consequences, sense of responsibility to set an example for their children and because they do not believe that having tans is as once a higher priority as it once was. Many parents reported that they had tanned naturally when they were younger, with one participant stating her tanning behaviour both currently and as a teenager. One participant commented on how her desire to tan compelled her to naturally tan until fake tans became available to her.

When I was younger I thought it looked good and then obviously back then we didn’t have any spray tans or you know any fake tans, so once they made those, I started using that. So for about 10-15 years in my life I have purposely gone out in the sun to change colour (Tracey)

Other participants also stated their desire to have a tan when they were younger, *“but it [tanning] is not a big issue... it was when I was younger in my teens and stuff – it was more of an issue” (Denise), “Have I ever sun-baked? Absolutely, especially when I*

was younger... We had a farm and we had a pool and we used to lie out in the sun heaps... just lie next to the pool..." (Ashley), *"back in my younger years I used to... put the olive oil on – that Greek oil on and just lie out in the sun. But yeah... all the time when I was younger, all the time"* and stopped tanning because *"I just seemed to grow up and as you get older you get a bit wiser I suppose..."* (Sarah).

One of the main views on tanning that many of the parents expressed was that tanning was almost exclusively a youth culture. When some parents were asked whether tanning was part of an Australian culture, some responded by commenting that tanning as a behaviour was more of a youth culture than an Australian culture for various reasons. *"I hear the young girls talk about going out in the sun you know and the holidays during the break they all talked about just lying in the sun. Their goal is to get a tan"* (Tracey).

'I think it is definitely more of a youth thing than an Australian thing... we have also lived for about 10 odd years down in the country and it is just not something that people do... I think it is definitely more of a youth culture than it is an Australian culture' (Lisa)

Parents Expectations

Many participants during the course of the interview expressed certain assumptions or wishes that they would expect would hopefully occur during their child's development. Parents expectations was seen as a developed theme with participants' raising three main expectations or wishes that developed into subthemes. Parents had certain expectations regarding their 'child as a teen and their level of protection' as well as their wishes for their 'children and protection from future damage' and 'preference for child to live an outdoor life'.

Child as a Teen and Their Level of Protection

Parents were concerned about their children growing up into teenagers because they believed it would result in more damage to the skin caused by the lack of effective sun safety practices. Many of the participants expressed that they could only hope that their children, when they became teenagers that they would apply the same level of sun protection that was practiced while they were under their control as children. “*I guess what you worry about is when they reach teenage hood and they don't do it [sun safety practices] anymore and you're not there*” (Ashley). Two other participants also commented on what their outlook on the future is for their children when they become teenagers.

I probably have until he [child] is 10 where I can take the bottle and pour it on him. After that I think the peer pressure is too strong... whether my son will have the strength of character to protect himself through that I don't know (Rebecca)

When he's 20 I can't keep going over to his house every morning and keep putting on sunscreen for him... I should hope I am able to instil some sun safety educational messages in him and he will look after his skin (Jade)

Many of the participants expressed during the interview that education and reinforcement was what they believed was essential so that their children as teenagers might not lower or disregard their use of sun safety practices. One participant mentioned how as a parent she was not only responsible for their children now but also to educate them for the future.

I guess as a parent, not only are you responsible for putting on the sunscreen and the hats and all that... but I guess you go to be really grilling it into your kids that you have got to be doing this, this and this and make sure that you reapply and hope that when they get that little bit older and they get out there on their own that they follow what you have been doing for them (Lucy)

Another participant commented how as her children grow into teenagers she believed that sun safety practices would decline.

I guess I am just going to make sure that they keep doing it [sun safety practices] as they get older. I mean it is easier to do it now but as they get older like when they are 12 and 13 they start you know becoming teenagers so I have got to make sure that they keep on doing it (Ashley)

Some parents pointed out that sun safety is only one of many health safety behaviours that decline during teenage years, which is supported through studies by (Bylund et al., 2010), which support the parents view, “*what my husband and I have tried to instil in her now with sun safe practices is that she continues into her teenage years because obviously that is when you become... more complacent about how you treat your body*” (Courtney).

Children and Protection from Future Damage

The UV photographs that were taken of both the child and the parent showed extensive damage on some of the parent's photographs with some degree of damage also appearing on the child's photographs depending upon their age. When parents were asked whether their child would reach the same level of damage as they did on their photograph most responded by saying that they hoped that they would not. Most participants also said that due to the current levels of knowledge, education and sun safety practices that are enforced at an early age, parents believed that their children will have less damage and be more sun conscious when compared to their childhood. One participant describes the damage on the photographs and answers whether her child's damage will reach the same level as her own.

No I don't think hers [child] will be as bad... She puts more sunscreen and wears hats and hats are a fashion statement now too... yeah, hats are cool these days. Hats weren't cool when we're growing up. We didn't want to wear hats. Now

hats, everyone has hats so... and now everyone wears hats and everyone knows to put sunscreen on so... and more products have sunscreen like... I know my moisturiser in the morning has sunscreen and I would look for that and I look for things that have moisturiser, like have sunscreen in so she is putting it on her face as well. She puts sunscreen on her face before we even, before she goes to school whereas we never did that so, even though she doesn't re-apply it, at least she has had something put on her face. And they wear the wide-brimmed hats and everything so I think she would have a lot less damage than what I would have (Denise)

Denise also commented that damage to her child can be avoided because *“you are taught it more now, it's just everywhere. All the child's magazines when it comes around summertime it is all there on TV, everywhere you go”*.

Other participants commented that *“In this day and age we have much more knowledge than we ever had and certainly more resources to make it better but no it would be something that um they would naturally have in check [the damage]”* (Lisa), *“I think I grew up differently than he has... in saying that I can't predict the future and he might become a labourer or have an outdoors job which may put him at increased risk”* (Tracey), *“we also didn't have very good knowledge back then and we were not very aware of what solariums and the sun can do to you”* (Jamie).

Preference for Child to Live an Outdoor Life

Although sun safety is of importance in the prevention of many possible consequences of over-exposure to the sun, many parents commented on the need for children to be outdoors and be possibly exposed to the sun. Some of the participants said that they would prefer their children to live a life outdoors and be healthy and active even at the possible risk of having damage done to their child's bodies. One participant commented on how she perceived that an outdoor life is much more beneficial for her son than an indoor life despite possible UV damage.

So is there a potential for that [UV] damage? Yes there is, in a country like this that we live in. Yes there is because I would hope to god that he would have an outdoor life as opposed to doing drugs and shit so... but the downside is this [the damage]. Can I say that because of this [Viewing the photographs] I would not want my son to be in outdoor sports or stuff like that because of this? No, I would be an outright liar because I wouldn't. I would still want him to be out there you know doing the sun sport and just working out his testosterone anywhere but home. As long as it is anywhere outside, healthily is good. (Rebecca)

Another participant said that even seeing the UV damage on her child's photograph that *"I would rather her be active and having fun outside then... naturally having a few wrinkles and sun spots on her face then having her couped up inside on the couch"* (Denise)

Other parents having seen the photographs made them reassess the benefits and consequences of outdoor play, with some expressing that the knowledge of the danger from UV and outdoor play may influence the amount of time spent outside. For example,

I mean I think it is very healthy for the kids to be outdoors but um yeah, to already see some damage to her skin and it looks like she already has some colour to her skin... maybe a bit more indoor play but yeah we are in the sun quite a bit so um maybe kind of reduce the hours that we are in the sun (Courtney)

Some parents were still conflicted as to what they should do with their children and whether outdoor play was beneficial at the possible consequence of sun damage. *"If that is bad [the damage] I don't know where else we can go other than letting her out of the house"* and was still conflicted as to *'whether it is better to let them get that little bit of sun I don't know'* (Lucy).

Limitations of the Present Study

There are several limitations of the present study, mostly relating to the sample that was recruited. While there were sufficient participants recruited, all the participants involved in the study were mothers of the children with no fathers included as part of the study due

to none contacting the researcher to volunteer their time. Future research of a similar nature to the current study should aim to include fathers and get their attitudes and views on sun safety practices and determine whether their practices may influence their child. Another limitation of the current study that should be considered is the potential inaccuracy of the data because of possible researcher effects or because the participant might have given inaccurate answers to some questions for a variety of reasons, including being embarrassed or having difficulty remembering what had happened in the past.

Summary and Conclusions

Skin cancer incidences in Australia are higher than in any other country in the world and with Australians four times more likely to have skin cancer than any other type of cancer, suggests that as a nation Australians overall spends a lot of time outdoors. While there is a general consensus that sun safety is an important practice to help prevent skin cancer, it is important to examine children's sun safety practices because they spend more time outside than other age groups. Overexposure to sunlight will ultimately result in premature aging of the skin due to photoaging and the extent of the damage is highly dependent on the amount of UVR exposure. It is important to ensure that children not only practice sun safety as a child but also to educate them so that they can do it themselves in later life. Therefore, parents' sun safety practices and attitudes are of interest to researchers since they influence and control their children's sun safety practises. The aim of the current study was to investigate parents and their children's sun safety knowledge, attitudes and behaviours and how they reacted to UVR damage done to their face with a UV photo taken of both themselves and their child. A qualitative, phenomenological approach allowed for data collection methods such as semi-structured

interviews which provided rich, in-depth data in a field that is more predominately based in statistics.

Through analysing the data using the process of thematic analysis, it was found in the current study that participants and their child's sun safety practices were generally at acceptable levels of protection, with all parents reporting that their children complied with the no hat, no play policy which is part of the school Sun-Smart campaign (Montague, et al., 2001). One main point of interest was that many parents mentioned their reliance on makeup or moisturiser with SPF sunscreen in it to protect themselves from the sun. While some parents that stated they used the makeup with the SPF in it to protect themselves from day to day activities that involved some UVR exposure, other parents suggested a reliance on it to protect their faces during activities that involve high amounts of UVR exposure. Future research to investigate people's attitudes and use of SPF in makeup and beauty products and determine whether it offers adequate protection for the situations in which people believe the makeup is protecting them from UVR damage is needed.

An important finding in this study is also the reaction to the UV photographs and how parents reassessed their attitudes after viewing the photograph. While most of the parents said that they would increase their sun safety practices after the interview, they were more interested in their child than themselves, with some parents suggesting that even after viewing the damage on the photographs that they would still protect their child first and make sure they apply more sun safety practices than themselves.

Parents had expressed that their knowledge of sun safety when they were younger was low, which they attributed to a lack of mass media campaigns at the time. Consistent

with the current literature, parents were, generally quite knowledgeable at the time of the interviews on how to protect both themselves and their child from the consequences of overexposure to the sun. A finding of interest is that the majority of parents reported that they had someone in their family who was close to them have some form of skin cancer and that the event had made them more aware of the dangers of overexposure to UVR. The results also suggested that some parents that felt they were doing everything they can to protect their child and then saw damage on their child's photograph expressed a sense of helplessness in terms of not knowing what else they could do to protect their children.

The parents had reported that they viewed tanning as a behaviour negatively and that they viewed that having too much of a tan is unattractive. While most parents reported that they did not tan either naturally or through solariums at the time of the interviews and that they viewed the behaviour of tanning negatively, most reported using fake, artificial tans due to social or media pressures. In relation to parents' fake tan use, is that while parents view a tan itself as acceptable they view the behaviour of tanning as strictly a youth culture that they do not partake in. Of concern is that most parents believed that a slight tan on a child symbolised a healthy and active lifestyle as long as the tan was achieved with some sun safety practices and that a lack of a tan was symbolic of an unhealthy, indoors lifestyle. This finding has important implications for future programs that may aim to adjust the public's attitudes towards tanning.

The finding that parents expected sun safety use to decline with age in their children is consistent with the current literature (Bylund, et al., 2010). Parents also expected that their children will not have as much damage to their faces as they have when they will reach their age is an important finding as it suggests that parents view the

current sun safety campaigns and practices that children are learning and engaging in as a positive practice. An important finding of this study is that parents, even after viewing the damage on the UV photographs of both themselves and their child still preferred that their children lived an outdoor life which they considered to be healthy and active. It is important that future sun safety programs not only emphasise the importance on sun safety practices but also a healthy outdoor lifestyle and finding a balance between the two.

The results from this study make a distinctive contribution towards the current body of knowledge regarding sun safety practices from a parents' perspective and the influence the parents' sun safety practices may have on their children. By utilising UV flash photography as part of the interview process, it allowed data to be collected recording the experiences of the parent viewing the damage that has been done to both their and their child's faces with their current sun protection methods. It is important that future research investigates the relationship between a parent and their child and how it can influence sun safety practices overall due to the importance of that relationship. By increasing knowledge in this area, programs will be able to target parents more effectively and hopefully increase sun protection use and attitudes in both parents and their children.

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Appendix A

PARTICIPANTS WANTED

Parents with a child aged between 4 and 12 years old are wanted to participate in a 4th year psychology honours study which aims to investigate parent's attitudes towards sun safety and the psychological processes parents use when deciding whether to use sun safety and how it might influence their child.

Interested participants have to be willing to have themselves and their child's (aged between 4 and 12 years old) faces photographed twice, once with a normal flash and a second ultraviolet (UV) flash. The UV flash will reveal damage caused to your skin by excessive exposure to the sun and harmful UV radiation. The parent also has to be willing to be interviewed by the researcher for about 1 hour.

Your child will not participate in the study on any level except to have their photograph taken (they will not see the photographs), with all photographs destroyed at the end of the interview.

If you are interested in participating in this study or want more information about the study please contact the researcher Matthew Welch by email at mwelch1@our.ecu.edu.au or by phone at 9249 4204.

This study is supervised by Associate Professor Paul Chang who can be contacted by email at p.chang@ecu.edu.au or phone at 6304 5745.

Appendix B

Questions

1. Can you describe your current lifestyle?
 - Do you often go to the beach or other highly sun related areas?
 - How often would you be exposed to sunlight in a normal week?
2. Have you ever been exposed to artificial sources of ultraviolet light?
 - Do you deliberately exposure yourself to either artificial or natural light?
3. What are your views on tanning?
 - Do you believe that people who have tans are more healthy or attractive than those without tans? Why?
 - Do you believe that tanning or being tanned is part of Australian culture?
 - Do you believe it looks healthy for children to have a tan? Why?
4. When going outdoors are you aware of possible consequences of exposure to the sun or artificial light sources?
 - How do you view sun safety practices?
 - Do you use sun safety practices?
 - When do you employ these sun safety practices?

At this point in time, the participants will be shown the photographs that were taken earlier before the interview and asked questions relating to the photographs.

5. What do you see in the photographs taken?
 - How do you feel about seeing the damage done to your face?
 - Why does it make you feel that way?
 - Are you worried that the damage you see in the photographs may appear at a later stage in life?
6. How do you perceive the differences in the amount of damage in the UV photographs between yourself and your child?
 - Why do you believe those differences exist?
7. Do you believe that your child will reach the same level of damage to your skin?
 - Why do you believe that is the case?
 - Do you believe you are confident and informed enough regarding sun safety to protect yourself and your child from what caused the damage to your skin?
8. What are your attitudes now after seeing the photographs towards tanning?
 - After seeing the photographs, has it changed your attitudes regarding having a tan being healthy and/or attractive?
 - Have your views on children having a tan as being healthy changed after seeing the photographs? Why?
9. After seeing these photographs, what do you intend to do now?
 - Do you believe that it will adjust your sun safety practices?

Appendix C

INFORMATION LETTER TO PARTICIPANTS

Title of Project: The Sun Safety Attitudes of Parents and the Effects on their Children

My name is Matthew Welch and I am a 4th Year Honours student in a Bachelor of Arts in Psychology Honours degree at Edith Cowan University (ECU). You are invited to take part in this research project, which I am conducting as part of the requirements of my degree. The research project has ethics approval from the School of Psychology and Social Sciences Sub-Committee, which is a part of the Faculty of Computing, Health and Science.

This project aims to investigate parent's attitudes towards sun safety and the opinions you have when it comes to sun safety especially with respect to you children. If you choose to take part in the project you and your child will be photographed (only the face) two times each, once with a normal flash and the second time with an ultraviolet (UV) flash. An ultraviolet (UV) flash/photo will reveal damage to your skin that is not visible to the naked eye, the damage that has been caused by exposure to UV rays from the sun or artificial sources such as tanning salons. The purpose of taking two photos is for you to compare the difference between the two photos.

I am only intending to interview you, the parent, not your child. The interview should last 1 hour. Your child does not participate in the interview or any other part of the study other than being photographed and your child will not see the photographs at any stage of the study.

The interview that you are requested to participate in will be audio recorded. This is so that the interview can be transcribed at a later date. Once the interview has been transcribed, the audio recordings will be destroyed.

All information collected during the research project will be treated confidentially and will be coded so that you remain anonymous to anyone other than the researcher. All data collected will be stored securely on ECU premises for five years after the project has concluded and will then be confidentially destroyed. The information will be presented in a written report, in which your identity will not be revealed. You can request a summary of the final report when the study is complete around late October.

I anticipate that the study may cause some discomfort for some participants in this study upon viewing the differences between the two photographs taken and the participant takes in how much UV damage has been done to their face. As a participant, you may also feel some discomfort or anxiety relating to the interview, however, please keep in mind that this is normal and that there is no right or wrong answers regarding this research. You will also be inconvenienced by taking part in the interview, which should

Appendix C

take no more than 1 hour and 30 minutes to complete (1 hour for the interview, possibly 15 to 30 minutes for the pictures to be taken).

Participation in this project is voluntary and you are free to withdraw at any time and there will be no penalty for doing so. If you would like to take part in the project, please contact the researcher (Matthew Welch) by email at mwelch1@our.ecu.edu.au, phone 9249 4204 or in person, to confirm interview arrangements.

If you have any questions about the research project or require further information you may contact the following:

Supervisor: Associate Professor Paul Chang

Telephone: 6304 5745

Email: p.chang@ecu.edu.au

If you have any concerns or complaints and wish to contact an independent person about this research project, you may contact:

Research Ethics Officer – Kim Gifkins

Edith Cowan University

270 Joondalup Drive

JOONDALUP WA 6027

Phone: (08) 6304 2170

Email: research.ethics@ecu.edu.au

Thank you for your time.

Yours sincerely,

Matthew Welch

Appendix D

CONSENT FORM



Title of Project: The Sun Safety Attitudes of Parents and the Effects on their Children

- I have been provided with a letter explaining the research project and I understand the letter.
- I have been given the opportunity to ask questions and all my questions have been answered satisfactorily.
- I am aware that I can contact Associate Professor Paul Chang or the Research Ethics Officer if I have any further queries, or if I have concerns or complaints. I have been given their contact details in the Information Letter.
- I understand that participating in this project will involve both me and my child being photographed with both a normal and ultraviolet (UV) flash and that only I (the parent) will be interviewed.
- I consent to having my voice recorded during the interview.
- I understand that the researcher will be able to identify me but that all the information I give will be coded, kept confidential and will be accessed only by the researcher and his supervisor, Associate Professor Paul Chang.
- I am aware that the information collected during this research will be stored in a locked cabinet at ECU for 5 years after the completion of the project and will be destroyed after that time.
- I understand that I will not be identified in the thesis of this research.
- I understand that I can withdraw from the research at any time without penalty
- I freely agree to participate in this project:

NAME: _____

SIGNATURE: _____ DATE: _____

Appendix E

List of Free Counselling Services for you to use 24 hours a day:

Lifeline

24 hour and crisis telephone and online counselling.

Phone: 13 11 14
www.lifeline.org.au

Samaritans

24 hour crisis telephone counselling

Metro: (08) 9381 5555
Country: 1800 198 313
www.thesamaritans.org.au