UNIVERSITY OF THE WESTERN CAPE

FACULTY OF COMMUNITY AND HEALTH SCIENCES

DEPARTMENT OF PSYCHOLOGY

Children's perceptions of the causation and prevention of childhood burn injuries

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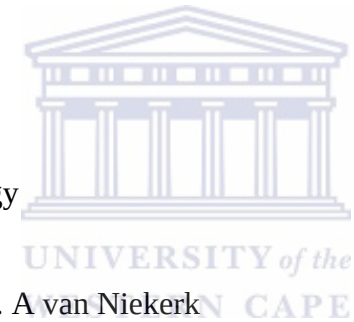

Degree: M.A Research Psychology

Supervisors: Mr. R Ahmed & Dr. A van Niekerk

Date: September 2010

Submitted in partial fulfilment of the requirements for the Master of Research Degree in the Department of Psychology at the University of the Western Cape

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ACKNOWLEDGEMENTS

Although this research contributes the completion of my Masters Degree, it has also contributed towards my personal and spiritual growth. This was an enriching journey, one that has taught me virtues I would not have learnt anywhere else.

I would have never gotten this far without the most supreme all-knowing God, thank you Father for the grace to finish this dissertation and mostly for blessing me with two excellent supervisors, Rashid Ahmed and Dr. Ashley van Niekerk whose different strengths and expertise complemented each other. Thank you, dear supervisors, for your encouragement, strive for perfection, and patience.

My spiritual and biological family and friends, I appreciate the times you willed me on to give only the best and to continue to PUSH (PRAY UNTIL SOMETHING HAPPENS). Thank you for your patience, support and understanding and for being part of the process.

To the schools where data was collected, thank you for making this study possible.

Most importantly, the children living in South Africa, thank you for inspiring this research project and for sharing your experiences with me. You have much more yet to contribute to society; your voices will be heard.

ABSTRACT

South Africa has a high rate of children's burn injuries with 1300 deaths annually. These burn injuries are considered preventable and South African research has identified this as a priority concern. South African childhood burn injury studies have mainly focused on expert and parents'/caregivers' descriptions and accounts. Despite their particular vulnerability, children's perspectives have not been consistently accommodated in the identification of childhood injury risk phenomena or in the development and implementation of safety interventions. Using a qualitative approach this study investigates children's perceptions of causation and prevention of burn injuries. Study data was collected from Khayelitsha, Site C and Philippi, Samora Machel in Cape Town as these areas have reported elevated rates of thermal and fire-related burn injuries. Study data were collected using three isiXhosa focus group discussions based on a convenience sample of 10 – 11 years old children ranging between 4 – 6 participants per group. They were selected based on verbal ability, age, residential area and ability to speak either English or isiXhosa. Thematic analysis was used to analyse the results. The themes demonstrate that children appreciate the magnitude of burns in their communities and attribute the problem to factors ranging from themselves, their social conditions and mostly their parents/caregivers. The children emphasized the importance of parental supervision and risk avoidance by the child and adults in prevention. This study recommends an integrated approach to burn injury prevention interventions and calls for the inclusion of children in studies concerning the wellbeing and safety of children.

Keywords: burns, causality, children, environment, fire, injury, knowledge, perceptions, prevention, risk

DECLARATION OF ORIGINALITY

I hereby declare that this study *"Children's perceptions of the causation and prevention of childhood burn injuries"* is my own work; it has not been submitted for any degree or examination in any other university before and that all the sources used or quoted have been indicated and acknowledged as complete references.

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September 2010

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Injuries represent one of the most important public health problems facing both low and middle income countries as well as high-income countries today and can be categorised as either intentional or unintentional, although intent for injuries such as burns is sometimes difficult to determine (Attia, Sherif, Mandil, Massoud, Abou-Nazel & Arafa, 1997). Unintentional injuries, the focus of this study, are injuries that do not result from violent behaviours (World Health Organization (WHO), 2003) and are a leading cause of death for children, which is the target group, and young adults (Krug, Sharma & Lozano, 2000). Peleg, Goldman and Sikron (2005) express that there is no universally accepted definition of a child due to the wide difference in lay, medical, and legal definitions of a child. According to The Children's Charter of South Africa and Detrick (1999) a child generally means every human being below the age of eighteen years unless otherwise stated. Biggeri, Libanora, Mariani and Menchini (2006) classify childhood into early childhood (0 – 5 years), middle childhood (6 – 10 years old), early adolescence (11 – 14 years old) and adolescence (15 – 17 years old). This study is interested in children up to early adolescence due to the physical and cognitive abilities necessary in preventing unintentional injuries. According to the World Health Report (2006a) unintentional injuries are usually classified according to their causal mechanisms (e.g. hot water, electrification, flames), place of occurrence (e.g. road, home, leisure, at school), and the circumstance in which they occurred (e.g. during play or involvement in household activities). According to this report the most commonly used subcategories are road traffic injuries,

drowning, burns and scalds, as well as poisonings. The first three afore-mentioned injury types constitute among the leading causes of death and injury in children globally (WHO, 2002 & 2006a) including South Africa (Bradshaw, Bourne & Nannan, 2003). Unintentional injury is increasing in low to middle income countries (LMIC) like South Africa and represents a significant public health problem in all higher income countries (Torell & Bremberg, 1995; Towner & Downswell, 2002). This is the second leading cause of death and disability in South Africa where the death rate is almost double the global average (Seedat, van Niekerk, Jewkes, Suffla & Ratele, 2009).

The incidence and mortality rates of burn injuries are continuing to be a major public health problem have not declined in countries such as India (Sarma & Sarma, 1994, cited in Liao & Rossignol, 2000), Greece, Italy, Chile and South Africa (Linares & Linares, 1990). In 2001, Swart and Seedat (2007) predicted that the burden of injuries would rise over the coming years with a large increase expected to occur in sub-Saharan Africa. World Health Organization (WHO) data reports that about 10% of global unintentional injury deaths are caused by fire-related burn injuries (Forjuoh & Gielen, 2008). Globally, there are more than 300 000 fire-related burn injuries annually and 95% of these results in burn mortalities in low and middle income countries (Peck, Molnar & Swart, 2009). Burns are also common in South Africa (Brudvik, 2006, van Niekerk, du Toit, Nowell, Moore & van As, 2004). In South Africa each year, 15 000 children sustain burn injuries (Napier & Rubin, 2002), and more than 1 300 die due to burns (van Niekerk, 2006). In Cape Town, 6 per 10 000 children sustain serious burn injuries; 1 to 2 year old children in low-income settings are predominantly affected by these injuries (van Niekerk, 2006). Globally, infants have the highest incidence of deaths caused by burns (Forjuoh

& Gielen, 2008). In the United States, burns are consistently listed among the top ten causes of injury and death in children younger than 5 years old (National Centre for Injury Prevention and Control, 2000, cited in Edelman, 2007). This group has the highest fire-related burn rates in both HIC and LMIC (Global Burden of Diseases Update, 2004; WHO, 2008) and for burn injury in general in South Africa (Global Burden of Diseases Update, 2004; Hyder, Kashyap, Fishman & Wali, 2004; WHO, 2008). On average, globally, this group accounts for 22, 2% of these deaths (Edelman, 2007; Forjuoh & Gielen, 2008) and have the highest mortality rates of burns (Holland, 2006; Van Niekerk et al., 2004; World Health Report, 2006a; WHO, 2006b).

It is reported that the high incidence of burn injuries in South Africa is due to multi-factorial agents commonly found to be the lack of an enabling environment such as low-economic status, lack of infrastructure, education, and traditional beliefs (Rode, 2007). The social factors that perpetuate this problem include poverty, family/household circumstances in terms of their living arrangements making children susceptible to burn risk and exposure to injury, alcohol and drug misuse, a weak culture of safety enforcement, and a failure to uphold safety as a basic right (Seedat et al., 2009). Poor management of thermal burns has always been problematic in this country (Rode, 2007) and has contributed to the low and middle income countries carrying an extraordinary burden of this devastating and mostly preventable injury (Bickler, Kiyambi & Rode, 2000; Davies et al., 1976). Despite this situation, burn injuries are considered to be understandable, preventable, and a non-random process (Roberts, Elkins, & Royal, 1984, cited in Boles, Roberts, Brown & Mayes, 2005). When developing prevention strategies it is important to identify vulnerable subgroups and risk factors (Aldemir et al., 2005, cited in Atiyeh, Costagliola & Hayek, 2009). It is helpful to execute this by a breakdown of injury

prevalence by population sub-groups (in terms of location) particularly by age and gender (WHO, 2006b) as this helps in risk assessment and the formulation of prevention interventions.

1.2 CLASSIFICATION OF BURNS

Unintentional burn injuries are defined as a thermal injury to the skin or other organic tissue (Forjuoh & Gielen 2008; Holland, 2006; McLoughlin, 1995) which this study will focus on. Such an injury takes place when some or all of the different layers of cells in the body are destroyed by hot liquid, a hot solid, or a flame (WHO, 2003) as a consequence of thermal energy, inhalation (Forjuoh & Gielen 2008; Holland, 2006; McLoughlin, 1995), smoke radiation, radioactivity, electricity, friction, respiratory damage, or contact with chemicals (WHO, 2003; WHO, 2006b).

The most common type of childhood burns is scalding or contact with hot fluids and foods (Albertyn, Bickler & Rode, 2006; Alden, Bessey, Rabbitts, Hyden & Yurt, 2007; Liao & Rossignol, 2000; Livingstone, Holland & Dickson, 2006; McLoughlin, 1995; Sharma et al., 2006; Tse et al., 2006; WHO Mortality Database: Tables, 2009) and is followed by flame-related burns or contact-related burns mostly on the hands (Sharma et al., 2006; Tse et al., 2006; WHO Mortality Database: Tables, 2009). Electrical and chemical burns are also common; electrical burns cause excessive internal damage and chemical burns' severity depends on whether the chemical is digested, splashed or inhaled (Forjuoh & Gielen, 2008; WHO Mortality Database: Tables, 2009). Scalds and contact burns are generally less severe than fire-related burns (Forjuoh & Gielen, 2008).

For this study, the classification of burns is done according to the World Health Organization's International Classification of Disease (ICD). ICD codes are used by most countries for coding data on hospital discharge records although there are other coding schemes such as the Nordic Medico-Statistical Committee (NOMESCO) scheme that is used in Nordic countries (McLoughlin, 1995). These codes describe the type of fire or burn injury that was sustained (Holland, 2006). Cause, extent and severity of burns, respectively, are the commonly used typologies to classify burns (Forjuoh & Gielen, 2008). In South Africa, injuries are generally classified according to the extent of the injury and the depth of the burn which are the two major factors that influence the management and prognosis of burns (Burrows, Bowman, Matzopoulos, & van Niekerk, 2001; Rode, Millar, Le, van der Riet & Cywes, 1989). Burns can be classified as minor or moderate to severe for referral purposes (Rode et al., 1989; van Niekerk et al., 2004). The extent of the injury is expressed as a percentage of the total body surface area (TBSA) and is calculated according to the age of the injured individual (van Niekerk et al., 2004) but is dependent on the cause and mechanism of the injury (Forjuoh & Gielen, 2008). Burn injuries in children are often severe and can result in painful physical long-term effects (Burrows et al., 2001; Rode et al., 1989; WHO, 2003) and far-reaching psychological, interpersonal, financial consequences for families and society (Attia et al., 1997; Brudvik, 2006; van Niekerk et al., 2004) as well as emotional disabilities (Seedat et al., 2009).

1.3 CONSEQUENCES OF BURN INJURIES

Severe burns in children may result in prolonged suffering, disfigurement, impaired physical and mental development (Peleg et al., 2005) and psychological effects which manifest in the form of poor self-esteem (Clark, 1999; Gilboa, 2001; Rode et al., 1989). These factors affect the child's

personality and social relationships especially those burns that result in gross disfiguration (Clark, 1999).

The most common burn injury physical long-term consequences include hypertrophic scarring, extensive contractures, the formation of keloids and the need to amputate an extremity (Esselman, 2007). Keloids are a nodular, firm, movable, tender yet painful scar tissue that forms on the skin after a burn (Stedman's Medical Dictionary) and is relatively more common among children of African descent (Dinules & Graham, 1998; Stedman's Medical Dictionary; Taylor, 2003). Hospitalisation rates of children with burns are much higher than that of children with other trauma (Peleg et al., 2005). Those burns that occur in rural areas where there is inadequate pre-hospital care often lead to greater volumes of illness and disabilities (Forjuoh & Gielen, 2008). Such long-term consequences and the disability resultant from burns can place considerable strain on individuals and their families, hospitals and rehabilitation facilities (Forjuoh & Gielen, 2008) which may be more pronounced in LMIC's due to the unavailability of specialised staff and medical technologies (Barss, Smith, Baker & Mohan, 1998).

1.4 PROBLEM STATEMENT

As established above, burns are dangerous (Holland, 2006; Van Niekerk et al., 2004) and are a serious global health threat to young children (Atiyeh et al., 2006; van Niekerk, 2007; WHO, 2002). Burn injuries not only affect the child but hold consequences for the child's family, the community as well the environment (Forjuoh & Gielen, 2008). Recent South African research has consequently identified childhood burn injuries as a major problem and made it priority concern (van Niekerk et al., 2004) as the majority of these injuries are considered preventable

(van Niekerk, Seedat, Menckel & Laflamme, 2006a; WHO, 2006a & 2006b) therefore suitable interventions must be developed.

Although parents are responsible for the safety of children, it is important to gauge children's understanding of the causation of burns so that intervention that will enable their contribution to safety can be designed.

1.5 RATIONALE FOR STUDY

Current burns research has focused on the extent and occurrence of this problem (Albertyn et al., 2006; WHO, 2006), its aetiology (Forjuoh, 2006; Ho, Ying & Chan, 2001; van Niekerk, Reimers & Laflamme, 2006a; WHO, 2006) and some aspects of prevention (Forjuoh & Gielen, 2008; WHO, 2006). Following this, there is a two-fold rationale to this study.

Firstly, burn injuries remain a significant problem in LMIC as there is a lack of research and effective interventions to decrease burn injury risk (Hyder et al., 2004). Burn injury mortality in economically developed countries has decreased due to the implementation of effective burn prevention programmes and regulations, as well as improved burn treatment (Lawrence, 1996, cited in Liao & Rossignol, 2000). These interventions came about through researching and studying this problem.

Secondly, there is a gap in knowledge about children's preventative strategies as well as the views of children about burns. Although children are among the groups most vulnerable to injury and suffer the greatest long-term effects (Nationwide Children's Hospital, 2003), few

studies have explored the prevention strategies that children employ with little known about how they deal with hazards (Boles et al., 2005; Kalnins et al., 2002). Children's perspectives have not been consistently accommodated in the identification of childhood injury risk phenomena or in the development and implementation of safety interventions despite their experiences of their trauma and proximity of the contexts within which child injury takes place (Nationwide Children's Hospital, 2003). The consequent knowledge gap on the prevention of these injuries therefore contributes to the ongoing threat to health and life (Nationwide Children's Hospital, 2003). The voice of the child is therefore and important aspect to the holistic preventative approach of childhood burns.

There is a growing need for research focused on children as social actors in their own right (Driesnack, 2005; Epstein, Stevens, McKeever & Baruchel, 2006). This is because children have been typically treated as passive objects of study and have been primarily reported upon through parent observation, proxies and second-hand accounts (Driesnack, 2005; Epstein et al., 2006). This has resulted in children being excluded from research (Christen, 1997; Franklin, 1995) and their voices not heard. Recent social studies of childhood advocate for a shift to conceptualising children as active and contributing persons (James, Jenks & Prout, 1998; Mayall, 2000) by affording them the opportunity to verbalise their experiences and opinions regarding their world as this study has done. The focus of research is now shifting from seeking information about children to seeking information from children as traditional data collection methods such as questionnaires, survey tools, and directed interviews are often inappropriately adult-centred, dominated and biased (Bradding & Horstman, 1999, cited in Driesnack, 1999) to adults. As with this study, children are now being more widely consulted and included in research and aspects of

decision-making and policies that affect their lives in aspects such as health care and social care using participatory research methods (Edwards & Alldred, 1999, cited in Wellman, Phillips & Rodgriguez, 2000; UNICEF, 1995). Before this movement, children were considered less experienced, less verbal, more dependent and less competent than adults (Christensen, 1997; Franklin, 1995). This suggests that children are now considered more able to contribute to decision-making aspects, verbal and experienced in matters concerning society. Responses based on behaviour play a critical role in coping and adapting to certain living conditions. This study, because it sought to explore children's perceptions to injury, will help to devise interventions based on children's behaviours and abilities according to them. This information coming from children namely; burn injury's determinants and occurrence (and prevention strategies) is necessary for the development of effective burn prevention programmes (Atiyeh et al., 2009; McLoughlin, 1995).

1.6 AIM

The absence of children's perspectives and lack of information on their understanding of causation and prevention of burn injuries calls for us to research into this area. Such an approach will allow for the development of interventions that fit with children's developmental abilities and skills. This study aims to gauge children's views of burn injury causation and prevention through their own experiences in order to contribute to the formulation of child-centred interventions for children. This study is guided by the following research questions:

1) What are children's understanding of risk and prevention?

2) What do children identify as risk factors for burn injuries?

3) What prevention strategies have children identified regarding burn injuries?

1.7 CHAPTER ORGANISATION

This report is divided into five chapters. The second chapter represents a review of literature relating to childhood burn injury causation and prevention, children's perceptions of this, and of the burn injury process. The third chapter describes the method used for this study, data collection, data analysis, reflexivity and ethical considerations observed. The fourth chapter presents the findings of the study and discusses and analyses the findings identifying major themes. In the fifth and final chapter, conclusions from the study are drawn and recommendations are made from the findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews literature on burn injuries in general with a focus on childhood burn injuries. The chapter is divided into 3 main parts namely; 1) magnitude and distribution of burn injury amongst children, 2) risk factors to burn injuries, and 3) prevention. The risk factors are discussed according to the individual, familial/household and community/societal contributors. Prevention is discussed according to what is referred to as the 4 E's namely; education, engineering/technology, environment modification (see e.g. Odendaal, van Niekerk, Jordaan & Seedat, 2009) and enforcement (see e.g. Peck et al., 2009).

2.2 MAGNITUDE AND DISTRIBUTION OF BURN INJURIES IN CHILDREN

2.2.1 GLOBAL MAGNITUDE

Globally, fire-related burns are the 11th leading cause of death for children in the 1 – 9 year old age-group (Forjuoh & Gielen, 2008). These burns are the 6th leading cause of death among the 5 – 14 year age group, and 8th leading cause among 15 – 19 year olds (Mock et al., 2008) In Africa there are about 17 million reported cases of childhood burn injuries (Hyder, Kashyap, Fishman & Wali, 2004) but it is not known how many children suffer from burn injuries throughout the world each year (Burd & Yuen, 2005). This could be because patients treat the injuries themselves with the assistance of pharmacists or with the informal help of trained health care professionals (Burd & Yuen, 2005). In the case of children, parents and caregivers may be

treating their children's injuries. Peleg et al. (2004) reported that 53% of all reported burn hospitalisation were of children below 14 years old, of which 76% were younger than 4 years. Infants have the highest global mortality rate from burns; this rate gradually declines with age (10 – 14 age-group) but increases again (15 - 19 age-group) (Forjuoh & Gielen, 2008). In Australia since the 1990's the number of major burns (in terms of TBSA) decreased whereas the total number of patients increased due to a rapid rise in the number of smaller, deep burns, suggesting that although the pattern of injury may be changing, the overall burden of burn trauma has remained constant (Holland, 2006). Whereas flames account for the most global cases of burn injuries (Attia et al., 1997; McLoughlin, 1995; Tse et al., 2006) and burn risk agents in low-income households (McLoughlin, 1995), scalding represents the most childhood burns cases in South Africa (see Burrows et al., 2001; Peden, 1997; van Niekerk, 2007) as well as in other parts of the world such as Asia (see Ahmad, 2010; Palmieri et al., 2008; Zwi, Zwi, Smettanikov, Soderlund & Logan, 1995).

2.2.2 REGIONAL VARIABILITY

Burns rates show great regional variability (Holland, 2006; Forjuoh & Gielen, 2008). Children in LMIC have been shown to have a disproportionately higher rate than those in high-income countries (HIC) (Forjuoh & Gielen, 2008). In 2004, the death rate of fire-related burn deaths was eleven times higher in LIC when compared to that in HIC (Forjuoh & Gielen, 2008). Most non-fatal burns occur in urban areas and the poorest regions of the world such as the WHO regions of Africa and South Asia whilst those in America and the HIC of Europe and the Western Pacific regions have among the lowest non-fatal burns in the world (Forjuoh & Gielen, 2008). In South-East Asia and Africa burn injuries are disproportionately concentrated (WHO,

2002) and represent an important health and economic problem in Africa (van der Merwe & Steenkamp, 2007). In Africa; infants below the age of 1 year have more than 3 times the world average incidence of fire-related burns (Hyder et al., 2004).

2.2.3 MAGNITUDE AND CIRCUMSTANCES OF BURNS IN SOUTH AFRICA

2.2.3.1 Magnitude

Burn injuries are more prevalent in South Africa than in HIC (Peden, 1997). Due to this, there has been a recent increase in interest directed at the epidemiology of childhood injuries in South Africa (Burrows et al., 2006; Peden, 1997). Burn injuries affect approximately 3% of South Africans annually (Rode, 2007). Records of the Red Cross Children's Hospital in Cape Town show that toddlers and infants sustain most childhood burn injuries (van Niekerk, 2004). Burn injuries due to scalding, open fires and other causes constitute one of the leading causes of non-natural death in children in this age-group (Burrows et al., 2001). These burn injuries usually take place in the home itself (Peden, 1997) and usually occur in the late afternoons, often after school hours and in the evenings (Peden, 1997; van Niekerk et al., 2004) and peaked during sleep and mealtimes (Peden, 1997). A study conducted in Gauteng showed that burns were six times more common in informal settlements than in formal residential areas (van Niekerk, Seedat, Bulbulia & Kruger, 2001). Scalding is more prominent in children below 5 years old although they are often non-fatal for both HIC and LMIC (see Delgado et al., 2002; Forjuoh & Gielen, 2008; Hyder et al., 2009). Burn care is expensive (Rode, 2007) and there is an over-representation of burns injury and this should be an important factor for the burn injury prevention sector (van Niekerk, 2006; van Niekerk, Reimers & Laflamme, 2006b). Shack fires

are the second most common reason for the admission of patients in the burns unit in Cape Town (Godwin, Hudson & Bloch, 1996). Because of this reason, fire and burn death rates have been the primary statistic for monitoring changes in burn incidence and for initiating preventive measures (Liao & Rossignol, 2000) as their incidence indicate whether burn injury has increased, decreased or remained constant.

2.2.3.2 Distribution by the type of burn injury, gender and age

Numerous studies (see Burrows et al., 2001; Peden, 1997; Zwi et al., 1995) in South Africa indicate that the majority of injuries are due to scalding with some variation depending on urban or rural location (van Niekerk et al., 2004) in the form of hot liquids from kettles, pots and baths (CAPFSA, 2006; van Niekerk, 2007). Fires due to the use of flammable substances especially paraffin are frequent in this country (Matzopoulos, Jordaan & Carolissen, 2006) and have caused clothing burns by setting clothes alight when individuals work too close to primus stoves (van der Merwe & Steenkamp, 2007). The Medical Research Council of South Africa approximated that in this country more than two thirds of burns are caused by dangerous or inappropriate energy sources (van Niekerk et al., 2007). Children's exposure to open flames is reported to be one of the most dangerous causes and yields more severe injuries than scalds affecting predominantly children below 14 years old (van Niekerk, 2007). In Cape Town, flame injuries accounts for 20% of burn injuries and those due to scalding accounted for about 70% of injuries, with some variation depending on urban or rural location (Peden, 1997). Open flames are more dangerous and cause more severe injuries than scalding and are the cause of the high rate of burn fatalities in South Africa (Burrows et al., 2001; CAPFSA, 2006; van Niekerk, 2007). Burn

injury risks thus differ in terms of their agents but moreover, in terms of frequency (Albertyn et al., 2006; Edelman, 2007; van Niekerk, 2007).

Burn rates vary across age groups and between the sexes (Mock, Peck, Peden & Krug, 2008). In this country, burns are the third most common external source of fatal injuries up to the age of 18 years and are the main cause for the group younger than 4 years (Albertyn et al., 2006; van Niekerk, Rode & Laflamme, 2004). The burn fatality rate of South Africa for children 4 years old and younger has been estimated to be four times as much as that in higher income countries (Peden, 1997). It has been estimated that in Sub-Saharan Africa alone between 18 000 and 30 000 children younger than 5 years old die as a result of fire-related injuries annually (WHO, 2002; Hyder et al., 2004). In South Africa, burns caused by fires was listed as the 11th of the top twenty causes of death in children below 5 years old in the year 2000 (Bradshaw et al., 2003). In 2003; fires were the 4th leading cause of death for boys in the 5 – 9 year age-group and the 5th cause for girls in the same age group (Bradshaw et al., 2003). Females have more frequent representation in flame burns which is mostly sustained in lower body parts during winter (van Niekerk et al., 2004).

2.3 BURN INJURY RISK FACTORS

Injury risks arise from particular injury-causing agents, caregiver behaviours as well as child behaviours (Tremblay & Peterson, 1999). The aetiology of burn injuries is therefore multi-factorial (Rode, 2007) and the predisposing factors can be classified as mainly human- and environmentally related factors (Cubbin, Le Clere & Smith, 2000; Morronguiello, 2003). This section entails a discussion of burns injury risk factors according to the ecological framework

which involves a description of individual level risk factors namely; child attributes, behaviour and individual activities, familial/household, community and societal risk factors (Albertyn et al., 2006; Smedley & Smyde, 2000) in respect of all burn injury types.

Most injuries are consequent to various activities (Runyan, 1998). These are the activities of the child, such as in play, and of the caregiver, such as in multitasking (e.g. household chores and child supervision), respectively, at the time of the event have been found to increase the risk of burn injury (van Niekerk, 2006). To understand the causation process, researchers use the "Epidemiologic Triangle" (Knudson, Vassar, Straus, Hammond & Campbell, 2001), also known as the Haddon Matrix which consists of three components namely; the host, agent and environment (Forjuoh & Gielen, 2008; Hammond, 1993, cited in Atiyeh et al., 2009). The host is the person at risk of injury, the agent is the entity which causes the situation and is always an energy, and the environment is the context in which the interaction between the individual and agent occurs and can refer to either the local or physical environment that predisposes the individual to the particular injury event (Knudson et al., 2001). These risks are caused by numerous sources in and around the home.

Numerous studies report that unsafe cooking, lighting equipment, household appliances, the location of lighting and heating equipment, and the careless use of electrical equipment and appliances all carry inherent risks for burn injuries and pose significant dangers to children (see Daisy et al., 2001; Delgado et al., 2002; Jordaan, Atkins, van Niekerk & Seedat, 2005; Munro, van Niekerk & Seedat, 2006; Sharma et al., 2006; van Niekerk, 2007). Reliance on fossil fuels such as paraffin for heating, lighting, and cooking cause the incidents rate of low and middle

income populations to be high (Barss et al., 1998; Forjuoh & Gielen, 2008; Godwin et al., 1996; van Niekerk et al., 2006; van Niekerk, 2007). This is commonly linked to childhood burns (Forjuoh & Gielen, 2008) as the use and storage of flammable fuel sources and substances (Attia et al., 1997; Delgado et al., 2002; van Niekerk, 2006; Werneck & Reichenheim, 1997) pose the danger of fires and are a poisoning risk for small children due to not being kept in containers with child-resistant closures (see e.g. Forjuoh & Gielen, 2008). The fires are commonly caused by igniting sources such as cigarettes and lighters which are the most common causes in HIC (McLoughlin, 1995).

2.3.1 INDIVIDUAL LEVEL RISK FACTORS: CHILD ATTRIBUTES, BEHAVIOUR & ACTIVITIES

Child attributes are those individual characteristics (Last, 1995) that children possess such as the child's age and gender which are important epidemiological determinants for burn injuries as with all other injury types (Attia et al., 1997). Correctly speaking, it is the cognitive abilities or limitations or lack of experience in preventing injuries that may be the contributor or determinant of burn injury risk. Almost all injury prevention programmes that have targeted children by attempting to influence their behaviour have been unsuccessful (Tremblay & Peterson, 1999) as a result of children's individual characteristics. Numerous studies have identified age, gender, the interplay between age, gender, child development, and ethnicity as the most important childhood burns injury risk factors (see Albertyn et al., 2006; Attia et al., 1997; Bang et al., 2006; Edelman, 2007; Forjuoh & Gielen, 2008). In this section we discuss these attributes, and child behaviour as well as activities that put children at risk of burn injury as well as genetic or constitutional factors of the child.

2.3.1.1 Age

The level of burn injury risk differs across the life-span according to human developmental stages. Different ages are associated with specific injury risks (Ministry of Health, 1998) therefore it is important to explore the magnitude of risk due to age. The incidence decreases by increasing age (Forjuoh & Gielen, 2008; van Niekerk et al., 2004a; van Niekerk, 2007; WHO, 2006) and slightly rises again in teenage years (Forjuoh & Gielen, 2008). This confirms Ngunyen, Tobin, Dickson & Potokar's (2008) finding that the frequency of burn injury increases with increasing age. This means that as the child grows older the lesser their chances of sustaining a burn injury but the chance then increases in their teenage year as a result of their exposure to household activities such as cooking. The highest risk groups are those under the age of four and it is their underdeveloped cognitive and intellectual development that put them at increased risk (Hyder et al., 2004). Children usually imitate their parents' behaviour resulting in them being vulnerable to injuries. This has led to Ahmad's (2010) finding that preschool and school-going age groups are more frequently involved with burns than toddlers are.

Age is thus an important factor for the acquisition of maturity and growth of the physical, cognitive, social and emotional competencies that are required to fully engage in family and society (Dawes & Donald, 2004). This is critical for the developmental cycle as age affects individual abilities, making it an important risk factor for children's burn injuries. Children, especially those of school-going age, are highly active in their play (Graham & Uphold, 1992). They love to explore and do not take the correct preventative measures and as a result may bump into dangerous objects. The age difference is because in young children often occur as a consequence of their curiosity and awkwardness (Forjuoh & Gielen, 2008) as according to the

developmental phase. For preschool children and toddlers it is a result of their tendency to explore the environment with no sense of danger (Tse et al., 2006). Boys older than 6 or 8 years have also been identified among children at more risk as they are more prone to being involved in serious fires (Forjuoh & Gielen, 2008). The child's risk taking behaviour is therefore positively correlated with risk to injury (Brudvik, 2006).

2.3.1.2 Gender

This study understands sex to be the biological classification of males and females. Gender is understood as the socially constructed roles of males and females classifying individuals as either men/boys or women/girls. The gender roles are usually used to assign individual tasks or roles in the household. This study uses the words sex and gender interchangeably in reference to males and females (see Attia et al., 1997; Bawa, Kale & Mohan, 2000; Morronguiello, 2003). Gender is generally identified as a risk factor (WHO, 2006) although some (see Bang et al., 2006) have found no correlation between gender and burn injury. The sex distribution of injury differs (Attia et al., 1997) and it is questionable whether sex differences impact on attitudes and whether beliefs apply to differences in injury risk among males and females (Morronguiello, 2003). This is because gender differs across the life span in terms of the different genders' exposure to risk and behaviour in risk situations (Morronguiello, 2003) such as local customs (Forjuoh & Gielen, 2008).

There is a marked difference in the gender distribution of non-fatal burn injuries among countries which can be related to cultural practices (Delgado et al., 2002; Forjuoh & Gielen, 2008; Kalayi & Muhammad, 1994). Women's burns result from inherent societal norms (Mashreky, Rahman,

Svanstrohm, Khan & Rahman, 2009) such as helping in the kitchen which exposes them to hot liquids and surfaces whilst male injuries tend to be more outdoors (Attia et al., 1997; Delgado et al., 2002; Forjuoh & Gielen, 2008; Kalayi & Muhammad, 1994). Higher rates are also recorded in women from Asian countries like South East Asia (Mock et al., 2008) and Pakistan (Ahmad, 2010). Clothing design such as loose-fitting clothes and those made of synthetic material (Attia et al., 1997) in association with the use of open fires for cooking and heating is associated with increased risk in young women in the South-East Asia and Mediterranean regions (Bawa et al., 2000). The high risk of women is found to be prevalent especially in the younger age groups (Mock et al., 2008).

In industrialised countries, in other words HIC (Ahmad, 2010; Glasheen et al., 1983, cited in Attia et al., 1997; Petridou et al., 1998), males are generally at greater risk of injury than females (Morronguiello, 2003; Tse et al., 2006). In LMIC, burns occur more to females than males and are further the only type of fatal injury that occurs more frequently among females than males (Attia et al., 1997; Delgado et al., 2002; Forjuoh & Gielen, 2008; Kalayi & Muhammad, 1994; The Global Burden of Disease, 2004; Mock et al., 2008). In comparison, this makes females more vulnerable to this form of injury as in Bangladesh for example where burn death rates are four times higher for females (Mashreky, Rahman, Svanström, Khan & Rahman, 2009).

In children, boys are more likely to be injured than girls (Ahmad, 2010; Brudvik, 2001; Morronguiello & Rennie, 1998; van Niekerk et al., 2004; WHO, 2006) and often have doubled the risk (Mock et al., 2008). This is because boys are generally more adventurous (Brudvik, 2001; Morronguiello & Rennie, 1998; van Niekerk et al., 2004; WHO, 2006) and engage in

greater risk-taking behaviours than girls (Morronguiello, 2003). It has been reported that in Africa, older girls are at more risk due to increased household chores (Albertyn et al., 2006; Forjuoh & Gielen, 2008). Some studies have reported girls to be at more risk than boys because of their involvement in domestic activities near open fires and clothing styles (see Ahmad, 2010; Barrs et al., 1998; Kalayi & Muhamad, 1994; Mock et al., 2008). Young boys (5-10 years) dominate male burn injury incidence because of their inquisitive and exploring nature at this stage (Eadie et al., 1995 & in Attia et al., 1997). They display more optimistic bias than girls; meaning that they believe that they are less likely to experience injury than their peers with the same skills (Morrongiello & Rennie, 1998). Their burn injuries mostly occur outdoors, especially in spring time, and are exceptionally highly represented in burns sustained on the head and neck region (van Niekerk et al., 2004).

2.3.1.3 The interplay between age, gender, and childhood development

In the preceding sections it has been shown that there are different burn injury rates for males and females as well as between age-groups and developmental stages. We have further seen how these factors are influenced by the regions where people live as well as by the form of the injury. Age is also related to burn injury as each developmental stage has its own developmental activities that affect risk and different genders have different activities that put them at risk of burns. This section discusses the interplay of age, gender and childhood developmental activities in children's burn injury risk. For example, studies reveal that boys are at greater risk than girls among infants and school-going children whereas girls are at greater risk than boys among toddlers and older children (see van Niekerk, 2004; WHO, 2006). From this finding we can see that injury risk is sometimes determined by age in relation to gender.

Infant scalding mostly affect infants although girls also sustain these injuries; during high risk activities that include bathing, use of hot water geysers without temperature control, and parents not keeping children away from hot liquids (Sheller & Thuesen, 1998; van Niekerk, 2006). These children lack coordination and are unaware of dangerous substances (Attia et al., 1997). Infants under the age of one year mostly get burned on their hands from touching heaters or hot-water pipes (Forjuoh & Gielen, 2008). They tend to reach out for things because this is the stage where their mobility starts to develop (Ngunyen et al., 2008). ***Toddler scalding*** mostly affects toddler girls in high risk activities such as bathing, cooking or cleaning and the use of paraffin and portable stoves in the home (van Niekerk, 2006) due to wanting to imitate adult behaviour. This is due to toddlers' inquisitive, energetic, and curious nature (Hyder et al., 2004). These activities usually occur due to inadequate supervision as a result of parent's divided attention. ***Older children*** namely preschool and school-age children especially girls are at high risk and characterised by an over-representation of burns caused by flames occurring at night and early mornings (van Niekerk et al., 2004). School-going children, especially boys, are at increased risk due to outdoor play and experimentation (van Niekerk, 2006). For girls this is mostly due to burn injuries resultant from their involvement in the kitchen (Delgado et al., 2002) due to flames resultant from cooking and lighting fires (van Niekerk, 2006). School-going children (10 – 11 years old), the target age-group for this study is important as they are in the developmental stage where they are exposed to a greater range of high-risk activities due to their greater physical and social mobility (van Niekerk, 2007). As children grow older they become less likely to be injured by common household objects as they become more interested in the world outside; their curiosity leads them to experiment with matches, lighters and fireworks (Forjuoh & Gielen, 2008).

2.3.1.4 Race/Population Classification

Inequality in terms of resources and lifestyle is related to race or [1]population groups in certain contexts like the USA and South Africa (Bulhan, 1985; Edelman, 2007, Laflamme, 2001; van Niekerk, 2007). A study in New Mexico did not reveal differences between inter-racial children (Edelman, 2007) indicating that not all countries are similar. Race impacts burn injury risk in South Africa due to the history of this country. South Africa consists of numerous population groups such as 'Xhosas', 'Coloureds', 'Whites' and 'Indians', with different languages cultural backgrounds and origins (Population Overview, 2010). The aim of the racial/ethnic segregation in South Africa was to guarantee the political and economic power of the white minority. South Africa is still dealing with the consequences of this policy as a large part of the growing black majority live in poverty (Population Overview, 2010). Further, race was included in a South African factor analysis regarding the type of housing that contributes to childhood burns risk (Edelman, 2007) since non-whites are mostly affected by social inequality. The fact that mortuary data in South Africa indicates that burn injury victims are predominantly black reflects the social inequality pattern that is also found regarding access to electricity (van Niekerk, 2007) as households resort to unsafe resources like paraffin for lighting and cooking due to not having access or being able to afford electricity (Matzopoulos et al., 2006). This type of finding is not peculiar to South Africa as ethnicity has been found to be an additional contributing factor of childhood burns in numerous studies (see Albertyn et al., 2006; Ballard et al., 1992; Edelman, 2007; van Niekerk et al., 2006).

[1] In South Africa, the terms "black" or "African", "coloured" (children of mixed heritage) and "white" have been used to refer to various population groups. Although these terms were tabled via the earlier South African policies of rail segregation, their usage in this thesis does not imply acceptance of the racist assumption on which these labels are based. Instead, they are applied here, as in other South African research as an ongoing reflection of the differential manner in which earlier South African policies of racial segregation, continue to impact on the lives of various groups of South African (van Niekerk, 2004).

Burrows, van Niekerk & Laflamme (2010) reported that the majority of fatal injuries are among Africans (65%) and the smallest proportion is with Indians/Asians (6%) which could be because Africans constitute the largest and Indians/Asians constitute the smallest population group. Research shows that African people have double the chance as compared to white people to be burn patients (Ballard et al., 1992; Edelman, 2007; van Niekerk, 2007). Various studies have identified a variance in what is considered high risk for burns (see Albertyn et al., 2006; Attia et al., 1997; Brudvik, 2006; van Niekerk et al., 2007) and have highlighted how cultural habits, lifestyle and bathing systems may constitute burn risk (Liao & Rossignol, 2000). The association of ethnicity to poverty, low education and cultural habits such as those of minority groups are major factors conducive to higher burn injury risks present in some societies (Edelman, 2007) such as using the stove as a heater. The difference in burn injury risks among population groups are more in relation to the frequency of burn injuries as a result of their different social contexts than it is due to the type of burn injury; there is therefore no significant association between population groups and burn injury (van Niekerk et al., 2004). Risk factors are thus not exclusive to particular ethnic groups (Attia et al., 1997); it is the exposure to risk (high or low) that makes the difference.

2.3.1.5 Individual risk factors

The presence of a pre-existing impairment (Atiyeh et al., 2009; Forjuoh, 2006; Forjuoh & Gielen, 2008) such as blindness, epilepsy or lameness in a child is risk factors for children's burns (Forjuoh, 2006; Forjuoh & Gielen, 2008). Child temperament (Schwebel & Plumert, 1999) and disability (Chen et al., 2007, cited in Forjuoh & Gielen, 2008) also place children at increased risk of burn injuries. Children in these categories have been found to have a

significantly higher incidence of burn injuries than those with no impairments (Chen et al., 2007, cited in Forjuoh & Gielen, 2008). Street children and individuals with uncontrolled epilepsy generally appear to be at more risk for burn injuries (Forjuoh & Gielen, 2008).

2.3.2 FAMILY LEVEL RISK FACTORS

A range of family factors such as how each family cares for their children and parent/caregiver relationships with children contribute to risk. In this section we explore family income and structure, the role of supervision and parental literacy. These factors were chosen on the basis that they were the most recorded in the reviewed literature (see Atiyeh et al., 2009; Edelman, 2007; Forjuoh & Gielen, 2008).

2.3.2.1 Family income and structure

Family patterns such as family income, family size, single-parenting, previous burn injury in the family, and immigrant families were identified as risk factors for both HIC and LMIC for example; Peru, Brazil, South African and the US (see Delgado et al., 2002; Shai, 2006; van Niekerk et al., 2006; Werneck & Reichenheim, 1997). The risk of burn injuries for children of low income families is eight times more than that of children from high income families (Atiyeh et al., 2009). Family patterns such as large families and mothers being away from home are associated with burn risk in the majority of studies (Atiyeh et al., 2009; Delgado et al., 2002; Edelman, 2006; van Niekerk, 2006). This is because large families require parents to go out to work leaving the children at home with minimal supervision causing them to get injured. Employment was identified as a risk factor for childhood burn injuries (0 – 12 years) in numerous studies (see Brown, Greenhalgh & Warden, 1997; Daisy et al., 2001; Forjuoh et al.,

1995; Petridou et al., 1998; van Niekerk et al., 2006; Werneck & Reichenheim, 1997). This could be because it is related to low income which was identified as a risk factor in some studies, mostly in HIC (see Brown et al., 1997; Delgado et al., 2002; Edelman 2007) as it affects people's living conditions and access to safety resources due to affordability.

Children from single-parent families are generally shown to be at increased risk of burns (Werneck & Reichenheim, 1997). This can be attributed to lack of supervision, which will be discussed hereafter, as the single-parent has to manage the house as well as take care of the children. In South Africa areas with the highest child dependency (where there are many children under adult care) are at increased risk of childhood burns (Edelman, 2007; van Niekerk et al., 2006a; van Niekerk et al., 2006b). This could be because child supervision can be strained under such conditions due to caregiver's competing demands. A study in Bangladesh, in contrast to this, did not find any relationship between family size, marital status and number of generations living together i.e. adults in relation to children in the home with burn risk (Daisy et al., 2001). Parental/caregiver education, employment and the type of residence where individuals live were the identified risk factors for children 12 years old and younger (Daisy et al., 2001). These factors (family size, marital status and number of generations living in the home with burn risk; parental/caregiver education, employment, residence) are inversely related to income in that affordability influences whether households can access safety resources (Attia et al., 1997; Daisy et al., 2001). Based on the fact that parent/caregiver illiteracy increases risk; increased literacy among parents does reduce burn injury risk Daisy et al. (2001). Literacy/education would then influence the chances of employment which would then enable households to afford safety resources. Concerning family size and generations living in the

home, in some cases younger siblings get injured while observing the experimentation of the older ones (Ho & Ying, 2001). This can be attributed to children's curiosity and peer pressure. History of a sibling death has been identified as a risk factor in Ghana, Bangladesh and Pakistan (Forjuoh, 2006; Forjuoh & Gielen, 2008). This could be because household have not taken note of and responded to the risk causing the sibling injury which may be the cause of the injury patterns in the home. Children of asylum seekers (Dempsey, 2006, cited in Forjuoh & Gielen, 2008) and those with foreign parents but who live in high-income countries (Carlsson, 2006, cited in Forjuoh & Gielen, 2008) have also been reported to have increased burn risk.

2.3.2.2 Supervision and parent literacy

Children's burn injuries are generally found to occur in and around the home (see Ahmad, 2010; van Niekerk, 2007) as a result of children playing in the house, the design of the house, children's ability to access matches, lighters, candles etc, and children trying to imitate what adults do (Ahmad, 2010). Lapses in child-supervision (Albertyn et al., 2006; Forjuoh & Gielen, 2008; Tse et al., 2006) and parental illiteracy are thus significant risk factors of childhood burn injury (Albertyn et al., 2006; Tse et al., 2006; van Niekerk et al., 2006). Parents' divided attention and low level of awareness which can be attributed to parents' competing demands (Ahmad, 2010; van Niekerk, 2007) makes it difficult for parents or caregivers to be aware of what is happening to the child at all times. This makes burns in young children a consequence of inadequate supervision and the lack of domestic safety measures (Attia et al., 1997; Sakuja, Brenner, Morrongielllo, Rivera & Cheng, 2004) which parents and caregiver need to learn. Level of education is thus inversely related to burn risk (Atiyeh et al., 2009) as this is related to parent literacy. Education above high school in either parent is associated with a decreased risk

for burns (Delgado et al., 2002). Burned children are therefore more likely to be children of parents with low level of education as low rate of literacy within the family increases risk of childhood burns (Forjuoh & Gielen, 2008).

2.3.3 COMMUNITY/SOCIETAL LEVEL RISK FACTORS

In this section we discuss the role of community/societal socio-economic status and social cohesion and community practices in risk factors for burns. These factors will be discussed in relation to how socio-economic status affects injuries, income, age and other specific associations

2.3.3.1 Poverty and socio-economic status in communities

Poverty is identified as a risk factor for many types of injury (Atiyeh et al., 2009; Edelman, 2007). There is an extensive, strong, pervasive link between poverty and child health (Seedat et al., 2009). Poverty is among the main demographic factors associated with the high risk of burn injury (Atiyeh et al., 2009; Edelman, 2007; Morronguiello, 2003; van Niekerk, 2007) and greatly impacts on childhood burns (Seedat et al., 2009; WHO, 2006). Studies show that people originating from low-income households or those with high poverty rates are at increased risk for burns (Atiyeh et al., 2009; Edelman, 2007; Morronguiello, 2003; Poulos et al., 2007, cited in Forjuoh & Gielen, 2008). One of the reasons is space restriction as in South Africa there are homes that consist of one or two main rooms that are divided by temporary internal divisions made of curtains or cardboard which are utilised for different functions such as sleeping, washing, cooking, eating or as a work space (Kellett & Tipple, 2000) depending on the time of day and what the family needs it to function as (Godwin et al., 1996; van Niekerk, 2007). This is

also a problem for other countries such as Hong Kong (Tse et al., 2006), where it is common practice to cook in the kitchen and then bring the utensils in the living room to cool as the kitchens tend to be small and the living rooms the largest rooms where equipment such as kettles are placed for cooling (Godwin et al., 1996; Tse et al., 2006). There is a higher injury risk when children play in the cooking area especially when the implements are unstable and the surfaces are uneven (van Niekerk, 2007). This mostly arises when children are left unsupervised in a potentially dangerous environment (Tse et al., 2006). This type of domestic arrangement greatly increases the exposure of a child to domestic equipment and sources of heat (Godwin et al., 1996).

Injuries greatly undermine the country's social and economic development (Seedat et al., 2009). People in the most deprived social class have 25 times more deaths resulting from burns than children in the most affluent social classes (Atiyeh et al., 2009). There is a markedly higher incidence of burns among children in LMIC (Reimers & Laflamme, 2005) as shown by the injury mortality of toddlers which is associated with poor economic conditions (Bradshaw et al., 2003). Further differences by socio-economic class within high-income countries such as Sweden and the United Kingdom show an increased risk of burns among poorer children (Reimers & Laflamme, 2005). In Sweden, for instance, burn injury was higher in the poorest socio-economic groups than in the more prosperous groups and burn injury risk was higher than for any other injury (Reimers & Laflamme, 2005). Several other socio-economic factors that increase the risk of childhood burns have been identified in numerous case-control and descriptive studies that have been conducted in different parts of the world (Delgado et al., 2002; Forjuoh, 2006; Petridou et al., 1998). These are related to the construction of homes which put

inhabitants at increased risk of burn injuries. This is because burns mostly occur in residential areas (Sharma et al., 2006) or the home environment (Forjuoh & Gielen, 2008; Sharma et al., 2006; van Niekerk, 2007).

Burn injuries thus remain a social and economic burden (Mashreky et al., 2009), that affect people at the individual, family, community and societal levels. This is because social or socio-economic contextual exposures increase burn injury risk (Reimers & Laflamme, 2005). A social deprivation agenda to reduce social inequalities would help eradicate poverty and reduce childhood burn injury risk.

2.3.3.2 Alcohol abuse

Substance use has been implicated as a contributory factor in most injury types if not all (Maldan Beech & Flint, 2001). The factors that lead to alcohol and drug use and those that increase the risk of injury are similarly interrelated (Maldan et al., 2001). Substance abuse is a cause of interpersonal violence and may lead to injury particularly prevalent in low socio-economic groups and the African population (Maldan et al., 2001). The consequences thereof are not only medical but impact on family as well as economic and social development (Jernigan, Monteiro, Room & Saxena, 2000). Furthermore, school surveys in Cape Town, Durban and Port-Elizabeth have found that children engage in alcohol consumption (Parry et al., 2002). Drinking thus brings many problems for developing countries (Parry, 2000). Households with individuals who consume alcohol are at increased risk of residential fires (Ballard, Koepsel & Rivara, 1992). They found this to be because individuals in such household have higher smoking levels which

appeared to be the more important underlying risk factor for burns. In essence, the cigarettes cause the burns but it is the individual's drunken state that creates the risk for the eruption of fire.

2.3.4 LIVING CONDITIONS

The home has been identified as the main risk factor in burn injury. It is related to poverty (as was discussed earlier) and the home structure which will be discussed in this section. There are a large number of SES factors that have been described which correlate with type of residence and/or living conditions that put substandard housing and poor living conditions in association with increased risk of burn injury and fatality (Albertyn et al., 2006; Edelman, 2007; van Niekerk, 2007). The late morning, when domestic tasks are being done (Forjuoh, 2006; Mashreky et al., 2009; Peden, 1997) and evening meal times; during the preparation and serving of food are the two peak times of the day related to the aetiology of burn injury incidents (Forjuoh, 2006; WHO, 2006). These factors are related to living conditions in terms of substandard living arrangements, limited or lack of access to safety equipment and seasonal variations in people's living environments. These circumstances are discussed in this section.

High population density is among the main demographic factors associated with the high risk of burn injury (Ahuja & Bhattacharya, 2004; Atiyeh et al., 2009; Edelman, 2007; Morronguiello, 2003; van Niekerk, 2007). Lack of running water (Delgado et al., 2002) in the form of inadequate access to a good supply of water in the form of a tap, hosepipe or sprinkler system to douse flames or stop the flames from spreading is a strong risk factor (Delgado et al., 2002; Poulos et al., 2007, cited in Forjuoh & Gielen, 2008). Electricity (Delgado et al., 2002; McLoughlin, 1995), crowding (Albertyn et al., 2006; Edelman, 2007; Forjuoh & Gielen, 2008;

van Niekerk, 2007) and type of residence (Atiyeh et al., 2009) also contribute to physical environmental risk factors and are related to low socio-economic status. These circumstances affect developing countries such as South Africa, India, Nigeria and Ghana (Attia et al., 1997; Forjuoh et al., 1995). Those who live in rural areas with inaccessible medical care have higher incidences of burns and its consequences (Soori, 1998, cited in Forjuoh & Gielen, 2008). The risk there is higher because of type of residence pertaining to traditional dwellings and mud huts (Albertyn et al., 2006).

Lack of smoke detectors or the presence of non-functioning smoke detectors and the absence of laws and regulations relating to building codes appear to be related, in some developing countries, to an increased risk of childhood burns (LeBlank et al., 2006, cited in Forjuoh & Gielen, 2008). The same was found in industrialised countries such as the USA although they are lower probably due to the relatively higher percentage of occupational and recreational burns or to better home safety with safer cooking and heating devices in industrialised countries (Malla et al., 1983, cited in Attia et al., 1997).

Season of the year (Forjuoh, 2006; Mashreky et al., 2009; Peden, 1997) and regional differences affect the incidence of burn injury as in tropical climate (Attia et al., 1997; WHO, 2006). There is a fairly even distribution of cases of burns throughout the year in tropical climates where heating is not generally required even in winter (Adamou et al., 1995, cited in Forjuoh & Gielen, 2008; Kalayi & Muhammad, 1994). There is an uneven distribution of burns in most of the Sub-Saharan countries (Albertyn et al., 2006; Forjuoh, 2006). Countries such as China and South Africa have seasonal variation with a higher incidence in winter (Edelman, 2007; van Niekerk et

al., 2004). There is a noted association of incidences of burns with public or religious holidays in many countries (Forjuoh & Gielen, 2008; van Niekerk, 2007).

2.4. PREVENTION

Prevention is understood as the response against the causes of injury, by doing so also preventing immediate consequences on an injurious event by designing and implementing protective mechanisms and the prevention of avoidable death, disability and other consequences through the provision of adequate care and rehabilitation services (Schopper, Lormand & Waxweiler, 2006). Prevention is thus two-fold: it prevents the causes of injury as well as the consequences thereof. It is important to study and discuss these burn injury risk factors because as Warda, Tenenbein & Moffat, 1999a, p. 145) put it, "risk factor data should be used to assist in the development, targeting and evaluation of preventive strategies" or methods as is discussed in this section. Prevention methods refer to the actual mechanism of injury reduction with particular attentions to the host's responses; be it either active or passive (Tremblay & Peterson, 1999). Prevention strategies designed for children must therefore be designed in such a way that they are able to apply them (Gable & Peterson, 1998, cited in Boles et al., 2005).

Burn injuries are considered largely preventable (Gielen & Sleet, 2003; Roberts, 2000; van Niekerk, 2006). This can be achieved through employing priority strategies to reduce the burden of burns in both low, middle income and high income countries (Lau, 2006, cited in Atiyeh et al., 2009; Gielen & Sleet, 2003; Roberts, 2000; van Niekerk, 2006). As such, prevention should target children and the populations at most risk (Attia et al., 1997; Delgado et al., 2002; Peck et al., 2009). Most efforts have effectively focused on such groups (Edelman, 2007). Although

prevention takes time, energy and money it is the ultimate solution to the burn injury problem (Atiyeh et al., 2009; Peck et al., 2009), is the best care for burn injuries (Liao & Rossignol, 2000) and cost-effective (Peck et al., 2009). Research shows that the decrease in burn injury mortality in economically developed countries is as a result of effective burn prevention programs and regulation in addition to improved burn treatment (see e.g. Liao & Rossignol, 2000; Peck et al., 2009; Warda et al., 1999a). There has been an increase of evaluated interventions in Europe, North America, and Australia (van Niekerk & Duncan, 2002). It has been found that burn injury reduction in the USA, UK, France and Germany is the result of effective prevention programmes, advances in technology, improved medical care (Linares & Linares, 1990) and well designed interventions aimed at reducing burn mortality and morbidity (Peck et al., 2009). There remains a lack of effective, replicable, and contextually congruent childhood injury prevention interventions in South Africa (van Niekerk & Duncan, 2002).

Prevention interventions can be classified into active and passive components (Atiyeh et al., 2009; Tse et al., 2006). "Active approaches encourage or require people to take an active role in protecting themselves despite hazards in their environments" (Gielen & Sleet, 2003, p. 65). Such approaches aim to educate individuals (Atiyeh et al., 2009; Roberts, 2000; Tse et al., 2006) to adopt measures that will help them avoid injury by modifying potential injuries agents in design and safety (Roberts, 2000; Tse et al., 2006) as well as ways to minimize injury whenever it occurs (Atiyeh et al., 2009). Passive approaches rely on the modification of products and/or environments to make them safer for all, irrespective of the behaviour of individuals (Atiyeh et al., 2009; Gielen & Sleet, 2003) and have been found to be critical to injury prevention interventions (Cubbin et al., 2000; McLoughlin, 1995).

Despite the lack of effective burn prevention programmes in LMIC's there is sufficient information from HIC's to support the view that burn injuries can be successfully prevented through education, engineering changes, enforcement of legislative protection, and environmental medications (Peck et al., 2009). The expansion of global efforts to eliminate burns will be the best way to protect the children of LMIC's from burn injuries (Peck et al., 2009). These prevention strategies are discussed in the next section.

2.4.1 PREVENTION STRATEGIES

2.4.1.1 Education

An increase in knowledge does not necessarily lead to behaviour or lifestyle changes (Linares & Linares, 1990; Peleg et al., 2005; van der Merwe & Steenkamp, 2007) but education remains necessary (Atiyeh et al., 2009) as it is a way of sharing information (Odendaal et al., 2009). However, there is a lack of evidence regarding its impact on child injury rates (Downswell, Towner, Simpson & Jarvis, 1996; Kendrick et al., 2007). Essentially, even though no connection is made regarding injury reduction and education, it has been found that education efforts must begin with education of health professionals, physicians and coalition members work to increase public awareness regarding prevention (Pressley et al., 2005, cited in Atiyeh et al., 2009) before the general public can begin to implement them. Such strategies will ensure education for good supervision of children, (Forjuoh, 2006), safety education for parents about the safe use of equipment (Gielen et al., 2001; Gielen et al., 2002), education regarding environmental hazards such as housing, regulation and design of industrial products (van Niekerk, 2006; WHO, 2006), as well as of the storing of flammable substances in the home (Forjuoh, 2006; van Niekerk,

2006; WHO, 2006). Education seems to be the most effective community intervention when focussed on improving the low SES through maternal education and skills development (WHO, 2006).

2.4.1.2 Engineering/Technology

Technological prevention measures such as safe stoves (McLoughlin, 1995; van Niekerk, 2006), smoke detectors (DiGuisseppi, Goss & Higgins, 2001; Forjuoh & Gielen, 2008; McLoughlin, 1995; Peck et al., 2009) and automatic sprinklers (Forjuoh & Gielen, 2008; Liao & Rossignol, 2000; WHO, 2006) have been found to be effective in high income countries (e.g. Forjuoh & Gielen, 2008; Linares & Linares, 1990; McLoughlin, 1995; Rivara, 1998). The limitation of these measures is that they are difficult to implement in developing countries like South Africa due to the costly implementation and maintenance thereof (Forjuoh & Gielen, 2008). For example in South Africa, the Parasafe Stove (R120) was introduced in response to the dangerous cheaper Panda Stove (R40) (Parasafe, 2008) which has resulted in households opting for the cheaper though dangerous options. Because of this reason, products need to be engineered or modified to accommodate their circumstances. Product modification involves changing the design of products (Forjuoh & Gielen, 2008; McLoughlin, 1995; Torell & Bremberg, 1995) such as the elimination of ignition sources (Atiyeh et al., 2009), the development of safe stoves (Bruce et al., 2004; Forjuoh & Gielen, 2008; van Niekerk, 2006), the distribution of stove guards (McLoughlin, 1995; van Niekerk, 2006) and barriers for electrical sub-stations (McLoughlin, 1995; van Niekerk, 2006) as well as the use safe lamps (Forjuoh & Gielen, 2008). Further measures need to be taken to ensure that individuals and stakeholders implement these strategies and follow such procedure. The enforcement of laws and policies facilitates such processes.

2.4.1.3 Enforcement/Legislation

Legislative policies can enforce the use of correct prevention strategies. A range of legislative policies have been put in place in HIC such as restrictions on the purchasing or ownership of fireworks by children (Forjuoh & Gielen, 2008; Edwin, Cubinson & Pape, 2008). The control of hot-water taps and reduction of hot-water temperature is effective (Forjuoh, 1998) and has reduced burns injuries in the United States (Rivara, 1998; Peck et al., 2009), Norway (Ytterstad & Sogaard, 1995) and New Zealand (Waller, Clarke & Langley, 1993). This control of hot water geysers has been recommended for South Arica suggesting that there should be mandatory specifications for hot water geysers to be decreased to a temperature of 49 - 54° C which is a temperature relatively safe for household needs (see van Niekerk, 2006; Liao & Rossignol, 2000). Laws regarding fire-retardant household materials and clothing have reduced the number of burns related to children's clothing in Australia, the US (Forjuoh & Gielen, 2008; Smith, Greene & Singh, 2002) and Europe (EUROPA Press Release, 2007). Clothing of natural fabrics should be made easily available (Daisy et al., 2001) as such fibres i.e. natural silk and wool (Gordon & Ramsay, 1983) as compared to manmade fibres i.e. cotton and linen (Oglesbay, 1998), are less flame retardant (Gordon & Ramsay, 1983; Oglesbay, 1998). Laws should be made for the legal banning of dangerous activities and equipment to combat the occurrences of burn injury (Atiyeh et al., 2009; Roberts, 2000) and active involvement and social orientation of the welfare and wellbeing of citizens (Atiyeh et al., 2009). Van Niekerk (2006) has also suggested that mandatory specifications for the transportation, keeping, storage, usage, handling, transportation or any other disposition of dangerous goods needs to be developed to alleviate burn injury for children in South Africa. These interventions should consider the socio-

economic status of people and the country as well as their physical and social circumstances (Cubbin et al., 2000) and require political pressure on the Government.

2.4.1.4 Environment modification

We have seen how the environment, that which is external to the person (Last, 1995), puts individuals at risk of burns injury. The effectiveness of environment modification is that it can be created and amended to reduce the likelihood of injury by modifying physical surroundings (Hammond, 1993, cited in Atiyeh et al., 2009; Torrell & Bremberg, 1995). For this, housing improvements are necessary as this would reduce the likelihood of secondary risks like electrical fires and electrocution in inadequate environments (van Niekerk, 2007) as well as prevent residential fires. Electrification is believed to be effective (Butchart, Kruger & Lekoba, 2000; Madubansi & Shackleton, 2006; van Niekerk, 2006) but it seems households still use paraffin for some of their energy requirements, especially when paraffin appliances are already in use, as it is a more affordable option (Matzopoulos et al., 2006). This is despite the fact that South Africa has been the leader of policy-initiated approaches to paraffin safety and declared South African National Standard (SANS) 1906, a compulsory specification for non-pressurised Paraffin Stoves and Heaters, in 2007 (Commentary, 2009). Installing electricity in these houses will stop the use of candles, paraffin and kerosene products (Butchart et al., 2000) and its dependence (WHO, 2007) resulting in a great decrease of the number of burn injuries (Butchart et al., 2000; Madubansi & Shackleton, 2007; McLoughlin, 1995; van Niekerk, 2006) but requires sustained pressure on governments (WHO, 2009). Improving the low socio-economic status of a community also upgrades the environment and involves environment and product modification, such as building formal houses, electrification and education (Butchart et al., 2000; van der

Merwe & Steenkamp, 2007). Promising modifications to prevent children's burns in this regard include keeping dangerous objects away from the reach of children (Daisy et al., 2001), such as raising cooking equipment off the ground and separating cooking areas from living areas (Forjuoh & Gielen, 2008; van Niekerk, 2007). Environmental strategies because they are passive, can change misconceptions that injuries are unpreventable and unavoidable accidents (Butchart et al., 2000). As promising as these strategies are, products and equipment used in households must also be modified to reduce hazards. Based on a Cochrane review of interventions, there is still insufficient evidence to determine the effectiveness of the modification of home environments (Lyons et al., 2003).

2.4.2 A REVIEW OF BURN INJURY PREVENTION STRATEGIES

2.4.2.1 Current prevention strategies

South Africa has a burden of injury but has nevertheless not managed to prioritise and to build a culture of safety and human rights (Seedat et al., 2009). Such a culture can be built through legislation, policies and structures that render the prevention of injuries mandatory and institutionalise safety practices (Seedat et al., 2009). This culture is predicated in recognition of the right to access socio-economic justice and optimum material conditions necessary for safety (Stevens, 2003). Interventions that have been found to work in improving the health of children from poor backgrounds are those that focussed on empowering families to improve their social and environmental circumstances, and moreover, changing the behaviour (Benzeval, Judge & Whitehead, 1995; Downswell et al., 1994). Improving the family's income was identified a possible strategy (Daisy et al., 2001). The more effective interventions in South Africa are safety

education, legislation and government policies (Childsafe, 2008; van der Merwe & Steenkamp, 2007).

2.4.2.2 Enforcement/Legislation

Target specific legislation has been found to be the most successful burn prevention intervention (Atiyeh et al., 2009; Linares & Linares, 1990; Warda, Tenenbein & Mofatt, 1999) such as laws and regulations that is one of the most efficient and effective ways of getting people to adopt safe behaviours (Atiyeh et al., 2009; Forjuoh & Gielen, 2008; Liao & Rossignol, 2000; McLoughlin, 1995). The South African government has implement equity-oriented policies that deal with the housing and electricity problems (Burrows et al., 2010) which are burns risk factors. The National Housing Policy has provided over 2 million houses since 1994 (Department of Housing, RSA, 2007) which contributed to overcrowding and congestion alleviation. According to the Paraffin Safety Association Southern Africa (2007) the National Electricity Basic Support Services Tariff Policy makes 50 kWh freely available to low-income households and, National SANS 1906 has been put in place to set standards for the use of kerosene-fuelled appliances. These measures are to reduce the use of flammable substances for heating and cooking. As part of legislative interventions the South African government has however failed to remove unsafe cooking devices such as stoves and to reduce the use of fossil fuels for cooking and heating (Seedat et al., 2009). There is little regulation of the manufacture and sale of products most often used by poor people for cooking and heating seemingly because promotion of products and expansion of the economy is placed above safety (Seedat et al., 2009).

2.4.2.3 Universal strategies

Burrows et al. (2010) have however identified safety-for-all prevention strategies in South Africa. These include home visitation and home safety education programmes to promote safe practices in the home (Laflamme et al., 2009). The home visitation programme is a multi-component intervention that effectively reduced household hazards associated with electrical and paraffin appliances and poisoning among children in a low-income setting in South Africa (Odendaal et al., 2009). These programmes have been applied in South Africa and have effectively influenced the adoption of a range safe of practices such as cooking safely and handling dangerous production out of reach of children and this has resulted in significant hazard reductions (Swart, van Niekerk, Seedat & Jordaan, 2008). It is critical for the success of interventions developed for socially and economically deprived populations in developing countries like South Africa that factors like affordability, accessibility and whether individuals can understand the instructions provided regarding safety products be taken into consideration (Burrows et al., 2010). For example, households would use safety devices if they were provided free of charge like a programme in South Africa did. They succeeded in reducing effects of storing paraffin in improper containers by distributing free containers with child-resistant closures to prevent paraffin poisonings (Matzopoulos et al., 2006; Odendaal et al., 2009). Interventions that focus on putting less demand on individual active prevention measures by reducing exposures to hazards in poor living is very important (Burrows, van Niekerk & Laflamme, 2010). Research also shows that parents and caregivers are less likely to comply or take precaution if these involve more effort and active measures; passive measures are more successful (Gielen et al., 1995).

2.4.2.3 An integrated interdisciplinary approach

The reduction of burn injury is an international health goal that requires an interdisciplinary perspective which calls for an integration of active and passive interventions (Gielen & Sleet, 2003) as people need to be taught safety skills in their unsafe environments (McLoughlin, 1995). Home visitation programmes, for instance, are effective (Bender, van Niekerk, Seedat & Atkins, 2002; Forjuoh & Gielen, 2008; Tse et al., 2006) and comprise multi-methods which usually entail educational, enforcement, and engineering components (Bender et al., 2002). Furthermore, educational programmes are shown to be generally more effective when coupled with increasing access to safety products or with changes to the law (Forjuoh & Gielen, 2008) for example if school and community programmes teach about the use of safe stoves or smoke detectors then this equipment should be made available for people to use. If programmes combine legislation on smoke alarms with installation education, more benefits can be expected (Ballestros, Jackson, Martin, 2005) as both the child and adults will know how to utilise resources. Product modification by the industry can also be motivated by market strategies which may in turn be influenced by educating the public to demand better service (Atiyeh et al., 2009; Liao & Rossignol, 2000). This is because education does not result in significant decreases in burn rates on its own (Liao & Rossignol, 2000). An increase in public awareness such at teaching individuals about their rights might lead them to exert pressure on authorities to pass appropriate prevention legislatives (Atiyeh et al., 2009). Interventions to prevent scalding, for example, focus mainly on education in conjunction with laws and their enforcement regulating the temperature of hot water from household taps (MacArthur, 2003). It is important to note that there are behavioural components to every technological advance that must be addressed (Gielen & Sleet, 2003). For example, home-owners need to check their smoke alarms

and change the batteries, occupants alerted by smoke alarms need to find their way to security and children and parents must apply safety education when in compromising situations. In order for legislation to be effective, the individual's effort is required (Gielen & Sleet, 2003), such as the purchasing safe stoves by the parent/caregiver and the child knowing how to stay safe. Strategies for education and information should aim at training the public to view injuries from an environmental perspective (Torrell & Bremberg, 1995) facilitating children being cognisant of the circumstances in their environment so that they can avoid injury.

Finally, educational strategies combined with legislation and standards, product modification appear to have the most far-reaching effects in the reduction of the incidence of burns (Forjuoh & Gielen, 2008). All in all, injury reduction requires some element of behaviour change that involves the creation of safer products and environments by manufactures of appliances and products (Gielen & Sleet, 2003), action by policy makers (Cataldo et al., 1986; Gielen & Sleet, 2003), and the establishment and maintenance of appropriate safety behaviour by parents, health educators and so forth (Cataldo et al., 1986). Empowering individuals (children and adults) can lead to the political or social action that is necessary to achieve structural changes (Bennett & Murphy, 1997; Gielen & Girascek, 2001).

2.5 CHILDREN AS SOCIAL ACTORS FOR PREVENTION

Having assessed the interventions above it is clear that they are mostly directed at adults for them to protect the child. They do not seem to target the child but rather target what should be done for the child. Policy documents typically address the health needs of children in terms of directives of what must be done *for* children- and not *with* children (Hart-Zeldin et al., 1990,

cited in Kalnins et al., 2002). It is only in recent years (Kalnins et al., 2002) that there has there been adult support for giving children a say about the social conditions that affect their lives. This section explores what children are able to do, their perceptions of prevention and how they would respond to risky situations. This study does not suggest that children be held responsible for their wellbeing but advocates for their inclusion in the process as active participants.

2.5.1 CHILDREN'S CAPABILITIES

When assessing a child's skills one must take account of the social context, cognition and self-concept (Mangrulkar et al., 2001). By 10 years old, children are able to reflect on their abilities and own successes and failures as their thoughts are logical and systematic (Louw & Edwards, 1998, p. 492) showing a developing self-awareness (Mangrulkar et al., 2001). Because this age-group is cognisant of viewpoints and can solve concrete problems (Treas, 2004) they are able to give valuable input about issues pertaining to them such as burn injury causation and prevention. School age children are at a stage where they are supposed to be developing a sense of competence and perseverance hence it is important that parents support the child's development of independence (Treas, 2004). Children in middle childhood develop a sense of industry and learn to cooperate with peers and adults (Mangrulkar et al., 2001). Children are mostly concerned with the present situation (Ballard, 1992) and can only reason with things that happened and not hypothesise issues (Louw & Edwards, 1998) therefore will not think about the consequences of their response.

In an attempt to understand what children can do, Biggeri et al. (2006) interviewed child delegates from South Asian countries and reported on how children defined their capabilities as

the basis of a bottom-up strategy for understanding the relevant dimensions of children's wellbeing. They conducted focus group discussion which focussed on the influence of the age dimensions on the relevance of children's capabilities. The foremost capabilities as conceptualised by the children were: 1) education, in that children are able to be educated; 2) love and care, in that they are able to love and be loved by those who care for them and that they are able to be protected and; 3) life and physical health, in terms of their ability to be physically healthy and enjoy a life of normal length. On the basis of previous studies, this study found that children's capabilities in terms of love and care, life and physical health, social relations (being able to enjoy social networks and to give and receive social support), participation and information (being able to participate in public and social life and to have fair share of influence and being able to receive objective information) was found to be age relevant and affected by maturity. For instance, the different age domains namely; early childhood (0 – 5 years), childhood (6 – 10 years), early adolescence (11 – 14 years) and late teens (15 – 20 years) have different social needs and will thus demonstrate different abilities and effects of children's capabilities outlined above. The authors of this study called for policy-makers to be aware of the relevance of non-economic activities such as household chores and their effects on children's capabilities. This is because this study showed that children are the most concerned with the present and have firsthand knowledge on the suffering that is brought about by child labour.

Although research on children's coping strategies has recently increased, little is known about children's understandings of events that necessitate a coping response (Rossman & Gamble, 1997) or about their health perceptions and behaviours (Graham & Uphold, 1992). The literature review identified only a limited number of studies.

2.5.2 CHILDREN'S PERCEPTIONS OF AND RESPONSES TO INJURY PREVENTION

In Health Promotion, for example, which enables people to take greater control over the conditions that affect their lives, (WHO, 1984, cited in Kalnins et al., 2002); children have not been much encouraged to think about conditions that affect their health and how to change them (Jensen, 1994, cited in Kalnins et al., 2002). Gable and Peterson (1998) as cited in Boles et al. (2005) studied children's self-reports about their behaviour in risky situations and found that 8-year olds most frequently identified fate as the main reason for the occurrence of minor injuries. These results imply that children felt that they have got no control over their injuries. Hsiao et al. (2006) surveyed 420 grade 5 pupils on their knowledge of burn prevention and first-aid treatment. They found that 36% of these pupils had received information about burn prevention and first aid and that half of them would not believe a TV message promoting burns first aid due to parental influence and mistrust of TV messages. The fact that 62% of these children would change their minds if the TV message was promoted by an authority figure suggests that children can learn from exemplary and influential adults. Whereas the previous study (8-year olds) showed that children have no agency with regards to injury prevention, the second one (10 – 11 year olds) shows that children can be taught safety behaviour and can recall preventative information.

Graham and Uphold (1992) studied the health perceptions and behaviours of school-age children (6 – 12 years). The children described themselves in good health. In terms of burn injury; 85% responded appropriately regarding what actions they should take in case of a fire emergency, 25% reported that they were left alone once or more a week, about half responded correctly concerning the care of burns, and only 34% knew first aid treatment. Kalnins et al. (2002) and

Graham and Uphold's (1992) research show us that children have received information on burns prevention and Ballard et al. (1992) have shown us that children are able to utilise and/or implement that information. As Nussbaum (2003), cited in Biggeri et al. (2006) presented; children have sense, imagination, thought, control over their environment and can give practical reasons as part of their human capabilities. All that is necessary is motivation and good modelling of correct behaviour. Children should be taught self-care behaviours as part of their movement towards self-reliance (Graham & Uphold, 1992) as that will help them prevent injuries. In Kalnins et al. (2002) children's responses reflect an egocentric perspective and can act on short-term solutions to the immediate problem (Kalnins et al., 2002). Studies about children's reasoning and readiness to make judgement shows that at age 5 – 8 years children start to realise that there are more than options to handling a particular situation but because their reasoning is uncertain (see e.g. Beck & Robinson, 2001; Robinson, Rowley, Carroll & Apperly, 2006) adult supervision is important as children's judgement is still underdeveloped and they might make a choice with dangerous consequences.

Based on the above studies, children can be actors of prevention on condition that they are supervised by adults or parents. This is the main concern with studying children's perceptions as there is a likelihood of high risk because children's emotional and social cognitions are still developing hence adult supervision is necessary till the age of 18 years. This is because children do not only learn based on instruction but also through observation. There is a need for health workers and educators to alert parents to the dangers associated with lack of supervision (such as leaving children unattended or locked out of the house) and the need to help families develop contingency plans for these circumstances.

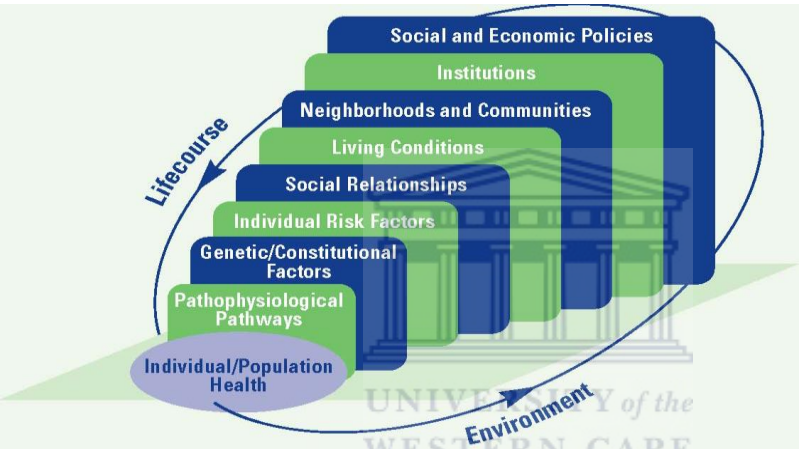
Children can thus be social actors for burn injury prevention. It is important for us to understand how children view risk and prevention because their comprehensions of events critically impacts on their coping strategies (Flavell, Green & Flavell, 1995). As we have seen above, not enough research has been conducted to investigate children's understanding of risk and prevention. Research on injury control and prevention may benefit from utilising non-traditional methodologies toward advancing current knowledge (Boles et al., 2005) and the area could benefit from studies in children's perceptions of injury. Biggeri et al. (2006) legitimated that children can participate in the process of outlining their core abilities and that if included, can contribute to research through a participatory bottom-up approach.

2.6 THEORETICAL APPROACH: Developmental Theory and effective interventions in community contexts

The logic of this study is framed within an ecological multilevel approach to organise its structure and theoretical context. The ecological model in its definition conveys the notion of multi levels of influence on health and clarifies the importance of both individual-level and community-level factors in shaping health and health-related behaviours (Gielen & Sleet, 2003). This study identified inter alia that individual risk factors, social relationships, living conditions, and communities as interacting risk factors. The ecological model describes influencing factors such as these and can be a basis to develop prevention programs (Dawes & Donald, 2004). It further shows that a dynamic interaction among biology, behaviour, and the environment affects individual health and well–being which changes all the time (Gielen & Sleet, 2003). The subject matter in this study is understood in the context of human development which Aber, Gephart, Brooks-Gunn and Connell (1997) defined as "the acquisition and growth of the physical,

cognitive, social and emotional competencies required to fully engage in family and society" and occurs in the individual's environment (see Figure 1). The environment is everything external to the human host and can be divided into physical, biological, social and cultural components (Last, 1995).

Figure 1: A Multilevel Approach (Smedley & Smyde, 2000)



As cited in Aber et al. (1997), this study applied Bronfenbrenner's (1979; 1986) *Ecological framework* and the notion of socially-related *developmental epochs* (or developmental phases) for developing interventions that are practical to children. According to this framework, children's development is influenced by four nested systems namely; the micro-system (e.g. the family, the school, peer group), the meso-system (the interaction of the family and school), the exo-system (the context in which the child is not directly involved but influences the child e.g. the child neighbourhood), and the macro-system (the wider political and cultural influences) (Aber et al., 1997). These systems surround, shape and overlap with each other in the environment (Aber et al., 1997; Dawes & Donald, 2004). For instance, the exo-system i.e.

community level which is considered an organisational setting for schools, churches and workplaces; and the macro-system i.e. social and health policies and their influences as institutions, can influence individual behaviour and social norms through expectations and sanctions. Strategies must therefore be designed in such a way that they can cut across all ecological levels. The risk at each of the levels must be addressed accordingly by the design of appropriate prevention strategies at the level of the child. Such programmes need an understanding of how the total child-context relationship functions (Dawes & Donald, 2004) as children have different functional abilities at different developmental stages which is influences by their developmental contexts.

Bronfenbrenner further explains a developmental context to be a socially constructed system of the child's environment and the way the child and his/her parents perceive and interpret it influences how they respond to it (Furstenberg & Hughes, 1997, cited in Dawes & Donald, 2004). This system has four basic proximal interacting dimensions that have to be considered in understanding child development, namely; person- (e.g., the temperament of the child or parent), process- (e.g., the forms of interaction process that occur in a family); context- (e.g., families, neighborhoods or the wider society); and time factors such as the developmental changes over time in the child or in the environment (Dawes & Donald, 1999). New demands are placed on children as societies set new tasks and in the way new transitions occur at significant points (Dawes & Donald, 1999).

There is a set of developmental periods (epochs) which are marked by the child's physical and

psychological maturation (Dawes & Donald, 1999). All psychological human development theories speak to the fact that middle childhood (7 to 11 years) is marked by significant transition. According to Freud's Psychosocial Stages, the latent stage, this stage is important in the development of social and communication skills and self-confidence (Louw & Edwards, 1998). Based on Piaget's theory, children at this stage begin to think logically about events and objects (Atherton, 2009), and plan, co-ordinate, and evaluate their actions (Mangrulkar et al., 2001). This is the time children go to school and they become more concerned with peer relationships and focus less on their parents (see e.g. Eccles, 1999; Louw & Edwards, 1998; Mangrulkar et al., 2001). Erik Erikson's theory marks this developmental stage as the Fourth Psychosocial Stage (industry vs. inferiority) (see e.g. Eccles, 1999; Louw & Edwards, 1998) and it is centred on internal conflict in the child (see e.g. Louw & Edwards, 1998). As with Freud's theory of developmental phases, children in this stage experience the most important events at school and in the community and need to cope with new social and academic demands (see e.g. Louw & Edwards, 1998). Much of the learning in this stage is centred on competence and productivity versus feelings of inferiority and incompetence (Eccles, 1999). Children who receive applause or encouragement from their parents/caregivers or teachers develop a sense of competence at the success of a task and those who receive little or no applause because they failed remain with feelings of inferiority (Louw & Edwards, 1998).

CHAPTER THREE

METHOD

3.1 AIMS

This study sought to explore children's perceptions of childhood burn injury causation and prevention because there is a gap in the literature regarding burns from the child's perspective. At present, such studies are dominated by adult reports, understandings and experiences; therefore prevention interventions are consequently adult-centred. Literatures on intervention strategies that accommodate the developmental needs of children are required. In attempt to address this; the present study addressed the following research questions:

1) What are children's understanding of risk and prevention?

2) What do children identify as risk factors for burn injuries?

3) What prevention strategies have children identified regarding burn injuries?

3.2 RESEARCH DESIGN

This study locates itself in the developing body of work that has just emerged, focussing on children as generators of knowledge and actors in their own right (see Driesnack, 2005; Epstein et al., 2006; Wellman et al., 2000). The literature review has suggested that children are typically treated as passive objects of study and are primarily reported upon through parent observation, proxies and second-hand accounts (Driesnack, 2005; Epstein et al., 2006). The paucity of research on childhood burn injury prevention, the need to start identifying prevention processes in children, the absence of children's perspectives and lack of information on their

knowledge of causation and preventions of burn injuries suggest that a qualitative approach is most suitable.

Qualitative enquiry, particularly participatory research, is popular with studies in children. Such methodologies demonstrate value to children's voices and thoughts which may be useful in understanding issues that affect them and in developing a more sophisticated understanding of childhood (Mahon, Glendinning, Clarke & Craig, 1996; Mayall, 2000). The qualitative approach is thus for exploratory social research as it answers the question to *how* phenomena comes to being, and seeks to explore and understand phenomena (Babbie, 2004), its product (Merriam, 1998) and why phenomena occur (Roberts, 1997). This approach aims to understand the motivations and perceptions of individuals (Greene, 1999) and is therefore richly descriptive (Merriam, 1998). It allows for the gathering of in-depth data and entails asking, listening and observing (Conners & Franklin, 2000) study participants' views and behaviour. "Many qualitative studies focus on behaviour in its 'natural' or everyday context, and consider how family, communities and cultural factors impact on the individual beliefs and behaviour" (Greene, 1999, p. 1). Using this approach was adequately suited for this study and focuses on the understanding of phenomena as opposed to the quantitative approach which is deductive, objective and seeks causation (Durrheim, 1999, cited in Durrheim & Terre Blanche, 1999).

Context in terms of physical, historical, social, political, organisation, individual context is critical in qualitative data analysis as this approach seeks the dependence or inter-independence of these. Because qualitative data analysis is based on an established conceptual framework it seeks predetermined categories according to the research questions. This method pays attention

to deviant exceptions giving a voice to minorities, yields new insights and leads to further inquiry. Qualitative researchers, including the researcher of this study, do not claim their empirical findings to be generalisable to a large population or to be applicable to a different population.

3.3 RESEARCH SITES

Intern-Africa, according to Hweshe (2008), identified Joe Slovo, Khayelitsha, Philippi, Langa and Gugulethu which are informal settlements on the outskirts of Cape-Town, South Africa as fire hotspot zones with a high prevalence of burns. This study was based in Khayelitsha (Site C) and Philippi. Participants were selected from Vuzamanzi Primary School in Khayelitsha, Site C; Wiltenvereden Valley Core Primary and Samora Machel Primary Schools both situated in Philippi. These are historically black townships situated on the fringes of Cape Town in the Western Cape Province on South Africa and are made of different types of dwellings (Ndingaye, 2005). Childhood burns are prevalent and housing was identified amongst the most pressing challenges in these areas (City of Cape-Town, 2006a). Because living spaces within these settlements are often very small or inadequate with over-crowding being a common phenomenon (Ndingaye, 2005) chain house fires arise easily. Children living in these areas are faced with a greater daily exposure to burn injury which mostly results from shack-fires (Hweshe, 2008; Phoenix Update, 2008) that cause burn mortality. Many fire disasters have historically resulted in property loss and considerable life loss (Tse et al., 2006).

Khayelitsha was established in 1983 after the Western Cape faced a serious housing crisis in the early 1980's due to the sudden increase of the African population in Cape Town (Base of the

Pyramid (SA) Learning Lab, 2010; Mangwana, 1990). Khayelitsha was meant to address the overcrowding problem arising from the influx of people moving into the city from the Eastern Cape and at the same time be the "model community" for other existing townships in Cape Town such as Inyanga and Gugulethu (Base of the Pyramid (SA) Learning Lab, 2010). Site C, our study site, is one of the areas in Khayelitsha and was established during the apartheid era as a dormitory area for the working class and has deep underlying problems of poverty and unemployment (Base of the Pyramid (SA) Learning Lab, 2010; Mangwana, 1990). The population is constantly growing; with a total of 449, 335 (12, 7%) people (City of Cape Town Statistical Tables, year not specified, cited in Base of the pyramid (SA) Learning Lab, 2010) and Site C, a total population of 23, 358 people (City of Cape Town, 2006a). The households in Khayelitsha are predominantly (62%) informal dwellings with most of them (39%) having piped water and electricity as an energy source (City of Cape Town, year not specified, cited in Base of the pyramid (SA) Learning Lab, 2010). This population is predominantly Black South African with a low percentage of so-called 'Coloured' people (City of Cape Town, 2006a). Site C is dominated by female-headed households and consists of more females (50, 55%) than (48, 98%) males; more males than females are employed. More than half (55, 06%) of the total population is unemployed. From this group, 61% comprises of students or scholars, 31% cannot find a job, and 8.3% are unable due to illness or disability (Census 2001, cited in City of Cape Town 2006a). The employed group mostly comprises of elementary workers, craft-related work and service work. Ndingaye (2005) reported that most people living in Site C of Khayelitsha live in iron shacks and are often unable to acquire basic necessities such as food due to the high poverty rate.

Philippi consists of four areas namely; Kosovo, Philippi West, Samora Machel, and Wiltenvreden Valley and is mostly dominated by informal settlements (City of Cape Town, 2006a). Philippi East and Brown Farm and the above mentioned areas except Kosovo are of the largest areas in Philippi (Anderson, Azari & van Wyk, 2009). According to the 2001 Census (City of Cape Town, 2006a); this population is predominantly Black African (98.5%) followed by the so-called Coloured population (1.44%), Indian/Asian (0.01%), and whites (0.04%); 91.13% of the population is isiXhosa speaking and 5.61% speaks Afrikaans (GIS, 2001, cited in Anderson et al., 2009). Similarly to Khayelitsha, Philippi also has more females than males (GIS, 2001, cited in Anderson et al., 2009). Of the economically active in the population; 58.5% are unemployed and 41.5% are employed (City of Cape Town, 2006a; GIS, 2001, cited in Anderson et al., 2009). From the employed group, 43.5% hold elementary occupations, (City of Cape Town, 2006a; GIS, 2001, cited in Anderson et al., 2009), 14.7% work in craft and trade related work, 15.5% work in the service sector (City of Cape Town, 2006a) and the minority (1.5%) hold professional occupations (City of Cape Town, 2006a). Of the community, 40.80% have no income; the highest income that those who are employed earn is between R 9601 – R 19200. Students and scholars make up 48.8% of the population, 7.8% are homemakers or housewives and 7.7% of the population is unemployed due to disability or illness, 19.9% are unable to find employment (GIS, 2001, cited in Anderson et al., 2009). Most of the inhabitants (87.44%) are in the 18 - 34 years age-group (City of Cape Town, 2006a). For the population above 20 years; 8.6% has no schooling, 43.3% have completed grades 8 – 11 and 17.2% have completed Grade 12 (City of Cape Town, 2006a; GIS, 2001, cited in Anderson et al., 2009). More than half (55%) of the Philippi population lives in an informal dwelling/shack (GIS, 2001, cited in Anderson et al., 2009. As with Site C of Khayelitsha, most of these dwelling in Phillipi

do not have electricity or good sanitation and are overcrowded (Ndlovu, 2008, cited in GIS, 2001, cited in Anderson et al., 2009). Almost half (49.4%) of Philippi does not have access to electricity and 45.2% rely on paraffin for fuel, warmth, and lighting (GIS, 2001, cited in Anderson et al., 2009). It is such living conditions make communities such as Khayelitsha and Philippi more susceptible to using dangerous substances and are in turn at risk of burns. The Economic and Human Development Department recommended economies of the poor, social packages and social capital interventions such as early childhood development for this community (City of Cape Town, 2006a).

3.4 PARTICIPANT SELECTION & SAMPLING

The criteria of the samples was that each group consist of four to six children aged 10 or 11 years old with equal gender representation who live in Khayelitsha, Site C or Philippi Samora, speak either isiXhosa or English, and be verbal in group settings. Sample size was informed by the literature on focus groups with children and recommended a size of a maximum of six children (Marczak & Sewell, 1998; Thomas & O'Kane, 2000). Participants need not have experienced burn injury in order to participate as their living environments put them at risk of burn injury.

Purposive sampling based on specific criteria of characteristics that possible participants were required to have been used for selection as this is a convenient form of selection. The children were selected by the class teachers. The researcher sent eight sets of information sheets, informed consent letters and focus group guides to each school; the first four with a maximum of six children who returned the signed document were selected to participate in the group discussion of their particular school. It was only the pupils of Wiltenvreden Valley Core Primary

School who had returned all their informed consent forms. The advantage of this form of sampling is that those potential candidates who fit the criteria for the sample were pre-identified allowing the researcher to invite participants on the basis of their availability (Neumann, 1997) thus saving time. Limitations of this technique include the degree of accuracy (Neumann, 1997) and bias in the selection of the sample (van Vuuren, 1999).

3.5 PARTICIPANTS

The first group had four participants, the second had eight, and third group consisted of six children; all the groups had equal gender representation. The second focus group exceeded the criterion for the number of participants due to fact that all the children returned their consent forms to the school on time and thereafter showed up for the discussion; the interviewer proceeded with all of them for that reason. The first focus group was at a primary school in Khayelitsha, Site C; had a child representative who lives in Site B, a neighbouring community that is separated from Site C by a street which is why the researcher allowed the child to participate. The second and third focus groups came from two primary schools in Philippi, Samora Machel. These focus groups had a significant representation from Kosovo, the neighbouring community in Philippi. This is because the two schools are central for both communities and there are no clear divisions between Samora Machel and Kosovo. All the children's home-language was isiXhosa except for one participant whose home-language is Sesotho but uses the isiXhosa medium at school.

3.6 DATA COLLECTION TOOLS AND INSTRUMENTS

Data collection took the form of focus group discussions. Focus groups were originally called "focused interviews" or "group depth interviews" (Marczak & Sewell, 1998). This method is used by social scientists and found to be useful in understanding how or why people hold certain beliefs about a topic or a program of interest (Marczak & Sewell, 1998). Researchers, using this approach, strive to learn through discussion about conscious, semiconscious, and unconscious psychological and socio-cultural characteristics and process among various groups (Basch, 1987, cited in Berg, 2001). Focus groups present the advantage of interviewing in a group setting within a culture where people are not forthcoming with opinions (Greene, 1999). The informal group atmosphere of the focus group discussion structure is intended to encourage participants to speak freely and completely about their attitudes, behaviours, and opinions.

This method is one of the few effective tools for obtaining data from children (Marczak & Sewell, 1998, Thomas & O'Kane, 2000). This method was also chosen on the basis that traditional verbal interviews are generally used "to hear" children but could be problematic as they raise several ethical and methodological concerns in that they rely on linguistic communication and may limit the issues and questions that the researcher could explore (Clark, 1999). Children often do not respond well to question-answer sessions due to the power-relations in adult-child communication, sole reliance on verbal interviews might consequently limit the value of the research interviews whereas integrating generating a discussion with the children allows them to direct the process as they speak about their views.

These discussions focussed on children's perceptions regarding childhood burn injury. The intention was to seek what children knew about causation and prevention of burns injury as well as the process involved and sought to answer what the children thought caused them to burn more than children from other contexts. The discussion started with an ice-breaker where participants introduced themselves giving personal and demographic information; they were also each given personal and biographic information sheets (Appendix D) stating basic information which they filled in. This exercise allowed the interviewer to build rapport with each learner as it allowed one-on-one interaction between the interview and child. The discussions had three main section namely; descriptions of burn injury, risk and causation of burns and prevention thereof. The children were assessed if they knew what burn injury is and what they viewed the causes thereof to be, their understanding of risk and prevention was explored and they were then asked to describe risky situations and thereafter prevention opportunities. The children were granted an opportunity to ask questions at the end of the discussion; their questions yielded more conversation around the topic and revealed rich information that was otherwise not explored in the focus group guide. One of the focus group discussions (Appendix E), and the focus group guide (Appendix C), is attached as a sample.

3.7 DATA COLLECTION PROCEDURE

On the approval of the proposal of this thesis by the University of the Western Cape, the investigator observed the requirements of the Western Cape Educational Department to access Government schools. The researcher selected participating schools, based on convenience and availability. She located all the schools in the targeted areas via the WCED site, requested their numbers from the WCED for those that were not available online and made appointments with

the principals of four schools in Khayelitsha, Site C and two in Samora Machel in Philippi. She then set up meeting with each of them and expressed an interest to enter their schools, explained the study and requested permission to work with children. From these, three schools seized communication and the remaining three participated in the research. The researcher visited the remaining schools for a second time bringing all the required documentation (Information sheets, informed consent letters and provisional focus group guide) after which she was put in contact with class teachers of the children according to the pre-specified criterion.

Teachers from the schools identified participants on the researcher's behalf by gauging children who were interested to participate and fitted the criteria specified for sampling as discussed above. The researcher met with children in the presence of their teachers where she explained the study to them and what was expected from them. She received verbal assent from the children that they were willing and interested in participating in the study. On the same meeting, she then distributed information sheets (Appendix A), informed consent letters (Appendix B), and FGD guides (Appendix C) that explained the study to the children. These letters were written in both English and isiXhosa. They had to take it home for their parents to read and sign and thereafter sent it back to the class teacher of the child from whom the researcher was to collect it. A second visit to each school was made to collect the forms and to build rapport with the children before the focus group discussion took place. The focus groups took place between 23 June 2009 and 10 March 2010. The reason for the final focus group being conducted in March 1010 was due to fact that the children in the third focus group informed the researcher that they were selected because they had been burnt. These factors were not part of the pre-specified criterion. Because the teacher did not follow the researcher's instruction the researcher

could not use this information and had to conduct an additional (fourth) focus group which is referred to in this report as FGD 3.

3.8 DATA ANALYSIS

The rationale of this study was to explore children's perceptions of childhood burn injuries. The focus was on the content of focus groups that guided the discussion to elicit the variety of aspects pertaining to their views of causation and prevention of childhood burn injuries. The aim of data analysis is to transform information (data) into and answer to the original research question (Durrheim, 1999, cited in Durrheim and Terre Blanche (1999). Thematic analysis was identified as the most appropriate method for this task as it is considered among qualitative researchers to be one of the best methods to focus on identifiable patterns or commonalities of experiences in living and/or behaviours (Taylor & Bogdan, 1984). Results generated by thematic analysis can be used as a basis for comparing and describing data (Sio-Wang, 2007). This was achieved by following Kelly and Terre Blanche's (in Durrheim and Terre Blanche (2005) steps in data analysis: (1) familiarisation and immersion of study material, (2) inducement of themes arising from the data collected, (3) coding of data, (4) elaboration and, (5) interpretation and checking of the points gathered.

On completion of transcriptions, the researcher had already familiarised herself with the content of the group discussions. She had thus gained preliminary understanding of the meaning of the data before immersing herself in the material again. This she achieved through replaying each discussion before transcribing it. On completion of each transcription, the researcher coded the

responses bearing on the research question and finally sought for themes as they emerged through the data. These were then noted down and those that were prominent were accepted as the themes. This was achieved by the researcher reflecting and assessing what stood out in the focus groups. These were then revisited after the coding was completed, elaborated on and explored more closely for emerging themes. The labelling of the themes and its codes in the final stages of the write-up process was most helpful as this helped to identify dominant and minor themes. The themes were then interpreted and checked by the supervisors for clarification and mis– or over interpretation. The outcome of the first focus group and the findings derived from showed the researcher how to improve this method. The experience of this initial focus group indicated where the researcher should improve in terms of language, structure, duration of the interview and how to manage the children's conversations. The second FGD had more structure and filled the gaps of the initial FGD and the third one tightened the information based on the second FGD and clarified some of the issues the interviewer could not address in the second one. The focus groups were conducted on different days so that the interviewer could transcribe and interpret each FGD before conducting the next in order for the next one to be stronger and informed by the previous one, to fill in the gaps and clarify what she missed in the previous FGD, and learn and correct possible mistakes that she might have made.

3.9 VALIDITY AND RELIABILITY

According to Guba and Lincoln (1981), for research, whether qualitative or quantitative, to be considered true and valuable it must contain truth, value, applicability, consistency and neutrality which were maintained in the implementation of this study. In quantitative research, validity and reliability are used to judge and evaluate statistical findings whereas in qualitative research

credibility is the preferred term (Byrne, 2001). In this section there is an exploration of how the two paradigms view reliability and validity and thereafter consider how the criteria according to qualitative research and consider to what extent it was met in this study.

There is a methodological difference between the qualitative and quantitative paradigms in terms of the nature of knowledge as different criteria are required to demonstrate the validity and reliability of the research conducted. Qualitative (naturalistic) paradigms must contain elements of trustworthiness while quantitative (rationalistic) paradigms must adhere to criteria for 'vigour' within the quantitative paradigm. Vigour is attained by observing internal validity, external validity, reliability as well as objectivity (Guba & Lincoln, 1981) which are fundamental concerns for quantitative researchers (Sinkovics & Ghauri, 2009). Some researchers argue that that these elements are not applicable to qualitative research and that trustworthiness which encompasses issues such as credibility, dependability, transferability and confirmability should be the main focus of qualitative research (Sinkovics & Ghauri, 2009). In qualitative research, the terms credibility, transferability, rigor and trustworthiness indicate the plausibility of the methods and findings (Byrne, 2001). Although qualitative research views validity as an integral process that is constructed in the context of participation and community (Chenail, 1994, cited in Singer, 2005), the role of these dimensions (internal validity, external validity, reliability, objectivity) is not as straight-forward (Sinkovics & Ghauri, 2009) as in quantitative research.

The researcher ensured reliability and validity by recording and transcribing the focus groups discussions to ensure accuracy; in the analysis process, the study supervisors rechecked the findings to reduce researcher bias and to confirm some basic accounts of the responses and

interpretations. An account of the context of the study is given by specifying the actual interviewers and place of interview as this help to assess the validity and generalisability of the findings (Greene, 1999). Qualitative data, as with this study, cannot be blindly generalised to other research because as with this study, it examined the perceptions of children of two particular communities.

3.9.1 CRITERIA FOR TRUSTWORTHINESS

Qualitative research explores how phenomena occur and can be used to investigate complex multi-faceted aetiologies (Roberts, 1997) that describe different aspects of credibility, transferability, dependability and confirmability (Graneheim & Lundman, 2004; Guba & Lincoln, 1981). These aspects and process that ensured that the criteria were met shall now be discussed.

Credibility is reflected in the believability of the results from the participant's perspectives (Guba & Lincoln, 1981), the quality of the research process and refers to how well data collection and the analysis process address the research question (Graneheim & Lundman, 2004). The researcher must demonstrate credibility first by documenting his/her experiences, perspectives and assumptions (Byrne, 2001). This researcher achieved credibility by reflecting as well as checking and re-checking the reports of the results of this study with the guidance of the two supervisors who have expertise in the fields of children's burns, psychology, community psychology and public health respectively. Due to fact that researchers use the perspectives and experiences of participants to make inferences, participants were regarded as being in the best position to judge credibility. The NSW Commission for Children and Young People warn that if

the power differential between the child and the researcher goes unaddressed, this can lead children to respond with what they think researchers want to hear (Noble-Carr, 2006). This researcher addressed this issue by assessing whether each child was able to understand the issues at stake in the discussion and assured them that this was not a test (Thomas & O'Kane, 2000).

Transferability refers to whether or not research data can be transferred to another future study. It is used to judge the extent to which the finding can be applied to other contexts by providing thick descriptions of the study and by using purposive sampling (Byrne, 2001). Lincoln and Guba (1981) however, strongly hold that it is impossible for researchers to assess this as they may not be certain of contexts of future studies. This is not problematic because the point is for research consumers to track how these finding were derived so as to understand the results and not how to try to use them in future research. This researcher described the research context and processes thoroughly. The focus group guide directed the discussions which were recorded, transcribed and analysed. This provides the reader or research consumer with enough information to judge the themes, labels, categories and constructs of the study which will enable them to judge to appropriateness of applying the findings to other contexts (Byrne, 2001).

For ***dependability*** in qualitative data, it is expected of the researcher to be able to account for the dynamic research contexts (Graneheim & Lundman, 2004; Guba & Lincoln, 1981). Dependability was enhanced by the researcher taking into account the changing contexts of the children and adjusting the research design and data collection questions accordingly. This awareness was integral to the conceptualisation of the study as well as how the data collection procedures were modified to accommodate context.

Confirmability refers to the extent to which research can be corroborated by others (Guba & Lincoln, 1981) and can be transferred to other settings (Graneheim & Lundman, 2004). This can be achieved by the researcher documenting procedures for the double-checking of data and findings by vigorously searching for negative findings that contradict common, prior findings and through data 'auditing'. Data was not double checked with the participants themselves but was reviewed by the supervisors of this study. The data was 'audited' by the researcher through examining the procedures around data collection and analysis by critically considering possible biases or distortions in either of the processes. The issues discussed with the children in the focus groups were yielded by literature and were based on previous findings. Transcriptions of the focus group discussion from which the quotes were extracted are attached as appendixes for confirmation of other researchers.

3.10 REFLEXIVITY

According to Singer (2005) one cannot come into a research setting and not influence the data that one observes. The researcher's identity as the researcher is therefore an important component of the process hence it was important for me to realise that as researcher my presentations of investigated phenomenon "lie somewhere between the thing-in-itself and their subjectivity" (Rennie, 1996, p. 266, cited in Singer, 2005). This researcher considered and questioned her own values throughout the research process as well in her interaction process with the child in order to promote children's agency (Goodenough, Williamson, Kent, & Ashcroft, 2003). The researcher had regular discussions with the thesis supervisors and received regular feedback concerning the meaning of the data received. Because power roles between the interviewer and interviewee can limit findings, this investigator has considered the risk of mis- or

over interpretation (Banister, Burman, Parker, Taylor & Tindall, 1994). Jamison and Gilbert (2000) have warned that the implementation of methods adapted to children's needs may involve the researcher in an ethical dichotomy between participation and protection. No problems that require ethical action such as threats to the child or his/her family surfaced in the focused groups. In all the groups, there was at least one child who indicated not having lunch on the particular day the focus groups were conducted; the researcher intervened in a collective manner by providing lunch for the children after each focus group. The researcher was touched by the children's living conditions and assumed the role of the caring parent. Due to the need to protect the children she may have projected her own feelings regarding living circumstances in LIC, this may have influenced the children's ability to disclose. It is for this reason that the researcher in the analysis stage submitted the codes and themes to the supervisors for review to facilitate self-reflexivity.

3.11 ETHICAL CONSIDERATIONS

Children are perceived as vulnerable and open to exploitation by researchers and must be protected from that (Mahon et al., 1996) hence this research study with young children was not coercive (Driesnack, 2005). Issues of informed consent, the appropriateness of children as research subjects, the research methods and potential for physical, emotional or psychological harm (Birbeck & Drummond, 2007) were revised prior to the research process. Written voluntary informed consent was obtained from the parents or guardians of each of the participants, the principal of the schools and the Western Cape Education Department. Assent was obtained from the child. Prior to data-collection, information sessions were conducted in the schools and addressed all the issues of the research process. Both the child and caregiver had a

right to choose and to withdraw from the study at any time. Confidentiality was particularly observed. The ground rules that were set at the beginning of each session ensured that confidentiality and commitment to the group were adhered to by participants as they were the ones who constructed them.

The methods utilised in this study supported the children's intellectual and social abilities and allowed the researcher to uphold the social and ethical obligation by protecting children against physical or emotional threat (Birbeck & Drummond, 2007). The researcher entered the research environment as a participating adult and built a relationship of mutual trust with the participating children upholding the ethical imperatives when working with them. Great care was given to the children feeling safe at all times. Information derived in the focus groups were kept in a safe under the strict supervision of the researcher and will be destroyed after the research process is completed. All of this is specified in the informed consent letters that the parents/guardians signed prior to the focus group discussion. These were signed on the basis of the information granted that explained the study. To ensure children's identities, pseudonyms were used instead to children's real names.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 INTRODUCTION

The study was guided by the following three questions: 1) what are children's understandings of risk and prevention, 2) what do children understand to be risk factors, and 3) what are the prevention strategies identified by children? Based on these questions; the three focus groups' responses yielded five main themes some of which have sub-themes. The broad themes are as follows; (1) burns are a big problem, (2) risk as a consequence of individuals' activities, (3) different factors that contribute to risk, (4) children's understanding of prevention, and (5) children's burns prevention strategies. Based on the study aims; these themes reveal how children perceive the burns problem, what they view as risk factors to burns causation, and how to prevent burns from occurring.

THEME 1: BURNS ARE A BIG PROBLEM

This study was conducted in response to the high prevalence of burns in South Africa. As established in the literature review, Khayelitsha and Philippi in Cape Town were identified as high risk burns areas. This theme serves as validation that the interviewed children are familiar with this context in order to answer what the risk and prevention factors of burn injuries are. Not surprisingly, the awareness about the extent of the problem emerged as a dominant theme with the children talking about the actual exposure, that is, the extent to which children are exposed to burn events. This refers to whether they had experienced burn injuries themselves or whether they had witnessed it or just heard of the occurrences. Focus groups one and two confirmed that

burn injuries are a frequent occurrence in the targeted communities. Focus group three did not yield any specific information about the magnitude or commonality of burn injuries. The following excerpts capture the extent of burns and the extent of children's exposure to it:

> Claire: Why is it that it is always burning here in Cape Town?
>
> Ada: …that child…that one who… [Cassie interjects]…passed away [Ada] …he used to go to school here; they were sleeping...and then a sudden fire appeared from his bed…
>
> Sandile: I've seen a child there in our street, he was inside his home and kept on crying that the house is burning, he burnt with it.
>
> Charlie: Miss, my sibling, we had put water up to heat, and [2]s/he went to the kettle and now as it switched off, the kettle fell and burnt his/her face and body.

Although the great extent of exposure to burn injuries was not highlighted as major in all three groups this theme deserved merit as burns are rife in South Africa as well as in Cape Town (see Albertyn et al., 2006; Ndingaye, 2005; van Niekerk et al., 2006). The child needs not to have experienced a burn injury for them to be considered exposed to burns, the fact that there is a chance for them to burn or having witnessed it happen to someone else qualifies them as being exposed. The excerpts from Ada, Sandile and Charlie demonstrate children's experience in multiple contexts i.e. their homes, neighbourhood and community in general. Direct exposure i.e. burns experienced by siblings seemed to be the most common form of exposure. As was confirmed in this study, informal settlements, as with our study sites Khayelitsha and Philippi

[2] Use of either female or male is because of translation. Unlike in English, in vernacular language there is sometimes no specification of whether the speaker is referring to a male or a female.

identified, are among the areas mostly affected and at most risk of fires (Hweshe, 2008). This is in line with literature as it was found that major burn injuries are mostly common among children from lower socioeconomic groups (Holland, 2006; Edelman, 2007). In the children's discussions they recalled events of house-fires that have resulted in death and general burns incidences in their homes and communities. These stories communicate that children are directly (their immediate environment) and indirectly (friends and community members) exposed to burn events or injuries with some discussing their experience of it in detail. The witnessing of house fire fatalities was dominant and seemed to be the most traumatic followed by recollections of scalds which occurred as a result of commonly used home appliances such as kettles, stoves and the clothing iron. Children revealed how they have witnessed peers and neighbours die because of burns as well as how they lost their homes to burns.

Witnessing such traumatic deaths and losing a home to burns is a form of trauma itself and can have detrimental effects if such events are recurrent which it seems to be in the circumstances under which these children live. Literature suggests that burns decrease in the 10 – 14 year age group, as with our sample, and rises again in the teenage years (see Forjuoh & Gielen, 2008). This is because burns and house fires mostly occur in children's surroundings (see Ahmad, 2010; van Niekerk, 2007) therefore it is expected that children will witness it. Such exposure remains a risk factor for serious negative outcomes like PTSD. As witnessed in the excerpts, many fires have resulted in both property and life loss (Tse et al., 2006) leaving children to suffer psycho-social consequences (Holland, 2006; van Niekerk et al., 2004; WHO, 2003) resultant from losing their homes, peers or loved ones and having to cope with the risky environment. This exposure is of concern (Phoenix Update, 2008), because children may have normalised these

circumstances as part of what is to be expected in their communities. Children should be protected from witnessing these events (see Sandile and Ada above, p. 72). Recent research has emphasised the post-trauma consequences and experiences of burns including the intra and inter-personal, community and cultural consequences of burn injuries (Mashreky et al., 2009; Pallua, Künsebeck & Noah, 2003; Phillips, Fussell & Rumsey, 2007).

THEME 2: CHILDREN'S UNDERSTANDING OF RISK

This was one of the research questions that guided the focus group discussions to explore children's understanding of risk. The ability to identify and appraise risk is important for prevention. The children generally found it difficult to define risk. Their responses focussed on concrete descriptions thereof in that they defined risk by way of giving specific examples of events and occurrences as opposed to abstract definitions. There were those who admitted to not knowing what risk is or demonstrated confusion about what risk really is. The first set of excerpts demonstrates children's understanding of risk and the second set illustrate their understanding of risky situations.

What risk is:

Babalwa: You're doing something carelessly, maybe you're doing something and you die

Colin: I think that person resents you

Claire: They are telling you not to play with that thing 'cause it will burn you

Bubele: I've heard of it but I just don't know what it means.

Examples of risky situations:

Babalwa: It is danger… (explains later)…when you touch power with wet hands

Claire: Maybe there is a man there, you were just sitting on your own … and then he rapes you unexpectedly.

Daphne: Say they've lit the stove and are cooking meat and say they'd be falling asleep and their mother arrives unexpectedly and switches the stove off after the meat has already burnt and you were almost burned…. Or someone who walks at night…. Yes, a skollie might get him/her

Elizabeth: Someone who is bleeding...

From the first set of excerpts, we can see that the children struggled to define risk. It could be that the children found this word hard to define because there is no direct translation of 'risk" from isiXhosa to English or because the word has different connotation in isiXhosa. This could be the reason they were able to demonstrate better understanding thereof when giving examples of risky situations. Focus group three had the most difficulty with defining "risk" which could be because most of the children in that particular group were 10 years old. This exercise may have been too abstract for them. Their understanding of risk is that it is an accidental occurrence that might lead to harm or danger and caused by a person.

Most of the examples that the children provided to illustrate risk pertained to things other than burns such as traffic safety and walking at night which are risk factors for being involved in a car accident, being raped or assaulted on the street or contracting HIV. This could be an indication of the most important risky situations in their experience and in these communities. Drawing on

Babalwa and Claire's explanations risk is doing something with a negative consequence either pre-informed or due to not knowing. Daphne's excerpt (the first part) explains risk as a dangerous occurrence that could have happened had a mediating event not occurred i.e. had the mother not intervened. This implies that children perceive themselves to create risk and that it is their own doing should they get burnt. Children thus understood risk factors in terms of individual behaviour as a direct cause of burns injury. They may be expected to know how to prevent or avoid risk and thus see the injuries as the individuals' own fault. The way they have personalised the responses, demonstrating a level of taking responsibility for their injuries, was the opposite of findings from a study concerning children's self-reports of 8-year olds regarding risk (Gable & Peterson, 1998, cited in Boles et al., 2005). In light of the fact that this sample was of 10 and 11 year old children, this shows that as children develop which Aber et al. (1997, p. 47) defines as "the acquisition and growth of the physical, cognitive, social and emotional competencies required to engage fully in family and society" they are able to identify risk and their role in it as opposed to merely assigning their injuries to fate as was found in the aforementioned study.

The description of risk as 'concrete' could be accounted for by Piaget's work. Piaget holds that children in this developmental phase are not able to do abstract thinking but think operationally and can thus only reason with existing phenomena and not with hypothetical instances (Louw & Edwards, 1998) hence they could not theorise risk. They think of tangible objects and specific events and not of what may be (Atherton, 2009) given a particular situation. This is why they can give concrete examples of risk. The reference to area like HIV may be connected to the impact of media messages in that there is more publicity about the risks of HIV and road traffic safety.

Therefore, children have limited understanding of the meaning of the word "risk" but have a clearer understanding of injury risk factors in that they recognise events and situations that may lead to them getting burned although they could not define or recall having heard the concept.

THEME 3: <u>RISK IS MULTI-FACTORIAL</u>

Children identified multiple burn injury risk factors. They consistently identified a number of contributing factors namely; the self as the locus of risk, the interaction between themselves and caregivers in relation to the failure of child supervision, alcohol consumption, and factors pertaining to social inequality in relation to technology and engineering.

Theme 3.1 Self as locus of risk

Children's acknowledgement of their limitation in sensing danger was a very dominant theme and cut across all groups. They communicated that children do not intentionally put themselves at risk of injury but it is because of their limited cognitive and emotional resources that they place themselves in risky situations. This finding is related to the developmental phase which is a risk factor for burns injury as it is related to risk taking behaviour and is consistent with their understanding of risk as discussed above. In the discussion children consistently verbalised situations in which they contributed to their burn injuries. They attributed this to not knowing that their behaviour would lead to them getting injured. The following excerpts illustrate this:

> Babalwa: …not carrying a task out well.
>
> Bubele: …if you cook for yourself you'll burn yourself by mistake
>
> Fufu: Children don't think they'll get burned.

Although children accept their role in the creation of their injuries, they are aware of other contributing factors in this process. Babalwa suggests that if children knew how to perform tasks the right way then they would not have been injured. Bubele summarises this idea by noting that burn injuries in these contexts are in fact unintentional. Earlier we noted a level of self-blame for the burn injuries and now we see that they feel responsible for these injuries in what Bubele is saying. Bubele also alludes to the fact that tasks may be inappropriately assigned to children. Research suggests that preschool and older school-age girls are at more risk of being burnt as a result of functions mostly in the kitchen area (see Delgado et al., 2002). Risk may be due to children's underdeveloped physical and cognitive abilities as they cannot foresee danger and have a low sense of risk assessment. As literature shows, children's lack of coordination and ignorance of dangerous substances (Attia et al., 1997) in play makes them vulnerable to being injured.

That children can take responsibility for their mistakes regarding their burn injuries indicates that children can be agents of change in that they view themselves as actors of risk creation and prevention. While early life stress can have stress resilience effects such as reducing fearfulness (see Gunnar, Frenn, Wewerka & Ryzin, 2009), responsibilities such as those in the above excerpts however can leave the child with an emotional burden that they are not emotionally and cognitively developed for as we have seen above. Although children in this stage start to reason and can reflect about their behaviour and why they took certain actions (Johnson, 2003) they cannot foresee the consequence of their actions (Atherton, 2009) or mentally test the effect of risky behaviour such as playing with dangerous objects.

Theme 3.2 Risk as an interaction between self and caregivers in household activities

As part of risk, children revealed how their engagement in adult tasks and responsibilities placed them at a considerable risk of getting burned. Children passionately described the tasks that they perform at home and how they execute them and spoke about the dangers when they help around the house with tasks designed for adults such as operating the stove and taking care of their siblings while grown-ups are not there. The following excerpts capture the roles that children play at home and how they are risky for children.

> Babalwa: For example ….she (*the mother*) says to her child the child must put that corn in the fire, the grown-up might have been using something to hold when she does that so that she doesn't burn; probably that child didn't think to do that, they didn't know that their mother uses that thing although it is there but then the child puts the corn with his/her bare hands and consequently gets burnt.
>
> Colin: …you know you can't say to a grown-up person that you can't do something...
>
> Andile: Say for instance your mother told you to take the stove and put it there; and you forget and you then put it on top of the table and then the baby touches it and gets burned

According to Piaget (1960/1995) adult authority does not change the thought of the child. Children just get confused about what it is that is expected of them and their motivation for doing the right thing decreases as this is usually based on the desire to please the adult or follow their rules (Piaget, 1960/1995). Babalwa's excerpt points to the developmental limitation present that increase risk. Children are required to assist in adult tasks although they see the danger in

this and recognise their inabilities to perform the tasks but feel unable to say no which places them at burn injury risk. They continue to partake in these activities that put them at risk of getting burned despite this awareness. Based on Colin's excerpt, the reasons of them carrying out risky activities are related to them feeling powerless to point this out and have no agency regarding the matter (Piaget 1960/1995).

Such set ups are common as Dawes and Donald (1999) have found that societies place new demands on children to participate in household chores and responsibilities such as looking after younger siblings; duties that may be beyond their cognitive and physical abilities. This is the norm for African children and has a bearing on cultural habits (Edelman, 2007; Forjuoh, 2006) as different societies have different expectations from their children. Children's engagements in household activities based on the above excerpts are consistent with adult-child relationships and power imbalances as girl children are brought closer to the kitchen to help their mothers and are therefore exposed to the fire, hot liquids and hot substances (Durrani, 1974, cited in Forjuoh, 2006). Girls tend to be more involved in such activities like helping in the kitchen (Delgado et al., 2002; Forjuoh & Gielen, 2008). Children are thus saying that they have no agency regarding performing tasks around the home even if they themselves know the dangers. The context also plays a significant role and children in high-income areas do not perform such duties and have lower rates of burn injury (see Forjuoh & Gielen, 2008) which could be because of the different levels of exposure to burns. This calls for opportunity to explore ways to deal with this risk as an interaction between cultural practices and socio-economic reasons exists. Parents may be unaware of the risks or may also have fewer choices in terms of delegating household chores to children.

Theme 3.3 Failure of parental safety system

Children voiced lack of either parental or adult supervision as the strongest theme in all the focus groups. Children placed a strong emphasis on the dangers of being left unsupervised expressing that this is the underlying factor for their injuries. Instances surrounding children not being supervised include when they perform certain household tasks, when parents are not in the house or when parents are in the houses but have multiple things to do. The following excerpts illustrate this well:

> Cassie: …the child lights a flame stove and there is another child that around 4 years old in the bed … now the child may get off the bed and go to the flame…now there is no one to say stop, then the child gets burned …
>
> Babalwa: For instance you've left the child sleeping at home and maybe you've cooked, warming oil to bake vetkoek or eggs maybe, the oil maybe burns vigorously on top. The child then goes to the kitchen… and burn the child.
>
> Pumla: For instance when a parent has alight the heater and then goes to buy tomatoes and leaves the child and the child then plays with the heater …

The excerpts suggest that although children may be aware of competing parental tasks and other obligations they also appreciate the negative effect of inadequate supervision. Vast literature also suggests that inadequate child-supervision and lack of domestic safety measures are significant risk factors of childhood burn injury (see Albertyn et al., 2006; Forjuoh & Gielen, 2008; Sakuja et al., 2004; Tse et al., 2006; van Niekerk et al., 2006) as the children have illustrated. As with Phumla's excerpt, the literature informs us that this is usually the result of the caregivers' competing demands (van Niekerk, 2006). This however does not excuse the fact

that inadequate child supervision is risky as children are prone to engage in dangerous activity and access dangerous substances such as matches, firecrackers and household appliances when left on their own (Forjuoh & Gielen, 2008; McLoughlin, 1995). Poor parental safety systems increase risk in an environment where children are curious and want to experiment (Eadie et al., 1995, cited in Attia et al., 1997; Zhu et al., 1988, cited in Forjuoh & Gielen, 2008) and the living conditions in these areas (congestion, over crowdedness) coupled with high reliance on flammable substances (see Attia et al., 1997; Delgado et al., 2002; van Niekerk, 2006).

Theme 3.4 Alcohol consumption

Children spoke passionately about the role of alcohol consumption in children's burn injuries. They reported this to be the result of reckless behaviour, impaired judgement, and interpersonal conflict among adults after the consumption of alcohol. This theme was discussed in great deal in the first and second focus groups, the third group did not mention anything related to alcohol as a risk for burning injury. The following excerpts described these situations:

> Babalwa: …the child smokes, maybe he's drunk…and afterwards just goes to sleep…and knocks the ashtray over….and then the whole house burns
>
> Colin: … a man went to go drink [3]umqombothi and then goes home and still fiddles with the gas appliances and suddenly burns afterwards he leaves it just like that and says (mimicking drunken man), "no, no, I didn't think this would happen"
>
> Charlie: Or someone who is [4]enjoying

[3] Traditional beer
[4] To enjoy is direct translation from Xhosa slang meaning that the person is tipsy/intoxicated

There is rich literature connecting alcohol consumption to injury in general (see Seedat et al., 2009; WHO, 2006). Seedat et al. (2009) reported that in South Africa, 15% of children reported that one or both parent had been too drunk to care for them and 30% of them moved around between households as a result. Although it is believed that South Africa has one of the highest global alcohol consumption rate (Rehm et al., 2003); an estimated 46% rate of alcohol consumption (WHO, 2004), recent literature shows that the proportion of the population consuming alcohol in South Africa is low as compared to other countries but many people who drink appear to engage in risky drinking regularly (Peltzer & Ramlagan, 2009). The Medical Research Council of South Africa conducted a study of persons receiving services for traumatic injuries in the Cape Metropole of which 70% reported alcohol-related domestic violence cases (Parry, 2000). They found that alcohol contributed to these cases as it plays a significant role in leisure activities and in certain cultural and religious traditions (Parry, 2000). Literature indicates that alcohol and drug use is present in children and adolescents who suffer life-threatening injuries (Maldan et al., 2001). The accessibility of alcohol in South Africa is driven by a massive alcohol industry with an annual health and social cost estimated at R9 billion as a result of alcohol misuse (Seedat et al., 2009). This high rate is attributed to the country's history of Apartheid where the black majority was allowed limited permission to purchase alcohol (Parry & Bennetts, 1999). This has led to the proliferation of home-brews (Parry, 2005; Peltzer & Ramlagan, 2009; WHO, 2002), which Colin (in FGD 2) referred to as "*umqombothi*", and small scale outlets that serve them most which are commonly referred to as *shebeens* (Parry et al., 2002). There is thus a need to develop and implement comprehensive strategies to decrease the misuse of alcohol in South Africa (Peltzer & Ramalgan, 2009).

Theme 3.5 Access to safety resources is determined by the environment

This was the most dominant theme from all the groups. The children identified certain aspects of their lifestyle and restrictions or lack of resources to be significant factors. In the discussions children spoke about how their living arrangements and homes are unsafe and further do not have safe resources and appliances because of the circumstances under which they live. They described these restrictions to be stemming from poverty and social inequality possibly based on race as the reason people cannot afford safe resources. The following excerpts capture this:

Cassie: (Babalwa & Ada nod heads in agreement) its overcrowded, the houses are too close to each other – when one burns so do all the rest but only one was enflamed Miss…

Pete: The problem is that in shacks there is no electricity so now people take candles so that they can have light or they use [5]imbawula.

Ada: …in those houses of white people …do those things happen there?

Cassie: Don't they *('white' households)* have those water-things *(Referring to sprinklers)*?

The set of excerpts describes the living conditions of households in these communities. Based on our understanding, these descriptions i.e. the use of flammable substances, having lack of electricity, living in overcrowded settings contribute to the high occurrence of burns and are related to poverty and low socio-economic status. Pete helps us understand that the continuous use of these resources is due to these homes having limited options for energy and day to day living in low-income contexts. Research suggests that households resort to unsafe resources as

[5] Traditional fire place that is usually made of wood, paper and paraffin.

they cannot afford better or safer alternatives such as electric appliances and expensive engineering devices adding to their electricity costs (see Butchart et al., 2000). Affluent communities have electricity and individuals from such communities are therefore not at risk of burns resultant from unsafe alternatives resources. The children's experiences resonate with the published literature. Burns occur mostly in residential areas (Sharma et al., 2006) in the home environment (Forjuoh & Gielen, 2008; Sharma et al., 2006), due to substandard housing and poor living conditions (Albertyn et al., 2006; Edelman, 2007; van Niekerk, 2007) as a function of the factors the children mentioned e.g. type of residence, crowding, electricity, and high population density (see Albertyn et al., 2006; Edelman, 2007; Forjuoh & Gielen, 2008; van Niekerk, 2007) or congestion. These as referenced, are among the main demographic factors associated with the high risk of burn injury (Atiyeh et al., 2009; Edelman, 2007; van Niekerk, 2007) and have a significant impact on childhood burns (WHO, 2006).

The latter excerpts also communicate that children hold the view that different 'racial' groups may have different burn risks and outcomes. Ada's question draws a connection between poverty, race, and social inequality. This connection has been made in numerous research studies and it is found that injury is linked to many forms of social inequality (see Atiyeh et al., 2009; Edelman, 2007, Morronguiello, 2003; van Niekerk, 2007). Although research shows that belonging to a particular ethnic group is not exclusive to burn injury risk (Atiyeh et al., 1997); ethnicity does increase risk of childhood burns (Albertyn et al., 2006; Edelman, 2007; van Niekerk, 2007) and African children are more likely to be burn patients (Edelman, 2007; van Niekerk, 2007) when compared to white and coloured children as they are exposed to higher levels of risk (van Niekerk, Titi, Lau, Arendse, in press). In South Africa, this inequality is

related to 'race' (Laflamme, 2001) and remains the proxy indicator for social inequality in this country. Previous research shows that people who come from low-income households or those with high poverty rates are at increased risk from burns (Atiyeh et al., 2009, Edelman, 2007; Morronguiello, 2003), a finding similar to the children's descriptions. Poverty and inequality are crucial social dynamics that have contributed to South Africa's burn injury rates (Seedat et al., 2009) like the children have identified.

THEME 4: <u>CHILDREN'S UNDERSTANDING OF PREVENTION</u>

This study understood prevention as the act of avoiding risk of burn injury. As part of the research questions, the children were asked to define or explain the word "prevention" and in order to gain a clearer understanding of their perceptions about burn injury prevention. As with "risk", they attempted to define "prevention". The following excerpts capture the children's responses:

Pete: … "to be safe"

Cassie: …take care of yourself…

Sandile: …protecting your home…

Claire: … to protect your child…

The children's perceptions of prevention thus ranged from them taking individual interest of their safety by avoiding risk, someone ensuring that they (children) are safe, as well as someone ensuring that children's environments are safe. Someone making sure that they and their environment are safe was emphasised the most. Their understanding of prevention as safety

could be linked to the exposure and magnitude of risk as discussed earlier. This could be the reason why the children placed a strong emphasis on their own protection and having to be taken care of. They spoke about risky circumstances more than they did about prevention opportunities and did not dwell much on examples for prevention. This could be because they are more exposed to risky situations than preventative instances hence they could talk more about "risk". The prevention strategies identified are also consistent with what they have identified as risk. They have identified preventative strategies to include their own contribution to prevention, the role of the family and community, addressing the alcohol consumption, safety education, as well as addressing social inequality. This is consistent with the prevention strategies that they have identified namely, themselves, their interactions with adults, controlled alcohol consumption and the upgrade of their environments.

THEME 5: CHILDREN'S BURNS PREVENTION STRATEGIES

The children placed a strong emphasis on caregivers' roles and what could be done in their environments to prevent children from getting burnt. They also considered what they as children could do to prevent burn injury. All the groups spoke about prevention measures that children as well as adults/parents should employ that would help avoid risk as well as what could be done in their communities in general. The things that could be done for them were the most appealing strategies to the children.

Theme 5.1 Children have agency

The earlier discussion suggested that children recognised their role in burn injury risk and prevention studies point to child agency in prevention. They thus saw themselves as the locus

for prevention. They also recognised their limitations. Based on this, children proposed a two-fold agency to burns prevention in that they can be actors of prevention in the context of adult supervision, and secondly, in that they can do something on their own. The following excerpts capture examples of children's agency in burn injury prevention:

Ada: … when we see it burning small let us go to grown- ups maybe males… 'cause we can't we are small and will get burnt.

Fufu: ...you shouldn't go there to stop the fire; you must quickly call the fire brigade and if they don't arrive soon you must ask your mom or dad to help but not do it on your own

Beauty: Say, the power is off, don't buy too much candles in the kitchen, the room, lounge all over the place and then go and sleep without putting them off otherwise the house will burn.

Elizabeth: Children must protect themselves and not go near things that involve fire

Andile (1): You have to protect yourself for instance you want to heat the water you must ask a parent to take the kettle for you and bring it down.

Claire: Or take sand and throw it over that place that is burning, and throw water over it

Given that most of the examples that they have given pertain to prevention in relation to adults, Children seem to believe that adults have more power and ability to prevent them from being injured. Despite this, they saw avenues in which they could play an active part in preventing burn injuries. These are 1) to ask for assistance or help from adults/parents in case of an

emergency, 2) to call the relevant safety officers, 3) to apply the basic safety measures when necessary, and 4) to avoid burn injury situations. Even in the context of adult supervision, children's agency is prominent in these excerpts. This fits in well with active prevention strategies which has been recommended by various researchers (see Forjuoh & Gielen, 2008; McLoughlin, 1995; Torell & Bremberg, 1995; Turner, Spinks & Nixon, 2007; van Niekerk, 2007; WHO, 2006b).

Theme 5.2 Role of the parent

As is evident from children's perceptions of burn injury causation above, children felt strongly about the role of parents, adults and/or caregivers in both child burns injury risk and prevention. Children believed that appropriate child supervision will minimise risk and help keep them safe. This was the main focus of the prevention strategies identified. The following excerpts highlight instances where child supervision would be profitable and how risk could be avoided:

Dali: … it's not advisable to leave a child alone …

Sandile: When you see them approaching something you must reprimand and hit them that they don't go there and touch

Pumla: Don't put hot water on the floor...put it far from the children to reach

From these excerpts children expect to be supervised at all times and for parents to minimise situations that could create fires or burn injuries. Many studies advocate adequate child supervision as part of the most important effective prevention strategies (see Daisy et al., 2001;

van Niekerk, 2007). Butchart et al. (2005) found that the most advocated solutions to the burns problem in South Africa is sensitising parents and training them in improved safety behaviours. In light of the fact that parents' competing tasks contributes risks, Oakley (1992a) points out that social support for mothers is important. It could result in better health for the children as parents would be getting friendship, advice and having someone to talk to in relation to caring and protecting the child. This effect was stronger in families living in poverty probably because they have more burn injury risk factors than affluent families (Oakley, 1992a). This might also be because such families do not have safety measures that more affluent families have. Home visitation programmes were found also to be effective in reducing burn injury (Butchart et al., 2000; Odendaal et al., 2009) as families would get assistance in caring for their children (Butchart et al., 2000). Studies in HIC have also revealed that day-care helps as parents and/or caregivers are given time to attend to domestic duties while the children are away (Butchart et al., 2000).

Theme 5.3 Safety education

In all the focus groups children expressed that they did not know or expect that what they did at times would cause a fire or could lead to them sustaining a burn injury. They expressed directly that they would like their parents to teach them prevention skills and that they value their parents' opinion. Safety education was not only vertical (parent – child) but also horizontal (child – child) with children expressing how they could also educate each other. The following excerpts capture this:

I: Okay, so you have to keep checking whether there is still paraffin. How do you check whether there is still paraffin left? Do you do that while it's still on?

Cassie: No-no-no…

Cassie: When its finishing, it stops as "E" when it's full it stops at "FULL" when it's "H" its half.

Dali: …if your friend does something wrong regarding fire you should advise them about the right way.

Claire … I will keep on teaching the child …

These excerpts communicate the importance of safety education and communicate to us that children are in fact open to learn as well as to transfer information. It is interesting that children seem to value and believe horizontal education (children teaching other children) as also important. Research shows that approaches combining educational strategies have been found to have most far-reaching effects (Atiyeh et al., 2009; Forjuoh & Gielen, 2008; MacArthur, 2001). A study revealed that children would believe their parents moreover educators and health and would change their minds if TV messages concerning burn prevention were promoted by an authority figure (Hsiao et al., 2006). The importance of horizontal education identified in the study merits further investigation. It could point to the potential of peer education strategies in prevention or may be reflective of the failure of parental education strategies.

Theme 5.4 Upgrading the social environment

The effects of poverty manifest in terms of space restriction, access to safety resources and underdeveloped housing; factors that mostly affect low income households (see Atiyeh et al.,

2009; Edelman, 2007; WHO, 2006b). The children identified some factors in their own contexts. Recommendations that would address these conditions through the upgrading of their social environment were identified as prevention strategies. The following excerpts are children's suggestions of what needs to happen.

> Babalwa: I advise that when a person builds a house that they build a kitchen for it so that when one has children the children will stay in the dining room and not always go into kitchen when one is cooking, that the mother remains there alone and the children not go there and get burnt
>
> Claire: They (shacks) must be taken away and brick houses must be put there… (later) it will not burn so much when we are in brick houses…
>
> Gift: In informal settlements it is important that electricity be installed in the homes so that people don't get burnt from the gas...there shouldn't be gas and paraffin heaters, stoves and imbawula's

These examples pertain to environmental engineering while suggesting a link to conditions of poverty. These measures suggested by the children have been found to be effective prevention strategies in numerous South African studies (see Butchart et al., 2000; van der Merwe & Steenkamp, 2007) and have been found to be effective in HIC (see Forjuoh & Gielen, 2008; Rivara, 1998). South Africa would profit form targeting measures aimed at addressing inequalities in both the distribution of injuries among different socio-economic groups and structural safety (Burrows et al., 2009). An upgrade of the environment that involves building formal houses and electrification has been viewed as one that will also address and improve the

conditions associated with low SES in South Africa (Butchart et al., 2000; van der Merwe & Steenkamp, 2007). Children presented a sophisticated view to prevention identifying strategies supported by previous research.

What is most striking though is the link between poverty and social engineering. Children directly identified the link between conditions of poverty and burn injury risk and the need to modify the environment as results. Others (Babalwa) saw the need to modify the environment but could not see the associations between current conditions and poverty.

CHAPTER FIVE
CONCLUSION AND RECOMMENDATIONS

5.1 KEY FINDINGS

This study sought to gauge children's perceptions of how children's burn injuries are caused and can be prevented in order to inform effective child-centred burn injury intervention strategies. The main areas were 1) children's understanding of risk and prevention, 2) what children perceive as risk factors for burn injury and, 3) their prevention strategies regarding burn injuries.

Children's descriptions and explanations of both risk and prevention showed that these processes are multi-factorial interrelated processes. They struggled to define risk and their definitions of prevention were consistent to their developmental level. The children gave many concrete examples of both risk and prevention which may be due to their high exposure to burns. They were also able to make the connections between risk and prevention, for example, where they identified inadequate parental supervision and lack of safety resources as burns risk factors they identified parental supervision and access to safety resources as preventative strategies. From the discussions it surfaced that children have a better understanding of preventative measures in general as they gave more sensible descriptions of prevention. These descriptions and examples included prevention pertaining to HIV/AIDS and road safety which are common issues in media.

The children identified social inequality, low SES, excessive alcohol consumption to be the underlying burn injury risk factors and similarly to Seedat et al. (2009), recommended that the plan of action for injury prevention interventions should target these factors as well as address parenting education and aim to strengthen responsible safety behaviour modelling in the homes.

Consistent with other studies (e.g. Odendaal et al., 2009; Peck et al., 1998) their perspective on prevention can be grouped into education (to caregivers and children about safety behaviour), enforcement (legislation, policies), environment and engineering (e.g. housing improvements, access to safety devices). Due to children's social position (Bisht, 2008) the respondents felt powerless to prevent burns most probably because of not having agency as society readily place certain demands on children which they must adhere to. As a consequence of the socio-economic condition of South Africa, Killanin (2003) found that mothers' absenteeism from home due to work give children a sense of dependence and control as children stay at home with inadequate supervision. The study identified that children take up grown-up tasks prematurely. Throughout the discussions children were alluding to the importance of social cohesion. Poor social cohesion is a structural feature that contributes to developmental outcomes and child care contexts (Dawes & Donald, 2004). This merits exploration. If communities work together towards taking care of children, children will not be rushed into grown-up responsibilities.

Risk and prevention is therefore influenced by complex interacting pathways and there are specific challenges in low income contexts. Prevention interventions should be integrated and interrelated as both passive and active interventions are important in minimising burn injury risk on all ecological levels. The problem is not lack knowledge about effective preventative strategies; it is the implementation of that knowledge that seems to be the challenge.

5.2 LIMITATIONS

One of the main limitations was the language factor, as the discussions had to be interpreted from isiXhosa to English. This caused meaning to be lost or diluted in the translation process as

the medium of the interviews was isiXhosa. Furthermore, the children used words to describe their context and experiences which the researcher could not understand or relate to as there are different isiXhosa dialects. Some of the difficulties identified in defining constructs like risk may therefore be related to linguistic difficulties. Power-roles were a challenge in the beginning of the discussions in that the child mirrored the investigator as a parent or authority figure looking for correct answers. This is a common problem in interviews (Marczak & Sewell, 1998). In handling this, the researcher posed the questions in such a way that the children felt that they could make meaningful contributions but may have still influenced data collection. Purposive sampling, the technique for selecting participants, as well as the size of the sample limits the ability to generalise findings to larger populations (Marczak & Sewell, 1998). The advantage of this form of sampling is that those potential candidates who fit the criteria for the sample were pre-identified allowing the researcher to invite participants on the basis of their availability (Neumann, 1997) thus saving time. The degree of accuracy (Neumann, 1997) of the results if generalised to other groupings may be comprised. An additional limitation of this method is that it may increase bias in the selection of the sample (van Vuuren, 1999). It would have been profitable to confirm the findings with the groups but due to the lengthy nature and time-consuming data-analysis processes this did not happen.

5.3 RECOMMENDATIONS

Relatively few studies have dealt with the focus on the child although a growing literature base in this area is emerging (Boles et al., 2005). Children are being more widely consulted about many decisions and policies that affect their lives using participatory research methods (Alderson, 1995, cited in Wellman, Phillips & Rodgriguez, 2000; UNICEF, 1995). The focus of

this study; children's perceptions regarding burn injuries, is an important area of exploration in children's burns prevention (Boles et al., 2005).

This study reported on children's perceptions, directly from children, in their own contexts based on their own experiences. This is accordance with Edelman's (2006) recommendation that individuals' perceptions of burns risk and prevention must be studied in order to enhance our understanding of the behaviour of high-risk populations. Reference to developmental theory drawing on research in the public health area in order to understand the research question and to interpret the results was made. This study thus succeeded in: 1) filling a gap regarding knowledge about children's preventative strategies, 2) applied psychology to a public health problem thus 3) utilising a multi-disciplinary approach to the research question and, 4) responded to the shift of the social science to treat children as actors of social change.

Based on this study, far more research on children's perceptions of injury and prevention is needed. The pervasive references to social condition merits further investigation. The study suggests that interventions need to consider context. Equity measures aimed at addressing inequalities in the distribution of injuries among different socio-economic groups are effective (Laflamme, Burrows & Hasselberg, 2009) and have to be considered. It is therefore critical that everybody in all households from all communities work together with policy-makers with special dedication from government to make prevention interventions work as burn injuries leave considerable consequences for individuals and the country (see Forjuoh & Gielen, 2008; van Niekerk et al., 2004). As Seedat et al. (2009) established the government should identify reduction of injury as a key goal so as to develop and implement a comprehensive intersexual,

evidence-based action plan based on findings such as those in this study. Burn injury interventions would therefore benefit from using multi-level prevention strategies using an ecological approach.

5.4 SIGNIFICANCE

In addition to the gap of knowledge regarding children views on burn injury causation and prevention, Tremblay and Peterson (1999) identified a need for psychological support in the injury prevention field. This study reported on children's perceptions, directly from children, in their own contexts based on their own experiences. This is in accordance with Edelman's (2006) recommendation that individuals' perceptions of burns risk and prevention must be studied in order to enhance our understanding of the behaviour of high-risk populations. This study further expanded the role of psychologists in that this dissertation identified and sought to understand children's behaviour regarding a social and public health issue. This study thus achieved the following: 1) filled a gap regarding knowledge about children's preventative strategies, 2) applied psychology to a public health problem thus 3) utilising a multi-disciplinary approach to the research question, and 4) responded to the shift of the social science to treat children as actors of social change.

Since this study is placed in the behavioural and social sciences, which play a critical role in coping and adapting to certain living conditions, it has helped to understand children's perceptions of burn injury risk and prevention in order to devise interventions at the level of children's abilities and behaviour. The generation and clarification of these understandings will contribute to the development of more appropriate interventions and highlight issues relevant for

prevention policy more closely aligned to the contexts and experiences of children. This work is particularly important for planning interventions because knowledge of children's coping strategies and challenges to these will allow us to build on existing practices that have been found to work for children as they are the target audience of the interventions (Dawes & Donald, 1999). Because the legitimisation of knowledge requires the judgement of an entire community of stakeholders (which in this case include children, parents and healthcare practitioners) including children, the findings of this study must be taken seriously by including it in the formulation of interventions and implement them.

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