

ORIGINAL ARTICLE

Child understandings of the causation of childhood burn injuries: Child activity, parental domestic demands, and impoverished settings

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Abstract

Background: Burns are a global public health problem. In South Africa, the rate of paediatric burn deaths is 5 times higher than other upper middle-income countries, with concentrations in impoverished settings. Globally, the majority of research focuses on expert and caregiver descriptions of burn occurrence, causation, and prevention, with limited consideration of children's perspectives. This study investigated children's understanding of the causation and prevention of childhood burns.

Methods: Data were collected from eighteen 10- to 11-year-old children living in selected impoverished, fire-affected neighbourhoods in Cape Town, through 3 isiXhosa focus groups. All focus groups were transcribed, coded, and analysed for emerging themes through thematic analysis.

Results: Themes regarding burn causation and risks centred around 4 themes: (a) developmental limits in context; (b) domestic chores, child capacity, and inability to say "no"; (c) inadequate supervision and compromised caregiving; and (d) unsafe structures. Child accounts of prevention pertained to (e) burn injury prevention activities in comprised environments and emphasized child agency, and upgrading the physical environment.

Conclusion: The children in this study ascribed burn injuries as the consequence of their developmental limits in the context of poverty, constraints on parental supervision, and unsafe environments. The children recommended safety education and upgrading their physical environments as part of burns injury prevention. The child accounts offer useful insights to inform safety interventions in impoverished settings.

KEYWORDS

burns, causation, child development, children, environment, participation in research

1 | INTRODUCTION

Globally, more than 300,000 fire and burn deaths are annually reported, with the vast majority in low- and middle-income countries, and almost 100,000 of these are children (Peck, Molnar, & Swart, 2009). The highest paediatric burn mortality rates are reported in Sub-Saharan Africa (Wesson et al., 2013). In South Africa, an upper

middle-income country, child burns are pervasive with death rates more than five times higher than others in this category (World Health Organization (WHO), 2011). The high and persisting incidence of child burn injuries in South Africa is considered to be due to the complexity and multiplicity of agents manifest in impoverished settings, including adverse physical household environments and poor neighbourhood infrastructure, pressured family environments, the widespread reliance

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of fossil fuels and open fires, challenges to organized responses to fires, and inadequacies in the management of thermal burns (Van Niekerk, Titi, Lau, & Arendse, 2012).

In South Africa, as elsewhere, strategies that reduce child burn mortality, morbidity, and the extent of suffering are essential. South Africa has a research platform that has described aspects of the burden, causation, occurrence, treatment, and selected prevention strategies for paediatric burns (Van Niekerk et al., 2012). However, studies that have described childhood burn injury occurrence essential for targeted prevention strategies have largely relied on parent, caregiver, and burn expert accounts of children's vulnerabilities and related exposure to injury risks (Munro, Van Niekerk, & Seedat, 2006; Van Niekerk, 2007). This is despite an emerging accumulation of social science research that has increasingly recognized children as individuals who have the capacity to consider the health and social threats that face them and the appropriate responses to these (Driesnack, 2005; Epstein, Stevens, McKeever, & Baruchel, 2006).

Although there are descriptions of child burn occurrence and prevention information from low- and middle-income contexts (WHO, 2011), child accounts to complement adult and expert perspectives are virtually absent, especially in paediatric burns research (see McDowell, Hyland, Harvey, et al., 2015), with little if any representation of the voices of children from marginalized contexts (see Coyne, Mathúna, Gibson, Shields, & Sheaf, 2013; Ellingsen, Thorsen, & Størksen, 2014; Feenstra et al., 2014). Researchers and practitioners may, therefore, through greater use of children's meaning-making capacities and experiences, be better placed to understand the risk exposures experienced by children and thereby develop more effective, child-centred burn prevention and psychosocial support for vulnerable children and families (McIntosh, Stephens, & Lyons, 2012; Reisenberg, 2008). Accordingly, this study contributes to the steadily accumulating knowledge on child burn injury determinants and occurrence (Atiyeh, Costagliola, & Hayek, 2009), as well as prevention, but with a focus on child accounts of the risks, causes, and relevant prevention strategies for childhood burn injuries.

This study sought to explore children's perceptions of childhood burn injury causation and prevention in a low-income South African community. The 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?

2 | METHODOLOGICAL APPROACH AND RESEARCH DESIGN

In this exploratory study, participatory qualitative enquiry was used to explore and elucidate children's understandings of burns and its prevention in order to understand the exposures and prevention concerns that directly affect them. This study is aligned to other recent social studies of childhood that have advocated for a shift to the conceptualization of children as active research participants capable of contributing valuable knowledge and unique insights (Hammersley, 2015; Mayall, 2000).

Key messages

- Children placed strong emphasis on the dangers of being left unsupervised.
- Due to cultural norms, children may struggle to refuse potentially dangerous chores assigned to them by adults.
- Children recognized both their agency and their limitations.
- There may be different risk and prevention pathways for children from low-income, highly risk environments.

2.1 | Study setting

The study took place in Khayelitsha and Phillippi, which are two historically Black townships situated on the fringes of Cape Town, South Africa. These have been identified among those townships reporting a high incidence of childhood burn injuries (Ndingaye, 2005). These communities were established during the apartheid era as dormitory areas for the working class and remain plagued by deep and persisting problems related to poverty and unemployment (City of Cape Town, 2013). Both communities currently comprise of more females than males with the majority of economically active individuals in the population unemployed (City of Cape Town, 2013). Most of the dwellings in these areas do not have electricity or good sanitation and rely on paraffin for fuel, warmth, and lighting (City of Cape Town, 2013). The dwelling structures are typically small housing structures in dense neighbourhoods (Ndingaye, 2005). Thus, chain house fires arise more easily and often, with greater exposure of children to fires, burn injury, and their consequences (Phoenix Update, 2008).

2.2 | Participant selection sampling

Purposive sampling was employed to identify and recruit participants into the study, based on the basis of their fitting the study criteria, availability, and consent (Neumann, 1997). Each focus group consisted of four to six children, with six the maximum recommended number of children for a focus group discussion (Marczak & Sewell, 1998; Thomas & O'Kane, 2000). The children were aged 10 or 11 years old with equal gender representation, spoke either isiXhosa or English, and were selected on the basis of being verbal in school group settings, and residing in Khayelitsha, Site C or Phillippi's Samora Machel informal settlement, among the areas in Cape Town reported rife with burns injuries. The study sought to explore children's perceptions of childhood burn injuries; however, participants need not themselves have experienced a burn injury, as it was considered that the children's experiences in high-risk living environments would ensure the relevant experiences on the topic.

2.3 | Data collection

The study was approved by an Ethics Committee of the University of the Western Cape, Research Project Registration Number 08/8/17, and the requirements of the provincial Educational Department to access Government schools were followed. Numerous schools in the selected study settings were purposively approached for participation

and individually briefed. Permission to recruit and work with child participants was granted by three schools. The first four to eight children who returned signed information sheets and informed consent forms were selected to participate in the group discussion at their particular school. The first group comprised four participants, the second eight, and the third group consisted of six children. Each focus group explored children's knowledge about burn injuries in their community, their views on child burn causation, and on prevention. The focus groups were conducted in isiXhosa, the respondents' home language, and this facilitated smooth conversations and allowed participants to express themselves comfortably. The interviewer's first language is also isiXhosa, and she transcribed, translated, and led the initial analysis of the transcribed texts. All focus group discussions were recorded and transcribed verbatim to ensure accuracy.

2.4 | Data analysis

Kelly and Terre Blanche's thematic analysis steps were utilized to focus on the identification of patterns or commonalities of experiences in living (Taylor & Bogdan, 1984). Multiple in-depth readings of transcribed group discussions allowed for familiarization with the data. By immersing in the data, themes were induced and thereafter coded. Data were then verified, and the themes generated were interpreted based on the study objectives. The first author generated the codes through multiple readings of the transcript. The codes were organized into themes corresponding with those codes that were aligned to the three main research questions.

The reliability and validity of study data as well as theme extraction were ensured through the study coauthors checking and rechecking the designation of themes against the transcriptions to confirm accounts and interpretations, and thereby reducing researcher bias.

3 | FINDINGS AND DISCUSSION

This study found that children's accounts of burn causation and risks centred around four themes, namely, (a) developmental limits in context; (b) domestic chores, child capacity, and inability to say "no"; (c) inadequate supervision and compromised caregiving; and (d) unsafe structures. Their accounts of prevention pertained to (e) burn injury prevention activities in comprised environments and emphasized child agency, and upgrading the physical environment.

3.1 | Theme 1: Developmental limits in context

This study indicates that children were able to identify their limitations and the consequences of their actions in increasing the risk for a burn injury as illustrated below:

Bubele (boy): ... if you cook for yourself you'll burn yourself by mistake.

Babalwa (girl): ... not carrying a task out well.

Fufu (boy): Children don't think they'll get burned.

This finding is consistent with research that shows that children's perspectives on health and social issues may be considered within their

own development (Hart, 1992 in Harder, Christensson, & Soderback, 2009), a process encompassing "the acquisition and growth of the physical, cognitive, social and emotional competencies required to engage fully in family and society" (Aber, Gephart, Brooks-Gunn, & Connell, 1997: 47). This individual development is within specific social and environmental contexts, with children's understandings of burn risk influenced by multiple factors in their environment. However, there have been questions regarding whether children at this age can foresee the consequence of their actions (Atherton, 2011) or mentally test the consequence of certain behaviour (Johnson, 2003). The children in the current study were able to reflect on their behaviour and their reasons for certain actions. This children's recognition of their own contributions to their vulnerability, as opposed to accounting for it to external circumstances or to fate, departs from other studies, which report that children attribute injury circumstances out of their control (Boles, Roberts, Brown, & Mayes, 2005).

This study's finding regarding the children's recognition of their own vulnerability may in part be attributed to these children's early exposure to domestic chores as reflected in this and other reports of cooking for themselves and exposure to the difficulties to carrying out household tasks well, with consequent accidental burning. The statements made by the children in this study suggest some understanding and acceptance of the causal relationships possible between individual actions and burn risk, with the children in this study explicitly taking a share of the responsibility for their own safety. This could possibly be related to the early allocation of household responsibilities.

3.2 | Theme 2: Domestic chores, child capacity, and the inability to say "no"

The study indicated that children, even if they had been briefed or shown relevant safe behaviour by adults, often found themselves involved in chores and activities that placed them at risk of a burn injury. These children spoke to how they were often required to assist in adult tasks although they may have seen the dangers and recognized their inability to perform them, as well as their inability to refuse tasks given to them by adults:

Babalwa (girl): ... (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

Andile (boy): 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.

Colin (boy): ... you know you can't say to a grown-up person that you can't do something

Internationally, the risk of burn injuries for children of low-income families is eight times that of children from high-income families (Atiyeh et al., 2009). In South Africa, Van Niekerk, Reimers, and Laflamme (2006) asserted that this elevated risk in part reflected the widespread constraints on child supervision owing to the excessive and competing

demands on caregivers, and the involvement of the child in household activities in domestic environments that are often complex, an assertion supported by the current findings. Family income, family size, single parenting, and immigrant families have been identified by others as risk factors for households in low-income communities (see Delgado et al., 2002; van Niekerk et al., 2006). It is reported that in such families, caregivers are often under pressure because of work and domestic chores to leave children at home, with consequent gaps in supervision or with arrangements that only involve older child siblings. Furthermore, in impoverished settings, as with the communities in the current study, children are often exposed to adult tasks such as cooking, which is common in South Africa's poor neighbourhoods, with burns caused by hot foods or drinks widespread (Scheven, Barker, & Govindasamy, 2012; Van Niekerk et al., 2012). The exposure to burns through children participating in the preparation of food in the home is thought by other research to explain why older girls have a higher rate of injury than boys, as is the case in and around Cape Town (Van Niekerk, Rode, & Laflamme, 2004a) and globally (Peden et al., 2008).

With this study, as with others in African settings, we noted that a high value is placed on respecting, obeying, and learning from elders in the kinship network and community (Moses, 2008). Respect, obedience, and cultural traditions are, as suggested in the last quote above, seen as important social conventions that parents and children within particular ethnic groups abide by (Smetana & Gaines, 1999); thus, children from African cultural contexts who say “no” to their parents would be viewed as rebellious and would invite adult sanctions or conflict (Dixon, Graber, & Brooks-Gunn, 2008).

3.3 | Theme 3: Inadequate supervision and compromised caregiving

The children in the current study identified inadequate child supervision as a significant risk factor for childhood burn injury and related this to compromised caregiving, as depicted below:

Babalwa (girl): For instance you've [referring to an adult] left the child sleeping at home and maybe you've cooked, warming oil to bake vetkoek or eggs maybe, the oil maybe burning vigorously on top. The child then goes to the kitchen ... and [the cooking food] burns the child.

Pumla (girl): For instance when a parent has lit the heater and then goes to buy tomatoes and leaves the child, and the child then plays with the heater

Cassie (boy): ...the child is lighting a flame stove and there is another child (baby sibling) that is 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

The children in this study further placed a strong emphasis on the dangers of being left unsupervised and in a number of instances considered this to be the result of reckless behaviour, impaired judgement, or interpersonal conflict between adults, especially after the consumption of alcohol:

Babalwa (girl): ... maybe he's drunk ... and afterwards just goes to sleep ... and knocks the ashtray over ... and then the whole

house burns.

Colin (boy): ... a man went to go drink *umqombothi* [traditional beer] 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.”

The current findings therefore align with previous research and highlight inadequate child supervision as a significant risk factor for childhood burn injury (Forjuoh & Gielen, 2008; van Niekerk et al., 2006). The deleterious impact of alcohol use on families has been widely reported upon, with studies having indicated that 15% of children report that their care by one or both parents has at some point been compromised by alcohol (Coulton, Crampton, Irwin, Spilsbury, & Korbin, 2007). The current study indicates that children are aware of the many caregiver tasks and other obligations, as indicated in the above passages, but highlighted the negative effects of caregiver absences, whether momentary or longer, as a major contributor to childhood burns risk and injury.

3.4 | Theme 4: Unsafe living structures

Our study indicates that unsafe living structures in informal settlements were seen to contribute to the causation of childhood burn injuries:

Cassie (boy): [Babalwa & Ada (girls) 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 (boy): The problem is that in shacks there is no electricity so now people take candles so that they can have light or they use *imbawula* [Traditional fire place that is usually made of wood, paper and paraffin].

These accounts highlighted the children's connections between their immediate socioeconomic and physical living conditions and fires and burn injury, consistent with theory-based explanations that highlight the dynamic interaction between the child's developmental capacities and other interacting mesosystem and macrosystem (see Bronfenbrenner, 1979; Dawes & Donald, 2004; van der Veer, 2007). Other research (e.g., Butchart, Kruger, & Lekoba, 2000) have highlighted the role of unsafe appliances especially in informal settlements, which tend to rely on such equipment and are unable to afford safer alternatives such as electrical appliances. As with this study site, South African settings that comprise home structures made of flammable materials, are overcrowded, and use appliances that rely on fossil fuels for heating or candles for lighting can be especially vulnerable to household fires or burn incidents (Forjuoh & Gielen, 2008; Sharma et al., 2006). The children's accounts in the current study point to an emerging understanding of the complex individual and social challenges that may be faced in physically unsafe home environments and the greater exposure to injury.

3.5 | Theme 5: Burns injury prevention in compromised environments

The children in the current study identified a number of possibilities for childhood burns prevention. They identified children as having human

agency, although the extent of this was dependent on the activation of caregiver support, safety education, and strengthening the social environment.

3.5.1 | Theme 5.1: Child agency

The children emphasized their own burn prevention capacities, in that they could be enactors of prevention in the context of adult supervision, and that they could also take burns preventive action on their own. These findings included (a) asking for assistance or help from adults/parents in case of an emergency, (b) calling the relevant safety officers, (c) applying basic safety measures when necessary, and (d) avoiding burn injury situations. The following excerpts capture examples of this:

1. Children as actors of prevention in the context of adult supervision

Ada (boy): ... when we see it burning small (*a little bit*) let us go to grown-ups maybe males ... because we can't, we are small and will get burnt.

Fufu (boy): ... 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 (girl): Say, the power is off, don't leave 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.

2. Children can take burns injury preventive action on their own

Elizabeth (girl): Children must protect themselves and not go near things that involve fire.

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

Claire (girl): [You can] take sand and throw it over that place that is burning, and throw water over it.

Most of the examples that the children gave in the above extracts pertained to prevention in relation to the presence of adults, with the children thus appearing to recognize the greater control and ability that adults have to prevent childhood burn injuries as also reported in elsewhere, in both high- and low-income contexts (see Kendrick et al., 2013; Stewart et al., 2016).

In this study, the children's agency and individual capacities, even in the context of adult supervision, were prominent. Other research (see e.g., Beck & Robinson, 2001; Robinson, Rowley, Beck, Carroll, & Apperly, 2006) has shown that children's reasoning and readiness to make judgements are generally reported to start from age 5 to 8 years when they begin to realize that there may be multiple responses to a particular situation, although their reasoning for this may still remain uncertain. However, this study indicates that adult supervision is still considered crucial, even in instances where children appear agentic.

While both individual child agency and child agency within the context of adult supervision emerged from the findings, the results

do raise the question of whether the context inhibits greater child agency. The results of the current study indicates that children perceived that a more agentic role by children in relation to childhood burns prevention may be subordinated to the role played by teaching staff and health care professionals, and by adults in general. This finding may however undermine expressions of their opinions and decisions making, and thus a more active role in their promoting their individual safety. In this study, children seemed to implicitly criticize "adult-centrism" (Davo'-Blanes & La Parra, 2012), while, at the same time, accepting it, to an extent. The children in this study thus recognized both the individual behaviour required of them in childhood burns prevention and the importance of appropriate adult support. However, such children may show less agency as a result of the cultural values of adult-centric cultures.

3.5.2 | Theme 5.2: Activating caregiver support

The children in this study emphasized the role of parents, adults, and caregivers in child burns prevention. The children indicated that appropriate child supervision would minimize burn risks and help keep them safe. The following highlights instances where child supervision was seen to minimize risks:

Dali (boy): ... it's not advisable [for adults] to leave a child alone

Sandile (boy): When you see them [children] approaching something [dangerous] you must reprimand [so] that they don't go there and touch.

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

These children's perceived approach to prevention, which emphasized their need to be protected by adults, fits in well with active adult prevention strategies, as recommended by others (see Forjuoh & Gielen, 2008; Van Niekerk, 2007; World Health Organization, 2006). However, as reported elsewhere (see Oakley, 1992), the many demands that compete for parental attention, as also supported by the current study, suggest that social support for mothers is important. Caregiver and parental support could result in better health prospects for children, as parents could access and build supportive friendships, receive advice, and have someone to talk to in relation to caring for and protecting the child.

3.5.3 | Theme 5.3: Safety education

The children in this study expressed that, at times, children did not know that limitations in their knowledge and their consequent actions could cause a fire or burn injury. As indicated below, the children expressed a need for parents to teach children prevention skills and further indicated the value in their parents' teachings:

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

The recognition from the children of the importance of education is significant and aligned to an approach to burns prevention, that is, the sensitization and training of parents in safety behaviour (Butchart et al., 2000; Wesson et al., 2013). This finding highlights the receptivity

of some of the children to knowledge transactions across and between adults and children, while also suggesting the horizontal education modes between children, as also indicated elsewhere (e.g., Mbembati, Maseru, & Leshabari, 2002; Scheven et al., 2012). This educational emphasis in prevention, especially in combination with other strategy types, has been found to have an effect in reducing burns (Atiyeh et al., 2009; Forjuoh & Gielen, 2008; Peden et al., 2008).

3.5.4 | Theme 5.4: Upgrading the physical environment

The children also made recommendations for improvements in their physical environments and an acute sensitivity to their context. As illustrated below, the children made a link between environmental impoverishment and the risk of burns and prioritized the modification of especially home environments:

Babalwa (girl): 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 (girl): 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 (boy): 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.

Previous research has shown that children understand risks to their health and well-being as an ongoing process that is affected by their relationships, experiences, and activities within the context of their immediate environment (Harder et al., 2009). Their subjective expressions of these may be understood in the specific situations that these are experienced and expressed in (Pramling, 2004, in Harder et al., 2009). The success of environmental interventions developed for economically deprived populations in developing countries such as South Africa, however, may be affected by the affordability of environmental modifications and safe equipment, the accessibility to services, and factors that affect the implementation of interventions, such as whether individuals can understand the instructions, if any, provided with safety products (Burrows, van Niekerk, & Laflamme, 2010).

3.6 | Limitations

The study involved interpretations of the discussions, from isiXhosa to English. This may have resulted in the dilution of meaning, due to the different isiXhosa dialects. This may account for the children's varied responses to defining constructs such as "risk." Power roles were also a challenge, especially in the beginning of the discussions in that the child would have mirrored the investigator as a parent or authority figure, a common problem in such interviews (Marczak & Sewell, 1998). The researcher, however, posed the questions in such a way to encourage the comfort of the children and thus contribute to meaningful contributions. Purposive sampling, the technique for selecting participants, as well as the size of the sample, limits the ability to generalize these findings to larger or even other South African populations (Marczak & Sewell, 1998).

Finally, although only one author coded the initial findings, the other authors also read the interview transcripts and verified these codes, which would have minimized any individual biases, which might have occurred.

4 | CONCLUSION

This study indicates that children have an understanding of risk, burn causality, and prevention. They identified a range of individual, family, and environmental factors that have been associated with burn risks and emphasized the cooperative prevention actions that are required between children and adults. The children's context emerged as a significant factor in shaping their understanding of burn causation. The children's insights echo other accounts from the research literature and align with the developmental expectations of children at this age. The children recognized this and emphasized adult supervision as required to support children's safety judgements in adverse environments, to ensure appropriate safety decisions and actions.

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