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Determinants Facilitating Unintentional Household Injuries among under 5 Children in Sub-Saharan Africa: A Scoping Review

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Abstract **Review Article**

Introduction: Injury is the leading cause of death and long-term disability in children. Research evidences abound to support that the home is an important setting for injury. This review seeks to examine and map out the determinants facilitating unintentional household injuries among under 5 children in Sub-Saharan Africa.

Inclusion criteria: 1) under 5 children who experienced unintentional household injuries, 2) risk factors for unintentional household injuries among under 5 children, and 3) any reported incidence of unintentional household injuries among under 5 children in Sub-Saharan Africa. Also, full-text articles of all potentially eligible studies were obtained in English.

The exclusion criteria include 1) children who are 5 years and above, who experienced either unintentional or intentional household injuries, 2) risk factors for injuries among older children, or 3) any reported incidence of unintentional household injuries among children in regions outside Sub-Saharan Africa. Also, non-English articles were excluded from the review.

Methods: The study adopted a scoping review methodology to map existing published literature, following the updated version of the JBI methodology for scoping reviews. It extracted determinants facilitating unintentional household injuries among under 5 children in Sub-Saharan Africa and analyzed them. Electronic searches were completed on Google Scholar and PubMed.

Results: The search strategy yielded 484 results in Google Scholar and 36 results in PubMed. The reviewers screened 315 studies at the title and abstract screening stage using Covidence, and only 63 studies were assessed for eligibility at the full-text review stage. 8 studies met the inclusion criteria and were included in the review. Gender (37.5%) and age (75%) were some of the major socio-demographic determinants identified. Household family size (62.5%) and open cooking places (50%) were the common environmental determinants identified, while child supervision by primary caregivers (50%) was the common behavioral determinant identified.

Conclusion: There is need for more studies to understand the determinants of household injuries, given the paucity of attention paid on household injuries among under 5 children in Sub-Saharan Africa. This will guide injury prevention strategies to be tailored to the specific environments taking into account local risk factors and available resources.

Keywords: Accidental injuries, Domestic injuries, Risk factors, Poor resource settings, Young children.

I. Introduction

An increasing call for urgency is required as childhood injury is fast becoming a global health problem (Peden et al., 2008 p.1). Injuries result in morbidity and mortality (Trasias et al., 2018 p.129). Injury is defined as the ‘‘physical damage to human body on exposure to excessive amount of force which is beyond the physiological threshold of tolerance.’’ (Baker et al., 1992 cited in Al-Bshri and Jahan, 2021 p.1234). Unintentional injury is an injury that is not purposefully intended (Chen et al., 2013 p.95). Road transport injuries, burns, sports-related injuries, falls, drowning, suffocation, and poisonings are the main causes of unintentional injuries (Sleet, 2018 p.3).

Unintentional injuries, excluding road traffic injuries, account for over 6,700 deaths daily and 2.4 million deaths yearly (Mock et al., 2017 p.28) and children, especially under 5, are vulnerable to unintentional injuries. Global Burden of Disease study reveals that in 2019, an estimated 209,029 mortality in under 5 children were attributable to unintentional injuries globally, with Sub-Saharan Africa accounting for 24.9 percent of the global mortality burden among under 5 children due to unintentional injuries. In Sub-Saharan Africa, unintentional injuries among under 5 children accounted for over 4.5 million Years of Life Lost (YLL) in 2019 (Global Burden of Disease Collaborative Network, 2020). While mortality is presented as the most severe outcome for unintentional childhood injuries, serious consequences including non-fatal but disabling injuries occur more frequently and are prevalent in low and middle-income countries (LMICs) (Trasias et al., 2018 p.129). Non-transport unintentional injuries contribute to over 128 million disability-adjusted life years (DALYs) yearly, with LMICs contributing the highest proportion compared to high-income countries (HICs) (Mock et al., 2017 p.28). DALYs in children caused by unintentional injuries are elevated in Sub-Saharan Africa and South-Eastern Asia (Haagsma et al., 2016 p.10). Unintentional injuries among under 5 children in Sub-Saharan Africa accounted for over 4.6 million DALYs in 2019. In 2019, unintentional injuries among under 5 children in Sub-Saharan Africa led to a loss of 87,425 healthy life years due to reduced quality of life (Years Lived with Disability [YLD]) (Global Burden of Disease Collaborative Network, 2020).

The defined risk factors for unintentional injuries are age, gender, poverty, and educational level (Peden et al., 2008 p.10; Balan and Lingam, 2011 pp.2,3). Childhood injury is an intricate phenomenon forecasted by a combination of endogenous (cognitive and behavioral) and exogenous determinants (socio-demographic and housing variables) (Dal Santo et al., 2004 p.280), and children in LMICs are particularly susceptible to injuries (Tupetz et al., 2020 p.40). Ruiz-Casares classified the risk factors for childhood unintentional injuries in Sub-Saharan Africa into demographic factors, socioeconomic risk factors and environmental factors (Ruiz-Casares, 2009 pp.54-60).

Unintentional household injuries are injuries that occur due to unplanned and unfortunate events in the home. Homes are great sanctuaries. Not only do homes provide protection, it also offers us comfort and pleasure. However, research evidences abound to support that the home is an important setting for injury (Dal Santo et al., 2004 p.278; Atak et al., 2010 p.289; El Tayeb et al., 2014 p.148; Mukama et al., 2018 p.132; Sleet, 2018 p.3). Unintentional household injuries are the main drivers of morbidity and mortality in under 5 children (Colver et al., 1982 p.1177). The burden and costs of injuries at home are substantial (Mukama et al., 2018 p.132).

Falls are the second leading cause of unintentional injury death, after road traffic injuries, with an estimated 684,000 deaths occurring annually. Low-and-middle income countries (LMICs) are disproportionately affected by fall injuries, accounting for over 80 percent of fall-related mortalities globally (World Health Organization [WHO], 2021 para.2). Additionally, an estimated 38 million disability-adjusted life years lost per year is attributable to falls, which is more years lived with disability than road traffic injuries,

drowning, burns and poisoning combined (WHO, 2021 para.3). Fall injuries are of increasing concern worldwide with children and older adults most susceptible to unintentional injuries from falls (WHO, 2021 para.5,6). According to Centers for Disease Control and Prevention (CDC), (n.d.), non-fatal injuries among under 5 children in the United States of America, between 2000 and 2015 were majorly attributable to unintentional falls. In 2010, unintentional falls among under 5 children accounted for 1,077,652 emergency department (ED) visits with lifetime medical costs of over 2.5 billion dollars as well as 22,451 hospitalizations with lifetime medical costs of over 750 million dollars (CDC, n.d.). Despite the injury prevention efforts in a high-income country like the United States of America (American Academy of Pediatrics, 2001a pp.790-792; American Academy of Pediatrics, 2001b pp.1188-1191; American Academy of Pediatrics, 2006 pp.825-827; American Academy of Pediatrics, 2012 pp.774-779), the burden and cost of unintentional fall injuries among under 5 children remains significant.

Drowning is responsible for 7 percent of all injury-related mortality, making it the third leading cause of unintentional injury mortality. Drowning is a major global public health concern and an estimated 236,000 people died from drowning in 2019. 90 percent of unintentional drowning deaths are attributable to LMICs (WHO, 2023 para.2). The financial burden in direct and indirect costs of drowning amount to 273 million dollars annually, while that of Australia and Canada amount to a combined total of 258.5 million dollars annually (WHO, 2023 para.3). Globally, children under the ages of 5 years are most vulnerable to drowning (WHO, 2023 para.6). Other risk factors for drowning such as gender, access to water bodies, flood disasters, travelling on water, lack of child supervision and low socioeconomic status lead to drowning incidents (WHO, 2023 para.7-11).

Like falls and drowning, burns are a global health problem responsible for an estimated 180,000 fatalities annually. Majority of the burden is felt in low-and-middle-income countries, with the WHO African and South-East Asia regions bearing two-thirds of the burden (WHO, 2023 para.3). According to WHO (2023 para.4), low-income-countries experience a seven-fold increase in childhood burn mortality compared to high-income countries. This explains the disproportionate distribution of childhood burn-related burden between the low- and middle-income countries and the high-income countries. The cost of burn is substantial. WHO (2023 para.6) reported the annual amount expended for burn care from kerosene cookstove incidents to be an estimated 26 million dollars, with indirect costs also contributing to the financial impact in South Africa. Gender, age, and sociodemographic factors are all identified as burn-related injury predictors (WHO, 2023 para.9-11).

Annually, over 1.1 million calls are placed to the poison control centers about unintentional poisoning among under 5 children in the United States of America (Standford Medicine, n.d. para.1), with over 90 percent of the poisoning occurring in the home (John Hopkins Medicine, n.d. para.3; Standford Medicine, n.d. para.1;). The explorative tendencies of under 5 children (Dal Santo et al., 2004 p.280; Standford Medicine, n.d. para.1) coupled with their poor cognitive abilities (Dal Santo et al., 2004 p.280) predisposes them to poisonous agents such as medicines, household pesticides, chemical and cosmetics (John Hopkins Medicine, n.d. para.1). In 2022, the poison control centers received 40 percent of calls about unintentional poisoning for under 5 children, out of which an estimated 42,950 (3%) visited the emergency departments and 106 deaths were recorded in the United States of America (CDC, n.d; Gummin et al., 2023 cited in National Safety Council, n.d).

According to Safe Kids Worldwide (2022 p.1), fatal and non-fatal unintentional suffocation among young children in the United States of America resulted in an estimated 1,243 deaths, 1,985 hospitalizations and 16,372 emergency room visits, which translates to 24 deaths, 38 hospitalizations and 315 emergency room visits per week in 2019. In 2019, the annual combined direct and indirect costs from fatal and non-fatal unintentional suffocation among young children in the United States of America was

1.38 billion dollars (Safe Kids Worldwide, 2022 p.2).

In Sub-Saharan Africa, the dearth in data on the risk factors, mechanism of injury and types of injuries due to falls, drowning, burns, and suffocation among under 5 children presents a serious evidence gap and challenge in improving the understanding of the types and circumstances of unintentional household injuries in order to develop, inform and implement injury prevention programs to mitigate unintentional injury risks and safe lives.

A preliminary search on PubMed and Google Scholar was conducted within the last week of February 2024, and a scoping review on the topic was identified. However, the review focused on the risk and protective factors for unintentional injuries among children under 20 years of age in settings that extend beyond the home environment in Sub-Saharan Africa. In this review, we provide a structured overview of empirical research that focuses on the determinants of unintentional injuries among under 5 children in settings restricted to the home environment in Sub-Saharan Africa. The review focused on all empirical studies published, with no time frame limit, to establish a contemporary foundation for future research. Our aim in this paper is not to evaluate the quality of studies examining unintentional household injuries among under 5 children in Sub-Saharan Africa. Rather, we seek to examine and map out the determinants facilitating unintentional household injuries among under 5 children in Sub-Saharan Africa. Unlike a systematic review, a scoping review maps out relevant literature in a particular field of interest and does not make any assessment of the quality of the research (Arksey & O'Malley, 2005 p.4).

Review Question

What determinants for unintentional household injuries among under 5 children are reported in Sub-Saharan Africa?

II. Methods

The scoping review was conducted in accordance with the updated version of the Joanna Briggs Institute (JBI) methodology for scoping reviews (Aromataris & Munn, 2020 pp.406–445). The objectives, inclusion criteria and methods for this scoping review were specified in advance and documented in a protocol.

Eligibility Criteria:

1. Under 5 children who experienced unintentional household injuries.
2. Risk factors for unintentional household injuries among under 5 children.
3. Any reported incidence of unintentional household injuries among under 5 children in Sub-Saharan Africa.
4. Full-text English articles of all potentially eligible studies.

Exclusion Criteria:

1. Children who are 5 years and above, who experienced either unintentional or intentional household injuries.
2. Risk factors for injuries among older children.
3. Any reported incidence of unintentional household injuries among children in regions outside Sub-Saharan Africa.
4. Non-English articles.

Types of Sources

This scoping review considered descriptive observational study designs including case series, individual case reports, and descriptive cross-sectional studies for inclusion. Studies with qualitative, quantitative, and mixed research approaches were also considered for inclusion.

Search Strategy

Google scholar and PubMed were searched on the last week of February 2024 using key words such as "risk factors'', ''unintentional home injuries'', ''unintentional domestic injuries'', ''under 5 children'', ''children'', "Sub-Saharan Africa'', "poor resource setting". Additionally, Boolean operators like "AND" and "OR" were used to narrow down the search made. The search strategy sought to locate published studies (see Appendix I). The three-stage search strategy recommended by JBI

methodology for scoping reviews (Aromataris & Munn, 2020 pp.325, 418) was adopted. An initial limited search of PubMed and Google Scholar was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles was used to develop a full search strategy for PubMed and Google Scholar. The search strategy, including all identified keywords and index terms, was adapted for each included database and/or information source. The reference list of all included sources of evidence was screened for additional studies.

Study/Source of Evidence Selection

Following the search, all identified citations were collated and uploaded into Covidence software, and duplicates removed. Following a pilot test, titles and abstracts were screened by two independent reviewers for assessment against the inclusion criteria for the review. Potentially relevant sources were retrieved in full-text and their citation details imported into the Covidence software. The full-text of selected citations were assessed in detail against the inclusion criteria by the same two independent reviewers. Reasons for exclusion of sources of evidence at full-text that do not meet the inclusion criteria were recorded and reported in the scoping review (see Appendix II). Disagreements arose between the reviewers at each stage (2 conflicts at the title and abstract screening stage; and 1 conflict at the full-text review stage) of the selection process and these were resolved through an additional reviewer. The results of the search and the study inclusion process were reported in full in the scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) flow diagram (Aromataris & Munn, 2020 p.419).

Data Extraction

A data extraction tool for the scoping review was developed by the reviewers. Data were extracted from papers included in the scoping review by one of the reviewers using the data extraction tool developed, while another reviewer verified the data extracted. The data extracted included specific details about the participants, concept, context, study methods and key findings relevant to the review question. Pilot testing of the data extraction tool was conducted by the reviewers, as recommended by JBI methodology for scoping reviews (Aromataris & Munn, 2020 p.420). An extraction form is provided (see Appendix III). The data extraction tool was modified and revised as necessary during the process of extracting data from each included evidence source. The modification made was by removing the column for ‘‘settings’’ – (rural, peri-urban and urban) due to a number of reasons, after a consensus was reached among the reviewers. Firstly, all included studies did not in any way report the settings of the study to be a predictor for childhood injuries. Secondly, the reviewers jointly agreed that capturing the country where the studies were conducted, which was seen as the context, overrode the settings. Lastly, not all the included studies highlighted the settings.

Data Analysis and Presentation

Results extracted from the studies included in the scoping review were mapped according to the determinants of unintentional injury (concept) and geographical location/country (context) where such determinants occurred. Therefore, simple frequency counts of the determinants of unintentional injuries among under 5 children and the countries where such determinants occurred were analyzed in the scoping review. The data analyzed from the evidence source were presented in a tabular form (see Table 2). A narrative summary accompanied the tabulated results describing how the results related to the review’s objective and question.

III. Result

Search Results

The search strategy for studies yielded 484 results in Google Scholar and 36 results in PubMed. All search results were in English Language. 201 duplicates were identified by Covidence software, while the review team manually identified 4 duplicates. The reviewers screened 315 studies at the title and abstract

screening stage using Covidence, and only 63 studies were assessed for eligibility at the full-text review stage. 55 studies did not meet the inclusion criteria and were excluded due to different reasons as shown on the PRISMA flow diagram (Figure 1). 8 studies met the inclusion criteria and were included in the scoping review (see Table 1).

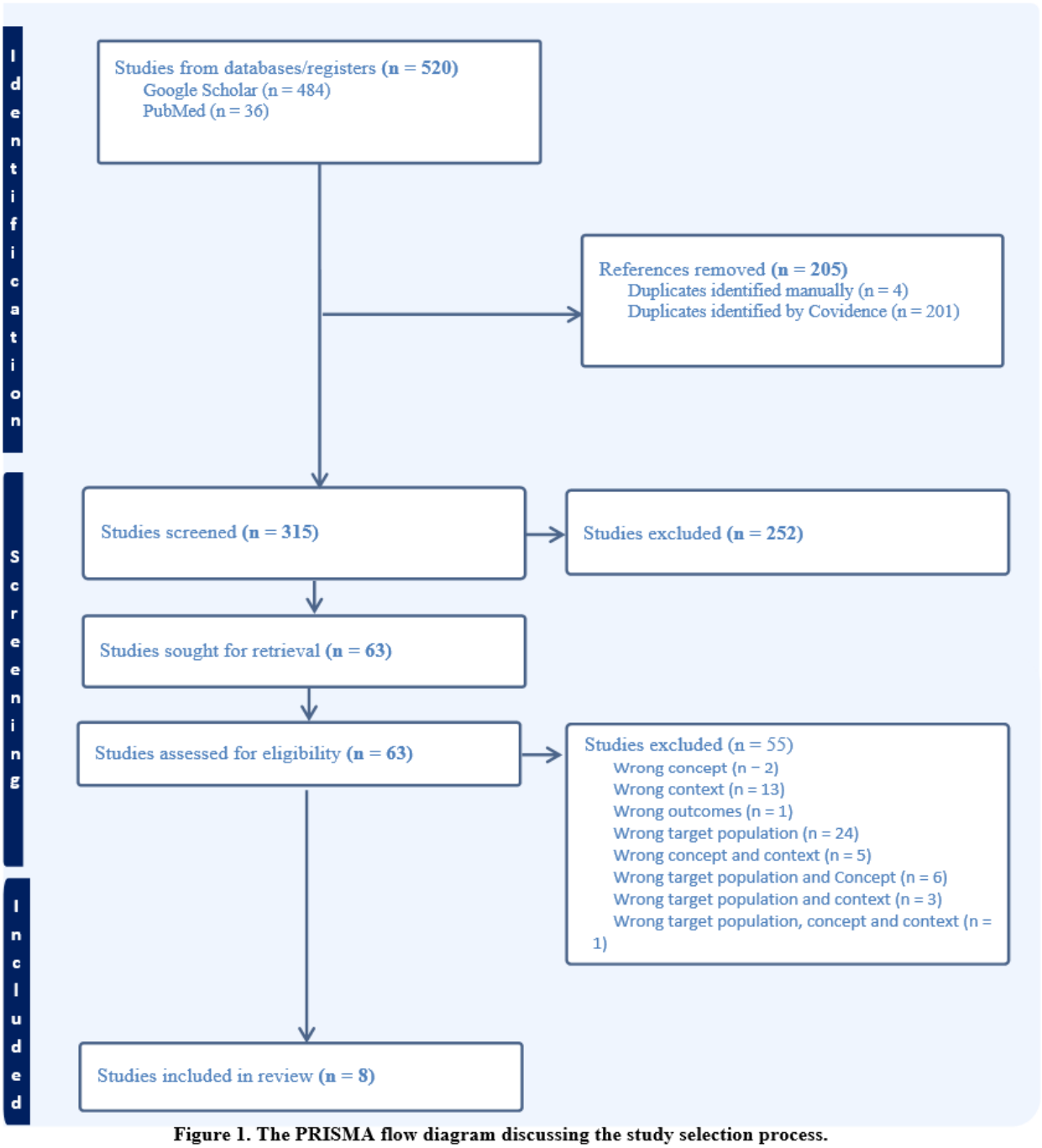

Figure 1. The PRISMA flow diagram discussing the study selection process.

Inclusion of Sources of Evidence

Table 1 Study characteristics

Authors	Year of publication	Title of article	Name of publication/journal	Country the study was conducted in	Type of source
Puvanachandra et al	2024	Voices from the Ground: Community Perspectives on Preventing Unintentional Child Injuries in Low-Income Settings	Int. J. Environ. Res. Public Health	Uganda	Primary Research
Puvanachandra et al	2022	The epidemiology and characteristics of injuries to under 5's in a secondary city in Uganda: a retrospective review of hospital data	International Journal for Injury Control and Safety Promotion	Uganda	Primary Research
Ibingira et al	2016	Prevalence of child injuries in Mbale region, Eastern Uganda	East and Central African Journal of Surgery	Uganda	Primary Research
Adane et al.	2023	Risk factors of cooking-related burn injury among under-four children in Northwest Ethiopia: A community-based cross-sectional study	Indian Pediatrics	Ethiopia	Primary Research
Tusiime et al.	2022	Prevalence, risk factors and perceptions of caregivers on burns among children under 5 years in Kisenyi slum, Kampala, Uganda	Injury Epidemiology	Uganda	Primary Research
Barnes & Moiloa	2008	Domestic energy use, time activity patterns, and risk of burns amongst children less than five years of age in rural South Africa	African Safety Promotion	South Africa	Primary Research
Adane et al.	2023	Prevalence and risk factors of cooking-related burn injury among under-five-years old children in a resource-limited setting: A community-based cross-sectional study in Northwest Ethiopia	International Journal of Injury Control and Safety Promotion	Ethiopia	Primary Research
Maharaj & Sewpaul	2016	Accidental burns in children under five years of age: The gendered burden of care and socio-economic deprivation	Children and Youth Services Review	South Africa	Primary Research

Table 1 Study characteristics continues

Study/research aim	Methodology	Method detail	Population	Concept	Results extracted from the evidence source
The study aimed to understand community perceptions around child safety and determine what culturally and age-appropriate solutions may work to prevent child injuries.	Qualitative method	Cross-sectional study where data were collected through focus group discussions.	Under 5 children	To understand community views around child safety and determine what culturally and age-appropriate solutions may work to prevent child injuries.	• Falls, burns, drowning and poisoning were the common causes of childhood injuries, with falls being the predominant cause. • Most of the childhood injuries were due to falls from bunk beds. • The presence of guard rails in bunk beds had no protective effect in preventing childhood falls. • Most of the burn injuries in children were due to hot solids. • Lack of supervision by primary caregivers increased the risk of unintentional childhood injuries. • The risk of childhood injuries increased in households using traditional cookstoves/charcoal stoves. • Use of paraffin lambs, candles, faulty wiring or open wirelines predisposed children to injuries. • Most of the common causes of childhood drowning were from unattended buckets of water or open water drums. • Negligent practices of households increased the risks of unintentional childhood injuries due to poisoning • The illiteracy level of the primary caregiver increased the risk of unintentional childhood injuries. • Lack of awareness that childhood injuries are preventable by primary caregivers was associated with an increased risk of childhood injuries.

					• Low income households had an increased risk of unintentional childhood injuries. • Poor living conditions increased childhood injuries.
This study aimed to present findings from a retrospective hospital record review of 4 hospitals in Jinja, a rural setting in Uganda.	Quantitative method	Cross-sectional retrospective study involving the extraction of data for children under the age of 5-years who sustained an injury during a 6 months period in 2019.	Under 5 children	To use the findings on the characteristics and childhood injuries to develop evidence-based interventions to reduce unintentional injuries among under 5 children within the home environment in a LMIC setting.	• Male children had an increased risk of childhood injuries compared to females. • The age vulnerability to unintentional childhood injuries was under 2 years old. • Burns followed by cuts were the most common cause of childhood injuries.
The study aimed to establish the prevalence, causes and associated factors of un-intentional injuries among the children of a cohort of mothers in the Promise EBF study in Mbale District of Uganda.	Quantitative method	Cross-sectional community survey study where data was collected using a questionnaire.	Under 5 children	To determine the burden and predictors of under 5 childhood unintentional injuries in Mbale District of Uganda.	• Overcrowding increased the risk of unintentional childhood injuries. • Falls followed by burns were the most common cause of childhood injuries. • Most of the burn injuries in children were due to hot liquids (scalds), followed by hot charcoal stoves/firewood. • There was no correlation between variables such as maternal education or settings of child's residence and unintentional childhood injuries. • Overcrowding and rural residence of the child increased the risk of childhood injuries after adjusting for cofounders. • There was no association between socio-demographic characteristics of the primary caregiver or the child's gender and unintentional injuries caused by cuts

					• Open fire cooking increased the risk of unintentional childhood injuries.
The study aimed to investigate the prevalence and risk factors of cooking-related child burn injury	Quantitative Method	Cross-sectional study where data was collected through face-to-face interviews using a structured questionnaire	Under 4 children	Risk factors for unintentional cooking related burn injuries among under 4 children in Northwest Ethiopia	• The age vulnerability to unintentional childhood injuries was 2 years and above • The illiteracy level of the primary caregiver increased the risk of unintentional childhood injuries. • Overcrowding increased the risk of unintentional childhood injuries. • Having the cooking area inside the living room increased the risk of unintentional childhood injuries. • Lack of supervision by primary caregivers increased the risk of unintentional childhood injuries.
The study sought to establish the prevalence of burns among children under 5 years at household level in Kisenyi slum in Uganda together with the associated risk factors.	Mix method	Analytic cross-sectional design with quantitative and qualitative techniques. Quantitative data were collected using a structured questionnaire and observational checklist, while qualitative data involved use of a key informant interview guide.	Under 5 children	Burden and risk factors for burn related injuries among under 5 children in Kisenyi slum, Uganda	• Overcrowding increased the risk of unintentional childhood injuries. • Lack of supervision by primary caregivers increased the risk of unintentional childhood injuries. • Open fire cooking increased the risk of unintentional childhood injuries. • The age vulnerability to unintentional childhood injuries was 2 years and above. • Children with single parents had an increased risk of unintentional injuries. • High income households had an increased risk of unintentional childhood injuries. • Households with poorly stored flammables

					increased the risks of unintentional childhood injuries. • Households with raised cooking places have no association with childhood injury risk • Most of the burn injuries in children were due to hot liquid (scalds).
The study seeks to understand the association, if any, between child burns and socio-demographic risk factors, domestic energy patterns and the amounts of time that children spent in proximity to fires in a large, rural village.	Quantitative Method	Descriptive Cross-sectional survey using structured questionnaire to collect data	Under 5 children	Correlation between childhood burns and socio-demographic risk factors, domestic energy patterns and the time spent by children in proximity to fires in a large rural village	• The age vulnerability to unintentional childhood injuries was 2 years and above. • Male children had an increased risk of childhood injuries compared to females. • Overcrowding reduced the risk of unintentional childhood injuries. • Open fire cooking increased the risk of unintentional childhood injuries. • Households where children spend more time in close proximity to open fires daily, have an increased risk of childhood injuries. • Maternal education, household income, housing quality, size of kitchen, number of siblings and birth order have no association with childhood injuries
The study aimed to investigate the prevalence and risk factors of cooking-related child burn injury in a resource-limited setting in Northwest Ethiopia.	Quantitative Method	Cross-sectional study using questionnaires to collect data	Under 5 children	Burden and risk factors for unintentional cooking related burn injuries among under 5 children in Northwest Ethiopia	• The risks of childhood injuries increased in households that do not extinguish their cookstoves between use. • The risk of childhood injuries increased in households using traditional cookstoves as their primary cookstoves compared to households with improved cookstoves. • The age vulnerability to unintentional childhood injuries was 2 years and above.

					• The illiteracy level of the primary caregiver increased the risk of unintentional childhood injuries. • Overcrowding increased the risk of unintentional childhood injuries. • Having the cooking area inside the living room increased the risk of unintentional childhood injuries. • Lack of supervision by primary caregivers increased the risk of unintentional childhood injuries. • Lack of awareness that childhood injuries are preventable by primary caregivers was associated with an increased risk of childhood injuries. • The risk of childhood injuries increased in households using the traditional cookstove to cook more than four meals daily, compared to households cooking lesser number of times. • Similarly, the risk of childhood injuries increased in households cooking for more than 5 hours daily, compared to households cooking between 1 and 2 hours daily. • Most of the burn injuries in children were due to hot liquid (scalds). • Households where children spend more time in close proximity to open fires daily, have an increased risk of childhood injuries.
The study seeks to understand those factors that contribute to burn injuries in children, as this might	Qualitative Method	In-depth interviews using semi-structure interview guide	Under 5 children	To identify the risk factors for unintentional burn injuries in under 5 children that would contribute to	• The age vulnerability to unintentional childhood injuries was under 2 years old. • Male children had an increased risk of childhood

contribute to more holistic interventions, geared towards primary prevention.

interventions that would help in preventing childhood burn injuries.

injuries compared to females.

- Most of the burn injuries in children were due to hot liquid (scalds).
- Low income households had an increased risk of unintentional childhood injuries.
- Children with single parents had an increased risk of unintentional injuries.
- Overcrowding increased the risk of unintentional childhood injuries.
- Unsafe home environment and poor living conditions increased childhood injuries.

Table 2: Study Characteristics and Results

Variables	Frequency (n=8)	Percentage (%)
Country study was conducted		
Ethiopia	2	25
Uganda	4	50
South Africa	2	25
Type of evidence source		
Primary research	8	100
Methodology		
Quantitative method	5	62.5
Qualitative method	2	25
Mixed method	1	12.5
Method of data collection		
In-depth Interviews	1	12.5
Mixed methods	1	12.5
Survey and/or questionnaires	4	50
Focus Group Discussions	1	12.5
Clinical record audit	1	12.5
Study population		
Under 5	5	100

Common types of unintentional injuries		
Burns	8	100
Falls	2	25
Poisoning	1	12.5
Drowning	1	12.5
Cuts	1	12.5
Common cause of burns		
Hot Liquid (scald)	4	50
Hot solid	1	12.5
Common cause of falls		
Falls off bunk beds	1	12.5
Common cause of drowning		
Unattended buckets of water or open water drums	1	12.5
Childhood injury risk due to Gender		
Male	3	37.5
Female	0	0
Age vulnerability to injury		
< 1 year	0	0
< 2 years	2	25
≥ 2 years	4	50
Childhood injury risk due to caregiver's literacy status		
Literate	0	0
Illiterate	3	37.5
No association	2	25
Childhood injury risk due to single parenting		
Yes	2	25
No	0	0
Childhood injury risk due to household income		
Low	2	25
High	1	12.5
No association	1	12.5
Childhood injury risk due to overcrowding		

Yes	5	62.5
No	1	12.5
Childhood injury risk due to cooking inside the living room		
Yes	2	25
No	0	0
Childhood injury risk due to open fire cooking		
Yes	4	50
No	0	0
Childhood injury risk due to raised cooking places		
Yes	0	0
No	0	0
No association	1	12.5
Childhood injury risk due to type of cooking stove used		
Local/traditional stove	3	37.5
Improved cooking stove	0	0
Childhood injury risk due to poor living condition		
Yes	2	25
No	0	0
Childhood injury risk due to unsafe home environment/housing quality		
Yes	1	12.5
No	0	0
No association	1	12.5
Childhood injury risk due to paraffin fuel burned		
Yes	1	12.5
No	1	12.5
Protective effect of guard rails in bunk beds for preventing childhood injury		
Yes	0	0
No	1	12.5

Childhood injury risk due to negligence/lack of supervision by primary caregiver		
Yes	4	50
No	0	0
Childhood injury risk due to the long duration of time spent in close proximity to open fire		
Yes	2	25
No	0	0
Childhood injury risk due to poorly stored inflammable		
Yes	1	12.5
No	0	0
Childhood injury risk due to household cookstove non-extinguishing practice		
Yes	1	12.5
No	0	0
Childhood injury risk due to lack of awareness by the primary caregiver that childhood injuries are preventable		
Yes	2	25
No	0	0
Childhood injury risk due to number of meals cooked using a traditional cooking stove		
< 4 times	0	0
> 4 times	1	12.5
Childhood injury risk due to daily length of time spent on cooking using a traditional cooking stove		
1- 2 hours	0	0
> 5 hours	1	12.5

Overview of the included studies

Table 2 represents an overview of the included studies (n=8), having met the inclusion criteria following screening by the reviewers using Covidence software.

Two of the included studies were each conducted in Ethiopia (25%) and South Africa (25%), while the remaining four studies (50%) were conducted in Uganda. All included studies (100%) were primary research studies. Five of the studies (62.5%) used quantitative methodology, two studies (25%) used qualitative methodology, while the remaining one study (12.5%) adopted a mixed method. Data were collected for the studies using in-depth interviews (12.5%), mixed methods (12.5%), questionnaires (50%), Focus Group Discussions (12.5%) and clinical record audits (12.5%). All studies (100%) identified risk factors facilitating unintentional childhood injuries among under 5 children. Burns (100%), falls (25%), poisoning (12.5%), drowning (12.5%) and cuts (12.5%) were identified as the common cause of unintentional household injuries among under 5 children in the included studies.

Four studies (50%) reported hot liquid (scald), while one study (12.5%) reported hot solid (hot charcoal) as the common cause of childhood burn injuries. Similarly, one study (12.5%) reported falls off bunk beds as the common cause of childhood injuries due to falls. Another study (12.5%) also reported unattended buckets of water or open water drums as the common cause of childhood injuries as a result of drowning.

Predictors for childhood injuries from the included studies include gender (37.5%), age (75%), literacy status of the primary caregiver (37.5%), single parenting (25%), household income (37.5%), household family size (62.5%), location of the cooking area (25%), open cooking places (50%), primary cookstove type (37.5%), poor living conditions (25%), unsafe home environment/housing quality (12.5%), type of fuel burned (12.5%), child supervision by primary caregivers (50%), storage of inflammables (12.5%), child handling practice (25%), household cookstove extinguishing practice (12.5%), awareness of primary caregivers to burn injury prevention (25%), number of meals cooked daily (12.5%) and length of cooking time (12.5%).

However, variables such as literacy status of the primary caregiver (25%), household income (12.5%), housing quality (12.5%) were identified by some of the included studies not to be associated with childhood injuries. Also, the presence of guard rails in bunk beds was reported in one of the studies (12.5%) not to have a protective effect in preventing childhood injuries.

IV. Discussion

The frequency count distribution analysis in Table 2 maps out the evidence by summarizing the studies that identified risk factors facilitating unintentional household injuries among under 5 children in Sub-Saharan Africa. This scoping review identified burns (100%) (Barnes & Moiloa, 2008 pp.1-4; Ibingira et al., 2016 p.61; Maharaj & Sewpaul, 2016 pp.51-57; Tusiime et al., 2022 pp.1-9; Adane et al., 2023a pp.119-121; Adane et al., 2023b pp.220-229; Puvanachandra et al., 2022 p.552; Puvanachandra et al., 2024 p.6); falls (25%) (Ibingira et al., 2016 p.61; Puvanachandra et al., 2024 p.6); poisoning (12.5%) (Puvanachandra et al., 2024 pp.7,8); drowning (12.5%) (Puvanachandra et al., 2024 p.7) and cuts (12.5%) (Puvanachandra et al., 2022 p.552) as the common cause of unintentional household injuries among under 5 children in the included studies.

The determinants for childhood injuries identified in the included studies were categorized according to three broad variables such as socio-demographic, environmental and behavioral risk factors (Adane et al., 2023b pp.222, 223).

Socio-demographic Risk Factors

This includes risk factors such as gender, age, literacy status of the primary caregiver, single parenting, and household income.

Three studies (37.5%) reported male children to have an increased risk of childhood injuries compared to females (Barnes & Moiloa, 2008 p.3; Maharaj & Sewpaul, 2016 p.54; Puvanachandra et al., 2022 p.552). This

conforms with similar studies from other regions which reported males to be more vulnerable to unintentional household injuries compared to females (Morrongiello et al., 2004 pp.426, 427; Banerjee et al., 2016 p.6; van Zoonen et al., 2022 pp.718, 720). Four studies (50%) reported that age vulnerability to unintentional childhood injuries was 2 years and above (Barnes & Moiloa, 2008 p.3; Tusiime et al., 2022 pp.3, 6; Adane et al., 2023a p.121; Adane et al., 2023b p.227). This finding is consistent with findings from other regions that showed that pre-school children who are two years and above (toddlers) are most susceptible to childhood injuries (Dal Santo et al., 2004 p.280; Simpson et al., 2009 p.164; Atak et al., 2010 p.289). In contrast, two studies (25%) reported that age vulnerability to unintentional childhood injuries was below 2 years (Maharaj & Sewpaul, 2016 p.54; Puvanachandra et al., 2022 p.552). Three studies (37.5%) revealed that the illiteracy level of the primary caregivers increased the risk of unintentional childhood injuries (Adane et al., 2023a p.121; Adane et al., 2023b p.227; Puvanachandra et al., 2024 p.8). This finding confirms the finding from a similar study in Iran that reported that the illiteracy level of parents serves as a precursor for their knowledge gap in child injury prevention measures (Barat et al., 2017 p.14). The finding is, however, in contrast with the findings from a similar study in Turkey that reported the illiteracy level of mothers to be associated with reduced unintentional childhood injuries, given that more educated mothers reported higher frequencies of unintentional childhood injuries (Atak et al., 2010 p.291).

Two studies (25%) showed no association between the caregiver's education and childhood injuries (Barnes & Moiloa, 2008 p.3; Ibingira et al., 2016 p.61). This finding aligns with the findings from a study in United States of America that reported maternal education not to be a significant predictor for childhood injuries (Dal Santo et al., 2004 p.278). Two studies (25%) showed that children with a single parent had an increased risk of unintentional injuries (Maharaj & Sewpaul, 2016 pp.54, 55; Tusiime et al., 2022 pp.3, 6). This finding aligns with the findings from an Australian study that reported single parenting as a predictor for increased incidence of childhood injuries (Richardson et al., 2005 p. 47). Maharaj & Sewpaul (2016 p.54) and Puvanachandra et al. (2024 p.9) reported that children in low-income households had an increased risk of unintentional injuries. This finding supports the findings from similar studies in other regions that reported a positive association between low household income and childhood injuries (Barat et al., 2017 p.15; von Zonnen et al., 2022 p.720). In contrast, Tusiime et al., (2022 p.7) reported that children in high-income households had an increased risk of unintentional injuries. This finding is supported by the findings in a Turkisk study linking increased childhood injury risk in households with high incomes (Atak et al., 2010 p.290). One study (12.5%) showed no association between household income and unintentional childhood injuries (Barnes & Moiloa, 2008 p.3).

Environmental Risk Factors

Risk factors under this category include household family size, location of the cooking area, open cooking places, primary cookstove type, poor living conditions, unsafe home environment, type of fuel burned and presence of guard rails in bunk beds.

Five studies (62.5%) showed that overcrowding increased the risk of unintentional childhood injuries (Ibingira et al., 2016 p.61; Maharaj & Sewpaul, 2016 p.55; Tusiime et al., 2022 p.4; Adane et al., 2023a p.121; Adane et al., 2023b p.227). This aligns with findings from similar studies in other regions that linked overcrowding to an increased risk of childhood injuries (Banerjee et al., 2016 p.5; van Zonnen et al., 2022 p.720). Conversely, Barnes & Moiloa (2008 p.3) reported that adult overcrowded households reduce the risk of unintentional childhood injuries.

Two studies (25%) reported that having the cooking area inside the living room increased the risk of unintentional childhood burn injuries (Adane et al., 2023a p.121; Adane et al., 2023b p.227). This finding is consistent with the findings from an Indian study that reported cooking inside the living area as an unsafe behavior that increases the risk of childhood burn injuries (Mirkazemi & Kar, 2009 p.302). Four

studies (50%) reported that open fire cooking increased the risk of unintentional childhood burn injuries (Barnes & Moiloa, 2008 p.3; Ibingira et al., 2016 p.61; Tusiime et al., 2022 p.4; Puvanachandra et al., 2024 p.6). This finding aligns with the findings from a study that linked the usage of open fire for warmth during winter with increased risk of childhood burn injuries (Mirkazemi & Kar, 2009 p.302).

Three studies (37.5%) revealed an increased risk of unintentional childhood burn injuries in households using traditional cook stove as their primary cooking stove (Ibingira et al., 2016 pp.61,62; Adane et al., 2023b pp.225, 227; Puvanachandra et al., 2024 p.6). This finding confirms the World Health Organization Report which revealed that under 5 children had an increased risk of cookstove related burn injuries (Mehta et al., 2021 pp.511,514). Two studies (25%) revealed an increased risk of unintentional childhood injuries in households living in poor conditions (Maharaj & Sewpaul, 2016 p.55; Puvanachandra et al., 2024 pp.9,10) and poor unsafe home environments (Maharaj & Sewpaul, 2016 p.56). These findings confirm the findings from another study that linked children in homes requiring repairs to an increased risk of unintentional injuries (Dal Santo et al., 2004 p.280). However, one study (12.5%) showed no association between housing quality and childhood injuries (Barnes & Moiloa, 2008 p.3). One study (12.5%) reported increased risk of unintentional childhood burn injuries in households using prafin lambs and candles, having faulty wiring or exposed wirelines (Puvanachandra et al., 2024 p.7). However, Barnes & Moiloa (2008 p.3) revealed that the type of fuel burned is not significantly associated with childhood burn injuries.

One study (12.5%) reported that the presence of guard rails in bunk beds had no protective effect in preventing childhood injuries due to falls (Puvanachandra et al., 2024 p.6). This finding is consistent with the findings from an Australian study that revealed that the injury risk associated with bunk beds is 13 folds greater for children aged 2 – 4 years (Thompson, 1995 cited in Watson et al., 1997 p.98).

One of the studies (12.5%) reported no association between raised cooking places and childhood burn injuries (Tusiime et al., 2022 p.7).

Behavioral Risk Factors

This includes risk factors such as child supervision by primary caregivers, storage of inflammables, child handling practice, household cookstove extinguishing practice, awareness of primary caregivers to injury prevention, number of meals cooked daily, and length of cooking time.

Four studies (50%) reported that lack of supervision by primary caregivers increased the risk of unintentional childhood injuries (Tusiime et al., 2022 pp.3,4; Adane et al., 2023a p.121; Adane et al., 2023b p.228; Puvanachandra et al., 2024 pp.7,8). This confirms the finding in a similar in study in New Zealand that reported lack of supervision as a predictor for childhood injuries (Simpson et al., 2009 p.162). One study (12.5%) showed that households with poorly stored flammables increased the risks of unintentional childhood burn injuries (Tusiime et al., 2022 p.7). This finding conforms with the findings from an Indian study that showed a positive association between storage of inflammables in the home and an increased risk of childhood burn injuries (Mirkazemi & Kar, 2009 p.302).

Two studies (25%) reported that households where children spend more time within 1.5 meters to open fires daily have an increased risk of childhood burn injuries (Barnes & Moiloa, 2008 p.3; Adane et al., 2023b p.228). One study (12.5%) reported that the risks of childhood burn injuries increased in households that do not extinguish their cookstoves between use (Adane et al., 2023b p.225). Adane et al. (2023b p.228) reported that the lack of awareness that unintentional childhood injuries are preventable by primary caregivers was associated with an increased risk of childhood injuries. This finding confirms the findings from other similar studies linking poor knowledge about injury prevention measures and childhood injury risk (Simpson et al., 2009 p.164; Ablewhite et al., 2015 p.7; Younesian et al., 2016 p.73; Barat et al., 2017 p.14). One study (12.5%) showed that children in households using the traditional cookstove to cook more than four

meals daily and households cooking for more than 5 hours daily had increased risks of burn injuries compared to households cooking lesser number of meals and for lesser number of hours daily (Adane et al., 2023b p.228).

While childhood burn injuries were identified as the cross-cutting unintentional household injury among under 5 children in Sub-Saharan Africa in the included studies, this review, therefore, amplifies the dearth in studies that identify the risk factors for unintentional household injuries among these target group within the region, going by the limited number of included studies in the review.

Strength and Limitations

This scoping review will be the first scoping review to map out the risk factors facilitating unintentional household injuries among under 5 children in Sub-Saharan Africa.

However, formal appraisal was not given to the methodological quality of the included studies, as the aim of a scoping review is generally known to provide an overview of the existing evidence regardless of its quality.

V. Conclusion and Recommendation

This scoping review mapped out the determinants facilitating unintentional household injuries among under 5 children in Sub-Saharan African. Home is a primary necessity, and modern homes add esteem. Unfortunately, careless attitude can transform the home into death traps. The determinants of unintentional household injuries among under 5 children involve a combination of socio-demographic risk factors, environmental risk factors and behavioral risk factors. Empirical research and experience have shown that unintentional household injuries don't just happen, they are predictable and like many diseases, preventable. Unfortunately, almost all risks in which children are exposed at home are often due to interactions among individuals and their physical and social environments.

Implications of the findings for research

This review identified only a handful of studies exploring the risk factors of unintentional household injuries among under 5 children in Sub-Saharan Africa. Therefore, given the paucity of attention paid on unintentional household injuries among under 5 children in Sub-Saharan Africa, there is a need for more studies to understand the risk factors of unintentional household injuries among under 5 children within the region. This will guide injury prevention strategies to be tailored to their specific environments, taking into account local risk factors and available resources.

Conflict of Interests and Acknowledgments

Conflict of interest

There is no conflict of interest in this study.

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Review Appendices

Appendix I: Search Strategy

Google Scholar (February 21, 2024)
No Search limit
Keywords:
Risk Factors
AND
Unintentional home injuries OR Unintentional domestic injuries
AND
Children OR Under 5 Children
AND
Sub-Saharan Africa OR Poor Resource Settings

PubMed (February 22, 2024)
No Search limit
Keywords:
Risk Factors
AND
Unintentional home injuries OR Unintentional domestic injuries
AND
Children OR Under 5 Children
AND
Sub-Saharan Africa OR Poor Resource Settings

Appendix II: Sources excluded following full-text review

S/N	Study ID assigned by Covidence	Title of the study	Author(s) and year	Reason for study exclusion
1	9	Child injuries in Ethiopia: A review of the current situation with projections	Li et al., 2018	Wrong target population
2	29	Unintentional injuries among children in resource poor settings: where do the fingers point	Balan and Lingam, 2011	Wrong target population and context

3	35	A systematic review of epidemiological patterns and proposed interventions to address pediatric burns in Nigeria.	Banerjee and Shumba, 2020	Wrong target population and concept
4	37	Unintentional Childhood Injuries in Sub-Saharan Africa: An Overview of Risk and Protective Factors	Ruiz-Casares, 2009	Wrong target population and concept
5	41	Burns in low- and middle-income countries: A review of available literature on descriptive epidemiology, risk factors, treatment, and prevention	Forjuoh, 2006	Wrong context
6	53	Pediatric unintentional injury: Behavioral risk factors and implications for prevention	Schwebel and Gaines 2007	Wrong target population and context
7	56	Childhood drowning in low- and middle-income countries: Urgent need for intervention trials	Hyder et al., 2008	Wrong context
8	124	Injury patterns in rural and urban Uganda	Kobusingye et al., 2001	Wrong target population and concept
9	138	Childhood unintentional injuries: the perceived impact of the environment, lack of supervision and child characteristics	Munro et al., 2006	Wrong concept
10	143	Socioeconomic Inequalities in Injury: Critical Issues in Design and Analysis	Cubbin and Smith, 2002	Wrong outcomes
11	145	Caregiver experiences, contextualizations and understandings of the burn injury to their child. Accounts from low-income settings in South Africa	Niekerk et al., 2006	Wrong target population
12	155	The role of supervision in child injury risk: definition, conceptual and measurement issues	Saluja et al., 2004	Wrong concept and context
13	156	Risk factors for injuries in young children in four developing countries: the Young Lives Study	Howe et al., 2006	Wrong context
14	158	Paediatric burn injuries in Sub Saharan Africa—an overview	Albertyn et al., 2006	Wrong target population
15	163	Childhood burns in south eastern Nigeria	Okoro et al., 2009	Wrong target population

16	200	Review of childhood burn injuries in sub-Saharan Africa: a forgotten public health challenge: literature review	Hyder et al., 2004	Wrong concept
17	255	Prevalence of preventable household risk factors for childhood burn injury in semi-urban Ghana: A population-based survey	Gyedu et al., 2016	Wrong target population
18	256	Interactions Between Child Behavior Patterns and Parenting: Implications for Children's Unintentional Injury Risk	Schwebel et al., 2004	Wrong target population and context
19	258	Childhood Unintentional Injuries: Factors Predicting Injury Risk Among Preschoolers	Dal Santo et al., 2004	Wrong context
20	260	Parental perceptions of barriers and facilitators to preventing child unintentional injuries within the home: a qualitative study	Ablewhite et al., 2015	Wrong context
21	261	Child home injury prevention: understanding the context of unintentional injuries to preschool children	Simpson et al., 2009	Wrong context
22	262	Approaches used by parents to keep their children safe at home: a qualitative study to explore the perspectives of parents with children aged under five years	Ablewhite et al., 2015	Wrong concept and context
23	268	Mothers' perception of childhood injuries, child supervision and care practices for children 0–5 years in a peri-urban area in Central Uganda; implications for prevention of childhood injuries	Siu et al., 2019	Wrong target population and concept
24	269	Caregiver accounts of unintentional childhood injury events in rural Uganda	Swanson et al., 2023	Wrong target population and concept
25	277	Prevalence and Age-specific Incidence of Burns in Ghanaian Children	Forjuoh et al., 1995	Wrong target population
26	280	Understanding Toddlers' In-Home Injuries: II. Examining Parental	Morrongiello et al., 2004	Wrong context

		Strategies, and Their Efficacy, for Managing Child Injury Risk		
27	285	Understanding Toddlers' In-Home Injuries: I. Context, Correlates, and Determinants	Morrongiello et al., 2004	Wrong context
28	287	Recognition of home injury risks by novice parents of toddlers	Gaines and Schwebel, 2009	Wrong concept and context
29	290	Parents' voices: perceptions of the barriers and facilitators to prevent unintentional home injuries among young children	Barat et al., 2017	Wrong context
30	292	The role of proximal circumstances and child behaviour in toddlers' risk for minor unintentional injuries	Kuhn and Damashek, 2014	Wrong concept and context
31	294	The Role of Fathers in Toddlers' Unintentional Injury Risk	Schwebel and Brezausek, 2004	Wrong concept and context
32	295	Toddlers' Unintentional Injuries: The Role of Maternal-Reported Paternal and Maternal Supervision	Damashek and Kuhn, 2013	Wrong context
33	301	Risk for household safety hazards: Socioeconomic and sociodemographic factors	Mayes et al., 2014	Wrong context
34	302	Unintentional Home Injury Prevention in Preschool Children; a Study of Contributing Factors	Younesian et al., 2016	Wrong context
35	304	Factors influencing young children's risk of unintentional injury: Parenting style and strategies for teaching about home safety	Morrongiello et al., 2006	Wrong context
36	307	Parents' perceptions of unintentional paediatric burn injuries — A qualitative study	Holden et al., 2020	Wrong target population and concept
37	309	Assessment of the proportion of households with burn victims, associated 3risk factors and knowledge of burn injury prevention strategies in South Western Uganda. A population based cross sectional survey	Martin et al., 2023	Wrong target population

38	313	Paediatric burn injuries in Enugu, South-East Nigeria: A 7-year multi-centre retrospective review	Nduagubam et al., 2022	Wrong target population
39	318	Prevalence and pattern of unintentional domestic accidents and trauma amongst children attending public hospitals in Kano, Nigeria	Abubakar et al., 2018	Wrong target population
40	319	Comparison of childhood household injuries and risk factors between urban and rural communities in Ghana: A cluster-randomized, population-based, survey to inform injury prevention research and programming	Stewart et al., 2021	Wrong target population
41	323	An exploration of the factors associated with unintentional paediatric burn injuries in Malawi: a qualitative study	Beard et al., 2018	Wrong target population
42	324	Evaluating the socioeconomic and cultural factors associated with pediatric burn injuries in Maputo, Mozambique	Karan et al., 2015	Wrong target population
43	427	The Epidemiology of Paediatric Burn Injuries in Johannesburg, South Africa	Banga, 2022	Wrong target population
44	433	Risk Factors to Childhood Burns in the New Juaben Municipality of Ghana	Siaw, 2014	Wrong target population
45	481	Incidence of childhood injuries and modifiable household risk factors in rural Ghana: a multistage, cluster-randomised, population-based, household survey	Gyedu et al., 2021	Wrong target population
46	484	Caregiver worry and injury hazards in the daily lives of Ugandan children	Stager et al., 2021	Wrong target population
47	485	Burn care in South Africa: a micro cosmos of Africa	Rode et al., 2014	Wrong target population
48	486	Severe brain injury in children aged 0–5 years in urban areas: the role of socio-economic development and parental responsibility	Sy et al., 2023	Wrong target population

49	487	Burn -repetitions in Ghanaian children: prevalence, epidemiological characteristics and socioenvironmental factors	Forjuoh, 1996	Wrong target population
50	489	Burn-Related Physical Impairments and Disabilities in Ghanaian Children: Prevalence and Risk Factors	Forjuoh et al., 1996	Wrong target population
51	490	Demographic characteristics and prognostic indicators of childhood burn in a developing country	Olawoye et al., 2014	Wrong target population
52	491	A prospective study of burns trauma in children in the University of Calabar Teaching Hospital, Calabar, south-south Nigeria	Asuquo et al., 2009	Wrong target population
53	493	Paediatric burn epidemiology as a basis for developing a burn prevention program.	Oseni et al., 2017	Wrong target population
54	495	Clinical Pattern and Outcome of Burn Injury in Children in AaBet Trauma Center Addis Ababa Ethiopia: Prospective Study	Mamo et al., 2023	Wrong target population
55	512	A Prospective Epidemiological Survey of Paediatric Trauma in Africa: A Cross-Sectional Study	Ali et al., 2024	Wrong target population, concept and context.

Appendix III: Data Extraction Instrument

Authors:
Year of publication:
Title of article:
Name of publication/journal:
Country study was conducted in:
Type of evidence source:
Study research aim:
Methodology:
Method details:
Population:
Concept:
Results extracted from the evidence source

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	p.1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	p.1 Background not required in abstract as per JBI guidance
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	p.4
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	p.4
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	p.4 Not registered
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	p.4
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	p.4
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	pp.4-5 (Appendix I)
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	p.5
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	p.5
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	p.5
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	Critical appraisal not done. Rationale on p.5
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	p.5

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	pp.5-6
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	pp.7-13 (Table 1)
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Not applicable
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	pp.13-16 (Table 2)
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	p.17
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	pp.17-20
Limitations	20	Discuss the limitations of the scoping review process.	p.20
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	p.20
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	p.20

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

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