

Social determinants of health associated with childhood accidents at home: An integrative review

Determinantes sociais da saúde associados a acidentes domésticos na infância: uma revisão integrativa

Determinantes sociales de la salud asociados con accidentes domésticos en la infancia: una revisión integradora

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ABSTRACT

Objective: to analyze the factors associated with childhood accidents at home according to the levels of the social determinants of health. **Method:** integrative review of the literature, with research in databases CINAHL, LILACS and PubMed, with the following main descriptors: child; social determinants of health; *accidentes*, home. We included 31 studies that related the social determinants of health and childhood accidents, in English, Portuguese and Spanish. **Results:** the proximal determinants identified were: age and sex of children, and ethnicity. Among the intermediate determinants of health, parental behavior, related to the supervision of an adult, prevailed. Parental employment and socioeconomic status were identified as distal determinants. **Conclusion:** the age and sex of the child, besides direct supervision, were the determinants most associated with accidents. The distal determinants should be better studied because their relation with the occurrence of domestic accidents has not been sufficiently clarified.

Descriptors: Child; Social Determinants of Health; Population Groups; Dangerous Behavior; Accidents at Home.

RESUMO

Objetivo: analisar os fatores associados aos acidentes domésticos na infância segundo os níveis dos determinantes sociais da saúde. **Método:** revisão integrativa da literatura, com pesquisa em bases de dados CINAHL, LILACS e PubMed, com os seguintes descritores principais: *child*; *social determinants of health*; *accidentes*, *home*. Foram incluídos 31 estudos que relacionaram os determinantes sociais da saúde e acidentes domésticos na infância, em inglês, português e espanhol. **Resultados:** os determinantes proximais identificados foram: idade e sexo das crianças, e etnia. Dentre os intermediários, prevaleceram o comportamento parental, relacionado à supervisão de um adulto. O emprego dos pais e a situação socioeconômica foram identificados como determinantes distais. **Conclusão:** a idade e o sexo da criança, além da supervisão direta, foram os determinantes mais associados aos acidentes. Os determinantes distais devem ser mais bem estudados, pois sua relação com a ocorrência dos acidentes domésticos não se mostrou suficientemente esclarecida.

Descritores: Criança; Determinantes Sociais da Saúde; Grupos Populacionais; Comportamento Perigoso; Acidentes Domésticos.

RESUMEN

Objetivo: analizar los factores asociados a los accidentes domésticos en la infancia según los niveles de los determinantes sociales de la salud. **Método:** la revisión integradora de la literatura, con investigación en bases de datos CINAHL, LILACS y PubMed, con los siguientes descriptores principales: *child*; *social determinants of health*; *accidentes*, *home*. Se incluyeron 31 estudios relacionados con los determinantes sociales de la salud y accidentes domésticos en la infancia, en inglés, portugués y español. **Resultados:** los determinantes proximales identificados fueron: edad y sexo de los niños, y etnia. Entre los intermediarios, prevalecieron el comportamiento parental, relacionado a la supervisión de un adulto. El empleo de los padres y su situación socioeconómica fueron identificados como determinantes distales. **Conclusión:** la edad y el sexo de los niños, además de la supervisión directa, fueron los determinantes más asociados con los accidentes. Los determinantes distales deben ser más bien estudiados, pues su relación con la ocurrencia de los accidentes domésticos no se mostró suficientemente esclarecida.

Descritores: Niños; Determinantes Sociales de la Salud; Grupos Poblacionales; Comportamiento Peligoso; Acidentes Domésticos.

INTRODUCTION

Accidents at Home (AH) in childhood represent an important global health problem⁽¹⁻²⁾, because they are potentially serious but still underestimated⁽³⁾. It is verified that these injuries have contributed significantly to raise the infant morbidity and mortality rates, since in addition to being closely related to the stage of childhood itself, they also often reflect the lack of protective capacity of the family and the lack of knowledge of the numerous risk factors that permeate the daily life of children⁽⁴⁾.

Among the major types of AH with children, there is a high prevalence of falls, burns and intoxications. From these accidents, the World Health Organization estimated that, in 2004, roughly 830,000 children under 18 would die worldwide as a result of an unintentional injuries. However, recent community-based studies conducted by the United Nations Children's Fund (UNICEF) suggested that the number could be much higher⁽²⁾.

In Brazil, a study aimed at analyzing the profile of emergency care due to accidents and violence involving children under 10 in 2011 showed that of the 7,224 emergency services among children from zero to nine years old, 7,043 (97.5%) were victims of accidents and 181 (2.5%) of violence. Of the total number of children, 19.5% were one year old and 42.7% two to five years old. Most of the events happened at home (67.4%), and this place was statistically associated with accidents⁽⁵⁾.

This situation indicates the need to know the determinants and conditions for the occurrence of AH with children, which relate to a wide network of social and cultural factors of individuals and their families⁽⁶⁾, such as lack of knowledge of families, non-cultural preventive measures, habits that favor the occurrence of accidents, poor supervision of children, unsafe domestic environments with the presence of dangerous products and materials, indiscriminate delegation of tasks incompatible with the child's age, access to guns, lack of more effective laws and lack of communication⁽⁷⁾.

Considering these facts, the broader context of health, which allows a more in-depth analysis of the risks for the occurrence of AH with children, should consider the complexity of the determinants of health. They are the conditions in which people are born, grow, live, work and age, shaped by the distribution of financial resources and power, as well as general resources, at the local, national and global levels⁽⁸⁾. Therefore, this set of factors must be organized and analyzed from the perspective of the Social Determinants of Health (SDH), to characterize the individuals' particularities and reflect their insertion in a space-time, as conditioning factors of AH in childhood⁽⁹⁾.

Based on this understanding, further studies are necessary to determine the risk factors for the occurrence of unintentional injury deaths⁽¹⁰⁾, since the detailed knowledge of these factors, in a preventive approach, is essential to allow progress to control accidents⁽⁷⁾. In addition, previous reviews of the

literature analyzed the risk factors for AH in childhood but did not list them from the perspective of SDH. Therefore, knowing the elements/factors that determine the life and health conditions of children victims of AH will provide more appropriate actions, which may intervene to transform certain SDHs that represent negative aspects to the health of this population in this context⁽⁹⁾.

OBJECTIVE

To analyze the factors associated with childhood accidents at home according to the levels of the social determinants of health.

METHOD

This is an integrative review of the literature. For its elaboration, the following steps were adopted: identification/formulation of the problem; literature search/collection of data; evaluation of data; analysis of the findings of the articles included in the review; and presentation and interpretation of results⁽¹¹⁾.

In the first step, the available knowledge about the relationship between social determinants of health and the occurrence of AH in childhood was listed. Thus, this study was guided by the following research question: What are the social determinants of health associated with the occurrence of AH in childhood? For its elaboration, the PICo strategy was adopted, in which the P corresponds to Participants, I to the phenomenon of Interest and Co to the Context of the study⁽¹²⁾. Subsequently, the controlled and uncontrolled index (CUI) were selected from the Health Sciences Descriptors (*DeCS*), Medical Subject Headings (*MeSH*) and List of Headings from CINAHL Information Systems, which are presented in Chart 1.

The search in the literature occurred between May and July 2017, simultaneously, by three researchers in databases accessed through the Portal of Journals of the Coordination of Improvement of Higher Education Personnel (*CAPE*), in an area with Internet Protocol (IP). The bases searched were: Index to Nursing and Allied Health Literature (*Cinahl*), Latin American and Caribbean Literature in Health Sciences (*Lilacs*), and Medline (International Literature in Health Sciences), via PubMed.

Chart 1 - Stratification of the research question following the PICo strategy⁽¹²⁾, Teresina, Piauí, Brazil, 2017

Description	PICo	Components	Descriptor	Type	CUI
Participants	P	Child	Child ChildPreschool	<i>DeCS</i> <i>MeSH</i> Titles <i>Cinahl</i>	Childhood
Phenomenon of Interest	I	Social Determinants of Health	Social Determinants of Health Socioeconomic Factors Cultural Characteristics Ethnic Groups Population Groups Psychological Phenomena and Processes Risk Factors Dangerous Behavior	<i>DeCS</i> <i>MeSH</i> Titles <i>Cinahl</i>	Reckless behavior Life conditions Breed Genre
Context of study	Co	Accidents at Home	<i>Accidentes</i> , Home	<i>DeCS</i> <i>MeSH</i> Titles <i>Cinahl</i>	<i>Accidentes</i> , Home Wounds and Injuries Accident Prevention Unintentional Injury

Nota: P - participants; I - phenomenon of interest; Co - Context of study; *MeSH* = controlled vocabulary of PubMed database; CUI = controlled and uncontrolled index; Titles *Cinahl* = controlled vocabulary of *Cinahl* database; *DeCS* = controlled vocabulary of *Lilacs* database.

As inclusion criteria, we adopted: primary studies that addressed the relation between the social determinants of health and the occurrence of AH in childhood; published in English, Portuguese or Spanish. Studies related to the other age range other than childhood, studies of traditional literature review or systematic or integrative review, studies that analyzed AH associated with other types of accidents (such as traffic accidents), those selected in the search for another database and studies that did not respond to the question of research. It is emphasized that the temporal cut-off for the selection of articles was not carried out, since a broad approach was sought.

The selection of the studies was initially performed by reading the titles and abstracts, based on the inclusion criteria, totaling 1,040 articles. 150 publications were considered potentially eligible and selected for reading in full, of which 31 were included in the final sample of this integrative review, as shown in Figure 1, which followed the PRISMA guidelines⁽¹³⁾.

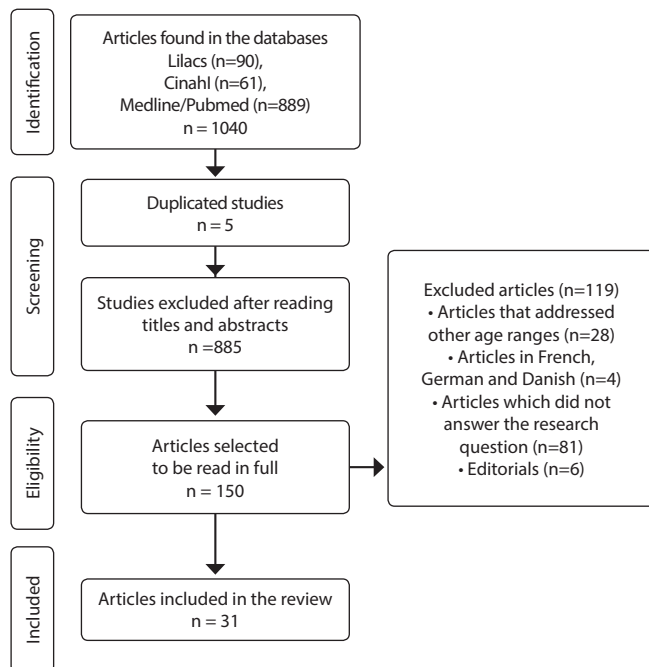


Figure 1 – Sample selection flowchart according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

A complete reading of the selected articles was conducted, and data extraction was done using an adapted data collection form⁽¹⁴⁾ capable of ensuring that all relevant data were extracted. The data included: definition of objects, methodology, sample size, variables measurement, method of analysis and concepts employed.

Regarding the underlying concepts, it should be pointed out that childhood was considered according to the proposal of the Statute of the Child and Adolescent (Federal Law 8.069/90) that considers a child to be a person under 12 incomplete years⁽¹⁵⁾; and that the definition of social determinants of health was established from the proposal of the National Commission on Social Determinants of Health, which specifies the social, economic, cultural, ethnic/racial, psychological and behavioral factors that influence the occurrence of health problems and their risk factors

in the population, such as housing, food, education, income and employment⁽¹⁶⁾. Finally, AH was considered the unintentional and avoidable event, causing physical and emotional damage, occurring in the home environment (living/family living space), excluding social environments (traffic, school, sports and leisure outside the home)⁽¹⁷⁾.

To evaluate extracted data, the Brazilian Center for Evidence-Based Health Care was determined by the Collaborating Center of the Joanna Briggs Institute (JBI), Brazil, based at the University of São Paulo (USP). The Levels of Evidence according to the type of study, according to the JBI are: Level I – Evidence obtained from a systematic review containing only randomized controlled clinical trials; Level II – Evidence obtained from at least one randomized controlled trial; Level III. 1 – Evidence obtained from well-outlined controlled clinical trials, without randomization; Level III. 2 – Evidence obtained from well-outlined or case-control and cohort studies, analytical studies, preferably from more than one research center or group; Level III. 3 – Evidence obtained from multiple time series, with or without intervention and dramatic results in uncontrolled experiments; Level IV – Opinion of respected experts in their fields, based on clinical criteria and experience, descriptive studies or reports of expert committees⁽¹²⁾.

The analysis of data of the articles included in the review involved a complete and impartial interpretation of primary sources, together with an innovative synthesis of evidence⁽¹¹⁾. The data obtained through the analysis of the objectives, results and conclusion of each study were grouped by similarity and organized into thematic categories, which had as their guiding principle the model proposed by Dahlgren and Whitehead. In this model, the SDH are arranged in different layers, from a layer closer to the individual determinants to a distal layer, in which the macrodeterminants⁽¹⁶⁾ are located. Thus, the presentation, analysis and discussion of data were divided into theoretical categories, according to the SDH, into: Proximal Determinants, represented by the operational categories related to the individual, such as age, sex, hereditary and ethnic/racial factors; Intermediate Determinants, which comprise the operational categories of lifestyle and social and community networks; and Distal Determinants (education, work environment, source of income, basic sanitation, culture, housing and social and health services) and general socioeconomic, cultural and environmental conditions⁽⁹⁾.

RESULTS

The characterization of the studies included in the review is presented in Chart 2. The years of publication varied between 1983 and 2017, and most of them were published as of 2010 (19 articles). Considering the place of development of the studies, most (8 articles) were carried out in North American countries (six in the United States - USA, and two in Canada). Regarding the types of AH analyzed in the surveys, the majority involved “general AHs” (16 articles), classification attributed to studies that did not specify AH or that addressed three or more accidents in the analysis; followed by seven articles that analyzed SDH related to Poisoning/Intoxication. As to the design, all the studies presented a quantitative approach, predominating the level of evidence III. (20 articles)⁽¹²⁾.

Chart 2 - Characterization of selected studies in chronological order according to authors, country, study design, number of participants, objectives, social determinants of health, main results and level of evidence, 2017

Authors	Country/Year	Study outline/number of participants	Objectives	Social Determinants of Health/ Main results	LV
Mahdi AH, Taha AS, Al Rifai MR ⁽¹⁸⁾	Saudi Arabia 1983	Prospective longitudinal study/ N= 178	To outline the etiological and ecological factors responsible for accidents in Riyadh (Saudi Arabia) and suggest relevant preventive actions for this society.	Proximal DSH: (child's age; child's sex). Intermediate DSH: (behavioral factors - supervision). Distal DSH: (housing; employment situation of father/mother; social factors; economic factors; cultural factors; education of parents). The AH addressed were Poisoning/Intoxication. The age range of children was from six months to seven years old, predominantly male. Most mothers were unaware of the toxicity potential of the substances. In 18% of cases supervision was delegated to an older child (sibling); 38% of families lived in small apartments and 30% in isolated houses in poor neighborhoods. In 80% of cases the father of the child had primary education and the mother had no formal education.	III 3
Mott JA ⁽¹⁹⁾	USA 1999	Retrospective longitudinal study/ N= 2.036	To examine the independent contributions of demographic, behavioral and environmental antecedents of medically assisted pediatric domestic injuries.	Proximal DSH: (child's sex; ethnicity/race). Distal DSH: (living conditions, housing, mother's education, social factors, economic factors, access to health services). General AHs were addressed. Boys were more likely to suffer a home injury. White, non-Hispanic children were significantly more likely too. Uninsured children were more likely to live below the poverty level and in households characterized as disordered, factors associated with the occurrence of injuries.	III 3
Ramsay LJ, Moreton G, Gorman DR, Blake E, Goh D, Elton RA et al ⁽²⁰⁾	United Kingdom 2003	Case-control prospective study/ N= 207	To investigate the physical, social and psychological environment of families with preschool children to identify the most significant risk factors for unintentional injuries.	Proximal DSH: (child's sex). Intermediate DSH: (mother's age). Distal DSH: (living conditions, employment of the father/mother). General AHs were addressed. For the case group, the child's primary caregiver was single, the majority received some benefit from the government. The assessment of physical and mental well-being did not reveal differences in both groups. A larger proportion (19%) of the group of cases did not receive social support when compared to those controlled, who received more support from friends and neighbors. The families of cases had more children.	III 2
Ramos CLJ, Targa MBM, Stein AT ⁽²¹⁾	Brazil 2005	Transversal study with descriptive and analytical components/ N= 286	To identify the profile of intoxications and risk factors in children under four, in Porto Alegre City.	Proximal DSH: (child's age; child's sex). Distal DSH: (housing; access to health services). The AH addressed were Poisoning/Intoxication. The most common age of accident occurrence was one (28.5%). 53.3% were boys.	III 3
Lima RP, Ximenes LB, Vieira LJS, Oriá MOB ⁽²²⁾	Brazil 2006	Descriptive study with quantitative approach/ N= 65	To trace the sociodemographic profile of families whose children in early childhood experienced domestic accidents.	Proximal DSH: (child's sex). Intermediate DSH: (mother's age). Distal DSH: (living conditions, housing, mother's education, social factors, economic factors, access to health services). General AH were addressed. There was a higher frequency of boys and unfavorable socio-demographic conditions. The sanitary conditions were precarious, the houses had few rooms, which favored the crowding of people in small spaces. There was no statistically significant association between mother's occupation, income and the occurrence of AH.	III 3
Moreira BFC, Vieira LJS, Oriá MOB, Ximenes LB, Almeida PC ⁽²³⁾	Brazil 2008	Descriptive study with quantitative approach/ N= 87	To identify the presence of risk factors for the occurrence burns and electric shock, in the opinion of the mothers and the researcher, in children during early childhood, and to verify the association with the sociodemographic data of mothers.	Intermediate DSH: (behavioral factors). Distal DSH: (life conditions; housing; mother's education). The AHs addressed were Burns and Electric Shock. In general, mothers were between 21 and 40, with a family income between one and two minimum wages, whose main occupation was to be housewives. It was verified that the researcher had a higher percentage of identification of risk factors than mothers, since they identified 98.85% of risk factors, whereas mothers, 66.70%. The identification of risk factors was not influenced by income (p=0.943), age (p=0.973), occupation (p=0.887) and marital status (p=0.899).	III 3

To be continued

Chart 2

Authors	Country/ Year	Study outline/ number of participants	Objectives	Social Determinants of Health/ Main results	LV
Liyanage IK, Pathirana AC, Wickramasinghe KK, Karunathilake IM, Olupaliyawa A ⁽²⁴⁾	Sri Lanka 2008	Transversal study with descriptive and analytical components/ N= 270	To identify risk factors for unintentional injuries at home among pre-schoolers in three suburban areas of Sri Lanka.	Distal DSH: (education of parents; access to health services). The study addressed general AH. Parental identification of risk factors was lower. The educational level of parents significantly affected the prevalence of risk factors (P<0.05). Only 38% received education on injury prevention, and the doctor in charge advised only 5% of the parents.	III 3
Morrongiello BA, Klemencic N, Corbett M ⁽²⁵⁾	Canada 2008	Transversal study with descriptive and analytical components/ N= 124	To evaluate the interactions between risk factors "behavioral attributes of the child" and "patterns of parental supervision".	Proximal DSH: (child's age; child's sex; ethnicity/race). Intermediate DSH: (behavioral factors). Distal DSH: (mother's education; economic factors). General AH were addressed. A higher score for boys was identified in the features' indicative of more energetic and intense behavior, while the mean scores for girls were higher in the attribute indicative of self-control. Children with a higher self-control score were not frequently supervised by mothers. In contrast, children with a high activity level were supervised more frequently.	III 3
Schmertmann M, Williamson A, Black D ⁽²⁶⁾	Australia 2008	Retrospective longitudinal study/ N= 8.472	Investigate whether child development plays any role in unintentional poisoning.	Proximal DSH: (child's age; child's sex; ethnicity/race). Intermediate DSH: (behavioral factors). Distal DSH: (mother's education; economic factors). The AH addressed were Poisoning/Intoxication. Boys and girls had the same age pattern for hospitalization rates for poisoning. Rates of hospitalization for unintended intoxication were significantly higher in children aged one to three than among children under one and four.	III 3
Belonwu RO, Adeleke SI ⁽²⁷⁾	Nigeria 2008	Descriptive study with quantitative approach/ N= 55	To determine the magnitude of accidental kerosene intake in children's morbidity/ mortality and to provide viable solutions to reduce the frequency of occurrence.	Proximal DSH: (child's age; child's sex). The AH addressed were Poisoning/Intoxication. The study showed that children aged four months to eight years old were affected at the peak age of 18 months. In 61.8% of the cases they were less than two years old.	III 3
Simpson JC, Turnbull BL, Ardagh M, Richardson S ⁽²⁸⁾	New Zealand 2009	Descriptive study with quantitative approach/ N= 100	To investigate the circumstances of injuries at home among children from 0 to 4 years old.	Proximal DSH: (child's age; child's sex). Intermediate DSH: (behavioral factors). Distal DSH: (living conditions, housing, economic factors, cultural factors). General AH were addressed. The caregivers of the children at the time of the accident were mostly women between the ages of 25 and 34, and the age group with the highest incidence of accidents was between two and three.	III 3
Morrongiello BA, Corbett M, Brison RJ ⁽²⁹⁾	Canada 2009	Quasi-experimental case-control study/ N= 70	To investigate the difference between small children injured and those not injured, based on the child's behavioral attributes and caregiver supervision indexes.	Proximal DSH: (child's sex). Intermediate DSH: (behavioral factors; mother's supervision). Distal DSH: (housing). General AH were addressed. The results revealed that there are no differences between groups of children regarding behavioral attributes. However, the control group received more supervision in general and during specific activities leading to injuries.	III 2
Ramos CL, Barros HM, Stein AT, Costa JS ⁽³⁰⁾	Brazil 2010	Case-control study/ N (caso)= 25 N(controle)= 25	To investigate whether the lack of knowledge about toxic agents at home is a risk factor for unintentional poisoning in childhood.	Proximal DSH: (child's age; child's sex). Intermediate DSH: (behavioral factors). Distal DSH: (housing, mother's employment, economic factors). The AH addressed were Poisoning/Intoxication. The mean age of the children was 31.8 months. The distraction was 15 times more likely to occur among caregivers of children who underwent poisoning compared to the control group. Among the families interviewed, 64% in the case group and 60% in the control group belonged to the lower socioeconomic classes.	III 2

To be continued

Chart 2

Authors	Country/ Year	Study outline/ number of participants	Objectives	Social Determinants of Health/ Main results	LV
Atak N, Karaoğlu L, Korkmaz Y, Usubütün S ⁽³¹⁾	Tunisia 2010	Transversal epidemiological study/ N= 704	To investigate the frequency of the accident that causes the injury among children less than five who live in the province of Malatya and the related factors, including the mother's level of knowledge on possible accident risks at home.	Proximal DSH: (child's age; child's sex). Intermediate DSH: (mother's age; mother's supervision; behavioral factors). Distal DSH: (employment of mother and father; mother's education). General AH were addressed. Most accidents took place at home, and 65.3% of them were due to falls; 65.1% took place in the presence of the mother. The frequency of accidents was higher in the age range from 4 to 5 years old and lower in the ≤1 year group.	III 3
Manzar N, Saad SM, Manzar B, Fatima SS ⁽³²⁾	Pakistan 2010	Case series, retrospective and non-interventionist study/ N= 100	To determine the poisoning agents and demographic distribution of children brought to the Karachi Civil Hospital with a history of accidental poisoning and to examine the factors associated with it.	Proximal DSH: (child's age; child's sex). Intermediate DSH: (behavioral factors; lifestyle). Distal DSH: (mother's education; housing; economic factors). The AH addressed were Poisoning/Intoxication. Factors such as mother's education, number of siblings and place of storage of substances were significantly related with cases of accidental poisoning. The mortality rate was 3%.	III 3
Shields BJ, Pollack-Nelson C, Smith GA ⁽³³⁾	USA 2011	Retrospective longitudinal study/ N= 244	To describe the epidemiology of drowning events that occur with kids in portable swimming pools in the United States.	Proximal DSH: (child's age; child's sex). Intermediate DSH: (behavioral factors; supervision). Distal DSH: (housing; rooms in general). AH were approached by Drowning. A total of 209 cases of fatal and 35 non-fatal drownings were identified between 2001 and 2009. The majority (94%) involved children under five, 56% were boys. 73% occurred in the child's home.	III 3
Carlsson A, Bramhagen AC, Jansson A, Dykes AK ⁽³⁴⁾	Sweden 2011	Quasi-experimental case-control study/ N(cases)= 50 N(control)= 50	To investigate how information provided to mothers of low education can improve the precautions taken to prevent burn injuries involving young children; and to compare the results with a group of mothers who did not receive information.	Distal DSH: (mother's education). AH by Burns/Scalding were addressed. The results showed that the intervention had a significant impact on improving the precautions mothers have taken to protect their children from burns and bruises at home.	III 2
Johnston BD, Quistberg DA, Shandro JR, Partridge RL, Song HR, Ebel BE ⁽³⁵⁾	USA 2011	Quasi-experimental case-control study/ N(cases)= 18 N(control)= 14	To estimate the prevalence of potential risk factors for falling from windows.	Proximal DSH: (child's age; child's sex). Distal DSH: (housing; economic factors). AH by Falls from Windows were addressed. The falls mostly happened in the rooms of the child's house. Most were boys. The main risk factors were the type of window, external height, depth of the threshold and absence of screen protection.	III 2
Pearce A, Li L, Abbas J, Ferguson B, Graham H, Law C ⁽³⁶⁾	United Kingdom 2012	Cohort study/ N= 14.378	To explore the home environment as a potential mediator between socioeconomic circumstances and unintentional injuries.	Intermediate DSH: (mother's age; behavioral factors; social and community networks). Distal DSH: (housing; social factors; economic factors). General AH were addressed. Most children lived in households with poor housing scores and were more likely to suffer injuries at home.	III 2
Güloğlu R, Sarıcı IS, Bademler S, Emirikçi S, İşsever H, Yanar H et al. ⁽³⁷⁾	Turkey 2012	Retrospective longitudinal study/ N= 42	To review the TV-related injuries to determine the risk factors, type of injuries, and operative intervention(s) needed in children injured by TV accidents.	Proximal DSH: (child's age; child's sex). Intermediate DSH: (mother/father supervision). Distal DSH: (housing). AH by TV devices were addressed. More than 65% of the children were between one and three. The injuries rate was higher in boys (66.7%) than in girls (33.3%). The most common mechanism of injuries (71.4%) among all age groups was device fall. Pulling the TV to one's direction (19%) was the second most frequent mechanism of injuries.	III 3

To be continued

Chart 2

Authors	Country/ Year	Study outline/ number of participants	Objectives	Social Determinants of Health/ Main results	LV
Carlberg MM, Shapiro-Mendoza CK, Goodman M ⁽³⁸⁾	USA 2012	Cohort study/ N= 1.064	To identify maternal and infant characteristics associated with accidental suffocation and bed strangulation (ASBS) in American infants.	Proximal SDH: (child's age; child's sex; ethnicity/race). Intermediate SDH: (mother's age; lifestyle). Distal SDH: (access to health services; mother's education). The AH addressed were Accidental Suffocation and Strangulation. The children with the highest ASBS mortality rates were boys and were born between 20 and 33 weeks of pregnancy. The majority of ASBS mortality (71%) occurred before the infant reached four months. The mothers of babies with the highest ASBS mortality rates were black, non-Hispanic, Native American/Alaska Native, smoked during pregnancy, were younger, had less than 12 years of education, and had not undergone prenatal care.	III 2
Vieira LJEDS, Pordeus AMJ, Lira SVG, Moreira DP, Pereira ADS, Barbosa IL ⁽³⁹⁾	Brazil 2012	Transversal study/ N= 362	To portray the sociodemographic profile of families living in a low income community; and to identify the associated factors for the occurrence of unintentional injuries in children.	Intermediate SDH: (parents' age; lifestyle; behavioral factors; social and community networks). Distal SDH: (life conditions; housing; basic sanitation; social factors; economic factors). The study addressed general AH. According to the family type, the majority (62.7%) were nuclear (father, mother and children). As for demographic density by residence, 43.6% of households had four people and 42.0% of families had five to seven. Considering the family income, 71.0% survived with up to a minimum wage. In 79.3% of households, at least one person was employed. In relation to the caregiver, the mother was cited in 71.8% of the families. In 50.1% it has been reported that parents have delegated responsibilities to their children.	III 3
Shah M, Orton E, Tata LJ, Gomes C, Kendrick D ⁽⁴⁰⁾	United Kingdom 2013	Case-control study/ N(cases)= 986 N(control)= 9240	To identify risk factors for scald injuries in children under 5.	Proximal SDH: (child's age; child's sex). Intermediate SDH: (mother's age; order of birth; lifestyle - monoparental vs. biparental homes). Distal SDH: (life conditions; social factors; economic factors). The AH addressed were Burns/Scaldings. Multivariate analysis showed that boys were 34% more likely to suffer scald injuries. With regard to age, children aged 1-2 were at higher risk when compared to those younger than 1 year old. A high number of older siblings were also associated with a greater chance of scalding injuries. High maternal age at delivery was associated with a decrease in the chance of scald injuries. Children living in households with single adults showed an increased chance of injuries.	III 2
Sheikh S, Chang A, Kieszak S, Law R, Bennett HKW, Ernst E et al ⁽⁴¹⁾	USA 2013	Transversal study with descriptive and analytical components/ N= 23.536	To characterize demographic, health, and potential risk factors associated with lamp oil poisoning reported by poison center attendants in the US, and discuss their implications for public health.	Intermediate SDH: (behavioral factors). Distal SDH: (cultural factors). The AH addressed were Poisoning/Intoxication. Most intakes occurred in children who were two years old; they involved tiki torch fuel products located on a table or shelf, and occurred indoors. The amount of oil in the lamp ingested does not appear to be associated with its odor (p=0.19) or oil color (p=1.00). Most of the exhibits were managed on-site and resulted in "effectless" medical results.	III 3
Kamal NN ⁽⁴²⁾	Egypt 2013	Transversal study with descriptive and analytical components/ N= 1255	To determine the frequency, characteristics and outcome of non-intentional domestic (non-fatal) injuries among children under five in rural El Minia province for one year; and to describe the demographic risk factors by a community-based study.	Proximal SDH: (child's age; child's sex). Intermediate SDH: (lifestyle - monoparental vs. biparental homes). Distal SDH: (parents' education; social factors; economic factors). The study addressed general AH. Boys have slightly higher injuries rates than girls. It was also determined that 32.9% of children who suffered injuries at home had between 24-35 months. The low educational level of parents significantly increased the risk of injuries. It was significantly higher for the children of families with lower income (p<0.05). Daughters of young mothers with parents of lower education and low socioeconomic status have a considerably higher risk of injuries.	III 3
Qiu X, Wacharasin C, Deoisres W, Yu J, Zheng Q ⁽⁴³⁾	China 2014	Transversal study/ N=366	Relate the characteristics of the houses and family relationships with the risk factors for accidents at home among children aged from 24 to 47 months.	Proximal SDH: (child's age; ethnicity/race). Intermediate SDH: (behavioral factors; psychological factors). Distal SDH: (social factors; economic factors; cultural factors; housing). AH were addressed in a general way. The results showed that a greater number of household risks were significantly attributed to school-age children. Migrant children are more exposed to risks at home compared to local children. High family stress has been identified as a risk factor as it can lead to mental distraction of parents and disturb the child's emotional behavior.	III 3

To be continued

Chart 2 (concluded)

Authors	Country/ Year	Study outline/ number of participants	Objectives	Social Determinants of Health/ Main results	LV
Mayes S, Roberts MC, Stough CO ⁽⁴⁴⁾	USA 2014	Transversal study/ N= 80	To examine the relation between the socioeconomic and sociodemographic factors of the family and the risk factors for the domestic injury.	Intermediate SDH: (parents' age). Distal SDH: (life conditions; economic factors). AH were addressed in a general way. In both low-income and higher-income families, risk factors were found. However, poorer families with younger parents have less knowledge to identify risk factors for the occurrence of AH.	III 3
Acar E, Dursun OB, Esin IS, Ögütli H, Özcan H, Mutlu M ⁽⁴⁵⁾	Turkey 2015	Case-control study/ N(cases)= 40 N(control)= 40	To examine the relation between home-based injuries in children and the presence of parents with symptoms of hyperactivity disorder (ADHD).	Intermediate SDH: (psychological factors). AH were addressed in a general way. The risk of ADHD among parents was significantly higher in children hospitalized for AH compared to the control group. Having a father at high risk for ADHD increased two times the relative risk of children being exposed to injuries.	III 2
Yamaoka Y, Fujiwara T, Tamiya N ⁽⁴⁶⁾	Japan 2016	Transversal study with descriptive and analytical components/ N= 6534	To investigate the association between unintentional injuries in children and postpartum depression.	Intermediate SDH: (psychological factors). General AH were addressed. 9.8% of the infants suffered unintentional injuries and 9.5% of the mothers had postpartum depression. After adjustment for covariates, postpartum depression was significantly associated positively with any unintentional injuries.	III 3
Stewart J, Benford P, Wynn P, Watson MC, Coupland C, Deave T, et al ⁽⁴⁷⁾	United Kingdom 2016	Case-control/ N(cases)= 338 N(control)= 1438	To determine the relation between a range of modifiable risk factors and cases of medically assisted burns in children under 5.	Proximal SDH: (ethnicity/race). Distal SDH: (housing; economic factors). AH by Burns/Scaldings were addressed. The children of the cases were slightly younger than the control ones (median age 1.47 vs. 1.56 years old), less likely to be of white ethnic origin (82% vs. 91%), more likely to receive state benefits (46 % vs. 35%) and greater probability of living in rented places (50% vs. 37%). In addition, they lived in neighborhoods with higher deprivation scores (median, 20.6 vs. 15.7).	III 2
Emond A, Sheahan C, Mytton J, Hollén L ⁽⁴⁸⁾	United Kingdom 2017	Cohort study/ N= 12.966	Investigate behavioral and child developmental characteristics and the risk of burns and scalds.	Proximal SDH: (child's age; child's sex). Intermediate SDH: (behavioral factors). AH by Burns/Scaldings were addressed. Boys younger than two years old were more likely to suffer burns, and girls suffered more burns between five and eleven. Pre-school injuries were related to gender and motor development, and in school-age children: frequent tantrums, hyperactivity, and coordination difficulties.	III 2

DISCUSSION

Category 1 – Proximal Social Determinants of Health

According to the level of comprehensiveness, individuals are based on the Dahlgren and Whitehead model, with individual characteristics of age, gender and genetic factors that, of course, influence their potential and health conditions⁽⁴⁹⁾. In 22 analyzed articles the relation between Proximal SDHs and the occurrence of AH in childhood was investigated. The child's age was reported as capable of influencing the occurrence of AH in 16 analyzed articles, varying the prevalence among younger and older children depending on the type of AH.

In studies involving AH in general, in which no type specification was made, a statistically significant association was observed between the frequency of AH that caused injuries and age groups^(25,28,31,43). The age group with the highest frequency is the group between four and five years old^(31,43). It is found that, in general, accidents are less frequent among children under one. In the context of the AH caused by a specific cause, the poisonings

or intoxications were also analyzed from the age of the child in seven surveys^(18,21,26-27,30,32,41). The same analysis was performed in cases of accidental drowning/submersion injuries in childhood⁽³³⁾ and television falling on the child⁽³⁷⁾. Following the same tendency of studies involving AH without specification, it is evident that the most prevalent age group in these occurrences varies from one to three years old⁽³⁷⁾, and one to five years old^(18,33), with a variation of the mean age of 31.8⁽³⁰⁾ to 36 months⁽³²⁾. The peak occurrence is usually between one and two years old^(26-27,30) and then decreasing to four years old⁽²⁶⁾.

In this age group, there are intense changes related to the growth and development of mobility, cognitive ability and receptive comprehension, which may contribute to the occurrence of AH⁽¹⁾. In addition, factors related to the child, such as age or stage of development, affect adult behavior, particularly supervision, an intermediate SDH⁽²⁸⁾. It is identified that younger children are more supervised than older ones⁽²⁵⁾. Parents are less likely to be present when accidents occur between the ages of two and four, and at that age, children tend to play more with their siblings, contributing to the occurrence of AH injuries⁽²⁸⁾.

In addition, children younger than one year are, in most cases, more supervised and therefore more protected, which can be evidenced by the fact that mothers who report providing more supervision have children who are less injured⁽²⁵⁾.

In contrast, cases involving burns/scalding, evaluated in two studies, determined that the prevalence of injuries resulting from this type of AH was significantly higher in the period between birth and two years old compared to the age group between two and four years old and five and eleven years^(40,48). In the case of a burning injury, the greatest risk is between the ages of one and two years when compared to those under one year old and are especially associated with motor development⁽⁴⁰⁾. Concerning the risk of asphyxia/strangulation/suffocation in bed, most deaths (71%) occur before a baby reaches four months, with a mean age of 96 days⁽³⁸⁾.

The studies that evaluated SDH Sex among children who suffered AH, either in the general context^(19-20,22,25,28-29,31,42) or in specific cases, such as poisoning or intoxication^(18,21,26-28), burn^(40,48), drowning⁽³³⁾, falls^(35,37) and asphyxia/strangulation/suffocation in bed⁽³⁸⁾ showed a higher ratio of males. Thus, it is possible to affirm that male sex is related to the occurrence of AH in childhood in all studies⁽⁸⁾. In many cases, the difference in the occurrence of AH between the sexes is related to the proportion of time the child is supervised, with boys more often not supervised than girls⁽²⁵⁾, emphasizing once again the association between the proximal and intermediate SDH. In addition, the greater occurrence of accidents in boys can be attributed to activities and behaviors that are differentiated in both sexes and to cultural factors⁽²²⁾, with greater exposure of boys to situations of risk, such as games with ball, bicycles, cycles, skateboards, among others⁽⁵⁾. Such correlation reveals an association between proximal and distal SDH.

Regarding the Proximal SDHs, as for the individual characteristics, six articles evaluated the children's ethnicity/race and their correlation with AH (in general^(19,25,43); asphyxiation/strangulation/suffocation in bed⁽³⁸⁾; burn⁽⁴⁸⁾). In this context, white children were significantly more likely to have an injury by AH reported^(19,25,38), followed by Hispanic and black ethnicity^(25,38). Migrant children have been shown to be exposed to more domestic risks compared to local children⁽⁴³⁾. In the specific area of AH involving burns, however, this situation is modified, with a higher prevalence among non-whites⁽⁴⁷⁻⁴⁸⁾. It is possible to state that there is a correlation between the Proximal SDH ethnicity/race and the Distal SDH cultural factors, since certain practices, in specific contexts, relate to the ways different liquids are heated when preparing beverages and foods to be offered to the child⁽⁴⁷⁾.

Category 2 – Intermediate Social Determinants of Health

The articles that refer to the second category, "Intermediate Social Determinants of Health", discussed diverse topics. In 24 studies, the following factors were identified: behavioral (supervision); lifestyle (single-parent/biparental households); maternal age; psychological factors; and social and community networks.

Behavioral factors, especially those related to the lack of adult supervision, were identified in a large part of the articles analyzed^(18,23,25-26,28-33,36-37,39,41,43,48). The main AHs that were related to this determinant were: intoxications; falls and burns^(18,21,26,30,32,41,48). In

such contexts, direct adult supervision is one of the protective factors to prevent childhood accidents. This is because providing more attentive care to a vulnerable person enhances the early identification of risks and therefore helps to prevent accidents⁽⁵⁰⁾. In some cases, this supervision is impaired due to the number of children in the family and the concomitant accomplishment of several housework by the responsible adult, the latter being a determining factor for accidental poisoning in childhood⁽³²⁾. This analysis reveals an association between Intermediate SDH supervision and Distal SDH, especially maternal occupation.

Maternal age was also associated with the occurrence of these injuries, since daughters of younger mothers suffered more accidents^(20,22,31,36,38-40,44). For children of mothers under 30, the risk of accidents was 1.9 times higher than for children of mothers over 30⁽³¹⁾. The relation between the age of parents and the occurrence of AH can be justified by the fact that older parents have more experience than younger ones and are more attentive to situations that give children the risk of accidents⁽²²⁾.

Another AH-related factor was the family lifestyle, especially in those with many children or in whom there was only one responsible for the child (father or mother)^(32,38-40,42). This evidence may be related with high family stress caused by the excess of activities within the home context, leading to mental distraction of parents⁽⁴³⁾. Thus, having a support network, such as friends and neighbors, can reduce the risk of unintentional injuries in children^(36,39). In this context, there is an association between different types of Intermediate SDH: lifestyle, psychological factors, maternal occupation and social networks.

The mental state of parents was also a conditioning factor for AH. Mothers who present postpartum depression are less prone to more protective behaviors, which facilitates the occurrence of falls in children younger than four months⁽⁴⁶⁾. In addition, the presence of some ADHD-related symptoms among parents, such as nervousness, impaired communication and lack of attention, make children more prone to injuries⁽⁴⁵⁾.

Category 3 – Distal Social Determinants of Health

In the third theoretical category, "Distal Social Determinants of Health", 27 articles referred to aspects of living and working conditions, general socioeconomic, cultural and environmental conditions identified in the employment of the father/mother^(18,20,22-23,30-31), housing^(18-19,21-23,28-30,32-33,35-37,39,43,47), access to health services^(19,21-22,38), cultural factors^(18,28,30,41,43), living conditions^(19-20,22-23,28,39-40,44), social factors^(18-19,22,26,36,39-40,42-43), economic factors^(18-19,22-24,28,30,32,35-36,39-40,42-44,47), environmental factors⁽³³⁾, education^(24,29,34,42) and basic sanitation⁽³⁹⁾.

The predominance of Distal SDH among AH indicates the relation between the socioeconomic level and the risk of injuries; however, in other findings, it is evident that families with low and high financial income have a similar risk for AH involving children, so this is not an aspect that can be directly confirmed⁽⁴⁴⁾.

Nevertheless, it is important to emphasize that housing-related characteristics, in which the child lives, such as small houses with few rooms, can influence the occurrence of these injuries by facilitating the crowding of people and the lack of attention on the part of adults⁽²²⁾. Moreover, many of these environments are

not safe for children, either because families do not have enough economic conditions to invest in preventive measures⁽³⁵⁾ or because parents are unaware of risk situations⁽²³⁾. In this context, there is again an association between different SDHs: housing, economic factors and education.

Study limitations

It is highlighted as a limitation of the study the non-inclusion of multiprofessional databases. For this review, three databases (Cinahl, *Lilacs* and Medline) were selected, which established a limiting factor, since the manuscripts that were not indexed could not be selected to make up the sample. In addition, it is indicated as limitations the non-inclusion of studies of the type review and the impossibility to consider in the discussion the great variety of contexts of origin of the reviewed articles.

Contributions to the Nursing, Health or Public Policy fields

The results presented in the study provide further information about the etiology of AH with children. When identifying the social determinants of health associated with these injuries, it is perceived that their prevention is not only the responsibility of parents and/or family, but of the community and the environment in which they live. Thus, primary health care plays a fundamental role in the prevention of these injuries, since it is the gateway of the Unified Health System and has a greater possibility of identifying the demands of individuals and their community. Knowledge of the associated social determinants of health may guide the

development of new educational programs and activities that may intervene, mainly, in changeable determinants.

CONCLUSION

The analysis of the articles evidenced the complexity and the multifactorial nature of the occurrence of AH in childhood. The presence of different SDH in the same context of occurrence of AH, whether belonging to the same category or coming from different categories, has been found to mutually reinforce the risks and hinder the implementation of preventive measures.

It has been observed that the Proximal and Intermediate SDH are those more statistically associated with the etiology of AH. The age and sex of the child, identified as Proximal SDH, are the ones that most influence the occurrence and the type of accident. Among the intermediate determinants, the lack of supervision by an adult facilitates the occurrence of injuries, mainly related to poisonings and burns. Despite a significant number of studies inserted in the review, it is necessary to expand investigations about psychological factors (Intermediate SDH) and social and economic factors (Distal SDH), since it was not possible to consistently identify the mechanism of action of these determinants in the occurrence of childhood AH.

The identification of the main SDH involved in unintentional injuries with children should be used to adopt protective measures, mainly directed to factors that are changeable, such as behavioral ones. It also reinforces the importance of investing in public policies that reduce social inequities and exposure to risks, considering the different contexts in which children are inserted.

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