

HOME ACCIDENTS AND ASSOCIATED FACTORS AMONG CHILDREN LESS THAN FIVE YEARS OLD IN SUDAN: A DESCRIPTIVE STUDY

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ABSTRACT

Background: Accidents mainly occur at home. Children are most vulnerable to accidents and violence at home.

Objectives: This study is aimed at identifying the rate of home accidents (burns and falls) among children under the age of five in Sudan and the associated factors.

Materials & Methods: This is a descriptive, cross-sectional study. It used the survey approach to identify the rate of home accidents among children below the age of five in Sudan and the associated factors from 2012 to 2013. The cluster random sampling method was used to select five of Sudan's 18 states; subsequently, 60 households were selected from each of the five states. Data was collected from 300 households through a questionnaire and then analyzed using the statistical package for social sciences.

Results: The rate of home accidents (burns and falls) among children under the age of five was 13.3%. From the different investigated factors, only tenure of the household showed a significant relation to home accidents. Most accidents were reported from Al Sharafa (Kassala) and Almazroug (North Kurdufan).

Conclusion: Home accidents are still a major problem and jeopardize the lives of little ones. Home accidents among children under the age of five are increasing and this issue requires more attention and effort.

Keywords: Under-five mortality, home accidents rate, households, associated factors

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INTRODUCTION

Sudan reportedly ranks 34th among the countries with high under-five mortality rates. With 102 deaths per 1,000 children under five years, this ranking is the highest in the North Africa region¹. Accidents, many of which occurred at home, are the leading cause of under-five child mortality and disability, potential years of life lost, and high medical costs in the developed world². Home accidents can be caused by many factors. A study conducted on Swedish infants and toddlers

indicated that the socioeconomic class is an important and influencing factor in home accidents³. More than 95% of the deaths from accidents occur in low- and middle-income countries, representing 40% of the childhood accidents in the world⁴. Furthermore, housing is a determinant of home accidents, which are reportedly more common in urban than in rural areas⁵. Another study supported this by reporting a positive relation between home accidents and poor housing⁶.

Accidents at home vary depending on the age of the children. Falls are reportedly more common among infants, whereas burns are less common. Children aged one to four were grouped together for a study and it was discovered that home accidents in this age group, particularly for one- to two-year-olds,

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were mainly a result of poisoning, in addition to falls and burns. Falls, however, are less fatal than other types of accidents. At school age, most accidents occur outside home than inside due to outdoor mobility of children^{7, 8}. Furthermore, home accidents are reportedly common among children aged four and below⁵. These marked differences indicate that age is an influencing factor in accidents.

Children below the age of five are at high risk for many accidents such as burns and falls⁹. Studies in four low-income countries revealed that 65% of childhood burns occurred in and around the home environment¹⁰. A World Health Organization (WHO) report stated that injuries among children under the age of five increase by increasing the age from one to five years¹⁰.

The WHO stated that the annual incidence of home accidents from hospital admissions has been reported in many studies; low-income countries have more morbidity and mortality associated with home accidents¹¹.

A study in Pakistan revealed that non-fatal accidents impose a burden on the world and predicted that 400 million children will suffer from non-fatal accidents every year¹². These accidents resulted in a 16% reduction in disability adjusted life years (DALYs)¹⁰. The WHO reported that the seventh leading cause of death in Sudan is accidents among children under the age of five¹⁰.

Home accidents in developing countries are common among children under the age of five¹¹. The emergence of this problem re-ranked under-five morbidity and mortality. However, home accidents among children below the age of five are now common; there are incomplete and fragmented reports and most of them go unreported. It is important to address all under-five morbidity and mortality factors, or else the problem will not be controlled¹³.

The home accidents observed in this study involved burns and falls. The burns could be of any type (any degree of burn). The falls observed in this study cover all injuries from falls.

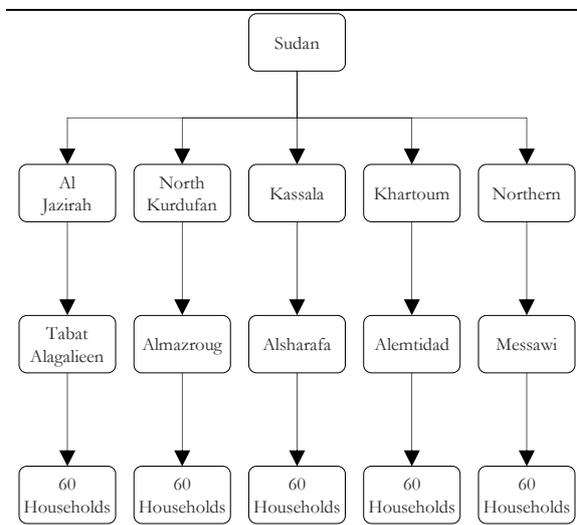
Despite several studies, under-five home accidents in developing countries have not been adequately described or investigated^{5, 7, 8, 12, 14–17}. The current study is aimed at identifying the rate of home accidents (burns and falls) among children under the age of five in Sudan and the associated factors.

MATERIALS & METHODS

This is a descriptive, cross-sectional study and the survey approach has been used to identify the rate of home accidents (falls and burns) and the associated factors among Sudanese households. Sudan’s total population was 32,000,000 in 2012. The country comprises 18 states. The population of this study consists of all households that had children under the age of five in Sudan in 2013.

We used the cluster random sampling technique to select five from Sudan’s 18 states. Subsequently, we randomly selected one popular administrative unit from each state (Figure 1).

Figure 1. Sampling process



The households selected by the cluster sampling technique are distributed all over Sudan. There are five clusters; in each cluster, 60 households were selected (a total of 300 households were selected) and all children under the age of five in the households were included in this study. To compensate for the different population size in each state, during the analysis, the data was weighted according to

the population size. A similar approach was used in the Sudan Household Survey¹⁸.

Data was collected using quantitative methods; interviews were conducted using a questionnaire to assess the rate of home accidents (falls and burns) and the associated factors. Trained nursing students at the University of Medical Sciences and Technology collected the data during their routine training period. The questionnaire was validated at Time 1 and Time 2. Cronbach's alpha was used to assess the internal consistency for the questionnaire in the pre-test. Cronbach's alpha was (0.836 and 0.761) for behavior and (0.73 and 0.76) for knowledge at Time 1 and Time 2, respectively.

The data collected was analyzed using SPSS package version 20 to find out the rate of home accidents and the associated factors using descriptive analysis, chi-square test and Anova T-test. The research respected the rights of participants and treated data with confidentiality to ensure the subjects are not harmed during the study.

RESULTS

It was discovered that most mothers lived in owner-occupied homes. Most of the mothers (88.3%) did not work outside home. With regard to the education level, the study revealed that 4% of the mothers were illiterate [almost similar to the illiteracy level (5%) in Sudan], 20.7% had primary-level education, 40% had secondary education, 30.7% had university-level education, and 3.7% had postgraduate education. The age of the mothers in this study was classified into three groups; 73.7% of the mothers were aged between 25 and 40 years, which is an acceptable percentage for women in the general population with children aged below five, 20.3% were less than 25 years old and 6% were above the age of 40 (Table 1).

Table 1. Demographic characteristics of households under study, 2013 (n = 300)

Parameters	Items	Frequency	Percentage (%)
Study area (Clusters)	Alemtidad	60	20.0
	Almazroug	60	20.0
	Tabat Alagalieen	60	20.0
	Messawi	60	20.0
	Al Sharafa	60	20.0
Housing tenure	Rented	30	10
	Owner-occupied	270	90
Family types	Nuclear	100	33.3
	Extended	200	66.7
Occupation of mothers	Worker	35	11.7
	Not worker	265	88.3
Age groups	Less than 25 years	61	20.3
	25–40 years	221	73.7
	More than 40 years	18	6.0
Level of education of mothers	Illiterate	15	5.0
	Primary	62	20.7
	Secondary	120	40.0
	University	92	30.7
	Postgraduate	11	3.7
Total		300	100

The study, aimed at assessing the rate of home accidents in Sudan, discovered that the rate of home accidents (falls and burns) is high in the country. The most common cause of accidents was falls (11.3%) for children under the age of five, followed by burns (6.3%) (Table 2).

Table 2. Rate of home accidents (burns and falls) in Sudan, 2013 (n = 300)

Home accidents	Frequency and percentage of home accidents (falls and burns) (%)	Fall freq. (%)	Burns freq. (%)
Yes	40 (13.3)	34 (11.3)	19 (6.3)
No	260 (86.7)	266 (88.7)	281 (93.7)
Total	300 (100)	300 (100)	300 (100)

The study revealed that home accidents are more common in Al Sharafa (Kassala), which accounts for 35% of the reported accidents, and Almazroug (North Kurdufan) (25%). Most of the residents of these two rural areas are illiterate. Messawi (Northern State), Tabat Alagalieen (Al Jazirah), and Alemtidad (Khartoum) accounted for 17.5%, 12.5%, and 10.0% of the reported home accidents, respectively (Table 3).

Table 3. Distribution of home accidents in Sudan states, 2013 (n = 40)

Cluster	Frequency	Percentage
Al Sharafa (Kassala)	14	35
Almazroug (North Kurdufan)	10	25
Messawi (Northern)	7	17.5
Tabat Alagalieen (Al Jazirah)	5	12.5
Alemtidad (Khartoum)	4	10
Total	40	100

Table 4 shows that 18.0% of the home accidents took place in rented houses and 11.1% in owner-occupied homes; this difference is statistically significant ($p = 0.004$). The family type, occupation of mothers, age and level of mothers' education were not statistically significant influencing factors ($p = 0.456, 0.498, 0.72$ and 0.55 , respectively) (Table 4).

Table 4. Relation between occurrence of home accidents and determinants of home accidents among children below the age of five in Sudan, 2013 (n = 300)

Item		Home accidents		P-value
		Yes (%)	No (%)	
Home tenure	Rented	18.5	81.5	0.004
	Owner-occupied	11.1	88.9	
Family type	Nuclear	13.8	86.2	0.456
	Extended	12.8	87.2	
Occupation of mothers	Worker	17.1	82.9	0.498
	Not worker	12.8	87.2	
Level of education of mothers	Illiterate	8.3	91.7	0.551
	Primary	17.7	82.3	
	Secondary	15.0	85.0	
	University	8.7	91.3	
Age	Postgraduate	18.2	81.8	0.721
	Less than 25 years	16.4	83.6	
	25–40 years	12.7	87.3	
More than 40 years	11.1	88.9		
Total		300 (100)		

DISCUSSION

Epidemiological studies about home accidents among preschool children have mainly been based on hospital records than survey methods. Population-based studies on home accidents are uncommon; however, they could provide more information, as they include unreported home accidents¹⁵. Parental reports of home accidents yield better details of the circumstances surrounding the accidents than hospital reports. In hospital records, the circumstances of accidents were noted only in 75% of the records and the location in only 40%¹⁹. The main flaw in population-based studies is the dependence on recall, which reduces the

reliability of the collected data with time. In this study, an attempt was made to minimize the difficulty of recall by restricting the reporting period to the last 12 months.

Most mothers targeted by the questionnaire lived in owner-occupied houses and most of them do not work outside their homes. This result is similar to that of a study conducted in Assiut University in 2003 to evaluate mothers' knowledge and practice with regard to home accidents among children below the age of six in rural areas. The study revealed that 94.4% of the mothers were not working for cash²⁰. One-third of the mothers had secondary-level education and the second third of them had university-level education. Our study also showed that about two-thirds of the families are the extended type.

It was discovered that 13.3% of children under the age of five suffered home accidents [falls (11.3%) and burns (6.3%)] in the last 12 months. Sudan reported that injuries among children below the age of five are the seventh leading cause of death²¹. The annual report of Khartoum's Ministry of Health showed that injuries are the 11th leading cause of death among children under the age of five with a higher rate of accidents in the state²². Tokuhata *et al.* reported that 91% of the injuries among children under the age of five are home injuries²³. Many studies (either hospital- or population-based) found out that falls are the most common cause of injury among children. Moreover, falls were the most common type of home accidents affecting children under five²⁴.

With regard to burn injuries, one unpublished study conducted in Khartoum indicated that the incidence of burns at home in the Alemtidad area is 1.15% among children under the age of five¹². These findings are lower than those of our study, as the study was conducted in Alemtidad (in Khartoum city), whereas our study included randomly selected rural areas. Furthermore, home accidents are more common in Al Sharafa (Kassala), which accounts for 35% of the reported accidents, and Almazroug (North Kurdufan) (25%); most of

the residents of these two rural areas are illiterate. Messawi (Northern State), Tabat Alagalieen (Al Jazirah), and Alemtidad (Khartoum) accounted for 17.5%, 12.5%, and 10.0% of the reported home accidents, respectively. A review of accidental childhood injuries showed that homes are a virtual breeding ground for accidents among children²⁵. Furthermore, a study conducted in Ontario on home accidents reported that minor injuries are common, especially at home, and remain a crucial problem²⁶.

Our study reported that the rate of falls was 34 (11.3%), while that of burns was 19 (6.3%). The reported rates were higher compared to those of the previous studies^{5, 7, 8, 16, 17}.

The determinant of home accidents considered in this study was home tenure; other investigated factors were not significantly related to home accidents (such as the place and cause of home accidents). In this study, the only reported determinant was house tenure. This finding contradicts the findings of another study conducted in London, which reported that the determinant of accidents among children at home is social disadvantage rather than ethnicity¹⁶. The difference between our study and the one conducted in London may be a result of the cultural diversity between the two countries. Another study reported that family type is a determinant of home accidents among children under the age of five²⁷.

We classified the level of the mother's education into categories and analyzed the same against home accidents. We discovered a positive relation between mothers' education and the safety measures for children under the age of five and home accidents^{28, 29}. Some studies reported a negative association between socioeconomic status and home accidents among children under five^{27–29}. Another study among adolescents reported a positive association between home accidents and socioeconomic class³⁰. Agass *et al.* found out that falls are the most common cause of home accidents (accounting for 58%) among children below the age of 16. Tursz *et al.* discovered that

most of the injuries that affected children under the age of two were related to physical trauma (mainly falls); burns and poisonings were frequent only among children in the second year of life and adolescents^{17, 19, 30}.

The limitation of this study was that the study was conducted on 300 households in Sudan after the proper randomized selection of areas and households. However, its strength is the randomized selection of areas, which allows us to generalize the findings in Sudan and similar settings in Africa.

It can be concluded that home accidents in Sudan are still a major problem among children (13.3%). The only influencing factor is house tenure. It is recommended that the findings be considered to establish appropriate educational interventions to mitigate the rate of home accidents among children under the age of five.

CONFLICT OF INTEREST

The author declared that he did not receive any financial support for this work, and there is no conflict of interest related to this study.

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