



EPIDEMIOLOGY OF UNINTENTIONAL INJURIES AMONG UNDER-FIVE CHILDREN IN ELOBEID, SUDAN

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ABSTRACT

Background: Child injuries are a growing global public health problem. Hundreds of thousands of children die each year from injuries or violence, and millions of others suffer the consequences of non-fatal injuries.

Objective: This study aimed to study the epidemiology of unintentional injuries (inside the home) among under-five children in El-Obied, Sudan. **Methodology:** This facility based cross-sectional study comprised of 202 under-five children. Data were collected via questionnaire and analyzed by SPSS software, version 11.5. **Results:** This study showed that the prevalence of injuries (inside the home) among under-five was 82%, the bruising and fractures is dominant (35%) type of injuries, followed by cuts (19.30%), burns (13.90%), poisoning (8.40%), and drowning (5.40%). 35% of unintentional injuries were due to fall, 19.30% due to broken glass. About 60.20% of mothers performing first aids to their children after injury. Disability occurred in 9.00% from injured children. Fire extinguisher not found in about 54% of houses, and 19.30% of floor is slippery. The present study showed that there was a significance correlation between injuries and the class of house ($X^2 = 202$, $df = 2$, $P < 0.00001$). **Conclusion:** The prevalence of unintentional injury found to be higher among the under-five children and housing safety standards was poor that may favour occurrence of home unintentional injuries.

KEYWORDS: Unintentional Injuries, Under-Five, Elobeid, Sudan.

INTRODUCTION

An injury is defined as “the physical damage that results when a human body is suddenly subjected to energy in amounts that exceed the threshold of physiological tolerance, or else the result of a lack of one or more vital elements, such as oxygen”.^[1]

Child injuries are a growing global public health problem. They are a significant area of concern from the age of one year and progressively contribute more to overall rates of death until children reach adulthood.^[2] Childhood injury is a major public health problem that requires urgent attention. Injury and violence is a major killer of children throughout the world, responsible for about 950 000 deaths in children and young people under the age of 18 years each year.^[3] Unintentional injuries account for almost 90% of these cases. In addition to the deaths, tens of millions of children require hospital care for non-fatal injuries. Many are left with some form of disability, often with lifelong consequences. The burden of injury on children falls unequally. It is heaviest among the poor with the burden greatest on children in the poorer countries with lower incomes.^[3,4]

In Sudan, there is higher frequency of trauma among males than females. It was found in the urban 39.5% had suffered at least one injury and in the rural society, 80% had suffered at least one injury. The skull injuries were the most prevalent which were due to blunt trauma rather than falls.^[5]

In this study, we aimed to study the epidemiology of unintentional injuries among under-five children in El-Obied, Sudan.

MATERIALS AND METHODS

Study area

El-Obeid is the capital of North Kordofan State. Its area have been estimated by 81 km² and the distance from Khartoum is about 560 km. El Obeid is connected to Khartoum by an asphalt motorway, a railway line and air-flights taking off its airport several times a week.

North Kordofan state located in central Sudan latitude 13° 20 N longitude 30° 15 E, 570 m above sea level, the semi arid area of north kordofan receive an annual precipitation of about 280 – 450 mm in the months from

July to September, temperature is generally high averaging 37°C in the summer and 18°C in the winter.^[6] The population of the City estimated by 440483 person. There are 38000 houses, 40000 families.

Study population

Children under-five in El-Obeid and their mothers and housing standards.

Study design

Community based cross-sectional study.

Sample size

A total of 202 children were selected as a study subject. The sample size calculated with Cochran's formula; $n = z^2 \cdot pq/d^2$.^[7]

Sampling technique

Culster sample: El-Obied, City was divided into four equal quarters (Clusters). The samples were selected from each quarter of El-Obeid City following a process of simple random sample.

Data collection

Questionnaires (we asked mothers in face to face interviews).

Data processing & analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version (11.5).

Ethical consideration

- Approval from the appropriate management authority obtained.
- Mothers of participants provided informed consents.

RESULTS AND DISCUSSION

This study showed that the prevalence of injuries (inside the home) among under-five was 82%, (**fig.1**) which is very high exposure as compare with 46.3% in similar study conducted in India about the profile of unintentional injury among under-five children in coastal Karnataka.^[8] A study conducted by Zaidi et al in Tamil Nadu reported the prevalence of injury to be 14% among under-five children.^[9] But another study from Egypt by Eldosoky et al, described the prevalence of home related injury as 38.3%.^[10]

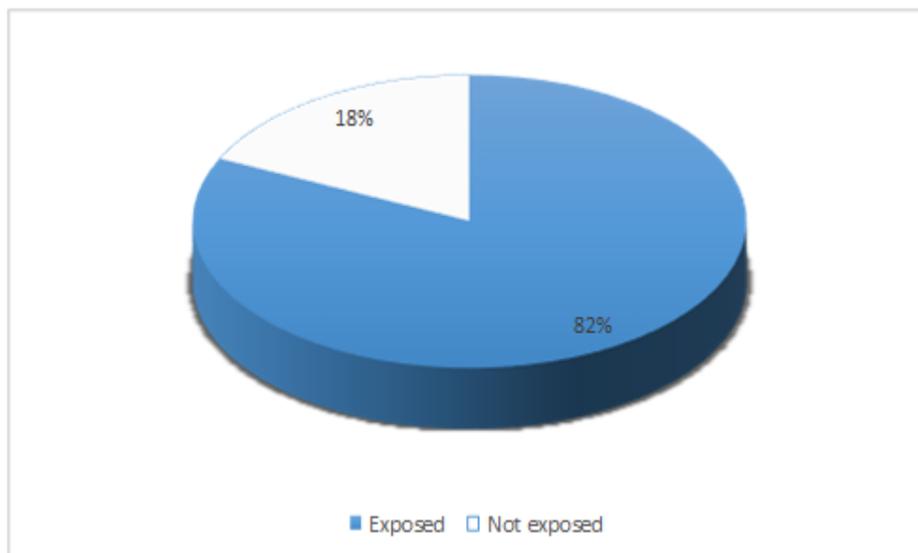


Figure 1: Exposure of children to unintentional injuries in El-Obeid.

n=202

In this study the bruising and fractures is dominant (35%) type of injuries (**fig.2**), that considered very high when compare with only 10.9% of injuries due to bruising and fracture in similar study conducted in Damascus.^[11] While cuts is second dominant type of injuries (19.30%) (**fig.2**). In similar study cuts were, constitute 48.4% of injuries.^[11]

This study showed that burns represent 13.90% of unintentional injuries. CDC childhood injury report

revealed that fire or burn-related injuries represented 5% of the unintentional injury deaths among children 0 to 19 years of age. The death rate for fire or burn-related injuries was 0.7 per 100,000. Males had a higher death rate than females (0.8 vs. 0.6 per 100,000). The rate was highest among children 1 to 4 years (1.5 per 100,000) and lowest among those over age 10 (0.4 per 100,000).^[12]

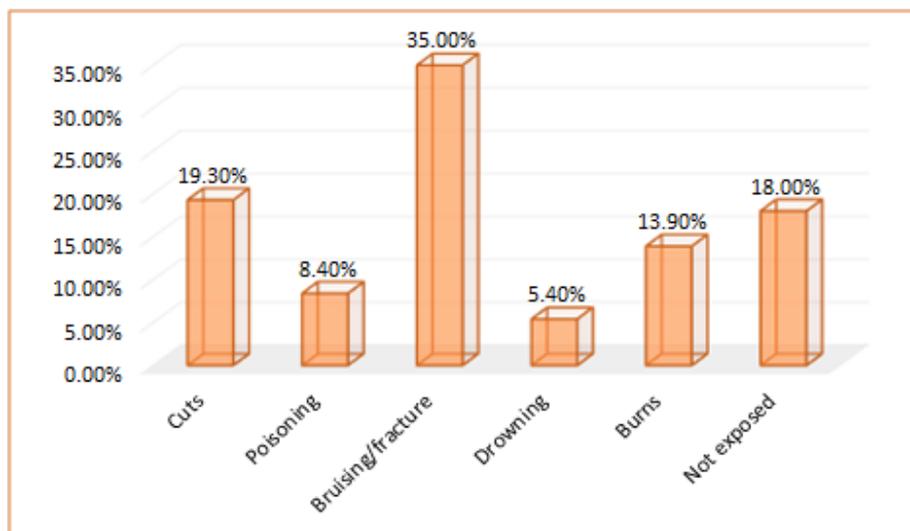


Figure 2: Types of injuries, which children exposed to it in El-Obeid.

n=202

The study conducted in Coastal Karnataka, India revealed that the potential causes of unintentional injuries as stated by mothers were sharp objects (29.2%).^[8] While in this study, 19.30% of unintentional injuries caused by broken glass. 35% of unintentional injuries were due to fall (fig.3). While in other similar study conducted in

North Kerala 64% of unintentional injuries were due to fall.^[13] CDC childhood injury report revealed that each year, approximately 2.8 million children had an initial emergency department visit for injuries from a fall. For children less than 1 year of age, falls accounted for over 50% of nonfatal injuries.^[12]

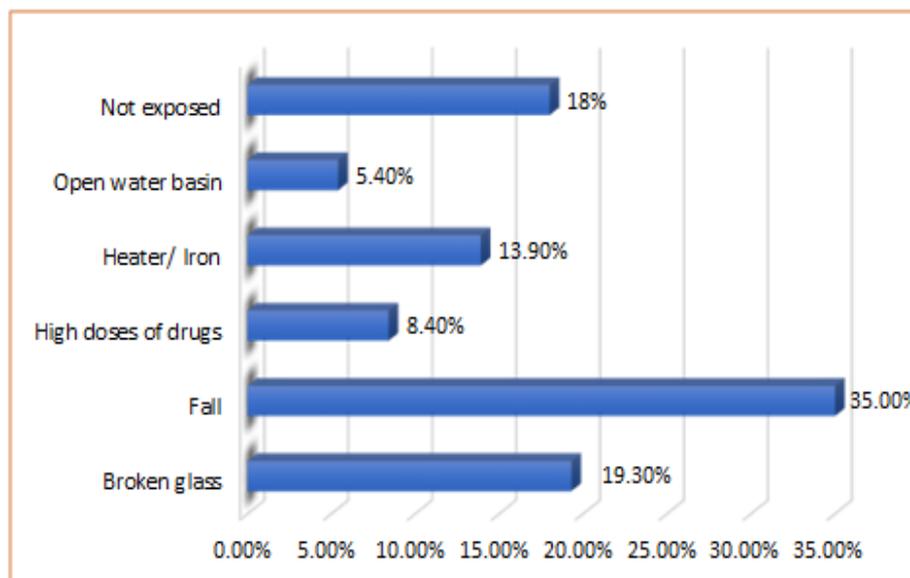


Figure 3: Causes of injuries among children exposed to it in El-Obeid.

n=202

In this study, 60.20% of mothers perform first aids to their children after injury, 38.60% going to hospital and 1.20% doing traditional therapy (fig.4). While in similar study, self-treatment has been reported to be the most common way of treating injury in Vietnam (51.5%), even in severe cases. There was a low rate of use public

health services (23.2%) among injury patients. It was almost the same as the use of private sources of healthcare (22.4%). Only 4.0% had sought care from referral facilities and 3.5% from other providers like polyclinics as their first choice.^[14]

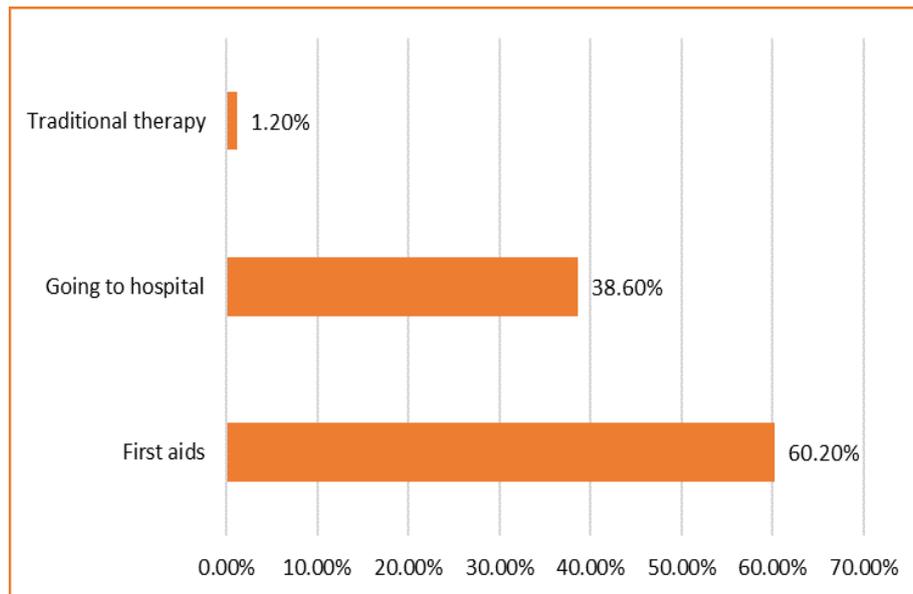


Figure 4: Procedures taken by mothers during injuries of her children.

n=202

The present study revealed that 42.50% of children were exposed to injuries once time, 23.70% exposed twice and 15.80% exposed three times and above (table.1).

Table 1: Frequency and disability due to unintentional injuries among children.

Frequency of injuries	Frequency	Percentage
Once	86	42.50%
Twice	48	23.70%
Three times and above	32	15.80%
Disability among children exposed to injuries		
Yes	18	9.00%
No	148	73.00%
Types of disability among children exposed to injuries		
Loss of organ	11	5.50%
Paralysis	1	0.50%
Malformations	6	3.00%

In spite of the importance of a topic like first aid, 14% of the studied mothers had not heard the term (table.2). In a study in El-Minia Governorate, Egypt 22.3% of the

studied women had not heard about first aid.^[15] This may be due to the insufficient of community health education.

Table 2: Knowledge of mothers towards unintentional injuries.

Knowledge regard first aid	Frequency	Percentage
Yes	174	86.00%
No	28	14.00%
Methods of prevention		
Supervision for children	36	17.80%
Home health education	48	23.80%
Provision of safety measures	116	57.40%
Others	2	1.00%

In this study fire extinguisher not found in about 54% of houses (table.3), this finding in contradiction with American Public Health Association and the U.S. Centers for Disease Control and Prevention, which determined that, each dwelling unit shall have at least one 10-pound fire extinguisher in good working

condition in or near the kitchen. In multifamily housing, there shall be fire extinguishers in common areas on each floor and in areas where flammable or combustible liquids are stored, used, or dispensed. The fire extinguishers shall be located in conspicuous,

unobstructed locations that are not obscured from view.^[16]

In this study 24.30% of house of study groups have uncovered pits (latrines, cesspools) (table.3), this result in contrast with American Public Health Association and the U.S. Centers for Disease Control and Prevention, which revealed that, swimming pools, hot tubs, spas (except a residential spa or hot tub with a safety cover complying with ASTM F 1346-91), ornamental ponds,

and other water features that hold water more than 24 inches (61 cm) in depth shall be completely surrounded by a fence or barrier at least 48 inches (122 cm) in height above the finished ground level that is accessible only through a self-closing and self-latching gate. The gate's latch shall be located 54 inches (137 cm) above the bottom of the gate on the interior side of the gate facing the water feature. The fence and gate shall not have climbable crosspieces.^[16]

Table 3: Housing standards implicated in children unintentional injuries.

Houses space	Frequency	Percentage
Adequate	154	76.20%
Not adequate	48	23.80%
Places of playing		
Safe	163	80.70%
Not safe	39	9.30%
Electricity connections		
Safe	176	87.10%
Not safe	26	12.90%
Fire extinguisher		
Available	93	46.00%
Not available	109	54.00%
Slipping floor		
Yes	39	19.30%
No	163	80.70%
Uncoverd pits (latrines, cesspools)		
Yes	49	24.30%
No	153	75.70%

The present study showed that there was a significance correlation between injuries and the class of house

(table.4). ($X^2 = 202$, $df = 2$, $P < 0.00001$). That mean third class house more implicated in presence of injuries.

Table (4): The association between the class of house and children injuries.

House classes	Injuries				Total	
	Yes		No			
First class	5	2%	6	3%	11	5%
Second class	74	37%	6	3%	80	40%
Third class	87	43%	24	12%	111	55%
Total	166	83%	36	17%	202	100%

($X^2 = 202$, $df=2$, $p<0.00001$).

CONCLUSION

The prevalence of unintentional injury was found to be higher among the under-five children, bruising and fractures is dominated type of injuries and the knowledge of mothers towards first aids was good, while housing safety standards was poor that may favour occurrence of home unintentional injuries.

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