UNINTENTIONAL CHILDREN'S INJURIES AT MANSOURA EMERGENCY HOSPITAL; PATTERNS AND OUTCOME

Alaa M. Embabi[1*], Farida abdelwahab[2], Adel Abdelghaffar[2], Osama M Embabi[4], Doaa Al emam[3]

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Abstract

Background: childhood unintentional injuries increased by more than 50% in East Africa making The African region bears the highest burden in the world Deaths attributable to injuries.
Aim: estimate the proportion and patterns of unintentional children injuries and determine their risk factors and outcome from total injuries.
Setting: main Emergency Hospital of Mansura University.
Methods: Hospital based cross-sectional study conducted on 218 children out of 790 unintentional injured cases at Mansoura emergency hospital, using interviewer-administered questionnaire.
Results: percent of unintentional children injury was (27.6%). school aged children were 67.4%. RTA was the most common mechanism of unintentional injury at school age (43.5%). While Falling was the most common at preschool age (63.4%). Fracture, deep injuries, complex trauma and burn were significanlty higher among children at school agewith OR= (11.1, 5.8,5,3.3 respectively). The rate of admission was higher among school age (OR= 2.9). Injuries at home occurred at higher significant level among preschool aged children, OR=15.4. Higher rate of death was detected among children aging from 6-18 years with no significance. a significant association between death and (RTA (p=0.01), complex injuries (p<0.001), polytrauma (p=0.005), coma (p<0.001) and Street as a place of injury (p<0.001).
Conclusion and contribution: The majority of children at preschool age fell of the furniture While The majority of children at school age fell of the stairs. Most of the mothers of injuried preschool children were at work at the time of accident. Burns by hot liquids and electricital burns were the commonest among children from 0-5 years old.

Keywords: Epidemiology, Children, Falls, Injury, Egypt

[1]Assistant lecturer of Public Health and Preventive Medicine, Faculty of Medicine, Mansoura University, Egypt.
[2]Professor of Public Health and Preventive Medicine, Faculty of Medicine, Mansoura University, Egypt.
[3]Assistant Professor of Public Health and Preventive Medicine, Faculty of Medicine, Mansoura University, Egypt
[4]Resident of orthopedic surgery, Faculty of Medicine, Mansoura University, Egypt
Corresponding Email: alaaembabi@hotmail.com

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1. INTRODUCTION

Unintentional injuries became the third leading cause of infant death in 2019 **(Xu et al., 2021).** Low- and middle income countries are disproportionately affected by these injuries, where child mortality due to unintentional injuries is more than three times greater than in high-income countries **(Bagahirwa et al., 2020).** childhood unintentional injuries increased by more than 50% in East Africa making The African region bears the highest burden in the world Deaths attributable to injuries **(WHO, 2015).**
Annually, more than 10,000 hospital admissions in the pediatric population are related to falls **(Verma et al., 2016).** Pediatric falls are associated with substantial physical, psychosocial, and financial consequences even though they may have a lower mortality as compared with other prominent pediatric injury mechanisms, such as motor vehicle crashes. Within the United States the annual costs of unintentional pediatric injury, of which falls is the leading cause, is estimated to be $300 billion **(Ibrahim et al., 2017).**
Acute pediatric poisoning remains a worldwide health issue that requires medical attention at hospital emergency departments with consequences of morbidity and mortality. In 2015, more than 1.3 million children were exposed to poisoning

substances according to the American Association of Poison Control Center (AAPCC) **(Mowry et al., 2016).** According to the World Health Organization (WHO) report (2008), an estimated 45,000 fatalities occur annually amongst children and young people (aged under 20) linked to acute poisoning **(Tobaiqy et al., 2020).**

Children, especially those aged 0 to 2 years, are at risk for scald and thermal burn because of their natural curiosity, impulsiveness, mode of reaction, and lack of experience in assessing danger and risk **(Li et al., 2017).**

AIM OF THIS STUDY

To estimate the proportion and patterns of unintentional children injuries and determine their risk factors and outcome from total injuries presented to main Emergency Hospital of Mansura University.

2. METHODS

Study Design:

A hospital based cross-sectional study was conducted during the period from November 2020 to December 2021 at Mansoura University emergency hospital.

Target population:

Injured Patient aged from 0-18 years old accepting to share in the study after explanation its aim and assuring confidentiality. In case of children or when patient was in coma or unable to speak, person who accompanied them answered the questionnaire. Any patient refuse to participate in the study or other injured cases older than 18 years were excluded.

Sample size and sampling method:

Sample size: was calculated using Daniel equation **(Daniel,1999),** based on the proportion of road traffic accidents (RTA) (20%) according to previous study (El-said Ahmed et al., 2017) with 95% level of confidence (CI) and acceptable margin error of 2%. sample size was calculated to be 682 patients. A systematic random sampling technique was used and a total of 1000 patients to compensate for incomplete data and to increase the study power. Response rate was 90.7%. The percent of unintentional children injury in relation to total injuries was 218 /907 (24%).

Study Tools:

An interviewer-administered semi-structured questionnaire, which included the following parts:

- **Part (A):** Sociodemographic characters of the studied cases (Age, sex, working parents, order of the child)
- **Part (B):** details of the injury (mechanism, type, site), Revised trauma score (RTS) was calculated after measuring Glasgow Coma Scale (GCS), systemic blood pressure (SBP), and the respiratory rate (RR) by the attending nurse at triage. The RTS is the sum of each variable multiplied by a weighted coefficient. RTS = 0.9368 GCS + 0.7326 SBP + 0.2908 RR. When summed, values can range from 0 to 7.84. Higher values indicate a better prognosis
- **Part (c):** detailed descriptions of specified injuries (falls, poisoning & burn).

Content validity of the questionnaire was assessed by a jury of 5 experts in the field of public health. A pilot study was done on 20 patients for testing the questionnaire and training the investigators on collecting data. Modifications were done accordingly. These cases were not included in results of the study. Cronbach's alpha internal consistency was calculated to be 0.79.

The researcher attended the emergency clinic two days a week. Subjects were selected using systemic random sample method until the total number of the sample (1000) was completed.

STATISTICAL ANALYSIS:

The collected data were coded, processed, and analyzed using Statistical Package of Social Science (SPSS) program (Version 24) for windows (*Chicago, IL, USA*). Categorical data were presented as number and percentages. Chi square and Fisher Exact tests were used to test the significance of categorical data. The level of significance was set at $p<0.05$ % and their 95% confidence interval (CI) were calculated.

3. RESULTS

In table (1), The percent of unintentional children injury in relation to unintentional injuries only it was 218/790 (27.6%). Preschool age (0-5y) children represented 32.6% of the studied children while school ages (6-18y) were 67.4%. About 74% of the children were males. The preschool injured children; 53.5% were boys and 46.5% were girls. Also, boys were the predominant sex among school agers (84.4%) versus 15.6% girls with p value <0.001.

Regarding parents' work out home, 71.8% of mothers and 85.9% of fathers of preschool injured children were working. Also, 61.9 % of mothers and 90.5 % of fathers of schoolers were working out home. About 22.5% of preschool injured children were the first child in the family, compared to 31.3 % of injured schoolers with no significant difference.

RTA was the most common mechanism of unintentional injury at school age followed by Falling and poisoning (43.5%, 22.4% and 12.9 respectively). While Falling was the most common mechanism of unintentional injury at preschool age followed by poisoning (63.4% and 25.4% respectively). There was a significant lower proportion of falling among school aged children than other group (22.4%vs63.4%) with OR=0.3.

Fracture, deep injuries, complex trauma and burn were significantly higher among children at school age (29.3% vs 8.5%) with OR=11.1 for fracture, (20.4% vs 11.3%) OR=5.8 for deep injuries, (24.5%

vs 15.5%) with OR=5 for complex trauma and (10.2% vs 9.9%) OR=3.3 for burns.

Regarding the site of injury, injuries of limbs was the highest (59.6% at preschool age and 46% for school age) with a significant difference (OR=2.5). polytrauma were significantly higher among school agers than other group (42.9% vs 3.8%) with OR=36.6.

Regarding the outcome between the two groups, 66.7% of the school aged children were admitted, 27.2% were discharged and 6.1% died. The rate of admission was higher among school age than preschool age (OR= 2.9). Injuries at home occurred at higher significant level among preschool aged children with OR=15.4

Table (2) shows the Population characteristics and circumstances of children falling by age. Among preschool injured children, 53.3% were boys and 46.7% were girls. Also, boys were the predominant among schoolers (87.9%) versus 12.1% girls with p value =0.001. Regarding parents' work, 71% of mothers of preschool injured children were working. As well, 57.6 % of mothers of injured schoolchildren were working. About 15.6% of preschool injured children were first child while 45.5 % of injured schoolchildren were first child with significant difference (p=0.004).

The majority of children at preschool age fell of the furniture (92%). While The majority of children at school age fell of the stairs followed by buildings then furniture (65%, 25% and 10% respectively) with significant p value <0.001.

The most frequent type of injury at school age was fracture (66.7%). While the most frequent at preschool age was superficial injuries (48.9%). Fracture was significantly higher among children at school age (p value<0.001).

As regard the place on incident, 77.8% of the children at preschool age were injured at home. While 72.7 % of injuries at school age occurred outside home. Falling at home occurred at higher significant level among preschool aged children than school age(p<0.001). The rate of discharge from the emergency hospital was lower among school age than preschool age (42.4% vs 60 %) without significant difference.

Table (3) shows the population characteristics and circumstances of children poisoning by age. Boys were the predominant sex among school age (94.7%) with p value =0.003. about 83% of mothers of injured preschool children were working vs 36.8 % in injured school age children with significant p value =0.004. About 44.4% of injured children aged from 0-5 and 26.3 % of injured children older than 5 years old were first child.

There was no significant difference between the two age groups regarding the causative agents; among children from 0-5 years old, 55.6% were poisoned by non-pharmaceutical agents among children older than 5 years old, 64.8% were poisoned by non-pharmaceutical agents.

regarding the outcome between the two groups, the rate of discharge was higher among school age than preschool age (63.2% vs 50 %) without significant difference.

As regard the place on incident, all children at preschool age were injured at home vs 73.7 % of injuries at school age without significance.

Table (4) shows the Population characteristics and circumstances of children burn by age. Among, boys represented 71.4 % of the preschool injured children and 66.7% of the school aged children. Regarding parents' work, 85.7 % of mothers of injured children from 0 to 5 years old were working. As well, 66.7 % of mothers of injured children older than 5 years old were working. About 14.3 % of injured children aged from 0-5 were first child and 86.7 % of injured children older than 5 years old were first child with significance(p=0.002).

There was no significant difference between the two age groups regarding the causative agents; among children from 0-5 years old, 85.7% were burnt by hot liquids and electrical burns and among children older than 5 years old, 53.3% were burnt by fire and 46.7% were burnt by hot liquids and electrical burns.

Regarding the outcome between the two groups, the rate of admission was 93.3% of the school aged children and 71.4% among preschool age without significant difference.

As regard the place on incident, all children at preschool age were injured at home vs 86.7 % of injuries at school age without significance. About 86% of children at preschool age were transported by ambulance while 13.3 % of children at school age were transported by private transport with significant p value =0.002.

Table (5) describes the association between death as an outcome and risk factors among children.

Higher rate of death was detected among children aging from 6-18 years old (6.1%) than 0-5 years old (1.4%) with no significance. Also, deaths were higher among males (5.6%) than females (1.8%) with no significant difference. There were no significant associations between death and mother's work, father's work and order of the child.

The table showed a significant association between RTA and death (p=0.01), complex injuries and death (p<0.001). Regarding site of injury; there were significant association as regard polytrauma versus mono trauma (11.4% vs 1.6%) with p=0.005.

Also, significant association between coma and death were found (p<0.001). Street as a place of injury was significantly associated with death (p<0.001).

Mean revised trauma score (RTS) was 3.44± 0.67 in children who died afterwards versus 6.83 ±1.4 in cases who didn't die at the examination room with significant difference (p<0.001).

Table (1): Characters of unintentional injuries by age of children n=218

Characters of unintentional injuries	total	0-5 Y N=71 (32.6%)	6-18 Y N=147 (67.45%)	Test of significance	OR (95% CI)
Sex					
Boys	162	38(53.5)	124(84.4)	χ 2=23.8	4.7(2.4-8.9)
Girls (r)	56	33(46.5)	23(15.6)	**p<0.001***	
Mechanism					
RTA	64	0	**64(43.5)**	22.2(**<0.001)***	-
Falling	78	**45(63.4)**	33(22.4)	4.6**(0.03)***	0.3(0.1-0.9)
Poisoning	37	18(25.4)	19(12.9)	1.6(0.2)	0.5(0.1-1.5)
fire/heat r	22	7(9.9)	15(10.2)	R	1
Others**	17	1(1.4)	16(10.9)	3.9(0.046)	7.4 (0.8-68)
Nature					
Fracture	49	6(8.5)	**43(29.3)**	24.7**(<0.001)***	13.1(4.3-39.7)
Superficial(r)	34	22(31)	12(8.2)	-	1
Deep(open/organ)	38	8(11.3)	**30(20.4)**	14**(<0.001)***	6.8(2.4-19.6)
Burn	22	7(9.9)	**15(10.2)**	5.7**(0.016)***	3.9(1.2-12.3)
Concussion	28	17(23.9)	11(7.5)	0.1(0.7)	1.1(0.4-3.3)
Complex trauma	47	11(15.5)	**36(24.5)**	13.9**(<0.001)***	6(2.2-15.9)
Site of injury	178				
limbs	89	31**(59.6)**	58(46)	5.1**(0.02)***	2.5(1.1-5.7)
polytrauma	56	2(3.8)	54**(42.9)**	33.5**(<0.001)***	36.6(7.6-176.3)
others *** (r)	33	19(36.5)	14(11.1)	r	1
Conciousness					
Coma	10	1(1.4)	9(6.1)	2.8(0.09)	5.1(0.6-41.2)
Altered	34	7(9.9)	27(18.4)	3.1(0.07)	2.1(0.9-5.3)
Alert(r)	174	63(88.7)	111(75.5)	r	1
Outcome					
died	10	1(1.4)	9**(6.1)**	5.4**(0.02)***	8.5(1.03-70.7)
Discharged(r)	78	38**(53.3)**	40(27.2)	R	1
Admitted	130	32(45.1)	98**(66.7)**	12.7**(<0.001)***	2.9(1.6-5.2)
Place	200				
Home	98	**60(84.5)**	38(29.5)	36.6**(<0.001)***	15.4(5-46.5)
Street	59	7(9.9)	**52(40.3)**	0.16(0.68)	1.3(0.3-4.8)
Others (r)	43	4(5.6)	**39(30.2)**	r	1
transportation to hospital					
ambulance	50	11(15.5)	39(26.5)	χ 2=3.3	
private transport	168	60(84.5)	108(73.5)	P=0.069	
Revised trauma score	Mean SD	6.65±1.62	6.74± 1.57	T=0.33 P=0.7	

**Others include: direct trauma(sharp/blunt), drowning, strangulation, pathological injuries, twisting
*** head/neck and trunk/pelvis injuries
Proportion of School injuries was 8.3%
Test used: χ^2=Chi-Square test r: reference OR: odds ratio
CI: confidence interval P: probability *statistically significant (p<0.05)

Table (2): Population characteristics and circumstances of children falling by age

characteristics of children falling	Total N=78	(0-5) Y N=45	(6-18) Y N=33	Test of significance
Sex				
Male	53	24(53.3)	**29(87.9)**	χ2=10.4
Female	25	21(46.7)	4(12.1)	p=**0.001***
Working mom	51	32(71)	19(57.6)	χ2=1.5 p=0.2
Working father	63	37(82.2)	26(78.8)	χ2=0.14 P=0.7
First child				
Yes	22	7(15.6)	15(45.5)	χ2=8.4
No	56	38(84.4)	18(54.5)	p=**0.004***
Nature of the fall**				
Building	5	0	5(25)	MC
Bed / furniture	25	23(92)	2(10)	**p<0.001***

Stairs /steps	15	2(8)	13(65)	
Injuries Fracture Sprain & superficial Others	 28 26 24	 6(13.3) 22(48.9) 17(37.8)	 22(66.7) 4(12.1) 7(21.2)	 12.7(<0.001)* 1.3(0.2) r
Site of injury Limbs others	 52 26	 28(62.2) 17(37.8)	 24(72.7) 9(27.3)	 χ2=0.9 p=0.33
Consciousness Alert Altered consciousness	 68 10	 39(86.7) 6(13.3)	 29(87.9) 4(12.1)	 FET P=1
Disposition Died Treated and discharged Admitted/ referred	 2 41 35	 0 27(60) 18(40)	 2(6.1) 14(42.4) 17(51.5)	 MC P=0.09
Place Home Others	 44 34	 35(77.8) 10(55.6)	 9(27.3) 24(72.7)	 χ2=19.7 **p<0.001***

** falling to ground, stumbling occurred in school age, falling from attendant arm occurred in preschool age
Test used: χ 2=Chi-Square test MC: Monte Carlo test
P:probability *statistically significant (p<0.05)

Table (3): Population characteristics and circumstances of children poisoning by age

characteristics of children poisoning	Total N=37	0-5 Y N=18	6-18Y N=19	Test of significance
Sex Male Female	 27 10	 9(50) 9(50)	 **18(94.7)** 1(5.3)	**FET** **p=0.003***
Working mom	22	**15(83.3)**	7 (36.8)	**χ2=8.28** **p=0.004***
Working father	35	16(88.9)	19(100)	FET P=0.23
First child Yes No	 13 24	 8(44.4) 10(55.6)	 5(26.3) 14(73.7)	 χ2=1.3 p=0.25
Causative agent Pharmaceutical agent Nonpharmaceutical agent	 14 23	 8(44.4) 10(55.6)	 6(31.6) 13(64.8)	 χ2=0.65 p=0.42
Consciousness Altered consciousness Alert	 3 34	 1(5.6) 17(94.4)	 2(10.5) 17(89.5)	 FET P=1
Disposition Treated and discharged Admitted/ referred	 21 15	 9(50) 9(50)	 12(63.2) 7(36.8)	 χ2=0.6 P=0.42
Place Home Others	 32 5	 18(100) 0	 14(73.7) 5(26.3)	 FET P=0.046
Transport Ambulance Private transport	 5 32	 5(27.8) 13(72.2)	 0 **19(100)**	 **FET** **P=0.02***

Test used: χ^2=Chi-Square test FET: fisher exact test
P:probability *statistically significant (p<0.05)

Table (4): Population characteristics and circumstances of children burn injuries by age.

characteristics of children Burn	Total N=22	0-5y N=7	6-18Y N=15	Test of significance
Sex Male female	 15 7	 5(71.4) 2(28.6)	 10(66.7) 5(33.3)	 FET p=1
Working mom	16	6(85.7)	10(66.7)	FET p=0.6
Working father	19	7(100)	12(80)	FET

				P=0.52
First child Yes No	14 8	1(14.3) **6(85.7)**	**13(86.7**) 2(13.3)	FET p=**0.002***
Causative agent Fire Hot water/ oil & electrical	9 13	1(14.3) 6(85.7)	8(53.3) 7(46.7)	FET p=0.08
Disposition Treated and discharged Admitted/ referred	3 19	2(28.6) 5(71.4)	1(6.7) 14(93.3)	FET P=0.22
Place Home street	20 2	7(100) 0	13(86.7) 2(13.3)	FET P=1
Transport Ambulance Private transport	8 14	6(85.7) 1(14.3)	2(13.3) **13(86.7)**	FET P=0.002*

All cases were alert, no deaths
Test used: χ^2=Chi-Square test FET: fisher exact test
P: probability *statistically significant (p<0.05)

Table (5): Association between death and risk factors of unintentional injuries

	Total	**Death**		**χ^2(p value)**	**OR(95% CI)**
		N	**%**		
overall	218	10	**4.6**		
Age in years 0-5 (r) 6-18	71 147	1 9	1.4 6.1	FET (0.1)	0.7(0.2-2.7)
Sex Male Female r	162 56	9 1	5.6 1.8	FET(0.4)	3.2(0.4-26.1)
Working mother **Yes r** **No**	142 76	6 4	4.2 5.3	FET (0.7)	1.2(0.3-4.6)
Working father **Yes** **No**	194 24	10 0	5.2 0	FET(0.6)	
First child **Yes** **No r**	62 156	4 6	6.5 3.8	FET (0.4)	1.7(0.46-6.3)
Mechanism RTA falling others r	64 78 76	7 2 1	10.9 2.6 1.3	5.9(**0.01)*** 0.3(0.57) r	9.2(1.1-76.9) 1.9(0.1-22.2) 1
Type of injury Complex trauma Concussion Others r	47 28 143	8 1 1	17 3.6 0.7	20.8**(<0.001)*** 1.6(0.2) r	29.1(3.5-239.9) 5.2(0.3-86.6) 1
Site of injury Polytrauma Monotrauma	70 122	8 2	11.4 1.6	FET**(0.005)***	7.7(1.6-37.5)
Consciousness Coma Alert/altered	10 208	8 2	80 1	FET**(<0.001)***	412(51.3-3308.9)
Place of incident Street Others	59 159	8 2	13.6 1.3	FET**(<0.001)***	12.3(2.5-59.9)
transportation ambulance private transport	50 168	5 5	10 3	FET(0.052)	3.6(1-13.06)
	Death	**No death**			
RTS	3.44± 0.67	6.83± 1.46		T=7.2	**P<0.001***

CI: confidence interval P:probability*statistically significant (p<0.05)
OR.odds ratio FET: fischer exact test r:reference

Table (6): Multivariate regression analysis for predictors of death:

Characters of children injuries	β	AOR (95%CI)	P value
Consciousness Coma Alert/altered(r)	5.302	200.7 (6.8-5891.5)	0.002
Revised trauma score	-2.311	0.099 (0.01-1.02)	0.053
Constant % Predicted Model χ^2	4.707 98.2% 61.73, p≤0.001		

AOR: adjusted odds ratio

4. DISCUSSION

In the present study, the proportion of unintentional children injury was (27.6%). the proportion of unintentional injuries among preschool age children was 32.6% of the studied children while school ages were 67.4%. So, school age children were liable to more injury than preschool children with statistically significant difference (p <0.001). This coincides with the incidence of China especially in rural areas as some rural children may drop out of school or go to work after primary or junior high school education **(Yin et al., 2020).**

As regard the places of injury, injuries at home represented 45 %. More than 60 % of injuries occurred in the home setting as reported by another Egyptian study **(Halawa et al., 2015).** Studies from Canada and Tehran found similar results **(Nguyen et al., 2004) (Karbakhsh et al., 2008).**

Regarding parents' work out home, 71.8% of mothers of preschool injured children were working. Also, 61.9 % of mothers of schoolers were working out home. studies also found that the UI rates were higher in children with working mothers but there was no increase in the frequency of injuries that required medical attention.

RTA was the most common mechanism of unintentional injury at school age in our study, followed by falling and poisoning (43.5%, 22.4% and 12.9 respectively) then other injuries as twisting, pathological fractures and dislocations and fires/heat (10.9% and 10.2%, respectively).

Similarly, the ASEAN 2019 study among school adolescents of secondary schools studying in Lao, Philippines, Thailand, and Indonesia indicate the most frequent cause of the reported injury was fall (10.2%) and motor vehicle (5.8%). The most common form of injury was a broken bone or dislocated joint (8.1%) and cut, puncture, or stab wound (3.4%) **(Pengpid and Peltzer, 2019).**

In contrary to our study and these studies; in the Indian study by **(Venkatashiva Reddy, Pundhir and Gupta, 2021),** the most like the cause of injury were cut/crash (30.6%), falls (26.3%), burns (19.4%) and road traffic injuries (11.3%), etc.

Regarding type of injury, the most frequent at school age was fracture followed by complex trauma, deep injuries, burns, superficial injuries and concussion (29.3%, 24.5%, 20.4%, 10.2%, 8.2% and 7.5%, respectively. A Uganda 2018 study among 1583 children (between 6 months and 18 years old) from Ugandan slums reported commonest injuries were cuts, bites, or open wounds (30.6%) and bruises or superficial injuries (28.6%) with the majority (75.5%) occurring at home **(Ssemugabo et al., 2018).**

Home and street injury were the most common in our study. This was supported by most similar studies as they found that the common place of injury is either home or house yards or schools or streets **(Venkatashiva Reddy, Pundhir and Gupta, 2021) (Ssemugabo et al., 2018).**

The role of gender was explicitly explored in several cohort studies **(Schluter, Paterson and Percival, 2006) (Ghebreab et al., 2021);** both of which identified males to be at a higher risk of childhood injury than females. This is consistent with our results and published literature from other countries such as United Kingdom **(Myhre et al., 2012) (Campbell et al., 2019).**

Our research studied the population characteristics and circumstances of children falling by age; About 15.6% of preschool injured children were first child while 45.5 % of injured schoolchildren were first child with significant difference (p=0.004). Likewise, second and third birth order was associated with increased incidence of fracture injuries. This is important; as children lacking proper supervision by their parents with more supervision by older siblings have a higher risk of childhood injuries **(Wang et al., 2011).**

The current study evaluated the population characteristics and circumstances of children poisoning by age, about 44.4% of injured children aged from 0-5 and 26.3 % of injured children older than 5 years old were first child. Among children from 0-5 years old, 55.6% were poisoned by non-pharmaceutical agents and 44.4% were poisoned by pharmaceutical agents. among children older than 5 years old, 64.8% were poisoned by non-pharmaceutical agents and 31.6% were poisoned by pharmaceutical agents.

Our results were consistent with previous work from Egypt **(Halawa et al., 2015)** reported more frequent poisoning among children aged 2–6 years than other age groups, predominantly with kerosene and

medications. In developing countries, unsafe storage of poisons in households; puts infants and young children at high risk for accidental ingestion.

As regard the place of fire/ heat accidents in our study, all children at preschool age were injured at home vs 86.7 % of injuries at school age without significance. Our study was consistent with the Egyptian study of **(Halawa et al., 2015)** who reported more than 60 % of injuries occurred in the home setting. Studies from Canada and Tehran **(Nguyen et al., 2004) (Karbakhsh et al., 2008)** found similar results.

ETHICAL CONSIDERATION:

- Study protocol was submitted for approval by institutional research board (IRB) (MD.20.03.289)
- Approval of the managers of the health care facilities in which the study will be conducted.
- Informed consent was obtained from the parent of each participant sharing in the study.

LIMITATIONS:

A single center hospital-based passive injury monitoring system with certain limitations was an obstacle to determining the rate of unintentional injuries in other areas in our district. This limits the number of our sample, and we could not obtain the exact rate of injuries, but up continuous monitoring can still provide useful information. Moreover, the household income, living arrangement, and psychological factors were not collected.

5. RECOMMENDATIONS:

- Preventing home injuries: implementing home safety measures: Engineering, for modifying products and modifying the environment to make home safer and parent injury prevention education and training programs.
- Improving risk-taking behavior (e.g. diving into water of unknown depth), adoption of safety practices (e.g. storage of medicines out of reach of children) and improving safety skills (e.g. safe cycling or road crossing)
- modifications to the home environment on the reduction of injuries due to environmental hazards including safety knowledge, possession, compliance with and use of safety equipment
- School-based programs: Primary preventive programs are aimed at preventing the situation in which the injury can occur, while secondary prevention aims to minimize the risk of injury should an event occur with the potential to cause injury by implementing a fire evacuation plan in the event of a house fire or wearing a cycle helmet to minimize head trauma in the event of a collision. Tertiary prevention through first aid treatment minimizes the harm incurred from an injury.

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