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Original Research Article

Influence of socioeconomic factors on accidental injuries in children

Poornima Shankar, Krithika G. S.*, Afroza, Balaji E.

Department of Paediatrics, Kempegowda Institute of Medical Sciences, Bengaluru, Karnataka, India

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***Correspondence:**
Dr. Krithika G. S.,
E-mail: krithika.gs@gmail.com

ABSTRACT

Background: The World Health Organization (WHO) report of 2006 stated that injuries account for a significant percentage of deaths in children. Of the 2.6 million child deaths recorded, among 1-14 year old children, 15.4% are said to be due to unintentional injuries. This study aims to establish if the socioeconomic status forms a risk factor for unintentional injuries.
Methods: This is a retrospective study conducted at Kempegowda Institute of Medical Sciences, Bangalore. Children between 0-18 years of age were included and case files of children admitted for unintentional injuries were studied and the socioeconomic status was analyzed.
Results: This study has helped us conclude that accidental injuries although variedly distributed between families of different socioeconomic class, were not significantly associated with lower socioeconomic status, overcrowding or parental age and employment. The only factor that emerged a risk was male gender (53.66%).
Conclusions: While majority of studies indicate that lower socio-economic status is associated with higher injury risk, our study did not indicate the same. Therefore, it calls for more studies which explore the various other factors.

Keywords: Injury, Accidental, Socioeconomic status, Poisoning, Fall

INTRODUCTION

Injuries are a major cause of morbidity and mortality in to pediatric age group and according to Garzon et al, 2005.[1] The World Health Organization (WHO) report of 2006 stated that injuries account for 1 to 1.5% of deaths in infancy, 6% of deaths in young children between 1-4 years and a much higher 25% in children between 5-9 years of age. It was also said that about 10 million children globally died every hour due to some form of injury and shockingly, 90% of them are unintentional.[2]

This brings us to question the factors that predict or are casual to accidental or unintentional injury risk. 'Unintentional injury' is defined as an injury that is not inflicted deliberately. This umbrella term could include burns, falls, and poisoning, drowning road traffic-related accidents.3 Several reports have brought to light how unintentional injuries are a major cause of mortality in children.[4-7] Of the 2.6 million child deaths recorded, among 1-14 year old children, 15.4% are said to be due to unintentional injuries. The most vulnerable of these children are 1-4 year old.[4]

Unintentional injuries are rarely attributed to a disease of the rich or poor. But the WHO report brought to light the interesting fact that economically impoverished countries are more at risk. African and South Asian countries show much higher incidence of accidental injuries than countries in Europe, America and Australia.[3]

Mackay et al published a systematic review of article between 1980 and 1996 suggesting that these accidental injuries in fact did hold a correlation to socioeconomic status. 8 Of the 10 million children hospitalized for

unintentional injuries, annually, 95% are said to be from low economy countries.[3]

Some of the socioeconomic factors that possibly affect injury risk are parental age and occupation, family type, poverty status, number of members in family and type of housing.[9-16] Laursen et al studied the influence of maternal age and education in Denmark and reported that lower maternal age and education form risk factors.[13]

In our study, we aim to establish how various socioeconomic risk factors like age, sex, parental age and occupation, family type, number of children and socioeconomic status affect different accidental injuries.

METHODS

This is a retrospective study conducted at Kempegowda Institute of Medical Sciences, Bangalore. Data of children admitted to our hospital between April, 2019 and October, 2020 (18 months) was collected from their case record files. Children between 0 -18 years of age who were admitted for accidental injuries with reliable history, were included in the study. Children with inherent higher risk of injury like physically or intellectually disabled children were excluded. The personal details of individual patients were not revealed and no ethical concerns were found.

Their type of injury, basic determinants like age, sex, time of injury and socioeconomic factors like parent's ages, employment status, type of family, socioeconomic status, were recorded from the case record files. These were tabulated in Microsoft excel spreadsheet and analysed using Microsoft excel and significance tests applied on RStudio. The population mean was taken from NFHS-5 (Karnataka – urban) statistics. All patients with accidental injuries were included.

RESULTS

In this study, a total of 41 children with unintentional injuries were studied. The injuries that were studied were burns, falls, road traffic accidents, poisoning, aspiration and animal bites. 24 % of children suffered falls and 24% ingested poisons, these being the most common of the injuries. This is indicated in table 1.

Table 1: Injury types and their distribution.

	Number	%
Burns/ scalds	6	14.63
Fall	10	24.39
Road traffic accident	7	17.07
Poisoning	10	24.39
Aspiration	1	2.44
Animal bite	7	17.07

Of the 41 children, 53.66% were boys and 46.34% were girls as shown in figure 1 and this was distributed amongst various injuries as shown in figure 2. The Karnataka child sex ratio, according to NFHS-517 is 1063 females per 1000 males. The odds ration being 1.23 indicates that males are more prone to accidental injuries. It was further noticed that males composed of 80% children prone to poisoning injury.

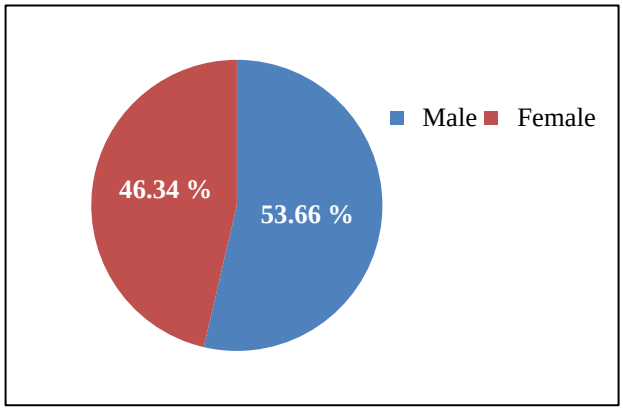

Figure 1: Sex distribution of all injuries.

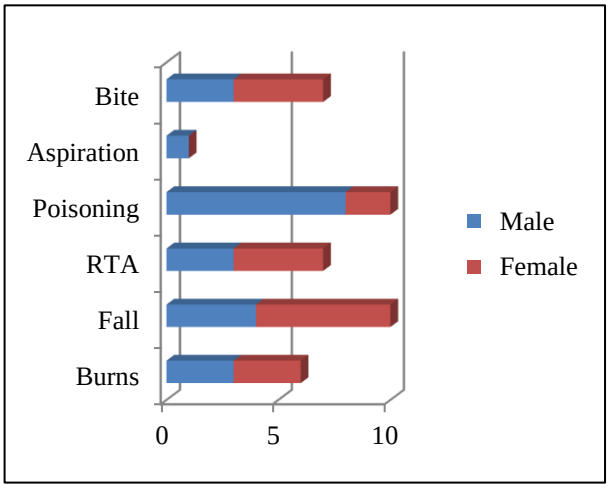

Figure 2: Sex distribution of various injury types.

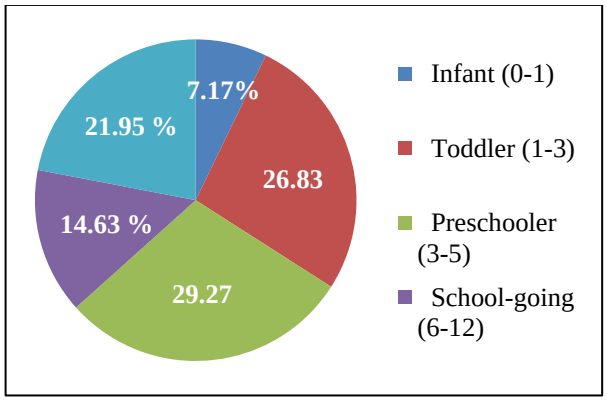

Figure 3: Age distribution of injuries.

Table 2: Socioeconomic factors and injury types.

Injury		Overall	1	Burns	2	Fall	3	RTA	4	Poisoning	5	Aspiration	6	Bite
	No.		**n=6**		**n=10**	**%**	**n=7**	**%**	**n=10**	**%**	**n=1**	**%**	**n=7**	**%**
Age (in years)														
Infant (0-1)	3	7.17	0	0	1	10	1	14.29	0	0	1	100	0	0
Toddler (1-3)	11	26.83	3	50	2	20	1	14.29	4	40	0	0	1	14.29
Preschooler (3-5)	12	29.27	2	33.33	4	40	1	14.29	4	40	0	0	1	14.29
School-going (6-12)	6	14.63	1	16.67	1	10	1	14.29	1	10	0	0	2	28.57
Adolescent (13-18)	9	21.95	0	0	2	20	3	42.86	1	10	0	0	3	42.86
Sex														
Male	22	53.66	3	50	4	40	3	42.86	8	80	1	100	3	42.86
Female	19	46.34	3	50	6	60	4	57.14	2	20	0	0	4	57.14
Time of the day														
Day time	29	70.73	5	83.33	8	80	5	71.43	7	70	0	0	4	13.33
Night time	12	29.27	1	16.67	2	20	2	28.57	3	30	1	100	3	42.86
Mother's age														
<20 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-25 years	12	29.27	1	16.67	2	20	4	57.14	3	30	1	100	1	14.29
25-30 years	18	43.9	4	66.67	6	60	0	0	5	50	0	0	3	42.86
30-35 years	11	26.83	1	16.67	2	20	3	42.86	2	20	0	0	3	42.86
>35 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Father's age														
<20 years	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20-25 years	3	7.32	0	0	2	20	1	14.29	0	0	0	0	0	0
25-30 years	11	26.83	1	16.67	2	20	2	28.57	4	40	1	100	1	14.29
30-35 years	14	34.15	4	66.67	0	0	1	14.29	5	50	0	0	4	
>35 years	13	31.71	1	16.67	6	60	3	0	1	10	0	0	2	28.57
Mother's employment status														
Employed	11	26.83	2	33.33	3	30	4	57.14	1	10	1	100	0	0
Umemployed	30	73.17	4	66.67	7	70	3	42.86	9	90	0	0	7	100
Number of Children														
1	7	17.07	1	16.67	2	20	2	28.57	2	20	0	0	0	
2	23	56.1	4	66.67	3	30	4	57.14	7	70	1	100	4	57.14
3	9	21.95	1	16.67	4	40	1	14.29	1	10	0	0	2	28.57
4 or more	2	4.88	0	0	1	10	0	0	0	0	0	0	1	14.29
Family type														
Single parent	1	2.44	0	0	0	0	0	0	0	0	0	0	1	14.29
Nuclear	11	26.83	2	33.33	2	20	3	42.86	3	30	1	100	0	0
Extended	12	29.27	3	50	3	30	0	0	3	30	0	0	3	42.86
Three generation	17	41.46	1	16.67	5	50	4	57.14	4	40	0	0	3	42.86
Socioeconomic status														
Upper	3	7.32	0	0	0	0	2	28.57	1	10	0	0	0	0

Continued.

Injury		Overall	1	Burns	2	Fall	3	RTA	4	Poisoning	5	Aspiration	6	Bite
Upper middle	11	26.83	1	16.67	3	30	0	0	2	20	1	100	4	57.14
Lower middle	18	43.9	3	50	6	60	3	42.86	5	50	0	0	1	14.29
Upper lower	7	17.07	1	16.67	1	10	2	28.57	1	10	0	0	2	28.57
Lower	2	4.88	1	16.67	0	0	0	0	1	10	0	0	0	0
Place of injury														
Home	21	51.22	6	100	7	70	0	0	7	70	1	100	0	0
Outside of Home	20	48.78	0	0	3	30	7	100	3	30	0	0	7	100

The mean age of children suffering accidental injury was 6.78 years (SD: 4.87). The age distribution is indicated in figure 3.

The socioeconomic factors that possibly affected these injuries were then studied. Their percentage distribution is indicated in Table 2.

Accidental injuries were found to be more common during the day (29 children, 70.73%) as opposed to in the night (12 children, 29.27%).

There was no significant difference between occurrence of accidental injuries and distribution of maternal age, maternal employment status and paternal age as opposed to general population. All fathers were employed and thus this factor was not studied.

The mean number of children that parents of the patient had was found to be 2.15. Compared to NFHS – 517 fertility rates of Karnataka (1.5), number of siblings a child had did not have a significant risk on injury risk (p=0.4).

Most of the children admitted for accidental injuries were found to belong to upper middle or lower middle class of modified Kuppuswamy classification.

There was one death which was due to animal bite in a male preschooler.

DISCUSSION

This study has helped us conclude that accidental injuries although variedly distributed between families of different socioeconomic class, were not significantly associated with lower socioeconomic status, overcrowding or parental age and employment. The only factor that emerged a risk was male gender (53.66%). This might be due to the more playfully aggressive nature associated with the gender. In studies done previously, parental age and education was found to be associated with significant risk. Scholer et al and Nathaens et al stated that a maternal age <20 years was a risk factor while Potter et al showed no significant association. Blakely et al.[18-22] found an association between injury and parental education. However, none of these were confirmed in our study.

While majority of studies indicate that lower socio-economic status is associated with higher injury risk, our study did not indicate the same. It was evident that male children were more injury prone. Other socioeconomic factors did not seem to affect injury risk. Therefore, it calls for more studies which explore the various other factors. A positive association will help to minimize the risk of accidental injuries to children.

The limitation of this study includes a relatively small sample size and lack of assessment of other factors that could influence injury risk like child's mental status and parenting style. Also, since our hospital attracts more patients of middle-class socioeconomic status, a significant lower class and upper-class population may not have been surveyed.

CONCLUSION

While majority of studies indicate that lower socio-economic status is associated with higher injury risk, our study did not indicate the same. It was evident that male children were more injury prone. Other socioeconomic factors did not seem to affect injury risk. Therefore, it calls for more studies which explore the various other factors. A positive association will help to minimize the risk of accidental injuries to children.

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