Unintentional Injuries among Under-Five Children in Mid-Western Nepal

Kafle B[1], Yadav UN[2], Marhatta SB[3], Mishra D[4], Pant ND[5]

Abstract

Introduction: Unintentional injury is the biggest threat to the survival of the under-five children, which impact is immeasurable to families and often entire communities. The objectives of this study were to assess the prevalence of unintentional injuries among under-five children and the factors associated with it. **Material and Methods:** A facility-based quantitative cross-sectional study was conducted from August 2016 to January 2017. Multistage time frame convenient sampling method was applied to collect the data from 259 mothers of under-five children in the selected district of Mid-Western Development region of Nepal. The data was collected from 10 rural health facilities and two from urban setting using a semi-structured questionnaire. An analysis was performed using SPSS ver.15. **Results:** The prevalence of unintentional injuries was found to be 33.20 % among the under-five children. The present study showed that ecological belt, the age of mothers, education of mothers, education of fathers, the occupation of mothers, the occupation of fathers, family income quintiles, household type, numbers of a sibling, age and gender of children were significant factors associated with unintentional injuries among under-five children. More than 70% of the respondents were not aware of how to provide first aid care to the children with respect to unintentional injury. **Conclusion:** This study highlights the burden of unintentional injuries among under-five children in mid-western development region of Nepal. Intervention targeting multifactorial issues in line with all type of fall injuries, burns and injuries with the use of sharp objects might be helpful to tackle the problems.

Key words: Fall injuries, Unintentional injuries, under-five children

Introduction

World Health Organization (WHO) reported lives of more than 2000 families every day around the world experience the loss of a child to an unintentional injury that could have prevented. Unintentional injury is the biggest threat to the survival of the under-five children, which impact is immeasurable to families and often entire community[1]. The leading causes of unintentional injury were

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falls, burns, other injury intentional strikes, exposure to an unspecified factor and motor vehicle transport[2].

More than 875,000 children are dying annually in the world due to injury, of which most of them occur in low and middle-income countries (LMIC)[3]. Worldwide each year about 349,000 children aged <5 years die due to unintentional injury and 98% of them died from LMIC.In total 13% burden of morbidity among ≤15 years of aged children is due to injury and 37% of deaths in <20 years due to unintentional injury. Global burden of disease estimated unintentional injury among <5 years children were responsible for 232, 00,187 disability-adjusted life years (DALYs) in 2015 and evaluate 8.9/100,000 children <5 death rates. People from deprived and a minority background in poor countries often face more impact of injury[4]. In India figure shows 82,000 children died of which 46.3% died due to unintentional injury in aged <5 children[5,6]. In 2015, an estimated of 1,240 under-five children died from the injury, of them (48.8%) were of unintentional injury in Nepal. Evidence shows that injuries to children occurs three times more in Nepal than western world[4]. In Nepal non-fatal falls injury being the most common cause of injury in children[7]. Children spending long periods of time in the home and the household environment presents a variety of potential hazards which increases the probability of childhood unintentional injury in the household setting and surrounding environment[8].

In low-income countries, unintentional injury has remained a major cause of death and disability for millions of children[9]. Injuries proved to have double impact burden of both disease and severe psychological disturbances at the individual level and economic consequences at family level[10]. Every year more than hundred thousand children die from injury and millions of children suffer the consequences of non-fatal injuries[1].

Fall injury is a common injury among under-five children. It is evidenced that young adults faced higher rates of intentional injuries while children are prone to the unintentional type of injury[9]. Global burden of disease report projected that global death because of injury will increase by 28% between 2004 and 2030[11].

High-income countries have identified risk and protective factors for individual types of child injury[12]. The literature showed age, sex, race, mother education, socio-economic status, children were not first bornand types of surface are the characteristics of children susceptible to injury or risk factors[12,13,14,15,16,17,18].

Adequate supervision, engineering measures, environmental measures, law and regulation, educational approaches, community interventions, mass media and pamphlet campaigns, pedestrian education, parent education and research are protective factors for injury[1,19,20,21,22,23]. Though this problem is well recognized in the western world in context to Nepal, this problem is not much more focused by researchers except few and lack of effective robust death registration systems data unclear in injury death rates. There is scarce of information on unintentional injuries among under-five children in the mid-western region. This study was adopted to fill the literature gap and findings might help develop interventions for the prevention of unintentional injuries among targeted groups. The objectives of this study were to look at the prevalence and find out the factors associated with unintentional injuries among under-five children of Mid-Western Nepal.

Material and Methods

This was a facility-based cross-sectional survey was conducted in Bardia, Dailekh and Mugu district of Mid-Western Development Region of Nepal. The study was conducted between August 2016 and January 2017. The study adopted a multi-stage time frame convenient sampling method for selection of study samples that are mothers of under-five children [Figure 1]. The totals of 259 mothers of under-five children were enrolled in the study.

The semi-structured tool prepared after through literature review and was validated by taking expert opinions. The mothers who did not have children below five years were excluded from this study. The data was collected through face to face interview at the health facilities by one of the research team member. All respondents were informed that the data collected would be treated with anonymity and confidentiality. Written informed consent was obtained from the respondents before interviewing them. The research protocol was approved by Institutional Review Committee of Manmohan Memorial Institute of Health Science.

The data were analysed using SPSS version 15. Frequency and proportion were reported, and the chi-square test was used as a statistical test to check the associations.

Results

Prevalence of unintentional injuries: Out of the 259 studied samples, the prevalence of self-reported unintentional injuries was the 33.20% among the under-five children in the selected study sites (Figure 2).

Socio-demographic characteristics of the respondents: In this study socio-demographic variables shows that 45.56% of mothers were in age group of 21 to

25 years with a median age of 25 years and interquartile range of mother aged group of (22 and 29). Additionally, this study shows that the median age of marriage of mothers was 17 years. All of the respondent mothers were married, and majorities of the respondent were ascribed as Hindu religion 93.82%, followed by Islam and others 3.9% and 2.3 % respectively. The major occupations of mothers were a housewife (39.0%) and others engaged in agriculture, business and daily wages (35.9%, 12.4%, and 5.4%) respectively. Our study shows a majority of mothers one quarter (25.1%) were illiterate and followed by higher secondary, primary and secondary education (22.0%, 21.6%, and 16.2%) respectively. The present study revealed that 3 out of 4 families lived in joint family structure and half of the study population was staying in *kaccha-pakka (semi-modern structure)* types of houses (Table1).

Profile of Under-Five Children: Our finding shows that male children under three years of age were more prone to unintentional injury. Fall injury and burn injury was a most common unintentional injury. Majority of the injury was reported to be in the upper extremities (31.39%) and followed by the head, lower extremities and face (30.23%, 18.60%, 11.62%) respectively. Of total (31.39%) injury occurred inside the home (i.e indoor environment) and followed by outside of the home, kitchen, and yard (29.06%, 22.09%, and 17.44%) respectively. The study also revealed that injury occurrence was prominent during the daytime. Notably, the majority of injury was severe, followed by mild and moderate (39.53%, 37.20%, and 23.25%) respectively. Commonly injury occurred due to the absence of the caretaker in the home while children are alone (Table.2).

Factors associated with unintentional injuries among the under-five children: Ecological belt, age of mothers, education of mothers, education of fathers, occupation of mothers, occupation of fathers, family income quintiles, types of household, number of siblings, age of children and gender of children showed significant association with unintentional injuries among under-five children (Table 3)

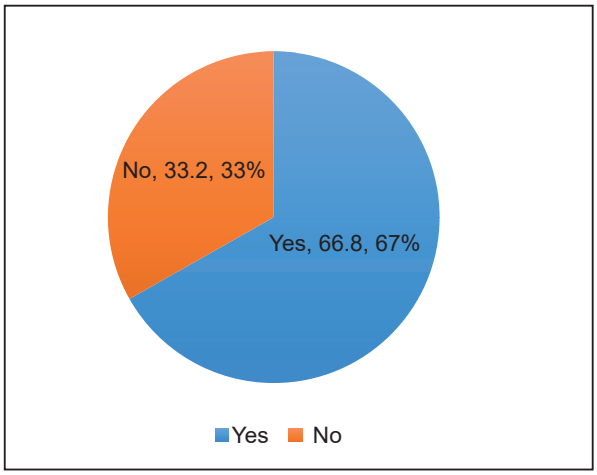

Fig 2: Prevalence of unintentional injuries among under-five children (n=259)

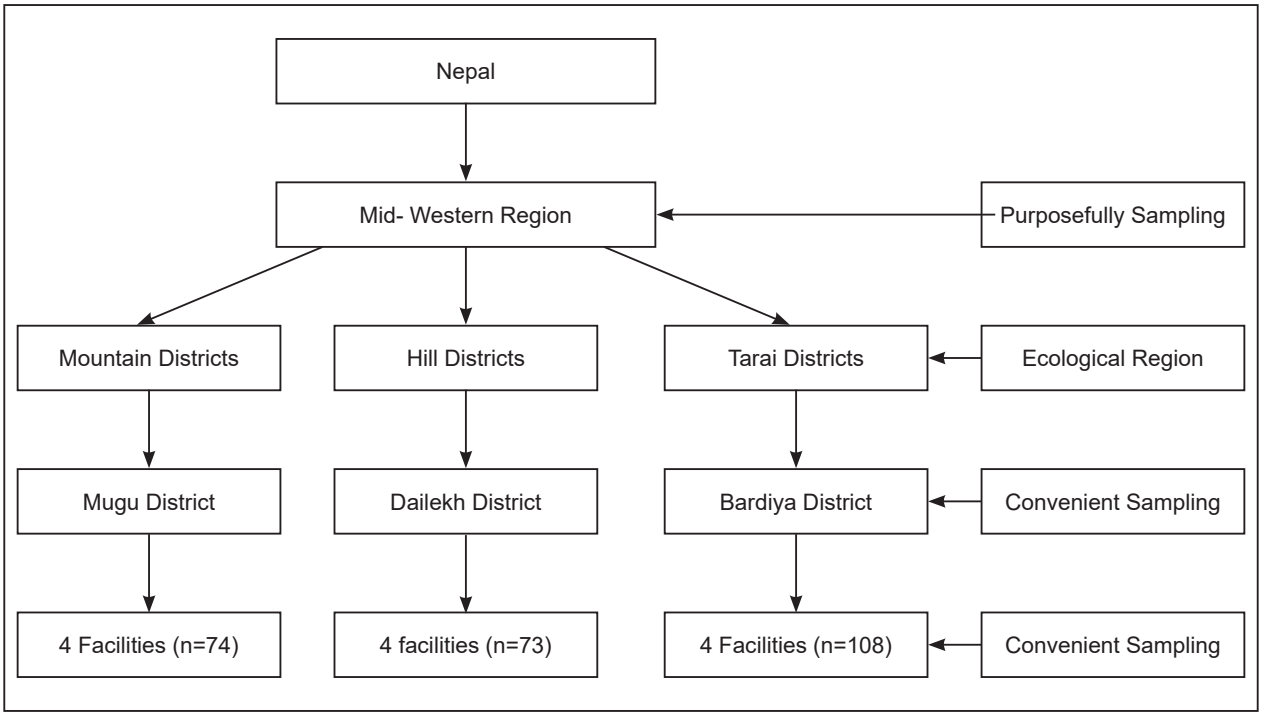

Fig. 1: Sampling model of multistage time frame located convenient sampling

Table 1: Demographic Characteristics of the Respondent

Category	Frequency (n)	Percentage (%)
Marital status		
Married	259	100.0
Occupation status		
Agriculture	93	35.9
Daily Wages	14	5.4
Business	32	12.4
Housewife	101	39.0
Government Job	8	3.1
Others	11	4.2
Education status of mothers		
No schooling	65	25.1
Primary	56	21.6
lower secondary	39	15.1
secondary	42	16.2
higher secondary	57	22.0
Religious status		
Hindu	243	93.8
Islam	10	3.9
Others	6	2.3
Occupation status of the husband		
Agriculture	75	29.0
Daily Wages	21	8.1
Business	38	14.7
Government Job	35	13.5
Foreign employment	50	19.3
Others	40	15.4
Education status of Husband		
No schooling	34	13.1
Primary	42	16.2
Lower Secondary	42	16.2
Secondary	62	23.9
Higher Secondary	79	30.5
Type of family		
Nuclear	57	22.0
Joint	200	77.2
Others	2	.8
Types of house		
Kachha	79	30.5
Pakka	39	15.1
Kachha-Pakka	141	54.4
Quintiles distribution		
Lowest	73	28.2
Second	33	12.7
Middle	50	19.3
Fourth	70	27.0
Richest	33	12.7
Types of yard		
Plastered	29	11.2
Unplastered	230	88.8

Table 2: Profile of children under five year's (U5) age

Category	Frequency (n)	Percentage (%)
No. of U5 children in a home		
1	106	40.9
2	133	51.4
3	16	6.2
4	4	1.5
Gender		
Male	142	54.8
Female	117	45.2
Age		
<3	183	70.7
>3-less or equal to5	76	29.3
Types of injury		
RTA	1	1.16
Falls injury	38	44.18
Burn	26	30.23
Sharp Instrument Injury	14	16.27
Animal bites	7	8.13
Part of injury		
Head	26	30.23
Face	10	11.62
Upper extremities	27	31.39
Lower extremities	16	18.60
Others	7	8.13
Severity of the injury		
Mild	32	37.20
Moderate	20	23.25
Severe	34	39.53
Place of injury		
Yard	15	17.44
Outside of home	25	29.06
Inside of home	27	31.39
Kitchen	19	22.09
Time of injury		
Morning	26	30.23
Day	32	37.20
Evening	26	30.23
Night	2	2.32
Any kind of disability		
Yes	4	4.65
No	82	95.35
Present	39	45.35
Not present	47	54.65
Situation during getting injury		
Single	37	43.02
With a friend	14	16.27
Parents/Caretaker	35	40.69
The responsibility of getting an injury		
Children own self	30	34.88
Parents	39	45.35
Caretakers	17	19.76

Table 3: Association between socio-demographic characteristics and injury status

Variables	Category	Recent Injury		Frequency/ Percentage (N=259)	*p*-value
		Yes (n=86) N (%)	No (n=173) N (%)	N (%)	
Ecological Belt	Mountain	34 (39.5)	44 (25.4)	78(30.12)	<0.001*
	Hill	28 (32.6)	45 (26.0)	73(28.19)	
	Tarai	24 (27.9)	84 (48.6)	108(41.69)	
Age of Mothers	<20	8 (9.30)	21 (12.14)	29(11.19)	0.041*
	21-25	38 (44.19)	80 (46.24)	118(45.6)	
	26-30	25 (29.07)	45 (52.33)	70(27.03)	
	>31	15 (17.440	27 (15.61)	42(16.22)	
Education of Mothers	Illiterate	23 (26.74)	42 (24.28)	65(25.09)	0.014*
	Primary	25 (29.07)	31 (36.05)	56(21.62)	
	High School	23 (26.74)	58 (33.53)	81(31.27)	
	College/Above	15 (17.44)	42 (24.28)	57(22.01)	
Education of Father	Illiterate	8 (9.30)	26 (15.03)	34(13.13)	0.039*
	Primary	21 (24.42)	21 (12.14)	42(16.22)	
	High School	36 (41.86)	68 (39.31)	104(40.15)	
	College/Above	21 (24.42)	58 (33.53)	79(30.50)	
Occupation of Mother	Working	62 (72.09)	85 (49.13)	147(56.76)	0.000*
	Not Working	24 (27.91)	88 (50.87)	112(43.24)	
Occupation of Father	Agriculture	29 (33.72)	46 (26.59)	75(28.96)	0.006*
	Daily Wages	10 (11.63)	11 (6.36)	21(8.11)	
	Business	12 (13.95)	26 (15.03)	38(14.67)	
	Government Job	10 (11.63)	25 (14.45)	35(13.51)	
	Foreign employment	14 (16.28)	36 (20.81)	50(19.31)	
	Others	11 (12.79)	29 (16.76)	40(15.44)	
Family Income Quintile	Lowest	26 (30.23)	47 (27.17)	73(28.19)	0.036*
	Second	8 (9.30)	25 (14.45)	33(12.74)	
	Middle	17 (19.77)	33 (19.08)	50(19.31)	
	Fourth	22 (25.58)	48 (27.75)	70(27.02)	
	Richest	13 (15.12)	20 (11.56)	33(12.74)	
Number of Siblings	No	27 (31.40)	79 (45.66)	106(40.93)	0.004*
	One	49 (56.98)	84 (48.55)	133(51.35)	
	Two Plus	10 (11.63)	10 (5.78)	20(7.72)	
Types of Household	Kachha	23 (26.74)	56 (32.37)	79(30.50)	0.011*
	Pakka	7 (8.14)	32 (18.50)	39(15.06)	
	Kachha-Pakka	56 (65.1)	85 (49.1)	141(54.44)	
Age of the Children	<3	49 (56.98)	134 (77.46)	183(70.66)	0.000*
	>3- less or equal to 5	37 (43.02)	39 (22.54)	76(29.34)	
Gender	Male	53 (61.63)	89 (51.45)	142(54.83)	0.032*
	Female	33 (38.37)	84 (48.55)	117(45.17)	

Note: *p*-value <0.05 shows the significance association and* indicates statistical significance

Discussion

There was dearth of studies on unintentional injuries among under-five children in mid-western Nepal and this study came out with some interesting findings. Our finding shows that the prevalence of unintentional injury was 33.20%. This is supported by the study conducted by Eldosoky et al. in Egypt, where author showed slightly high prevalence as compared to our result that is 38.3%[12]. Similarly, another study conducted in India by Shriyan et al. showed a prevalence of 46.3% which is comparatively higher than our study[6]. Our findings indicate that male children under-three years of

age were at high risk of unintentional injury. This finding is unison with the findings of previous other author studies[11,12]. In contrast, a study done in Iran and India found injuries were common among children above three years of age[6,11].

In the study fall injury, burning and sharp instrument injuries were the most common types of injury. Similar findings were observed in previous other author studies. Children living in mountain ecological belt were more at risk for injury, which might be because of the topography of land and lifestyle of peoples in the mountain, education status, and age of mothers were notable factors that make children more prone to injury. It could be explained in a way that uneducated mothers and those of early age have very less information and knowledge regarding rearing and caring of a child and the preventive methods to avoid unintentional injury among children's. Similarly, the results from Iran and India evidenced that mother's education and age of mothers is a risk factor for unintentional injuries of children[6,11].

We found mothers in working status by occupation and having only one child were associated with the occurrence of unintentional injuries among children. The possible reason could be mostly women are involved in the agro-based economy and have less time to take care of the siblings during the work period, and they often leave they're children at home for better work outputs. In this light the results from previous other author studies also evidenced it[9]. In addition, education and occupation of the father were found to be associated with the occurrence of unintentional injuries among under-five children. This might be because the illiterate parent and basically farmer parent have less time and knowledge to care and rearing children. Consistent results are shown by a study from different setting[6,12,24]. In this study, we found lower socio-economic (lowest and fourth quintile), living standard, low quality of housing (*Kachha-Pakka*) and worked father are risk factors for injury. This might be due to low economic status or poverty push children in vulnerability to injury. The lower socio-economic status household had less chance to build up the quality living standard and quality house, this lead to fathers spend more time working and less time to rear and care of children. Similarly, other study conducted in Iran, India, Australia, Peru, and China[6,11,13,14,24].

As like other studies, this study does have some strengths and limitations of its own. This study provides the picture of unintentional injuries among under-five children of selected districts of the Mid-western region comprising the all three ecological regions of Nepal. This study hopes to influence the larger studies to capture this issue so that child injury interventions can be designed. Despite the strengths, our limitation is that we adopted time-frame convenient sampling and the tool was semi-structured based on literature review, so it's genuine to have questions on the generalizability of the findings to the whole development regions. Furthermore, the information was collected from mothers of under-five children, where recall bias could not be ignored, however, the research team tried to minimize it using one interviewer during the entire data collection process.

Conclusion

The prevalence of unintentional injuries in children from western Nepal were significant and based upon the results we suggest the need of intervention addressing multi-factorial factors focusing on social determinants of health like economy and jobs, ways to increase household income, focus on education, modify the social and physical environment of home and the community. Further, this study insists on the need to conduct the study at a large scale to capture the problems in a more systematic and scientific way.

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