Fall Injury and Socio-Demographic Characteristics among House Hold in Ethiopia

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Abstract

Background: Fall injuries are a public health problem throughout the world including Africa. Studies in Ethiopia are health facility-based and do not reflect the communities. Therefore, the aim of this study is to assess association between fall injury and socio-demographic characteristics among house hold in Ethiopia.

Methods: The study was based on the Ethiopian Demographic and Health Survey conducted in 2016. The survey collected information about injuries in the past 12 months among 16,650 households. Households were selected using stratified cluster sampling procedure. Data were collected using a standard interview questionnaire from January 18, 2016 to June 27, 2016. Descriptive statistics and binary logistic regression analyses were used to characterize the data and to identify the factors associated with fall injuries, respectively.

Result: A total of 16,650 (98%) heads of household participated in the study with 152 reported at least one household member injured from a fall in the past 12 months. Among household members who were involved in a fall, 95.4% survived and 5.6% died. Selected socio-demographic characteristics: Household head sex [OR: 1.53, 95% CI (1.05-2.15)], age [OR: 2.4, 95% CI (1.28-4.63)], marital status [OR: 8.14, 95% CI (1.05-63.15)]; family size [OR: 1.93, 95% CI (1.27-2.93)], owns land usable for agriculture [OR: 1.60, 95% CI (1.14-2.27)], owns livestock herds [OR: 1.46, 95% CI (1.02- 2.08)] and household wealth index [OR: 1.77, 95% CI (1.11-1.95)] were variables statistically significant with the fall injury.

Conclusion: Household head characteristics including family size, agriculture-asset and wealth index were variables statistically significant with the fall injury. Injury prevention efforts should focus on falls with special attention among farmer households and low economic status.

***Keywords**: Falls, Unintentional Injury, Head of Household*, *Ethiopia.*

Introduction

An estimated 646,000 fatal falls occur each year, making it the second leading cause of death after road traffic injuries globally. Over 80% of fall-related fatalities occur in low and middle income countries [(1)].

Health facility based studies in Ethiopia indicate blunt assault as the most common mechanism of injury followed by road traffic crashes [(2, 3)]. These studies revealed mechanisms and associated factors that do not reflect fall injury information among communities. Additionally, individuals injured in falls might not seek health facility care. In Ethiopia, well organized population-based data is scant [(4, 5)]. Therefore, the aim of this study was to assess the association between fall injuries and household socio-demographic characteristics.

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Materials and Methods

This study was conducted based on readily available

Ethiopian Demographic and Health Survey (EDHS) 2016 data with no sample size estimation for the current study. The household datasets of the EDHS 2016 survey were downloaded from the EDHS Program website in SPSS format [6, 7]. The analyzed dataset is available from: https://dhsprogram.com/Data/.

The EDHS data were collected from January 18, 2016 to June 27, 2016 using standardized and pretested questionnaires. Households were selected from nine regions and two city administrations in Ethiopian using stratified cluster sampling procedures [8].

Injuries were assessed by asking the head of household whether any child or adult in the household was killed or injured in the past 12 months by any mechanism resulting in the victim or caregiver not being able to carry out their normal activities for at least a day. In addition, information about the mechanism, length of injury, severity of injury (fatal or not), characteristics of the victim (age, sex), were explored.

Socio-demographic characteristics: head of household sex, age, education, marital status, family size, residential place, agriculture related asset and household wealth index were assessed. The wealth index was given scores based on the number and types of consumer goods they own, properties ranging from a television to a bicycle or car, source of drinking water, toilet facilities, and house flooring materials. These scores were derived using principal component analysis. Association between fall injury and selected socio-demographic characteristics was determined using binary logistic regression analyses and the outputs were provided using odds ratio (OR) with the respective 95% confidence interval (CI).The data were analyzed using SPSS version 20.

Ethical Considerations

The EDHS 2016 study was ethically cleared by the National Research Ethics Review Committee, Ministry of Science and Technology of Ethiopia. Data were collected after obtained informed consent from the respondents prior to participation [8].

Results

Socio-demographic characteristics of participants

Of the 17,067 occupied households, 16,650 household heads (respondents) were successfully interviewed, yielding a response rate of 98%. Weighted sample distributions showed that 68.6% of the households were from rural areas while the remaining 31.4% were from urban areas.

The majority of respondents (68.5%) were men. The mean (±SD) age of the respondents was 44.2 (±16. 2) years. About half (52.4%) of the respondents had no formal education and very few (9.5%) had attained a higher level of education. The median (inter-quartile range) of household size was 4 (3-6).

Fall injuries among households

Among participants, 152 reported at least one household member injured from a fall in the past 12 months. In addition to falls, the survey collected information about the occurrence of other unintentional injuries in the same reference period. Fall injuries were the most common form of injury (33.2%). The other frequent causes of injury were road traffic accident (21.0%), violence/assault (14.1%), burns (10.5%), bite or kick by animals (5.5%), drowning and poisoning (2.2%). Falls contributed to 9% fatalities of all mechanisms of injury among injured households' members. Among household members who were injured in the past 12 months, 145 (95.4%) survived and 7 (4.6%) died. With respect to length of time, 61(42.2%) injured persons or their caregivers at home were unable to do their daily activities for more than one month (Table 1).

Table 1: Proportion of injury among affected household member in Ethiopian, EDHS 2016.

Injury status (n=152)	Frequency	Percent
Fall injury by sex		
Male	99	65.1
Female	53	34.9
Injury by Age		
0-14	48	31.6
15-24	18	11.8
25-34	14	9.2
35-44	20	13.2
45-54	19	12.5
55-64	15	9.9
64+	18	11.8
Length of time away from daily activities (n=145)		
< 8 days	30	20.7
8 to 30 days	51	35.2
31 day to 6 months	43	29.7
> 6 months	18	12.4
Don't know	3	2.1
Fall injury by place		
Urban	41	27.0
Rural	111	73.0
Fall injury by region		
Tigray	20	13.2
Afar	3	2.0
Amhara	29	19.1
Oromia	25	16.4
Somali	2	1.3
Benishangul	16	10.5
SNNPR	13	8.6
Gambela	7	4.6
Harari	6	3.9
Addis Adaba	16	10.5
Dire Dawa	15	9.9
Injury by household wealth index in quintile		
Lowest	29	19.1
Second	35	23.0
Middle	22	14.5
Fourth	19	12.5
Highest	47	30.9

Socio-demographic factors associated with injury

Selected socio-demographic characteristics: Household head sex, age, marital status, family size, owns land usable for agriculture, owns livestock and household wealth index were variables statistically significant with the injury (Table 2).

Table 2: Association between socio-demographic factors and injury among household heads in Ethiopia, EDHS 2016

Variable name	Injury status (n= 16650)		p-value	Crude OR (95% CI)
	Yes (%)	No (%)		
Sex of household head				
Male	117(1.0)	11296(99.0)	0.026*	1.53(1.05-2.24)
Female	35(0.7)	5202(99.3)		1
Age of household head				
15-29	15(0.4)	3347(99.6)		1
30-64	112(1.0)	10860(99.0)	0.002*	2.3(1.34-3.95)
>64	25(1.1)	2291(98.9)	0.007	2.4(1.28-4.63)
Marital status of household head				
Never married	1(0.1)	1045(99.9)		1
Married	118(1.0)	11946(99.0)	0.02*	10.3(1.44-74.0)
Widowed	22(1.0)	2086(99.0)	0.02*	11.0(1.48-81.9)
Divorced	11(0.8)	1412(99.2)	0.05*	8.14(1.05-63.15)
Education level of household head				
No education Preschool	76(0.9)	8650(99.1)	0.48	1.25(0.66-2.36)
Primary	52(1.1)	4606(98.9)	0.15	1.61(0.84-3.09)
Secondary	13(0.8)	1673(99.2)	0.80	1.11(0.49-2.48)
Higher	11(0.7)	1569(99.3)		1
Type of residence				
Urban	41(0.8)	5191(99.2)		1
Rural	111(1.0)	11307(99.0)	0.23	1.24(0.87-1.78)

Family size in household				
<4	45(0.7)	6413(99.3)		
4-5	47(0.9)	4953(99.1)	0.15	1.35(0.89-2.04)
5-6	17(0.9)	1953(99.1)	0.45	1.24(0.71-2.17)
>6	43(1.3)	3179(98.7)	0.00*	1.93(1.27-2.93)
Owns land usable for agriculture				
Yes	103(1.1)	9344(98.9)	0.00*	1.6(1.14-2.27)
No	49(0.7)	7154(99.3)		1
Owns livestock herds/farm animals				
Yes	109(1.0)	10469(99.0)	0.036*	1.46(1.02-2.08)
No	43(0.7)	6029(99.3)		1

Wealth index in quintile				
Lowest	29(0.6)	4647(99.4)	0.18	0.73(0.46-1.16)
Second	35(1.5)	2313(98.5)	0.01*	1.77(1.14-2.75)
Middle	22(1.1)	2035(98.9)	0.36	1.27(0.76-2.110
Fourth	19(0.9)	2001(99.1)	0.70	1.11(0.65-1.99)
Highest	47(0.8)	5502(99.2)		1

**p-value less than 0.05*

Discussion

A total of 152 respondents reported at least one household member injured from a fall out of 16,650 total household heads surveyed. Out of the total injured household number, males were more affected than females in the study. It is similar to other injury studies from different countries [2, 3, 9-13]. The reason might be due to male involvement in risk taking behaviors and social interactions, which are highly correlated with injuries [14-17]. Fall injuries were highest among children aged 1-14 years. This may be due to risk taking activities and the lack of parental supervision at home for young children [18-23].

Among household members who suffered an injury in the past 12 months, 95.5% survived and 4.6% died. This finding indicates that fall injuries result in a higher proportion of injury death when compared to other mechanisms of injury in Ethiopia (four hospitals in Addis Ababa ; < 1%) [24] and Kenya (Provincial General Hospital ;1%) [9].

Among household heads age group of 30-64 years and greater than 64 years have more than twice the odds of fall injury as compared to 15-29 years. This might

be due to a larger family size among age group of 30-64 years in a single home might compromised parental care practice compared with 15-29 years age group. It is explained by family characteristic study that large family size is one of the predictor for injury [25]. In addition; the current study revealed that households with more than six family members have greater odds of injury than households with less than four members. This result is consistent with other injury studies among children [25, 26]. It might be due to household crowding life condition [26]. Households with individuals more than 64 years of age might be more affected by fall injury. Falls among those over 64 years might be due to decreased muscle strength, disease and behavioral related problem and problems sleeping [27, 28].

Marital status of household head was a potential predictor for injury. It might be due to those married, divorced and widowed household heads might have more family members compared with single individuals. Additionally, divorced and widowed household heads might suffer from varying psychological stressors [29]. These conditions might compromise the safety practice to prevent injury among household heads [30].

Households that own land or livestock had higher odds of injury than households that do not possess such assets. This indicates that farming occupations have association with the occurrence of fall injury due to higher occupational risks. This finding is in line with other health facility-based injury studies from the country [3, 31].

Injury was more common among individuals from household of the second-tier wealth index compared with highest tier. Different injury studies indicate low socioeconomic status as a risk factor for the occurrence of injury [12, 26, 32, 33]. However, this current study found that the lowest wealth index was not a factor. The inconsistency might be due to criteria while computing the wealth index among studies.

This study had its strengths and limitations. The study is population-based and used large data from valid nationally representative information. Such information has not been frequently presented in previous studies in Ethiopia. However, the study data were from household heads and investigation resulted from self-reported data. Also, the study only assessed the socio-demographic factors of fall injury and did not explore more about household members' risky behaviors and other personal characteristics. Finally, we recommended further study, particularly using case-control design to explore more evidence on determinant factors associated with fall injury in the community.

Generally, household head characteristics, family size, agriculture-related asset and household wealth index were variables statistically significant with the fall injuries. Injury prevention efforts should focus on fall prevention efforts with special attention among farmers and low economic status.

Data Availability

The datasets used and/or analyzed during the current study available from: https://dhsprogram.com/Data/.

Conflicts of Interest: The authors declare no conflicts of interest.

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