ADDISS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF EMERGENCY MEDICINE

REASERCH THESIS ON

ASSESSMENT OF INJURY CHARACTERISTICS AND OUTCOME OF FALL DOWN ACCIDENT AMONG VICTIMS AT ADULT EMERGENCY DEPARTMENT OF TIKUR ANBESA SPECIALIZED HOSPITAL, ADDIS ABABA, ETHIOPIA

BY ANDUALEM WUBETIE

ADVISORS: SISAY TEKLU (MD, GYNECOLOGIST)

- **YONAS ABEBE (RN, MSC.EM&CCN)**

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SUMMARY

BACK GROUND:- Fall down accident is a major public health problem worldwide. It is the second leading cause of unintentional injury death, after road traffic injuries with annual estimation of 424 000 fatal falls. Over 80% of fall-related fatalities occur in low- and middle-income countries accounting over two third of these deaths. Though not fatal, approximately 37.3 million falls are severe enough to require medical attention occur each year. These falls are accounted for over 17 million disability-adjusted life years (DALYs) lost. (2)

Statement of problems:. According to the World Health Organization, over 91% of unintentional injury deaths and 94% of DALYs lost in LMIC in 2004. The highest injury burden often occurs in those countries with the weakest evidence to guide intervention strategies, the fewest resources, and the least developed infrastructure to effect change. Rapid urbanization and industrialization and also co morbidities are major risk factors. Fall down accident stastics in Ethiopia provides little knowledge about its magnitude and related information needed for prevention.

Significance of the study*:-* This study will help to gain information about the fall down accident characteristics and its burden related with major factors in the area of study and the country at large. It could help to develop countermeasures that could reduce the number and severity of accidents. In addition, the study may provide base line information to carry out further research.

Objective*:* To assess injury characteristics and outcome of fall down accidents among trauma patients at adult emergency department of Tikur Anbesa Specialized Hospital Addis Ababa, Ethiopia from Jan-Mar, 2015..

Methodology*:*

A prospective hospital based descriptive quantitative study was undertaken. A total of 233 fall down accident victims who visited the hospital between January and March 2015 were studied. A structured pre-tested interview questionnaire format was applied. The collected data were analyzed using SPSS version 20.0

Results

1124 (45.5%) were trauma patient from 2469 patients and 233 fall down accident victims were studied from 252 victims. Males were most affected gender accounted 179(76.8%) from of the 233 study participants. The patients' age ranged from 13 to 82 years and the dominant age group is from 21-30(33.5%). Students and government workers were the most affected social groups accounted for 41(17.6%), 38(16.3%) respectively. Majority of the victims were injured while walking 100 (42.9%) and next to that working activities accounted 86(36.9%). Obstacle objects was the most common factor for the majority of the accident 68(29.6).Musculoskeletal and head were the most injured body site 135(57.9%) and 54(23.2%) respectively. Lower limb fracture were the leading types of fracture61(26.2%). The overall length of hospital stay ranged from 1 day to 65 days with a mean of 5 days. The disability and mortality rate were 43(18.5%),8(3.4% respectively.

Conclusion

Economically active age group of the population was main victims of the accident and males were more than three times affected than females. Students and government employers were most affected social groups. The victims were injured mostly during walking and at work place. Musculoskeletal and head were the most injured body site and lower limb fracture were the leading types of fracture . Disability was the most outcome of this study.

Key words
Fall down accident, injury characteristics, outcome, Tikur Anbesa specialized hospital.

Table of contents **page**

LIST OF FIGURES

List of tables

Abbreviations

AA	Addis Ababa
AAU	Addis Ababa University
CSA	Central Statistical Agency of Ethiopia
DALYs	Disability-adjusted life years
ED	Emergency Department
GCS	Glasgow coma score
IRB	Institutional Review Board
LAMA	Left against medical advice
LMICs	low and middle-income countries
MOH	Ministry of health
NCBH	North Central Bronx Hospital
PPE	Personal protective equipment
STFs	Sleep, trip and falls
SPSS	Statistical Package for the Social Sciences
TAH	Tikur Anbesa Hospital
US	United States
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1. BACK GROUND OF THE STUDY

Globally, falls are a major public health problem. The world health organization estimates that in the year 2010, about 540,000 people die from falls (1). Annually an estimation of 424 000 fatal fall is occur, making it the second leading cause of unintentional injury death, after road traffic injuries. Over 80% of fall-related fatalities occur in low- and middle-income countries accounting over two third of these deaths. Though not fatal, approximately 37.3 million falls are severe enough to require medical attention occur each year. These falls are accounted for over 17 million disability-adjusted life years (DALYs) lost. (2)

According to global statistics, Approximately5.8 million people lost their lives each year due to injuries, which accounts for 10% of the world's death. 90% of these injury deaths occur in low and middle-income countries (LMICs) (3). It is estimated that 16000 persons die every day worldwide from all types of injuries. It is the most common causes of death among 15 - 59 year old people, and men have higher death rates than women. Injuries represent about 12% of the global burden of disease, making injuries the third most important cause of overall mortality. The rate of injury mortality in African nations in 2004 was highest in Nigeria and lowest in Egypt. South Africa and Ethiopia were second and third, respectively (4). Injury is more common among men and among persons aged 15–44 years (5). Trauma affects a relatively younger population, it accounts for more productive years of work lost than other illness, with an enormous economic and societal impact. The global burden of injury is inversely proportional to income. Mortality increases concomitantly with the decreasing economic level of a country, for example, a study shows 35% mortality rates for injured patients in the U.S., to 55% in Mexico, to 63% in Ghana (6)

Falls account for 40% of all injury deaths (7). Rates vary depending on the country and the studied population. For example an estimated 12,000 deaths and 10 million falling injuries annually in the United States. In the South-East Asia Region found that in China, 6-31% (9-13) while another, found that in Japan, 20% (14) of older adults fell each year. A study in the Region

of the Americas (Latin/Caribbean region) found the proportion of older adults who fell each year ranging from 21.6% in Barbados to 34%in Chile (8).

The etiology of falls as injury-producing events is multi-factorial, and has multiple mechanisms of exposure. (9). Even if all people who fall are at risk of injury, there are different risk factors that can affect the type and severity of injury. Individual factors commonly the age, gender and health of the individual.

Age is one of the key risk factors for falls. A study done in Maryland USA Uniformed Services University of the Health Sciences on falls in young, middle-aged and older adults on community shows that falls increased with age from 18% in young, to 21% in middle-aged and 35% in older adults (10). Older people have the highest risk of death or serious injury arising from a fall and the risk increases with age. This risk level may be in part due to physical, sensory, and cognitive changes associated with ageing, in combination with environments that are not adapted for an aging population (11). Falls are the leading cause of injuries requiring emergency treatment in older people and lead to more hospital admission and deaths than any other type of trauma (12).

Across all age groups and regions, both genders are at risk of falls but mostly noted that males are more likely to die from a fall, while females suffer more non-fatal falls Worldwide. Males consistently sustain higher death rates and DALYs lost. Possible explanations of the greater burden seen among males may include higher levels of risk-taking behaviors and hazards within occupations. Other risk factors are occupational and environmental which includes: occupations at elevated heights or other hazardous working conditions(construction work), alcohol or substance use, socioeconomic factors including poverty, overcrowded housing, and also underlying medical conditions, such as neurological, cardiac or other disabling conditions, side effects of medication, physical inactivity and loss of balance, particularly among older people; poor mobility, cognition, and vision, unsafe environments, particularly for those with poor balance and limited vision. According to WHO prevention methods, Fall prevention strategies should be comprehensive and multifaceted. They should support policies that create safer environments and reduce risk factors. They should promote engineering to remove the potential for falls, the training of health care providers on evidence-based prevention strategies; and the education of individuals and communities to build risk awareness.(2). Effective fall prevention programs aim to reduce the number of people who fall.

1.2. STATEMENT OF THE PROBLEM

As global focus of prevention and early intervention, techniques have substantially reduced the burden of infectious diseases, unintentional injuries are increasing in significance as a public health problem. The burden of injury is not only its fatality but also; nonfatal health outcomes represent a large component of the injury burden. A substantially higher number of injuries result in potentially life-long disability, significant psychological trauma, and subsequent financial loss. Because injuries usually occur in young healthy individuals due to work related, the number of years lived with disability is usually very large. According to the World Health Organization, up to 50% of young populations with unintentional injuries that present to a hospital are left with some form of disability (13). Fall is the major unintentional injury-related causes of disability-adjusted life-years lost annually accounted 12.2 %(14). The burden is higher in low- and middle-income countries (LMIC). According to the World Health Organization, over 91% of unintentional injury deaths and 94% of DALYs lost in LMIC in 2004. It accounted for over 7% of total deaths and over 9% of total DALYs in these countries. The highest injury burden often occurs in those countries with the weakest evidence to guide intervention strategies, the fewest resources, and the least developed infrastructure to effect change. Apart from individual factors, construction industry has been identified as one of the most hazardous industries in many parts of the world and falls are a leading cause of fatalities and disabilities in construction operations. Fall accidents are significant public health risk and a leading cause of nonfatal and fatal injuries among construction workers worldwide. A more comprehensive understanding of causal factors leading to fall incidents is essential to prevent falls in the construction industry (15). Developing countries like Ethiopia are striving hard to improve their basic amenities by building, housing complexes, roads, schools, hospitals, shops, offices, highways, power plants, industries, bridges and other infrastructures. Addis Ababa, Ethiopia's high altitude capital, is a city undergoing one of the fastest rate of urban growth in the world. The huge scale of development and change that is occurring makes it seem like the entire city is just one big construction site. All across the city new houses, condominiums, offices, roads and other pieces of urban infrastructure are being built more or less simultaneously(16). However, all these construction activities are carried out by unskilled labor forces at cheap rate. Falling accidents among these workers are high due to illiteracy, poverty, lack of health and safety training and information on health hazards and risks

at the work place. Such workers are known to face rapidly changing workplaces, a high degree of competition and bouts of unemployment [17,18]. Hence, in developing countries the occupational health and safety hazards faced by construction workers are greater than those in industrial countries. The impact is also 10 to 20 times higher in these counties, where the greatest concentration of the world's workforce is located [19,20]. However, even though work-related injuries present a major public health problem resulting in serious social and economic consequences, it can be prevented if appropriate measures are taken[9]. In Ethiopia, little work has been done on occupational health and safety aspects of building construction workers and as per literature review there is lack of data about prevalence and determinant factors of fall down accident related to construction works among these workers in addition to other personal and environmental factors. Therefore, the present study attempted to contribute in determining magnitude and factors of falling accident related to different causes.

1.3 Significance of the study

This study may be help full to have knowledge on complex problem of fall accident and to gain information about injury characterstics and its burden in the area of study and the county at large. It could help to develop countermeasures that could reduce the number and severity of accidents. In addition the study may provide base line information to carry out further research on characteristics and outcome of the falling accident. The data obtained in this study, may be used by concerned bodies for planning and evaluating falling preventive measures. The recommendations given if considered are going to benefit the public at large on prevention of falling accidents.

CHAPTER TWO

LITERATURE REVIEW

The global burden of disease study estimated that 5.8 million people die worldwide each year from injuries that accounts for 10% of the world's deaths, which corresponds to a rate of 97.9 per 100000 populations. Of these 5.8 million people, 3.8 million were male and 2.0 million were female *(21)*.

Falls are a major global public health problem**.** A study in US estimated that 12,000 deaths and 10 million falling injuries occur annually accounts for about 20 percent of the total of all national accident casualties , making it second after automobiles as an accident cause . More than 1/2 million persons require hospital treatment each year for fall related injuries ,most resulting in activity restrictions and lost time. According to the study in the North Central Bronx Hospital (NCBH) 203 patients who fell from heights of 5 to 72 feet and who died or were admitted to NCBH were reviewed. The findings show a male-to-female ratio of two to one, an age range of four months to 86 years. Seventy-six percent of patients had skeletal, 12 percent abdominal, and 10 percent skull fractures and cerebral edema. 5 percent of adults had craniocerebral trauma. Thirty-one percent required surgery. Ten percent of the admitted patients had permanent disabilities. Overall mortality was 28 percent. Most of the falls were accidental (45 percent) or suicide attempts (22 percent).(22)

Fall down is the most frequent accident in construction workers and it has been concluded that it is the most dangerous accident in many countries. Construction labor form 7.5% of the world labor and contributes to 16.4% of total fatal global occupational accidents (23). According to the study in USA, between 1992 to 2006 fall accidents contribute 32% of fatality (24) and 37% of death in the construction industry. In China, it accounts for 51% of injuries in the construction industry (25). A research conducted in Hong Kong found that fall accidents represent more than 47% of total fatality in 2004 (26). In another study in Indonesia on the nature of fall Accidents in Construction Projects shows that among 318 falling cases from height the main factors of falls are mostly personal(61%) and non personal (30%) . The accidents mainly occurred on areas of scaffolding (52%) ,on working structure (28%) and on ladder(20%). The falling accident occurred during morning time (27%), afternoon(42%),evening (21%).the most riskier groups are from age20-30 .(27) While in another study in Korea showed that it accounts 21.6% from ladder, 16.1% from steel frame structure, 14.5% from foothold,14.4% from scaffold,7.1% from

passage and floor. Steel pipe scaffolds cause more accidents compared to system scaffolds. out of all injuries caused by falls from scaffolds, 18% was caused by pipe scaffold, 41% was caused by pipe frame scaffold, and 0.2% was caused by system scaffold. The most common reason for falls from the height is negligence of employers in keeping the guideline of construction safety.(28) A study in Newcastle General Hospital,UK in 2003 shows that alcohol drink has a higher incidence of fall down acciden with significantly 48% of victims have sever head injury compared with non alcoholic accounting 9% of victims have. (29)

slip,trip and falls are the common cause of accidental reports. According to the study in Morgantown, West Virginia ,Of the 226 STFs, there were 46 (20.4%) falls to a lower level, 117 (51.8%) falls on the same level, 41(18.1%) slips, trips, or loss of balance without a fall, and 22 (9.7%) from other events. The event associated with the highest number of falls on the same level were to the floor, walkway, or other surface (77 injuries) and onto or against objects (31 injuries). The source associated with the highest number of falls were floors of building, walkways, ground surfaces, steps, and parking lot surfaces (118 STFs, 52% of all STFs). Body motion and posture was the second most prevalent source of STFs (40,17.7%). The most prevalent nature or diagnosis of injury for STFs from first report of injury was due to contusion (75), pain, nature unspecified (69), sprain (24), strain (27),and laceration (12). **(30)**

According to a study conducted in Eldoret, Kenya, falls accounted for 17%. Eighty percent of the casualties were treated as outpatients while 20% were admitted and the mean length of stay was seven days (31). According to the study on Occupational Injuries, among building Construction Workers in Gondar City, the fall injuries constitute about 37.4 % among the total injuries accounting 38.7%.Of the total injuries, more than half (68.39%) were reported by males while the rest reported by females workers(32). In another study in North Gondar, fall accounted for 18.6% next to assault 48.5%. (33) According to a community based study in Jimma zone, falling accident was among the most common causes of injury, accounted for 20.9%. The results also showed that most of the injuries occurred around the house, (26. 1%), inside the house, (22.3%) and farming place, (17.6%) Common outcome of injury were wound (53.8%), sprain (8.0%), bruise (7.1%) and fracture, (6.6%) (34).In a preliminary study in Tikur Anbessa Hospital, Accidental fall accounted for 21% next to motor vehicle injuries accounted for 41% of all causes. Admitted cases were 11.6% with an overall mortality of 1.47% (35). In another study on the same area on trauma in a retrospective study from 1960 to 2013, fall down accident accounted

16% from all unintetional injuries.(36).Based on the previous studty in the study area and other places, fall down accident is a relatively comprehensive picture of magnitude and outcome of injury.Therefor, with the objective of determining injury characters and out come of fall down accident, this study would also play a part in evidence based policy dialogue to help advocate for formulating injury prevention strategies.

CHAPTER THREE

OBJECTIVES

3.1. General Objective

The general objective of the study is to assess injury characteristics and outcome of fall down accident among victims at Adult Emergency Department of Tikur Anbesa specialized hospital, Addis Ababa, Ethiopia, 2015.

3.2. Specific Objectives

1. To assess the injury characteristics of fall down accidents victims.
2. To determine the major causes and contributing factors of fall down accident
3. To assess mortality and morbidity fallowing fall down accident.
4. To assess the relationship of risk factors for fall down accident with mortality and morbidity

CHAPTER FOUR

METHODS AND MATERIALS

4.1. Study Area and Period

The study was conducted at Tikur Anbesa specialized hospital, Addis Ababa from January 2015 to March 2015. Addis Ababa is the capital city of Ethiopia. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), Addis Ababa has a total population of 2,739,551, of whom 1,305,387 are men and 1,434,164 women; all of the populations are urban inhabitants (37).

The city has 49 hospitals. Thirteen are public hospitals**.** Of these public (governmental) hospitals six of them are under Addis Ababa city administration. Other five hospitals are administered under the federal ministry of health of Ethiopia including Tikur Anbessa General Specialized hospital,. The rest two hospitals are under defense ministry of Ethiopia. Thirtysix of the city's hospitals are private. Furthermore, the city has 51 health centers and 700 different level private clinics (**data obtained from medical service directorate of the federal ministry of health, AARHB, and Addis Ababa city admistration)**

This study was conducted in **Tikur Anbessa General Specialized hospital**, which provides organized emergency care services. Black Lion Hospital (Tikur Anbesa in Amharic), located in the nation's capital Addis Ababa, is Ethiopia's largest general public hospital and one of University Hospitals in the country. In 1998 Black Lion Hospital, which is also the largest referral hospital in the country was given to Addis Ababa University (AAU) by the Ministry of Health (MoH) for the faculty as a main teaching hospital. The faculty is the oldest and the largest among the health training institutions in the country, staffed with the most senior specialists. The hospital totally holds 123000m.sqarea of land, and its buildings have settled on 45000m.sqarea; there are 1262various rooms from the basement to the eight floors.

The hospital provides a tertiary level referral treatment and is open 24 hours for emergency services. The hospital is administered by Addis Ababa University and is the largest and oldest teaching hospital among all in Ethiopia providing teaching for about 300 medical students and 350 Residents every year. Black Lion hospital offers diagnosis and treatment for approximately

370,000- 400,000 patients a year. The hospital has 800 beds, with 130 specialists, 50 non-teaching doctors. The emergency department sees around 80,000 patients a year. (38)

4.2. Study design

This study was a prospective hospital based descriptive methods of study for injury characteristics and outcomes of fall down Accidents among patients attending emergency department of Tikur Anbessa General Specialized hospital, A.A, Ethiopia.

4.3. Source Population

The source population was all patients (trauma and nontrauma) patients visiting adult emergency units of Tikur Anbessa Specialized hospital, Ethiopia.

4.4. Study Subjects

The study subjects were all victims of falling accident visiting adult emergency unit of Tikur Anbessa General Specialized hospital in a study period.

4.5. Inclusion and Exclusion criteria

Subjects for the study were all falling down accident victims who attend Adult emergency department of tikur anbesa hospital within the data collection period. The study was included all victims irrespective of injury severity during the study period. Those victims who refused to give consent and those that did not answer the questions because of his or her conditions and as well with no key informant was excluded.

4.6. Sample size determination

All victims of Falling down accidents who came in the study period were the samples of the study.

4.7. Sampling techniques and procedures for interview and record reviews

All patients who had fallen down accident within a period of the data collection were interviewed.

4.8.1 Methods of Data Collection for interview and record reviews

The data was collected by interviewing study subjects or close attendants for Socio demographic variables, causes of falling accidents, place of accidents, date and time of accident. Additionally

charts of falling accident patients from the medical records section was checked for, relevant information (data). Also the final outcome of each patient was studied as the patient had died, discharged or referred. The Card number of victim was documented in order to prevent the participants from getting, missed, or mixed up and to evaluate the outcome and it was erased after data collection**.**

4.8.2 Instrument

The structured interview questionnaires and card review checklist was used and it was checked by pretest.

4.9. Variables

4.9.1. Dependant variables

- Site of injuries of the victim
- Type of injury
- Type and severity of organ injury
- Type of surgical procedure performed
- Patient outcome of injury

4.9.2. Independent variables

- Socio demographic variables
- The victim's activity
- Time of injury
- place of falling accident
- Victim's previous history

4.10. Data Quality Control

The quality of data was assured by properly designing and pre-testing of the questionnaire, proper training of the interviewers and supervisors of the data collection procedures, proper categorization and coding of the questionnaire. Every day, questionnaires was reviewed and checked for completeness by the supervisors and principal investigator and the necessary feedback was offered to data collectors.

4.11. Methods Data Analysis and interpretation

The data was edited manually, entered into the computer and analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.00.

4.12. Operational definitions

Fall---an event which results in the person coming to rest inadvertently on the ground or other lower level, and other than as a consequence of sustaining a violent blow, external trauma, loss of consciousness, sudden onset of paralysis, or an epileptic seizure

Falling from height---falling of a person more than two meters

Falling from low level---falling of a person less than two meters

4.13 Ethical considerations

Permission to carry out the study was obtained from the Institutional Review Board (IRB) of Addis Ababa University College of health science, school of medicine, department of emergency medicine. The interviews to these accident victims was done after having their consent to participate in the study after explaining the purpose of the study. Respondents was informed that they have a right to decline the interview.

4.14. Dissemination of the result

The study result will be presented to Addis Ababa University, Faculty of Medicine department of emergency medicine and documents will be disseminated to all responsible bodies in the study area, for the hospital where the study is conducted, MOH and Addis Ababa university school of emergency medicine.

CHAPTER IV

RESULTS

4.1. Socio – Demographic characteristics

From the total 2469, patients who visited the emergency department of Tikur Anbesa Specialized Hospital during the study period, 1124 (45.5%) were trauma patients. From this fall down accident accounted 252(22.42%) next to road traffic accident 402(35.8). Out of the 252 cases that were interviewed, 233 questionnaires were correctly completed making a response rate of 92.5%Ci. From 233-study population, Males were 179 (76.8%) and females were 54 (23.2%), giving a male to female ratio of 3.3:1. The patients' ages ranged from 13 to 82 years. The majority of victims were between 21 - 30 years old accounting for 78(33.5%) of patients. Students/trainee 41 (17.6%) followed by government employers 38 (16.3%) were the dominant social groups who were affected with injury. Next to students and government employers, daily labors and construction workers accounted 33(14.2%) and 30(12.9%) respectively. The educational status of most victims was primary school 81(34.8%) and followed by illiterates 43(18.5%). Ethnic origin of 94(40.3%) respondents were Amhara, followed by Oromo 75(32.2%) and regarding religious status 183 (78.5%) were orthodox, Muslim 34 (14.6%) and 15(6.4%) Protestant.

Table 1: Table showing the percentage of Socio demographic characteristics of patients with fall down accident attending adult emergency department Tikur Anbesa Specialized hospital , Addis Ababa Ethiopia, Jan-March, 2015

Socio demographic characteristics		Number	Percentage (%)
Sex(n=233)	Male	179	76.8
	Female	54	23.2
Age (in yrs)	11-20	42	18
	21-30	78	33.5
	31-40	36	15.5
	41-50	20	8.6
	51-60	28	12
	61-70	16	6.9
	>70	13	5.6
Religion	Orthodox	183	78.5
	Muslim	34	14.6

	Protestant	15	6.4
	Others	1	0.4
Ethnicity	Amhara	94	40.3
	Oromo	75	32.2
	Tigray	20	8.6
	Gurage	16	6.9
	SNNPR	14	6
	Others	13	5.6
Educational status	Illiterate	43	18.5
	Can read and Write	25	10.7
	Primary school	81	34.8
	Secondary school	42	18
	Higher education	41	17.6
Marital	Married	117	50.2
status	Single	99	42.5
	Divorced	5	2.1
	Widowed	12	5.2
Occupation	Construction worker	30	12.9
	Daily labor	33	14.2
	Housewife	19	8.2
	Student/trainee	41	17.6
	businessmen(merchant)	27	11.6
	Farmer	31	13.3
	Retierd	9	3.9
	Government worker	38	16.3
	Other	5	2.1

Regarding the time of the accident,204 (87.6%) accidents occurred during the day time, and 29(12.4%) at night. During the day time the incidence was higher in the afternoon than in the morning. On the other hand night incidents was significantly high till mid night and there was a very few accidents 5(2.1%) after mid night to morning.

Table 2: Table **.** Showing the percentage of time of fall down accident among patients attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, Jan-March 2015

Time of accident in	Frequency	**Percent (%)**
From morning up to mid-day(12-6am)	88	37.8
In the afternoon	116	49.8
Up to mid night	24	10.3
After mid night till morning	5	2.1
Total	233	100.0

The incidence of injuries were almost similarly occurred in all days of the week but relatively higher on Saturday and Monday 38(16.3%) ,35(15%) respectively. The least occurred on Tuesday 27(11.6%).

Regarding place of accident 146(62.7%) of fall down accident occur in Addis Ababa. From this 33(22.6%) of accidents occur in Nifas silk sub city,27(18.5%) Lideta and 23(15.8%) Kirkos. The least accident occurred in Yeka 3(1.3%) and Kolfe 5(2.1%). Out of Addis, there were 87(37.3%) fall down accident and from this, 56(64.4%) of accidents occurred in Oromia ,18(20.7%) in Amhara and 10(11.5%) in SNNP regions respectively.

Table. 3 showing the percentage of accident by location and place among patients attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, Jan-March 2015

location and place of accident		Frequency	Percent
Addis Ababa (n=146,62.7%)	Nifas silk lafto	33	22.6
	Akaki kality	12	8.2
	Bole	13	8.9
	Kirkos	23	15.8
	Yeka	3	2
	Arada	13	8.9
	Gulele	6	4.1
	Addis ketema	11	7.5
	Lideta	27	18.4
Out of Addis Ababa (n=87,37.3%)	Kolfe	5	5.7
	Oromo	56	64.4
	Amhara	18	20.7
	Tigray	1	1.1
	Debub	10	11.5
	Somali	1	1.1
	Afar	1	1.1

Based on height of fall, 156(67.4%) of fall accidents occur from low level (<2 meter) and the rest 76(32.6%) occur more than two meter.

Regarding risk factors, history of fall down accident and chronic medical disease were, 45(19.3%) 42(18%) respectively.

Table 4: Table showing the percentage of risk factors with fall down accident attending Adult Emergency department Tikur Anbesa Specialized hospital , Addis Ababa Ethiopia, 2015

Factors	Frequency	Percent
History of fall	45	19.3
Presence of known chronic medical disease	42	18
Any medication taken prior to fall	20	8.6
Presence of disability	11	4.7
Drink alcohol prior to fall	12	5.2
Construction worker	30	13

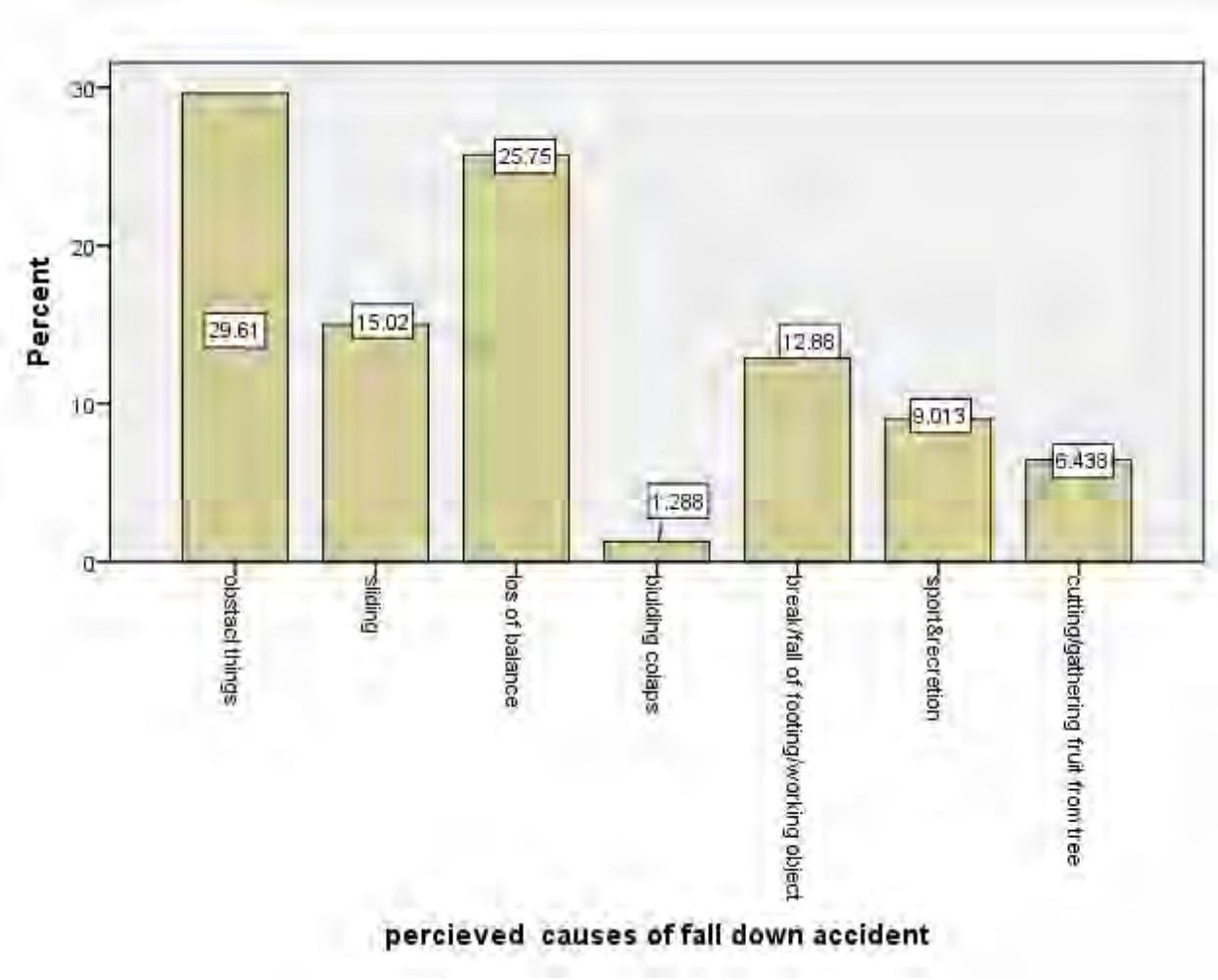


Figure 1. Showing the Perceived cause of the fall down accident among patients attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, \ Jan-March, 2015

The most perceived cause of fall down accident was human movement obstacle objects accounted 68(29.6). Next to that, lose of balance and sliding accounted 60(25.8%),35(15%) respectively.

The victims activity prior to the accident shows that most of the accident occurs during walking accounted 100(42.9%). 86(36.9%) occurs during working activity from this , 32(13.7%) and 27(11.6%) of accidents are non specified working and construction working activities respectively.

Table 5: Table showing the percentage of victims' Activities prior to the fall with fall down accident attending Adult Emergency department Tikur Anbesa Specialized hospital , Addis Ababa Ethiopia, Jan-March,2015

Activities performing prior to the fall	Frequency	Percent
Walking(ambulation)	100	42.9
Non specified working activities	32	13.7
sport and recretion	22	9.4
loading/unloading	12	5.2
cutting tree or gathering fruit and wood	15	6.4
work in construction	27	11.6
bathing and toilate	11	4.7
in home activity	14	6.0
Total	233	100.0

* Non specified working activity includes, cleaning, carrying, etc

Regarding means of transport to take victims after accident, more than half 120(51.5%) were taken by taxi and those taken by ambulance and private car have similar proportion with 53(22.7%). The rest 4(1.7%),3(1.3%) were taken with walking and carried respectively.

Table 6:- Table showing means of transport to hospital with Victims of fall down accident attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia Jan-March, 2015

Means of transport	Frequency	Percent
Ambulance	53	22.7
Taxi	120	51.5
private car	53	22.7
Carried	3	1.3
Walking	4	1.7
Total	233	100.0

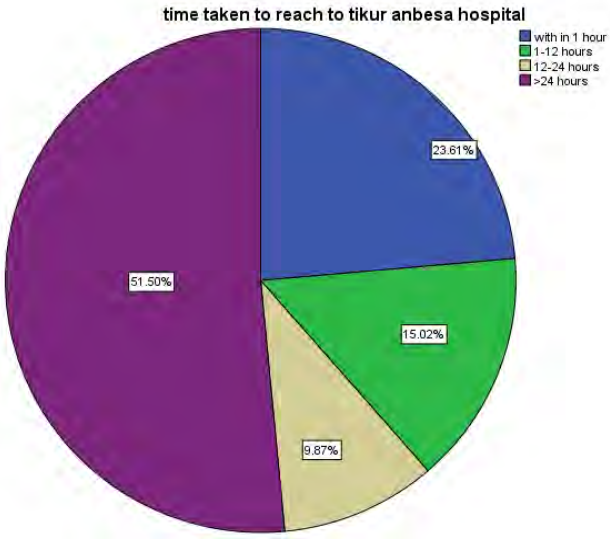
Treatment after the accident

Regarding treatment after the accident 151 (64.8%) of the victims had got treatment before reaching Tikur Anbesa hospital, of them 99(42.5%) had got treatment in hospital and 40 (17.2%) in the health center. The rest 9 (3.9%), 5(2.1%) at the scene and in traditional medicine respectively..

The time taken to reach the first facility after accident is that most of victims 144(61.8%) was arrived with in the first hour. Whereas 44(18.9%) arrived longer than 24 hours and 42(18%) arrived within the first 12 hours.

The time of arrival to Tikur Anbesa after the accident ranges from minutes to more than 7 days. The majority of victims arrive to TikurAnbesa emergency department was longer than 24 hrs of the accident accounting 120(51.5%). Only 55(23.6%) reach with in the golden hour of trauma which is within the first hr.

Fig 2. showing the time taken to reach to Tikur Anbesa after the incidence of accident among patients attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, Jan-March ,2015



Injury Characteristics

Based on injured body site, musculoskeletal of extremities was the most frequent injured body sites accounted 135 (57.9%) in which more than half of the victims had suffered followed by head injury 54(23.2%) and spinal injury 49(21%) respectively.

Table 7: Table showing the percentage of Regions of the body injured patients with fall down accident attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, Jan-March,2015

Anatomic Region Involved	**Frequency(number)**	**Percentage**
Musculoskeletal (extremities)	135	57.9
Head	54	23.2
Abdomen	2	0.9
Chest	13	5.6
Maxillofacial	19	8.2
Pelvis	10	4.3
Spines	49	21

Intracranial hemorrhage pattern of head injury victims show that from 34 intracranial hemorrhage victims most 16(47.1%) had epidural hematoma followed by subdural hematoma, 12(35.5).

Based on Glasgow coma scale score 201 (86.3%) of victims were mild, 20(8.6%), moderate and 12(5.2%) sever. Most importantly the mortality rate for severe head injury was 6 (75%), 1(12.5%) for moderate head injury and 1(12.5%) for mild head injury.

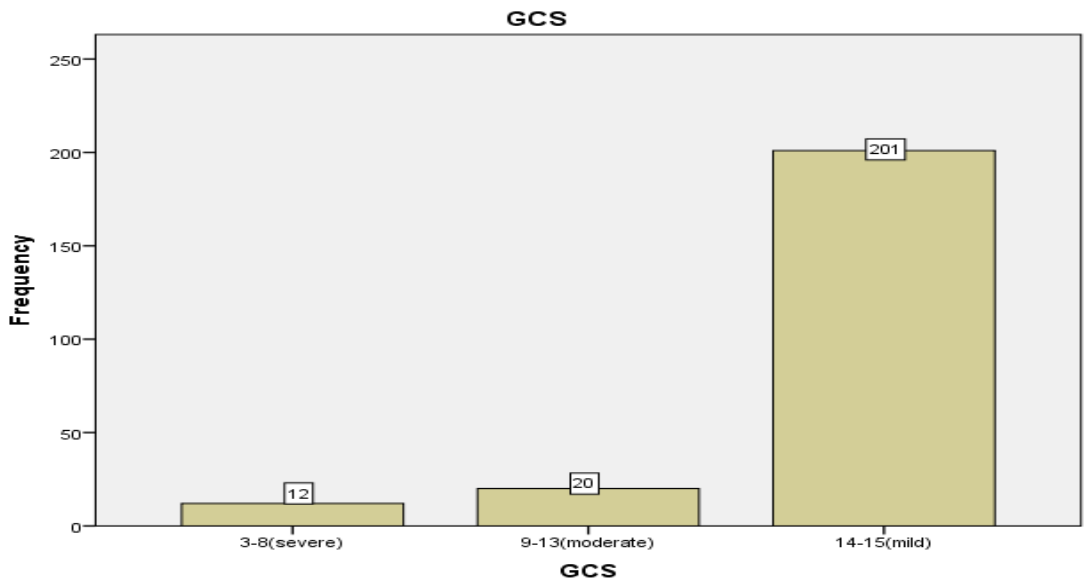


Figure 3. Showing the percentage of Glasgow coma score of victims with their respective mortality rate with each GCS score for patients with fall down accident attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, , Jan-March, 2015

.From fractured victims of fall accidents, lower limb 61 (26.3%) was the most common followed by Skull/maxillofacial 53 (22.7%) and upper limb 52(22.3%) fractures.

Table 8: Table showing the percentage of Type of fracture injuries among the victims of falling accident attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, 2015

Type of fracture injury	Frequency of injuries	Percentage
Lower limb fractures	61	26.2
Upper limb fractures	52	22.3
Skull/maxillofacial fractures	53	22.7
Pelvic fractures	14	6
Rib fractures	8	3.4
Spinal fractures	47	20.2
Clavicle fractures	8	3.4

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From the total 233 victims, 47(20.2%) had spinal injuries. The most affected region was lumbar region 22(46.8). Next to Lumbar, Thoracic and cervical region were among the affected spine regions accounted 15(31.9%) and 8(17%) respectively. The most affected site was T12/L1 accounted 7(14.9%) and the least one was on Sacral region.

Table 9:- shows the percentage of spinal injury site among the victims of falling accident attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, 2015

Site of injury	Frequency	%
Cervical region	8	17
Thoracic region	15	31.9
Lumbar region	22	46.8
Sacral	2	4.3

Injury characteristics of construction worker

Among victims suffering from fall down accident 30(12.9%) were related with construction worker from these only 2 victims used personal protective equipment. 14(46.7%) trained construction work related training, 16(53.3%) on job trained. Concerning area of falling 21(67.7%) of victims fall on working structure , 8(25.8%) on ladder and 2(6.5%) on scaffolding

Table 10:- characterstics of fall down accident with construction worker.

No, of Construction industry workers		Frequency (30)	%
Construction related work trainer		14	46.7
Training given related to job(on job trained)		16	53.3
PPE used at work		2	6.7
Area of falling	on scaffolding	2	6.5
	on working structure	21	67.7
	on ladder	8	25.8

From the total 210 surgical procedures performed, treatment of fracture and reduction was the most performed procedure accounted 122(58.1%) followed by Wound debridement 54(25.7%).

Table 11. Showing the percentage of surgical procedure performed among fall down accident patients attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, Jan-March 2015

Type of surgical procedure	Frequency	Percentage
Treatment of fractures and reduction	122	58.1
Wound debridement	54	25.7
Chest tube insertion	5	2.4
Exploratory laparotomy	1	0.5
Craniotomy/burr holes	9	4.3
Other surgical procedures	19	9
Total	210	100

Outcome of fall down accident

Most victims 106(45.5%) has treated and discharged well without disability. 43(18.5%) of victims were discharged with disability. The most common type of disability was spinal injuries with paraplegia and quadriplegia 30(12.9%). 29(12.4%) of victims transferred to other health institution, 8(3.4%) of victims deceased, 6(2.6%) left against medical advice and 41(17.6%) of victims were under treatment at the end of this data collection. The total length of stay ranged from 1 day to 65 days with a mean of 5 days (SD±10).

Table 12. Table showing the percentage of final outcome for fall down accident patients attending emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, Jan-March, 2015

Victims out come	Frequency	Percent
Discharge well without disability	106	45.5
Discharge with disabilities	43	18.5
Transfered to other health institution	29	12.4
Died	8	3.4
LAMA	6	2.6
Under treatment	41	17.6
Total	233	100

On crude logistic regression analysis, time of arrival to TAH more than one hour and presence of spinal injury were associated with disability of the victim and these were statically significant with, [Crude OR = 4.085 (95% CI: 1.18, 14.085)]. [Crude OR = 2.30 (95% CI: 1.019, 5.189)]. respectively

Table 13: Bivariate logistic regression analysis of selected variables with their final outcome for patients attending the emergency department of Tikur Anbesa Specialized hospital, Addis Ababa Ethiopia, , June 2013.

Variables	Response	Disability		Odds Ratio with 95% confidence interval	P-value
		No	Yes		
1. Time of arrival to TAH	within one hour more than one hour	51(92.7%) 139(78.1%)	4(7.3%) 39(21.9%)	1 4.085 (1.185-14.085)	.026
2. spinal injury	1 Yes 2 No	33(67.3%) 157(85.3%)	16(32.7%) 27(14.7%)	2.300 (1.019-5.189) 1	0.045
3.height of fall>2 meter	1 yes 2 no	60(78.9%) 129(82.7%)	16(21,1%) 27(17.3%)	0.938(0.386-2.278) 1	0.938
4.work in construction	1. yes 2. no	24(80%) 165(82.5%)	6(20%) 35(17.5%)	1.227(0.384-3.923) 1	0.73

CHAPTER V

DISCUSSION

Over 80% of fall-related fatalities occur in low- and middle-income countries accounting over two third of these deaths (2).It is the most common causes of death among 15 - 59 year old people, and men have higher death rates than women(4) . A study conducted in the North Central Bronx Hospital (NCBH) findings show a male-to-female ratio of two to one,

Similarly in this study finding, significantly high proportion of males were fall down accident 179 (76.8%) in comparison with female54 (23.2%), giving a male to female ratio of 3.3:1 ratio. Moreover, 156 (67%) of the victim's age group in both sex were in range of 13-40 while only 77(33 %) were in age group of greater than 40 years. This is consistent with the other study (5). But most studies showed that the risk of fall down accident increases with age(10) . The reason of this study finding may be due to high proportion of work related fall accident and the greater burden seen among males may include higher levels of risk-taking behaviors and hazards within occupations. And also life expectancy in our country is low(60 years).

Fall down accident affects a relatively younger population. It accounts for more productive years of work lost than other illness, with an enormous economic and societal impact.

A substantially higher number of injuries result in potentially life-long disability, significant psychological trauma, and subsequent financial loss (13). The finding also show that 117(50.2%) of victims were head of their house hold and thus suffer immediate economic effects as a result accident. The loss of earnings, together with medical bills, can have double lost effect on a family's finances.

Time of accident

The finding of this paper showed that most 204 (87.6%) of accidents occurred during the day, 29(12.4%) at night. The incidence was higher in the afternoon, 116(49.8%) than in the morning 88(37.8%). On the other hand during the night the incidence was significantly high up to mid night 21(10.3%) and there was a very little accident 5(2.1%) after mid night to morning. Similar finding at Indonesia on the nature of fall accidents finding strengthen this finding in which (69%) accidents occurred during the day, (21%) at night. The time of accident is (27%) during morning time,(42%) afternoon and (21%) evening. This high incidence of fall down

accident in the afternoon may be due to the tiredness of their work. Whereas the high number of accident up to mid night may be due to the consumption of alcohol and light problem.

Location and place of the accident

Most of the accidents occurred in the central portion of the country accounted 146(62.7%). Nifas silk and Lideta sub city were the most place of accident respectively. And Oromia Regional State from out of Addis Ababa was most of the accidents occurred 56(64.4%) from 87 victims. It is due to the urban infrastructure are being built and most of accidents are frequent on sites of construction performed mainly Nifas silk sub city, Lideta and Kirkos. The reason most accident occurred in Oromia Regional state is due to geographical proximity to Tikur Anbesa Hospital relative to other regional states.

Perceived causes of falling

The most immediate cause of fall down accident for this finding is human movement obstacle things accounted 68(29.6%).Lose of balance (body motion)and sliding accounted 60(25.8%),35(15%) respectively. This may be due to unsafe roads which is under construction and non properly constructed roads. This finding is consistent with other study (30).

Activities causing the fall

The highest percentage of individuals fell while ambulating (walking) regardless of age group with young people falling while participating in sports, exercise or running (10). Similarly this study show that most of the accident occurs during walking accounted 100(42.9%) followed by working activity 86(36.9%). Sport and recreational activity 22(9.4%).The reason for this result may be due to unsafe road because of under construction and temporary alternative roads. Unsafe working environment is also one major factor.

Injury characteristics of construction workers

Construction industry has been identified as one of the most hazardous industries in many parts of the world and falls are a leading cause of fatalities and disabilities in construction operations. (15). According to the study in USA, between 1992 to 2006 fall accidents contribute 32% of fatality (24) and 37% of death in the construction industry. In China, it accounts for 51% (25). A research conducted in Hong Kong found that fall accidents represent more than 47% of total fatality in 2004 (26). In another study in Indonesia , shows that among 318 falling cases from height, the main accidents mainly occurred on areas of scaffolding (52%) ,on working structure (28%) and on ladder(20%).(27). While in another study in Korea showed that it accounts 21.6%

from ladder, 16.1% from steel frame structure, 14.5% from foothold,14.4% from scaffold,7.1% from passage and floor.(28) .

Similarly this study finding shows that among victims suffering from fall down accident 30(12.9%) were related with construction worker from this it accounted 4(50%) of fatality rate from the total fall down fatality. Only 2 victims used personal protective equipment. 14(46.7%) trained construction work related training, 16(53.3%) on job trained. Concerning area of falling the most 21(67.7%) of victims fall on working structure, 8(25.8%) on ladder and 2(6.5%) on scaffolding. Compared to other finding this finding has smaller sample because it is compared with other causes of fall accident victims. But highest fatality compared to other factors.

Site of injury

From the whole site of injury, the most affected body site is musculoskeletal of extremities accounting 135 (57.9%) in which more than half of the victims had suffered followed by head injury 54(23.2%) and spinal injury 49(21%). The reason may be easily exposed part and used as body balance mechanism during fall. This is in agreement with the study done in North Central Bronx Hospital (NCBH) that shows (76%) skeletal which is higher than this finding. Head injury (10%) is less than this finding. The most common affected type fracture in this study was lower limb fracture 61 (26.3%).

Disability and Fatality

Spinal injury is the common cause of disability in fall down accident victims. In this study 30(69.8%) of spinal cord injury victims had disability. The disability rate for victims with spinal injury was 2.3 times greater than those victims without spinal injury (P = 0.045), [OR =2.3 (95%CI:1.019- 5.189). Other associative finding with disability was time of arrival to Tikur Anbesa Hospital. It shows that 39(90.7%) of disabled victims had come more than one hour. Only 4(9.3%) of victims had disability those come within one hour. The disability rate for victim came more than one hour is 3.6 times greater than those victims came within one hour(p=0.02),(OR=4.08(95%CI:1.185-14.085).This may be due to secondary injury(insult) because of mishandling and for specialty and tertiary care referral from other institution.

Both disability and mortality is higher for males compared with females. 35(19.6%), 8 (14.8%) disability from total male and female respectively. And 7(3.9%), 1(1.9%) mortality from total

male and female respectively. This study is consistent with other studies (2,22). The possible explanations of the greater burden seen among males may include higher levels of risk-taking behaviors and hazards within occupations. Females mostly work non-hazardous work.

Magnitude, length of stay and outcome

The finding of this paper showed that fall down accident is the second major cause of injury in trauma next to road traffic accident with the magnitude of 252(22.4%) from 1124 total trauma victims. Males are more affected 179(76.8%) than females 54 (23.2%). This finding is higher compared with studies conducted in Eldoret, Kenya accounted for 17% from total trauma(31) ,a study conducted in North Gondar (18.6%)(33) and a retrospective study on trauma from 1960 to 2013 on the same area 16% (36) .But consistant with studies conducted in , a community based study in Jimma zone (20.9%) (34) and a previous preliminary study on trauma in Tikur Anbessa Hospital (21%)). The reason for higher magnitude for this finding may be the increased construction industry and related factors.The length of stay was ranged from 1 day to 65 days with the mean of 5 days. this is consistant with a research done in Kenya , the mean length of stay was seven days (31).

Most of victims 106(45.5%) had treated and discharged well without disability. 43(18.5%) of victims were discharged with disability(paraplegia, quadriplegia, limb amputation,....). 29(12.4%) transferred to other health institution, 8(3.4%) of victims died, 6(2.6%) left against medical advice and 41(17.6%) of victims were under treatment at the end of this data collection.

6. CONCLUSION

The finding of this study shows that from over all trauma admissions , fall down accident is considerably high indicating the major public health problem. Economically active age group of the population was main victims of the accident and males are more than three times affected than females. Students and government employers were most affected social groups. The victims were injured mostly during walking and at work place. Musculoskeletal and head were the most injured body site and lower limb fracture were the leading types of fracture . Out of the total 233 victims studied, 43(18.5%),8(3.4%) of victims were disabled and died respectively. The most common cause disability is spinal cord injury. Construction workers have highest mortality rate. Based on this finding , Appropriate prevention strategies should be designed and implemented against fall down accident.

RECOMENDATION

- It is important to raise awareness in the public about prevention of fall accident through educational campaigns
- Professionals have to be well trained in trauma handling and management.
- Organized trauma centers should be built for early management and prevention of secondary insult
- Occupational guide lines should be prepared and implemented
- Appropriate occupational health training should be implemented for construction workers

7. CHALLENGES AND LIMITATION OF THE STUDY

- The study was conducted in a three months consecutives period of time making it seasonal and the sample size is small due to short period of time.
- The paper failed to know the final outcome of 41(17.6%) of victims who are under treatment till the end of data collection period and 29 (12.4%) patients who had referred to other health facilities for different reason.
- Documentation problem and attachment of the results of investigation was other major challenge making patient's chart incomplete.

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Appendixes

በአዲስ አበባ ዩኒቨርሲቲ የጤና ሳይንስ ኮሌጅ የሕክምና ትምህርት

ድንገተኛ ሕክምና ትምህርት ክፍል

በጥቁር አንበሳ ሆስፒታል በድንገተኛ ህክምና ክፍል የሚመጡ የመውደቅ አደጋ ተጎጂዎችን የጉዳት አይነት እና ውጤት ለማጥናት ለተዘጋጀው ቃለመጠይቅ የግለሰቦችን ፈቃደኝነት መጠየቂያቅፅ፡፡

ሰላምታ

ስሜ----------ይባላል፡፡እኔበአዲስአበባዩኒቨርሲቲህክምናትምህርት ክፍል ድንገተኛሕክምና ትምህርት የሁለተኛ ድግሪ ተመራቂ ተማሪ ነኝ፡፡በአሁኑ ሰአት የመመረቂያ ጽሁፌን የመውደቅ አደጋ ተጎጂዎች የጉዳት አይነት እና ውጤት በጥቁር አንበሳ ሆስፒታል በድንገተኛ ህክምና ክፍል ውስጥ በሚል አየሰራሁ እገኛለው፡፡የዚህ ጥናት አላማ የመውደቅ አደጋ የሚያስከትለውን ውጤት እና የተጎጂ ህብረተሰብ ክፍሎችን ለይቶ የአደጋውን አስከፊነት ለሚመለከታቻው ክፍሎች ማሳወቅ እና ችግሩ አስፈላጊውን ትኩረት እንዲያገኝ ማድረግ ነው፡፡ስለሆነም እርስዎ አስፈላጊውን መረጃ በመስጠት የጥናቱ ተሳታፊ እንዲሆኑ በአክብሮት እንጠይቃለን፡፡እርስዎን በተመለከተ ጥያቄ አቀርብልዎታለሁ፡፡በዚህ ጥናት የሚሳተፉት በሙሉ ፈቃደኝነትዎ ነው፡፡እንዲሁም በቃለ መጠይቁ ያለመሳተፍም ሆነ በማንኛውም ሰዓት ቃለ መጠይቁን የማቋረጥ መብትዎ የተጠበቀ ነው፡፡ነገርግን የሚሠጡን መረጃ ችግሩን ለማሻሻል ለሚደረገው ጥረት ከፍተኛ ጠቀሜታአለው፡፡

ስምዎ የትም ቦታ አይጠቀስም፡፡የሚሰጡት መረጃ ሚስጥራዊነቱ የተጠበቀነው፡፡እንዲሁም ከጥናቱ ጋር በተያያዘ ብቻ ነው ጥቅም ላይ የሚውለው፡፡

በጥናቱ ለመሳተፍ ፈቃደኛ ነዎት?

1. **አዎን** 2. **አይደለሁም**

መልሱ አዎን ከሆነ እናመሰግናለን፡፡ቃለ መጠይቁን ያካሂዱ መልሱ ፈቃደኛ አይደለሁም ከሆነ አመስግነው ወደ ሌላ ተጠያቂ ይለፉ (ግለሰቡን በቃለ መጠይቁ ለማሳተፍ ምንም አይነት ጫና እንዳያደርጉ)

የጠያቂው ስም..... **ፊርማ**.....

ቃለ መጠይቁ የተካሄደበት ቀን..... **ወር** .....**ዓ.ም**.....

የገምጋሚው ስም.....**ፊርማ** .....

የመረጃ መሰብሰቢያው ቅጽ የተመረመረበት ቀን..... **ወር**..... 2000 **ዓ.ም**

የመረጃ መሰብሰቢያው ቅጽ 1.**የተሟላ** 2.**ያልተሟላ**

የሆስፒታሉ ስም : ----------

ካርድ ቁጥር: ----------

ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE, SCHOOL OF MEDICINE, DEPARTMENT OF EMERGENCY MEDICINE

Consent Form

This questionnaire is prepared to assess the injury characteristics and outcome of fall down accident among victims at Adult Emergency Department of Tikur Anbesa specialized hospital, Addis Ababa, Ethiopia.

Consent form and introduction

My name is _____. I am working with --------- who is doing a research on the injury characteristics and outcome of fall down accident among victims. We are interviewing victims and/or relatives to assess the injury characteristics and outcome of fall down accident among victims. I am going to ask you some questions that could be important for organizations working on fall and related accident preventions. Your name will not be written in this form and the information you give will be kept confidential. If you don't want to answer all of or some of the questions, you do have the right to do so. However your willingness to answer all of the questions would be appreciated.

Would you participate in responding to the questions in this questionnaire?

Yes ☐ No ☐

Name of interviewer: ---------- signature**----------**

Name of the supervisor ---------- signature ----------

Date of checking----------

Remark: 1. Complete 2. Incomplete

Questionnaire

Interviewer-administered questioner and record review checklist for the assessment of the injury characteristics and outcome of fall down accident among victims at Adult Emergency Department of Tikur Anbesa specialized hospital, Addis Ababa, Ethiopia.

Name of the hospital: ----------

Name of the reviewer: ----------

Date: ----------

Day: ---------- **Card number:** ----------

PART I - Socio-demographic characteristics

Ques.NO	Questions	Choice of answers	Code	Skip to question no.
101	Sex	a) Male.....1 b) Female.....2		
102	Age	a) 11-20.....1 b) 21-30.....2 c) 31-40 .....3 d) 41-50.....4 e) 51-60.....5 f) 61-70.....6 g) >70.....7		
103	Religion	a) Orthodox.....1 b) Muslim.....2 c) Catholic.....3 d) Protestant .....4 e) Others (specify) ----------		
104	Ethnicity	specify ----------		
105	Educational status	a)Illiterate(Cannot read and Write) -1 b)Can read and Write----------2 c)Primary school----------3 d)Secondary school----------4 e)Higher education ----------5		
106	Marital status	a) Married .....1 b) Single.....2 c) Divorce.....3 d) Widowed.....4		
107	Occupation	a) Construction worker.....1 b) daily labor.....2 c) House wife.....3 d) Student/trainee ----------4 e) businessmen(merchant) .....5 f) farmer.....6 g) other specify.....		

PART II -The following questions are about the pattern of injury of the victims

Ques. NO	Questions	Choice of answers	Code
201	Geographical location and place Of the accident	Specify ----------	
202	Date of accident in Ethiopian calendar	Specify ----------	
203	Day of accident e.g. Monday	Specify ----------	
204	Time of accident in Ethiopian calendar	Morning to mid-day (after 12-6 am)----------1 Afternoon (after 6-12pm)----------2 Up to midnight(after 12-6pm)----------3 After midnight to morning (after 6 to 12am)------4	
205	Time taken to reach to the first heath facility after accident	Specify ----------	
206	Time taken to reach to TikurAnbesa Specialized Hospital	Specify ----------	
207	Means of transportation to the hospital	Ambulance)----------1 Taxi)----------2 Private car)----------3 Carried)----------4 Others specify ----------5	

208	Is there any treatment given	Yes ----------1 No----------2	
209	If yes for Q no 208 where did you received the treatment	At the scene----------1 In the health center ----------2 In the hospital ----------3 Others specify ----------4	
210	Which Regions(s) of the body injured	Head ----------1 Maxillofacial ----------2 Chest----------3 Abdomen----------4 Pelvis ----------5 Spines ----------6 Musculoskeletal (extremities) ----------7	
211	Glasgow Coma Scale (GCS) score at admission for head injury victims	3-8----------1 9-13----------2 14-15----------3	
212	Presence of open wound	Yes ----------1 No ----------2	
213	Type of Fractures the victims suffered	Skull/maxillofacial fractures ----------1 Clavicle fractures----------2 Spinal fractures----------3 Rib fractures----------4 Pelvic fractures----------5 Upper limb fractures----------6 Lower limb fractures----------7	
214	Types of hemorrhages the patient suffered?	Subdural ----------1 Epidural ----------2 Subarachnoid ----------3 Intracerebral---------- 4	
215	Type of visceral injuries the patient suffered?	Spleen----------1 Intestines----------2 Liver----------3 Urinary bladder----------4 Kidney----------5 Others(specify)----------6	
216	Type of chest injury the patient suffered	Pneumothorax----------1 Hemothorax----------2 Pneumohemothorax----------3 Rib fracture----------4 Cardiac temponade ----------5 Others (specify)----------6	

217	Presence of spinal injury	a) yes.....1 b) no.....2	
218	If yes, specify the site		
219	Types of surgical procedures done for the victim	Chest tube insertion ----------1 Treatment of fractures----------2 Craniotomy/burr holes ----------3 Wound debridement ----------4 Exploratory laparotomy----------5 Other surgical procedures (specify)----------6	

part -III-**The following questions are about the risk factors of injury of the victims**

301	Has the victim had previous history of fall?	a) yes.....1 b) no.....2	
302	If yes, what type of injury suffered?	Specify	
303	Presence of known chronic medical disease	a) yes.....1 b) no.....2	
304	If yes, specify		
305	Has any medication taken?	a) yes.....1 b) no.....2	
306	If yes, specify		
307	Presence of disability	a) yes b) no	
308	If yes, specify		
309	What is a specific reason for fall	Specify.....	
310	What was your activity during fall?	Specify.....	
311	Do you drink alcohol prior to fall?	a) Yes.....1 b)No.....2	
312	How high is place of fall?	a) height(>2 meter).....1 b) low level(<2 meter).....2	

313	Are you working in construction industry?	a) yes.....1 b) no.....2	
314	If qu.no310 is yes, what is your length of service in this industry	Specify.....	
315	Is your original baseline training that you had related for your work?	a) yes.....1 b) no.....2	
316	Have you had any training related to your job?	a) yes.....1 b) no.....2	
317	Do you use PPE at work?	a)yes.....1	

		b) no.....2	
318	Have you had training in use & care of this equipment	a) yes.....1 b) no.....2	
319	Is it available?	a)yes.....1 b) no.....2	
320	Area of falling	a) on scaffolding.....1 b) on working structure.....2 c) on ladder..... .....3 d) other.....4	
321	Is there any history of fall down accident in construction site	a) yes b) no	

part IV -**The following questions are about the outcome of injury of the victims**

401	Length of stay in the hospital (per day)	Specify ----------	
403	Type of permanent disabilities The patient suffered	Traumatic limb amputations----------1 Permanent neurological deficit----------2 Severe spinal injuries with paraplegia----------3 Post-traumatic seizures----------4 Others (specify)----------5	
404	Final Outcome	Discharged well without permanent disability----1 Discharged with permanent disabilities----------2 Transferred to other health institution----------3 Died ----------4	

Thank you!