


Mechanisms, Pattern and Outcome of Pediatrics Trauma At Agaro General Hospital, Southwest Ethiopia, 2021

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Yalemtehay Dagnaw¹ , Belete Fenta² , Aynalem Yetwale² ,
Tsegaw Biyazin² , Alemayehu Sayih¹, Nigatu Dessalegn¹,
Emebet Adugnaw¹, Fatuma Ali¹, and Yitbarek Tesfa¹

Abstract

Introduction: Over 80% of trauma related deaths in children occur in low income and middle-income countries including Ethiopia. Trauma affects several aspects of child life and is still a major concern. Despite the Ethiopian federal ministry of health (FMoH) conducting away different trials, there was an increased burden and high projection of pediatric trauma. In Ethiopia, There is insufficient evidence about the mechanisms, patterns and outcomes of pediatric trauma including this study area, Therefore this study aimed to assess the mechanisms, patterns, and outcomes of pediatric trauma in Agaro General Hospital, Southwest Ethiopia, 2021.

Methods and Materials: This cross-sectional study was study conducted on randomly selected 405 pediatric patients who visited the Agaro General Hospital between 1/1/2018 and 30/8/2021. Data were extracted from each medical chart using a structured checklist. Data were entered into Epi-data 4.4.2.1 for cleaning and analyzed using SPSS version 24. Tables, charts, and text are used to report the results.

Results: A total of 405 patients were included in the study. This study revealed that majority 271 (66.9%) of injured children were males. Most 188 (46.4%) of the traumas were occurred on the street. Fall down injury were the most common 151 (37.3%) cause of trauma, followed by road traffic accidents 98 (24.2%). Trauma caused by falls accounted for 43.7% and 34.4% % of all traumas in the 5–12 year and the <5 year age groups respectively. Most 126 (31.1%) of the subjects were exposed to head and face trauma. Majority 256 (63.2%) of children were discharged with improvement, while 12 (3.0%) of them have died.

Conclusions: Pediatric trauma remains a major public health concern. Most of trauma occurred among boys and fall down injury was the most frequent trauma, and the majority of the subjects were exposed to head and face trauma. Therefore, children should receive safety precautions, more supervision, and identification of specific risk factors for these injuries, and should be prohibited from risky practices by concerned bodies including families and traffic officers.

Keywords

trauma, mechanisms, patterns, outcome, children

Introduction

Trauma is defined as any physical damage to the body resulting from abrupt exposure to forces exceeding the tolerance level, or a lack of warmth or oxygen.¹ Although trauma is a major public health problem worldwide in both developed and developing countries across all age groups,² children in developing countries are especially vulnerable to injury because of challenging living conditions, lack of safe play areas and absence of childcare options.³ Children are predisposed to trauma owing their inability

¹ Department of Nursing, Mizan Tepi University, Mizan Teferi, South West Region, Ethiopia

² School of Midwifery, Jimma University, Jimma, Oromia Regional State, Ethiopia

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Corresponding Author:

Yalemtehay Dagnaw, Department of Nursing, Mizan Tepi University, Mizan Teferi, South West Region, Ethiopia
Email: tseyhayworld@gmail.com



to understand the cause and effect of the different mechanisms of injuries and develop many severe complications.⁴

The pattern of injuries varies according to different age groups in different countries with various causes such as, road traffic accidents(RTA),⁵ burns,⁶ falling down.^{4,7,8} The lower age groups (0–4 years) had a higher risk of mortality than the older age groups.⁹ Worldwide approximately one million children under the age of 18 years are estimated to die annually due to trauma; with more than 2000 children per day.¹⁰ Over 80% of the injury, deaths in children occur in low and middle-income countries (LMIC).^{11,12} Childhood Injuries contribute to 5.4% (265,000–348,000) of childhood deaths per year worldwide.¹²

Severe trauma outcomes create a high emotional and economic burden on the family, society, and the world as a whole related to high admission prevalence in hospital and serious medical and surgical intervention required.^{9,13} The economic crisis that occurs due to trauma is continues after discharge from the hospital due to the long term effects of complications throughout life.^{14,15} The mortality of children with trauma varies depending on the number of body organs affected and the complications of the injuries.⁹

In Ethiopia, in 2015, injuries resulted in 25,000 deaths among children aged 0–14 years. This figure is more than two times higher than that of the global burden of disease projects.¹⁶ Projection of pediatric trauma in Ethiopia in 2015 also showed a higher incidence of mortality until 2030 with the annual mortality caused by injuries projected to increase from 26,463, 27,807, and 30,364 in 2015, 2020, and 2030 respectively.¹⁷

The foremost causes of trauma related problems in LMICs are related to somany issues including:absence of a good pre-hospital and a formal triage system,¹⁸ inadequate staffing levels coupled with huge patient loads in emergency department management, and lack of basic surgical services.¹⁹ To solve these problems, the world health organization, recommends the establishment of first-responder training programs in LMICs²⁰ and Emergency Triage, Assessment, and Treatment plus (ETAT +) training.²¹

The Ethiopian federal ministry of health (FMOH) has also been working to reduce the burden of pediatric trauma by implementing ETAT+ strategies²² and the Ethiopian health sector program provides great attention to injuries and violence prevention.²³ Despite the above mentioned programs and trials there are still numerous children with trauma problem in Ethiopia. Eventhough there are few studies on trauma of children in Addis Ababa and Hawwassa, Ethiopia^{5,24} mechanisms, patterns, and outcomes of trauma are varied among different age groups, place-to-place and time-to time due to different characteristics. Again, as far as our knowledge there is no sufficient information in this study area since time. Considering that definite pattern and mechanism of trauma is necessary for formulating policy and instituting preventive measures. Therefore, this study aimed to assess mechanism, patterns, and outcomes of pediatric trauma at Agaro general Hospital in Southwest Ethiopia, 2021.

Methods and Materials

Study Design, Area, and Period

This cross-sectional was conducted in Agaro general hospital found in Jimma Zone of the Oromia Region south-western Ethiopia. Agaro general hospital is located in the Jimma Zone of the Oromia Region, at 397 km from Addis Ababa capital city of Ethiopia. It provides, dental, ophthalmic, medical, surgical, gynecology, obstetrics and pediatrics service. In the emergency department of Agaro general hospital 680, pediatric trauma was visited from 1/ 1/2018 to 30/8/2021. This study was conducted from 1/9/2021 to 23/10/2021.

Population, eligibility criteria. All injured children aged under 18 years who visited the emergency department of Agaro General Hospital were the source population. Medical chart of all injured children aged under 18 years old who visited in the emergency department at Agaro General Hospital from 1/ 1/2018 to 30/8/2021 E.C were study population. All pediatric trauma cases registered from 1/ 1/2018 to 30/8/2021 at Agaro General Hospital emergency department were included in this study. Pediatric trauma cases within complete registered variable information were excluded from the study.

Sample size determination. A single population proportion formula was used to calculate the sample size by considering the following statistical assumptions, $Z = 95\%$ (1.96), $d =$ Margin of error = 5%, $P = 39.8\%$ (0.398), taking the prevalence of childhood road traffic trauma among children visiting the emergency department of AaBET Hospital, Addis Ababa, Ethiopia.²⁴

$$n = \frac{(z\alpha / 2)^2 * p(1 - p)}{d^2}$$

$$n = \frac{(1.96)^2 * 0.398(0.602)}{(0.05)^2} = 368$$

Then considering a 10% non-response rate for incomplete and lost card, final minimum sample size required for this study was 405.

Sampling Techniques and Procedure

All traumatic children visited at Agaro General Hospital emergency departments between 1/ 1/2018 to 30/8/2021 were recruited as target population using the admission registration book. Then, sampling frame was prepared after a sequential number was assigned for each children with trauma. A sample among such children were selected from the sampling frame using a simple random sampling technique by using the computer random number generating system in Excel to select a required number of study participant's. Their medical record number was used to extract the medical charts of the selected participants from the card room. During the data collection, when randomly selected charts were missing major variables or card was lost, the charts were replaced with new, randomly selected, ones, from the remaining cards of the sampling

frame, finally, a total planned 405 charts were included in the analysis.

Study Variables

The variables included were socio-demographic variables (age, sex, and place of residence), Pattern-related variables (Arrival time to the emergency department, pre-hospital care, intent, mechanism and nature of injury, place of occurrence, vehicles involved in RTA, anatomic sites of body injury), mechanism-related variables and pediatric trauma outcome-related variables (duration of hospital stay and pediatric trauma outcome status).

Operational Definitions

Pediatric trauma: refers to traumatic injury in children ≤ 18 years.²⁴

A pattern of pediatric trauma: presents frequent/repeated ways in which injury event profiles occur in the age category.⁴

Outcome: measures how serious the injury threatens life loss (deceased/discharged with improvement).⁸

Data Collection Tool and Procedure

The checklist was adapted from previously conducted research in Addis Ababa²⁴ and modified from the related literature to address the objective of the study. Data collectors were trained in the data collection process for one day. Finally, data were extracted from each medical chart using a structured checklist by two BSc nurses and supervised by an MSc nurse. The checklist consisted of information emphasizing socio-demographic variables, Patterns and mechanism related variables and Pediatric trauma outcome-related variables. During the data collection process of each questionnaire was checked daily by the principal investigators for completeness and accuracy of the information collected.

Table 1. Socio- Demographic Characteristics of Injured Children Visited at Agarogeneral Hospital, from September 1/1/2018 to 30/8/2021 (N = 405).

Variable	Category	Frequency(N)	Percent(%)
Sex	Male	271	66.9
	Female	134	33.1
Age in years	Less than 5 years	109	26.9
	5 to 12 years	167	41.2
	13 to 18 years	129	31.9
Residence	Urban	315	77.8
	Rural	90	22.2
Use vehicle for transportation	Yes	139	34.3
	No	266	65.7
Vehicle type	Private vehicle	135	97.1
	Ambulance	4	2.7

Data Quality Control

In order to ensure quality of data, A pretest was conducted on 5% 21 of the total sample size of the study before actual data collection period at Jimma medical center. Based on the pretest result wording, language consistency and edition were made. Principal investigator and supervisor were checking daily the completeness of the filled tool.

Data Processing, Analysis, and Presentation

The raw data after collection has been processed (edited, coded, classified and tabulated) of collected data so that they were amendable to analysis in line with the outline (plan) laid down for the purpose at the time of developing the research plan. The variables were entered into SPSS (Statistic Program for Social Sciences) version 24 for statistical analysis. Descriptive analyses: further transformation of the processed data has been conducted to look for patterns and relations among data groups, then reported as frequency distributions, and percentages. Descriptive analyses of continuous variables were reported as mean \pm standard deviation. The findings of the study were presented using tables and texts according to the type of data and interpreted carefully to provide their complete meanings and implications can be understood.

Ethical Consideration

Permission Letter was obtained from the research committee of Mizan-Tepi University College of health science, department of nursing. A formal letter was submitted to Agaro general Hospital executive officer and concerned bodies to obtain their co-operation. Then, data were collected after consent of cooperation was obtained from hospital administrator focal person to use the secondary data for this study. Because of the anonymous and retrospective nature of the study, the need for informed consent was waived.

Results

In this study, from January/ 1/2018 to 30/8/2021, approximately 680 patients under 18 years of age visited at Agaro general hospitals. Of these, 405 pediatric trauma medical charts were reviewed based on the required samples making a response rate of 100%.

Socio-Demographic Characteristics

Among a total of 405 study participants, 271 (66.9%) of injured children were male. The majority 167 (41.2%) of children age group of five to twelve years were more affected by trauma and their mean age was found to be 9.26 ± 4.95 . Likewise, the majority 315 (77.8%) of the trauma cases that happened was in children who came from urban areas (Table 1).

Pattern and Mechanism of Traumatic Characteristics

Majority of child trauma causes were fall/drown 151 (37.3%) followed by road traffic accidents 98 (24.2%) and animal bite 72 (17.8%). Most of the traumas were occurred on the street or road 188 (46.4%) followed by at home 149 (36.8%). Concerning to place of road traffic accidents, most of the traumas 57 (58.2%) were occurred among street walkers. Among the traumas caused by RTA, motor bicycle trauma accounted the highest portion 51 (52%) followed by car trauma 33 (33.7%). Regarding the location of trauma face and head trauma were the major 126 (31.1%) anatomical location—that trauma was occurred followed by 124 (30.6%) abdomen and pelvic trauma. Most children were traumatized as single body trauma that accounting for 336 (83.0%) of the total trauma (Table 2).

Patterns of Regional Injuries Divided into age Group and Outcome status

Abdominal and pelvic trauma were frequent in the 5–12 year age group children, accounting for 38.7% of trauma. Similarly head and face injuries were common among 5–12 year age group victims, accounting for 42.7% of trauma. Abdominal and pelvic traumas were leading causes of all mortalities in the hospital 12 (9.7%). Children with chest and thoracic injuries were have a higher proportion 50% of admission rate in the hospital (Table 3).

Patterns of Cause of Injury Divided into age Group

Trauma caused by falls was the most frequent in the 5–12 years old and the <5 years old age groups, accounting for 43.7% and 34.4% % of all traumas respectively. Road traffic accidents were the most common cause of trauma among 13–18 years age groups children accounting for 40.8%. An animal bite was the third most common commonly trauma accounting for 50.0% and 33.3% of traumas in the age group of 13–18 and 5–12 years old respectively (Table 4).

Outcome status-Related Characteristics

After triage in the emergency department, a majority 256 (63.2%) of children were discharged with improvement and 12 (3.0%) of the traumatic children were died. Regarding hospital stay, 292 (72.1%) of the children were stayed in the hospital for one day (Table 5).

Outcomes of Pediatric Trauma Patients Based on age Groups (Years)

In-hospital mortality was 66.7% and 33.3% in the 13–18 year and the 5–12 years age groups respectively. From overall

Table 2. Pattern and Mechanism Characteristics of Traumatic Children Visited at Agaro General Hospital Emergency Department from 1/1/2018 to 30/8/2021 (N = 405).

Variables	Category	Frequency(N)	Percent(%)	
Arrival time to the emergency department	Within 24 H	352	86.9	
	24 to 72 H	45	11.1	
	Above 72 H	8	2.0	
Pre- hospital care	Yes	62	15.3	
	No	343	84.7	
Place of injury	At home	149	36.8	
	At street or road	188	46.4	
	At school	52	12.8	
	Other places	16	4.0	
Causes of injury	Road traffic accident	98	24.2	
	Fall down	151	37.3	
	Physical assault	36	8.9	
	Burn	12	3.0	
	Animal bite	72	17.8	
	Sport related	8	2.0	
	Drowning	8	2.0	
	Natural event	20	4.9	
	Types of vehicle involved in RTA	Car	33	33.7
		Bicycle	51	52.0
Bajaj		14	14.3	
Place of RTA occurrence	During street walking	57	58.2	
	On transportation as a passenger	25	25.5	
	Riding bikes	16	16.3	
Anatomic sites of body injury happen	Abdomen and pelvic	124	30.6	
	Head and face	126	31.1	
	Chest and thoracic	8	2.0	
	Upper limb	69	17.0	
	Lower limb	66	16.3	
	Spine	8	2.0	
	Other	4	1.0	
	Type of trauma	Single body trauma	336	83.0
Polytrauma	69	17.0		
Triage categories	Red	145	35.8	
	Orange	56	13.8	
	Yellow	171	42.2	
	Green	29	7.2	
	Not documented	4	1.0	

Natural event: environmental degradation, volcanic eruption, flooding, climate change.

admission in the hospital. Majority 40 (44.90%) of admitted children were in the age group 5–12 years old (Table 6).

Discussion

Pediatric trauma is the most common and life-threatening injury in children and is public health problem. Mechanism, pattern and outcome of trauma vary from place-to-place with different characteristics. Therefore, this study aimed to assess

Table 3. Characteristics of Pediatric Patients with Regional Injuries Divided into age Group (Years) and Outcome status Visited at the Emergency Department of Agaro General Hospital Between 1/1/2018 to 30/8/2021 (N = 405).

		Age of trauma children in years					
		Age(<5)		Age(5-12)		Age (13-18)	
		N = 109		N = 167		N = 129	
		Frequency(n)	Percent(%)	Frequency(n)	Percent(%)	Frequency(n)	Percent(%)
Injured body part	Abdomen and pelvic	32	25.80	48	38.70	44	35.50
	Head and face	40	31.70	54	42.90	32	25.40
	Chest and thoracic	-	-	4	50.00	4	50.00
	Upper limb	20	29.00	24	34.80	25	36.20
	Lower limb	17	25.80	37	56.10	12	18.20
	Spine	-	-	-	-	8	100.00

Patterns of regional injuries divided into outcome status

		Outcome status after triage							
		Admitted		Discharged		Died		Referred	
n	Percent	n	Percent	n	Percent	n	Percent	n	Percent
Injured body part	Abdomen and pelvic	24	19.40	76	61.30	12	9.70	12	9.70
	Head and face	28	22.20	82	65.10	-	-	16	12.70
	Chest and thoracic	4	50.00	-	-	-	-	4	50.00
	Upper limb	12	17.40	53	76.80	-	-	4	5.80
	Lower limb	21	31.80	45	68.20	-	-	0	-
	Spine	-	-	-	-	-	-	8	100.00

Table 4. Characteristics of Pediatric Patients with the Cause of Injury Divided into age Groups (Years) Visited at the Emergency Department of Agaro General Hospital Between 1/1/2018 to 30/8/2021 (N = 405).

Variable		Age(<5)		Age(5-12)		Age (13-18)	
		N = 109	N = 167	N = 167	N = 129		
Cause of injury	RTA	29	29.6%	29	29.6%	40	40.8%
	Fall down	52	34.4%	66	43.7%	33	21.9%
	Physical assault	8	22.2%	24	66.7%	4	11.1%
	Burn	4	33.3%	4	33.3%	4	33.3%
	Animal bite	12	16.7%	24	33.3%	36	50.0%
	Sport-related	-	-	4	50.0%	4	50.0%
	Drowning	4	50.0%	-	-	4	50.0%
	Natural event	-	-	16	80.0%	4	20.0%

Table 5. Out come status-Related Characteristics of Children with Trauma Visited at Agaro General Hospital among Emergency Department from 1/1/2018 to 30/8/2021(N = 405).

Variables	Category	Frequency	Percent
Outcome status after an emergency visit	Discharged	256	63.2
	Admitted	89	22.0
	Died	12	3.0
	Referred	48	11.9
Length of hospital stay	One day	292	72.1
	Two day	28	6.9
	Three day	16	4.0
	Above three day	69	17.03

the patterns, the mechanisms and outcomes of pediatric trauma at Agaro general Hospital in Southwest Ethiopia, 2021.

In this study, a large proportion (66.9%) of male children were the most affected by trauma. A study conducted in united kingdom⁸ and Kenya⁷ was almost similar to this finding, where the proportion of male with trauma was 64.3% and 65.3% respectively. The possible reason for this may be differences in play time behavior between genders, as well as higher activity levels, greater freedom to play alone, and increased involvement in risky sports among males. The other possible

reason can be males usually display more conflict and fighting with their colleagues which may increase trauma in males and the socialization process leads males, from the time they are little boys, to engage in more behavioral risks and Lifestyle as well as masculine socialization than females, and to be supervised less by someone who might protect them from risk.²⁵

Regarding body regions affected in this study, most 126 (31.1%) of the subjects were exposed to head and face trauma, studies from united kingdom,⁸ Denmark²⁶ and Australia⁹ had documented similar findings. This may be due to the fact that most lower age children had a larger head as compared with other body parts and also had weaker neck ligaments and spine musculature, which leads to more head and face trauma.

Table 6. Characteristics of Traumatic Pediatric Patients with Outcome Status divided into age Groups at Emergency Department of Agaro General Hospital Visited Between 1/1/2018 to 30/8/2021 (N = 405).

		Age in years					
		less than 5 year		5 to 12		13 to 18	
		n	percent	n	percent	n	percent
After triage outcome status	Admitted	21	23.6	40	44.90	28	31.50
	Discharged	84	32.80	107	41.80	65	25.40
	Died	-	-	4	33.30	8	66.70
	Referred	4	8.30	16	33.30	28	58.30

Moreover, this study revealed that falldown injury was the most common cause of injury 151 (37.3%), which was supported by other studies conducted in Kenya (46%)⁷ and the united kingdom.⁸ A possible reason for this could be a lack of safety measures for unsupervised children, such as a lack of protection pads for children riding bikes, window guards, and building regulations, which lead to falling trauma. Another possible reason may be that most of our study participants were in the age group 5–12, so this age is the time they need any trial beyond their level including riding a bicycle.

Furthermore, this study's findings showed that the second most common cause of injury was RTA 98 (24.2%), which is lower than other studies conducted in Addis Ababa AaBET Hospital, where RTAs accounted (40%).²⁴ This difference might be due to the higher traffic burden in Addis Ababa, which is the capital city of Ethiopia. In this study, most injuries occurred on streets/roads 188 (46.4%). This is in line with a study conducted in Addis Ababa,²⁴ around (42.4%) of children's injuries were occurring on the streets. This could be a reflection of children often being allowed to play on local streets as in our study more 41.2% number of children were in the age group of 5 to 12 years. The other possible reason for this may be that age group needs trial of different risky activities such as playing various types of physical activity related games and trying different creative ideas.

In this study regarding to the trauma caused by RTA, motor bicycle trauma accounts the highest portion 51 (52%), which is supported by studies conducted in Japan⁴ and united kingdom,⁸ where almost a third of the children were exposed to motor vehicle collisions. The possible justification may be that since most care givers/parents use motor bicycle and seat their child in their back without seatbelt to send and return back from school due to economical inadequacy to use safe cars for their child.

In this study 5–12 year age group children were frequently traumatized with A and pelvic trauma, accounting of 38.7% of trauma. A possible reason may be that this study showed road traffic accident was common and thus studies show that abdominal and pelvis injury mostly associated with RTAs,²⁷ and which might be supported by an evidence that approximately 15% of the overall trauma injuries affect the abdominal area.²⁸

Moreover, in this study children who had abdominal and pelvic traumas were leading of all mortalities in the hospital 12 (9.7%). This might be because the abdomen holds various sensitive organs such as the kidney, spleen and liver internally thus, sensitive organ injuries usually lead to mortality in children.

This study also found in-hospital mortality of children related to trauma after the emergency visit was 12 (3.0%). Our finding was higher than that study conducted in Addis Ababa AaBET Hospital (0.2%).²⁴ A possible reason for this significant discrepancy could be the difference in service provision, since AaBET Hospital is a referral hospital. However, our study mortality was lower than the study conducted in Japan at 3.9%⁴ and Australia 11.1%.⁹ A possible reason for this difference might be the age limit of the study participants.

Strength and Limitation of the Study

This study has certain limitations. First of all, owing to the retrospective nature of the study, the data were collected from secondary sources and some important characteristics that could be found in the patient medical chart may be missed. The second limitation is, patients with lost cards and incomplete records were excluded which may cause underestimation of the results. In spite of these limitations, the results of this study make certain contributions to current literature in certain aspects and better understanding on pediatric trauma cases to facilitate better management of this vulnerable population. This study was investigated for the first time about pediatric trauma patients in southwet part of Ethiopia.

Implication of the Study

Currently, some trials attempted with the aim of preventing pediatric trauma and its severe outcomes in Ethiopia.^{22,23} However, the current study's findings indicated that the pediatric trauma related burden and mortality is high. This highlights the fact that children with trauma are at a higher risk of developing different complications and disabilities. Thus, Ethiopian government needs to strengthen existing trials and strategies to decrease the proportion of different traumas in children by preventing common mechanisms of trauma. In addition to governmental organizations, Other non-governmental

organizations should focus on trauma reduction intervention programs to control the prevalence of different traumas in children and other disabilities. Additional attention should be given to children with different common modes of traumas including fall down, RTA and animal bite. Children with face, head, abdomen and pelvic trauma should also strictly followed and managed early to prevent longterm disability. Health education should be given for those parents who had children with trauma and also for mothers who had children aged from five to twelve for primary prevention of trauma. Different concerned bodies at different health institutions including clinicians should be encouraged to minimize the risk of different trauma.

Conclusions and Recommendation

Pediatric trauma remains a major public health concern. This study indicates the majority of trauma cases were boys than girls. Falls, road traffic accidents, and animal bites are the leading causes of pediatric trauma. Falls predominates in younger children, while RTAs predominate in older children. Abdominal trauma was associated with hospital admission. Therefore, proven preventive measures such as sit belt and bike helmets should be recommended by health professionals.

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Authors' Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethics Approval and Consent to Participate

Permission Letter was obtained from the research committee of Mizan-Tepi University College of health science, department of nursing. A formal letter was submitted to Agaro general Hospital executive officer and concerned bodies to obtain their co-operation. Because of the anonymous and retrospective nature of the study, the need for informed consent was waived and therefore no written consent from the child or parent was required. To keep the confidentiality names and medical record numbers of the participant were not registered in the data collection tool. Generally, the study was performed per the Declaration of Helsinki.

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Consent to Participate

All regulatory requirements were met and because of the anonymous and retrospective nature of the study, no written consent from the patient or parent was required.

Availability of Data and Materials

The raw data file could be provided for research purposes only, upon request via e-mail of the corresponding author

ORCID iDs

Yalemtsehay Dagnaw  <https://orcid.org/0000-0002-3764-3646>
 Belete Fenta  <https://orcid.org/0000-0001-8283-9667>
 Aynalem Yetwale  <https://orcid.org/0000-0002-1950-9515>
 Tsegaw Biyazin  <https://orcid.org/0000-0002-2906-2382>

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Abbreviations

ETAT	Emergency Triage, Assessment, and Treatment
LMICs	Low-and-Middle-Income Countries
RTAs	Road Traffic Accidents
WHO	World Health Organization

Author Biographies

Yalemtsehay Dagnaw, lecturer at Department of Nursing, Mizan Tepi University, Mizan Teferi, South West Region, Ethiopia

Belete Fenta, lecturer at School of Midwifery, Jimma University, Jimma, Oromia Regional State, Ethiopia

Aynalem Yetwale, lecturer at School of Midwifery, Jimma University, Jimma, Oromia Regional State, Ethiopia

Tsegaw Biyazin, lecturer at School of Midwifery, Jimma University, Jimma, Oromia Regional State, Ethiopia

Alemayehu Sayih, lecturer at Department of Nursing, Mizan Tepi University, Mizan Teferi, South West Region, Ethiopia

Nigatu Dessalegn, lecturer at Department of Nursing, Mizan Tepi University, Mizan Teferi, South West Region, Ethiopia

Emebet Adugnaw, lecture at department of nutrition,public health , Mizan Tepi University, Mizan Teferi, South West Region, Ethiopia

Fatuma Ali, Nurse at Department of Nursing, Mizan Tepi University, Mizan Teferi, South West Region, Ethiopia

Yitbarek Tesfa, Nurse at Department of Nursing, Mizan Tepi University, Mizan Teferi, South West Region, Ethiopia