TREATMENT OUTCOMES AND ASSOCIATED FACTORS AMONG CHILDREN ADMITTED TO PEDIATRIC EMERGENCY UNIT OF DILLA UNIVERSITY REFERRAL HOSPITAL, ETHIOPIA, 2023.

MASTERS THESIS

SAMUEL JIGSO DUBE (BSc.)

HAWASSA UNIVERSITY, HAWASSA, ETHIOPIA

NOVEMBER, 2023

TREATMENT OUTCOME AND ASSOCIATED FACTORS AMONG CHILDREN ADMITTED TO PEDIATRIC EMERGENCY UNIT OF DILLA UNIVERSITY REFERRAL HOSPITAL, ETHIOPIA, 2023.

SAMUEL JIGSO DUBE

A THESIS SUBMITED TO THE

HAWASSA COLLEGE OF MEDICINE AND HEALTH SCIENCES, SCHOOL OF NURSING

HAWASSA UNIVERSITY

HAWASSA, ETHIOPIA

IN PARTIAL FULFILLMENT OF THE REQUIRMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN PEDIATRICS AND CHILD HEALTH NURSING.

PRINCIPAL ADVISOR: - Mr. EPHRAM GEJA (ASSISTANT PROFESSOR)

CO-ADVISOR: - Mrs. MEKDES MEKONEN (ASSISTANT PROFESSOR, PHD CANDIDATE)

NOVEMBER, 2023

Declaration

I hereby declare that this MSc Specialty or equivalent thesis is my original work and has not been presented for a degree in any other university, and all sources of material used for this thesis have been duly acknowledged.

Name: _____

Signature: _____

This MSc Specialty or equivalent thesis report has been submitted for examination with my approval as thesis advisor.

Name: _____

Signature: _____

Place and Date of Submission: _____

SCHOOL OF GRADUATE STUDIES

HAWASSA UNIVERSITY

ADVISORS' APPROVAL SHEET

This is to certify that the thesis entitled "Treatment outcome and associated factors among children admitted to pediatric emergency unit of Dilla university referral hospital, Ethiopia 2023." submitted in partial fulfillment of the requirements for the degree of Master's with specialization in Pediatrics and Child Health Nursing, the Graduate Program of the School of nursing, and has been carried out by Samuel jigso Dube under our supervision. Therefore, we recommend that the student has fulfilled the requirements and hence hereby can submit the thesis to the department**.**

_____	_____	_____
Name of principal advisor	Signature	Date

_____	_____	_____
Name of co-advisor	Signature	Date

SCHOOL OF GRADUATE STUDIES

HAWASSA UNIVERSITY

EXAMINER'S APPROVAL SHEET

We, the undersigned, members of the Board of Examiners of the final open defense by Samuel jigso have read and evaluated his thesis entitled " Treatment outcome and associated factors among children admitted to pediatric emergency unit of Dilla university referral hospital, Ethiopia 2023', and examined the candidate. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the degree.

_____	_____	_____
Name of Principal Advisor	Signature	Date
_____	_____	_____
Name of Internal Examiner-I	Signature	Date
_____	_____	_____
Name of Internal Examiner-II	Signature	Date

ACKNOWLEDGMENT

First, I gratefully thank the almighty God for all his help. Next, I would like to express my gratitude to Hawassa University, College of Health Sciences, School of Nursing, for giving me the opportunity and continuing support during this work.

I would like to express my deepest gratitude to my advisors, Mr. Ephram Geja (assistant professor of emergency and critical care nursing) and Mrs. Mekdes Mekonnen (assistant professor of adult health nursing and Ph.D. candidate), for their ongoing constructive comments and recommendations.

Lastly, but not least, I would like to thank Dilla University for sponsoring me to advance my academic knowledge and skills.

Table of Contents

List of table

List of figure

Abbreviations and Acronyms

CHF	Congestive Heart Failure
DAMA	Discharge Against Medical Advice
DURH	Dilla University Referral Hospital
ER	Emergency Room
ED	Emergency Department
EMD	Emergency Medicine Department
ETAT	Emergency Triage And Treatment
EW	Emergency Ward
GCS	Glasgow Coma Scale
HIV	Human Immunodeficiency Virus
IRB	Institution Review Board
MDGs	Millennium Development Goals
PED	Pediatric Emergency Department
SDG	Sustainable Development Goal
SNNPR	South Nation Nationality and People Representative
SRD	Severe Respiratory Distress
UNICEF	United Nations International Children's Emergency Fund
US	United States
WHO	World Health Organization

Abstract

Background: Children in pediatric emergency units are those who need special attention, and unless treated early, they are a vulnerable population to unwanted outcomes. However, the majority of the children admitted to pediatric emergency units was improving and discharged; a significant number of children are still experiencing death, discharge against medical advice or referral from emergency units within 24 hours. However, there is limited information regarding their outcomes and determinants of outcomes.

Objectives: To assess treatment outcome and associated factors among children admitted to pediatric emergency unit of Dilla university referral hospital, Ethiopia 2023.

Methods: An institution-based cross-sectional study design was employed among children admitted to the pediatric emergency unit at Dilla University Referral Hospital from May 8, 2023 –June 8, 2023. A one year all charts of the children aged 29 days -14 years were reviewed for the study with final (complete) charts of 885. Data was collected based on a structured checklist developed on the Kobo Toolbox mobile application. Collected data was exported into and analyzed using STATA version 14. Frequency and percentage was used to describe variables. A multinomial logistic regression model was used to determine factors associated with treatment outcome. Model goodness of fit was checked using likelihood ratio test and it showed goodness of model fit. Bivariable and multivariable multinomial logistic regression analysis were employed. After multivariable analysis, variables with an adjusted odds ratio and a p-value of <0.05 at 95% confidence interval (CI) were declared as factors significantly associated with treatment outcome.

Result: Out of the complete 885 patient charts reviewed, the magnitude of patients improved, transferred, died, referred and discharged against medical advice was 51%, 40.9%, 7.6%, 0.1%, and 0.4%, respectively. Children presented with diarrhea [AOR=2.92, 95%CI (1.46-5.84)], severe respiratory distress [AOR=5.08, 95%CI (2.49-10.35)], coma [AOR=3.71, 95%CI (1.24-11.13)], comorbidity [AOR=3.33, 95%CI (1.49-7.41)] and staying home without seeking health care for > two days since the onset of signs and symptoms [AOR=1.99, 95CI (1.03-3.83)] were significantly associated factors with emergency unit mortality, whereas pneumonia [AOR=1.76, 95%CI (1.16-2.65)] and severe acute malnutrition [AOR=3.46, 95%CI (2.06-5.81)] were significantly associated factors with intra-hospital unit/ward transfer.

Conclusion: The findings of this study showed that the magnitude of mortality, transfer to the ward and discharge against medical advice was relatively higher. Presenting with diarrhea, respiratory distress, comorbid illnesses, coma, delay to present, pneumonia and severe acute malnutrition are factors associated with pediatric emergency treatment outcomes. Interventions focused on early diagnoses and the initiation of appropriate treatments was of the utmost relevance to improve patient's outcomes.

Keywords: treatment outcome, children, pediatric emergency, Ethiopia

CHAPTER ONE

1. INTRODUCTION

1.1.Background

Children in pediatric emergency units are those who need special attention, and unless treated early, they are a vulnerable population for unwanted outcomes (Phattharapornjaroen et al., 2021). A pediatric emergency unit is a unit that offers care for children with severe diseases or injuries with the exception of infants under 29 days old and surgical situations that require urgent intervention and it is also a critical hospital unit that needs urgent decisions and prompts actions which may prevent mortality and reduce morbidity (Ambaye and Tefera, 2016). Prior to being released home or to the ward to finish their treatment, it provides quick life-saving interventions for all critically ill children who require hospitalization (Ambaye and Tefera, 2016, Kula et al., 2023).

There were different causes of pediatric emergency admission across the world. Surgical cases and respiratory infections were the common causes of emergency admission whereas symptoms like fever, cough, nausea, vomiting, and abdominal pain were common presenting complaints in united states of America (McDermott et al., 2018). In addition, children's illnesses and emergency admissions have been largely increasing in developing countries primarily as a result of infectious and communicable diseases (Onubogu and West, 2022).

Likewise patients may have different outcomes after they have been admitted to emergency unit. The possible outcomes were death, transfer to ward, improvement, discharge against medical advice and being referred to other institutions (Ambaye and Tefera, 2016, Solebo, 2014). Childhood mortality is a crucial indicator for keeping track of children's health among various outcomes and also it reflects the severity of disease and the standard of care provided to patients in the unit in an emergency situation (Mussa, 2020, Jofiro et al., 2018).

In pediatric departments, early child mortality is commonly caused by preventable and reversible diseases because critical clinical conditions, such as shortness of breath, fast breathing, and fever

with seizures are some of the preventable causes contributing to childhood mortality in pediatric departments; therefore, urgent treatment and resuscitation are required to avoid poor outcomes (Simbila et al., 2022).

For a better result, effective intervention and good emergency care for children require effort and coordination from the bedside to the level of government (Jofiro et al., 2018). Therefore, health professionals who work in pediatric emergency should triage all patients according to the severity of their conditions based on Emergency Triage Assessment and Treatment (ETAT) protocol, making sure that the more seriously ill child is treated to first (Anyanwu et al., 2014).

1.2.Statement of the problem

Emergency room (ER) remains one of the most utilized areas for pediatric patients in healthcare institutions and there has been a clear upward trend of visit of this unit in different part of the world(Kula et al., 2023). For instance in the European context, 23 million users sought care in pediatric emergency department (PED) in 2019 (Montoro-Pérez et al., 2023, Negasi et al., 2022). This is a complex situation to be faced with because, paradoxically, children have never been healthier.

Sub-Saharan African facilities experience higher patient loads and mortality than other regions particularly for pediatric emergency patients and it is estimated that up to 27% of all emergency visits involve patients less than 13 years old (Chen et al., 2020). In Ethiopia, Tikur Anbesa specialized hospital about 12,240 children (7 days old to 13 years old) presented to the pediatric emergency unit within five years period which showed significant increment from 1796 in (2012-2013) to 2448(2012-2016) admissions per year (Jofiro et al., 2018).

Despite the fact that the majority of patients admitted to pediatric emergency units show positive outcomes, there are still a significant number of unfavorable outcomes. For instance, mortality in EWs is about 1% in developed countries whereas it ranges from 2.8% to 4.1% in developing countries(Ambaye and Tefera, 2016). According to the report from china, a high mortality (93.4%) for children less than 5 years old in the PED of a single hospital (Zhu et al., 2015a) was also identified. Even worse currently sub-Saharan Africa alone accounts for more than 50% of child mortality which increased from 14% before decades so that child mortality still remained as higher in this region (Muhammad, 2022).

The determinants of death in emergency wards (EWs) are not similar throughout the world. According to the report from multicenter pediatric emergency units of Spanish, pediatric emergency death was related to their previous illnesses, sudden infant death syndrome, and traumatism (Lopez et al., 2017). Whereas in Nigeria, severe malaria, late presentation and unconsciousness were some of the identified cause and risk factors of emergency death (Edelu et al., 2020). In Ethiopia (Tikur Anbesa Hospital), Pneumonia, a delay in presentation of more than 48 h, diarrheal diseases and shortness of breath were associated with early pediatric mortality (Jofiro et al., 2018).

The magnitude of other emergency unit outcomes like discharge against medical advice has been reported as varying across different parts of the world which ranges from 1.2% to 31.7%; (Alwallan et al., 2021). Unlike developed countries, it is doubled in developing countries. For instance it is accounted as, 0.6%, 3.8, and 0.3 in Saudi Arabia, Nigeria and Ethiopia respectively. This is mainly related with economic constraints (Ambaye and Tefera, 2016, Alwallan et al., 2021).

Globally, tremendous interventions were done to reduce unfavorable outcomes by formulating different favorable health policies, and appropriate resource allocation to hasten the achievements of the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs) (Díaz et al., 2019, Brugnolaro et al., 2020). WHO introduced a new guidelines (protocol) and training materials for ETAT. African countries also approved ETAT+ package as national framework at facility-based pediatric care (Hands et al., 2021).

The same is true in Ethiopia; the Federal Ministry of Health had set the Child Survival Strategy for increasing access to promotive, preventive and basic essential curative health services to the majority of the underserved population. Even though, those measures had reduced unfavorable outcomes, the progress of decline was not impressive. Also, the studies come up with inconsistent findings concerning to outcome of pediatric emergency unit and associated factors. Regarding these, studies from India, china and Addis Ababa showed pediatric mortality were 8.4%, 93.4% and 4.1 respectively and severe pneumonia was the leading cause (Mahajan et al., 2014, Zhu et al., 2015b, Jofiro et al., 2018). Whereas a study from Senegal showed cardiac causes and being < 60 months were factors that determine mortality (Thiongane et al., 2022).

In Ethiopia, under five Child mortality rate fell gradually from 246.7 deaths per 1,000 live births in 1971 to 49 deaths per 1,000 live births in 2020. This is also true for emergency mortality from 17.1% in 2013 to 4.1% in 2018 at a single institution (UNICEF, 2020, Jofiro et al., 2018). But currently we are still far away from the SDGs (Goal 3.2) for 2030 in which child mortality rate is expected to be as low as 25 per 1000 live birth in all countries. Despite Ethiopia's efforts to reform its health system through global partnerships, a significant number of children are still experiencing unfavorable outcomes in emergency units but there are limited information regarding to this. Therefore, this study aimed to assess treatment outcome and associated factors among children admitted to pediatric emergency at Dilla University Referral Hospital.

1.3.Significance of the study

Recognizing children’s outcomes at emergency units will enable the proper actions to be done and the standard of care to be enhanced.

The findings of this study will help planners and policy makers with the identification of priorities and allocation of resources required for pediatric emergency unit.

Additionally, the findings may also add some new knowledge and improve the critical thinking skills of clinicians in the care of children with acute illnesses. It will be used as a baseline or evidence for awareness creation and improvement of children's health status at a community level. Moreover, the analysis presented in this study will convey valuable information and highlight various starting points for future researchers that will explore topics similar to this.

CHAPTER TWO

2. LITERATURE REVIEW

Many studies have been conducted and showed baseline findings on pediatric emergency treatment outcomes and associated factors. Although the literature covers a wide variety of such studies, this review was focused on three major themes that emerged repeatedly throughout the literature reviewed. These themes were: causes of pediatric emergency admission, treatment outcome and factors associated with it. Therefore, these themes were presented here as the main focus of this literature review.

2.1. Causes of pediatric emergency admission

Children who are admitted to pediatric emergency units are those with acute illnesses or injuries that require urgent interventions. Different studies have presented baseline data regarding the types of patients admitted to emergency units and their treatment outcomes during their stay in the unit(Onubogu and West, 2022).

A cross-sectional study conducted in Thailand found that the leading causes of admission to pediatric emergency unit were medical conditions, and among these the three most common diagnoses were upper respiratory tract infection (23.1%), acute febrile illness (17.1%), and acute gastroenteritis (14.1%) (Pandee et al., 2015). With another study conducted on adolescent age group in the pediatric emergency department of children's hospital, Italy, found that the main causes of presentation were trauma (45.3%), organic diseases (38.8%) and mental health problems (15.9%) (Cozzi et al., 2022).

Likewise, a study conducted in Nigeria showed that, the five common indications for emergency room visits were infectious diseases and they included malaria (18.3%), sepsis (11.9%), gastroenteritis(10.4%), upper respiratory tract infections (8.8%), and bronchopneumonia (7.9%) (Onubogu and West, 2022). In addition to these, according to a study done in Mozambique, the two most common complaints were medical (67%) and injury-related (33%). Among the medical cases, respiratory diseases (29.3%), fever (26.7%), and gastrointestinal disorders (14.2%) were the most common (Brugnolaro et al., 2020).

According to a descriptive cross-sectional study conducted in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, found that the most common causes of admission to the pediatric emergency department were severe pneumonia (24.7%) and heart diseases (13.2%) (Ambaye and Tefera, 2016).

2.2. Outcomes of the patients admitted in pediatric emergency unit

Globally, there has been a significant improvement in children's survival over the past three decades. However, the death of a child in the emergency department remained as a major challenge and one of the most serious problems (Whitehead, 2014).

Mortality rate of children at emergency unit and its causes are varying throughout the world. In most developed countries, mortalities have been reported to be below 1%. In contrast, studies from developing countries have reported mortalities range from 2.8% to 7.3% among children hospitalized in EDs. Trauma and cardiovascular are main causes of death in developed countries whereas infectious diseases are predominate in the developing countries especially in sub-Saharan Africa (Zhu et al., 2015a, Lopez et al., 2017).

According to a cross-sectional study done in the USA, there were 34.1 pediatric fatalities out of every 100,000 visits to emergency departments. The leading cause of death for all pediatric emergency visits was injury-related, accounting for 21.1% of the overall mortality (Rice et al., 2017). According to a different study done in Italy, the mortality rate was 7%, and the three most common direct causes of death were respiratory failure (25%), increased intracranial pressure (10%), and septic shock (43%) (Bressan et al., 2021).

But the study conducted in Spain reported that mortality rate was 1.5 /100 000 visits. The main causes of death were related to their previous illnesses (24.5%), sudden infant death syndrome (20.7%), and traumatism (18.8%) (Lopez et al., 2017). Whereas according to study from Pakistan, among the children admitted to PED, 11 % left against medical advice and 4.3% died (Ijaz et al., 2018).

Additionally, a study done in Nigeria revealed that the mortality was 5.9%. The main causes of mortality were infectious diseases (88.3%). The three infectious disorders with the highest fatality rates were sepsis (36.7%), gastroenteritis (16.7%), and meningitis (10.0%). Another study conducted in the same nation revealed that 3.2%, 4.1% and 45.5% died, left the hospital

against medical advice and discharged with improvement respectively (Onubogu et al., 2022, Onubogu and West, 2022).

The study conducted in Tikur Anbesa specialized hospital, Ethiopia showed that, 69.1%, 12.3%, 17.1%, 0.3% and 0.2 were improved, transferred to ward, died, discharged against medical advice and referred to other institutions respectively (Ambaye and Tefera, 2016). Another study conducted at the same institution reported that mortality was 4.1%. The top ten causes of deaths were pneumonia (17.8%), congestive heart failure (CHF) (13.6%), sepsis (11.8%), meningitis 10.1%, hypovolemic shock 6%, hematological malignancy 4.4%, anemia 4.1%, tuberculosis 3.9%, abdominal mass 2.7% and renal failure 2.4% (Jofiro et al., 2018).

2.3. Factors Associated with Outcome of children admitted to pediatric emergency unit

2.3.1. Socio–demographic factors

According to a cross-sectional study from the USA, older children had much lower odds of dying or being transferred compared to infants, and girls were less likely than boys to be transferred or die in the ED (Whitfill et al., 2018).

Similar study done in Nigeria stated that, the majority of the mortality was in infancy (52.9%) followed by other under-fives (38.2%) (Anyanwu et al., 2014). Whereas study done in Mozambique showed that, living in the extra-urban area and being referred to the PED by a health care provider were significantly associated with both hospitalization and death in the PED (Brugnolaro et al., 2020). In addition to this according to cross sectional study done in the same nation, Some of the common reasons for discharge against medical advice (DAMA) include lack of acceptance of the treatment modalities and financial constraints (Bassey and Ijezie, 2016).

In addition to this, a Study conducted in Tikur Anbesa, Ethiopia, more death occurred in male than female with the ratio of 1.3:1 (Jofiro et al., 2018).

2.3.2. Seasonal factors

A study done in the pediatric emergency unit of the Mohammed VI teaching hospital, Morocco showed that most of the deaths (40%) occurred in the winter season and majority of the deaths (68%) were recorded between the time ranges of 4 pm to 8 pm (Lahmini and Bourrous, 2020). Similar study conducted in Guinea-Bissau stated as mortality was 51% higher in the rainy season

than in the dry season. Malarial deaths were the main reason for the seasonal mortality difference, causing 50% of all deaths in the rainy season (Nielsen et al., 2017).

2.3.3. Factors related to disease (illness and clinical presentations)

Globally, different regions experienced different diseases that were linked to pediatric emergency treatment outcomes. For instance, in industrialized nations, cardiovascular disease and trauma were the leading causes of death, while infectious diseases are more common in developing nations (Zhu et al., 2015a, Lopez et al., 2017).

A study from Nigeria found that 3.5% of patients were discharged against medical advice, which is attributed to the diagnosis since the majority of them had chronic conditions and may have decided to seek out other forms of assistance (Anyanwu et al., 2014).

Whereas study from Dar es Salaam, Tanzania, showed that, altered level of consciousness (8.6%), low random blood glucose were among factors observed to be associated with 24 hours mortality (Mussa, 2020).

According to a study from Switzerland, children with respiratory disorders were more likely to be transferred from the pediatric emergency room to the pediatric ICU (Simma et al., 2021). In addition to this, a study from the USA found that 23% of children diagnosed with pneumonia were transferred to another unit from a pediatric emergency unit (Williams et al., 2016).

Moreover, a retrospective cross-sectional study was carried out at the Tikur Anbessa Specialized Hospital, Ethiopia. This study found that pediatric emergency mortality was significantly associated with fever, shortness of breath, and a late start of signs and symptoms (> 2 days) (Jofiro et al., 2018).

2.3.4. Delay in seeking of healthcare facility

According to a study done in Pakistan and Tanzania, emergency mortality was associated to ED presentations that were delayed by more than 48 hours from the onset of the disease (Simbila et al., 2022, Mukhtar et al., 2021).

A study conducted in Tikur Anbesa specialized hospital, Ethiopia, also showed that a delay in presentation to a pediatric emergency of more than 48 hours was significantly associated with early pediatric mortality (Jofiro et al., 2018).

2.3.5. Healthcare facility related factors

It is recommended that children should seek immediate medical attention. However, According to a WHO report, more than half of childhood mortality is caused by a delay or insufficient response to medical care, which can be prevented by obtaining medical help sooner (WHO, 2016).

High quality hospital care for sick neonates, infants and older children are not readily available and is highly demanding in low and middle income countries. This results in high childhood mortality in resource- limited settings (Shah et al., 2022).

A study report from Nigeria showed that delayed initiation of interventions played a role for pediatric emergency mortality within 24 hrs of admission (Enyuma et al., 2019).

A cross-sectional study conducted in Sultan Qaboos University showed that nursing care behaviors are strongly linked with positive patient outcomes (Labrague et al., 2020).

2.4. Conceptual framework

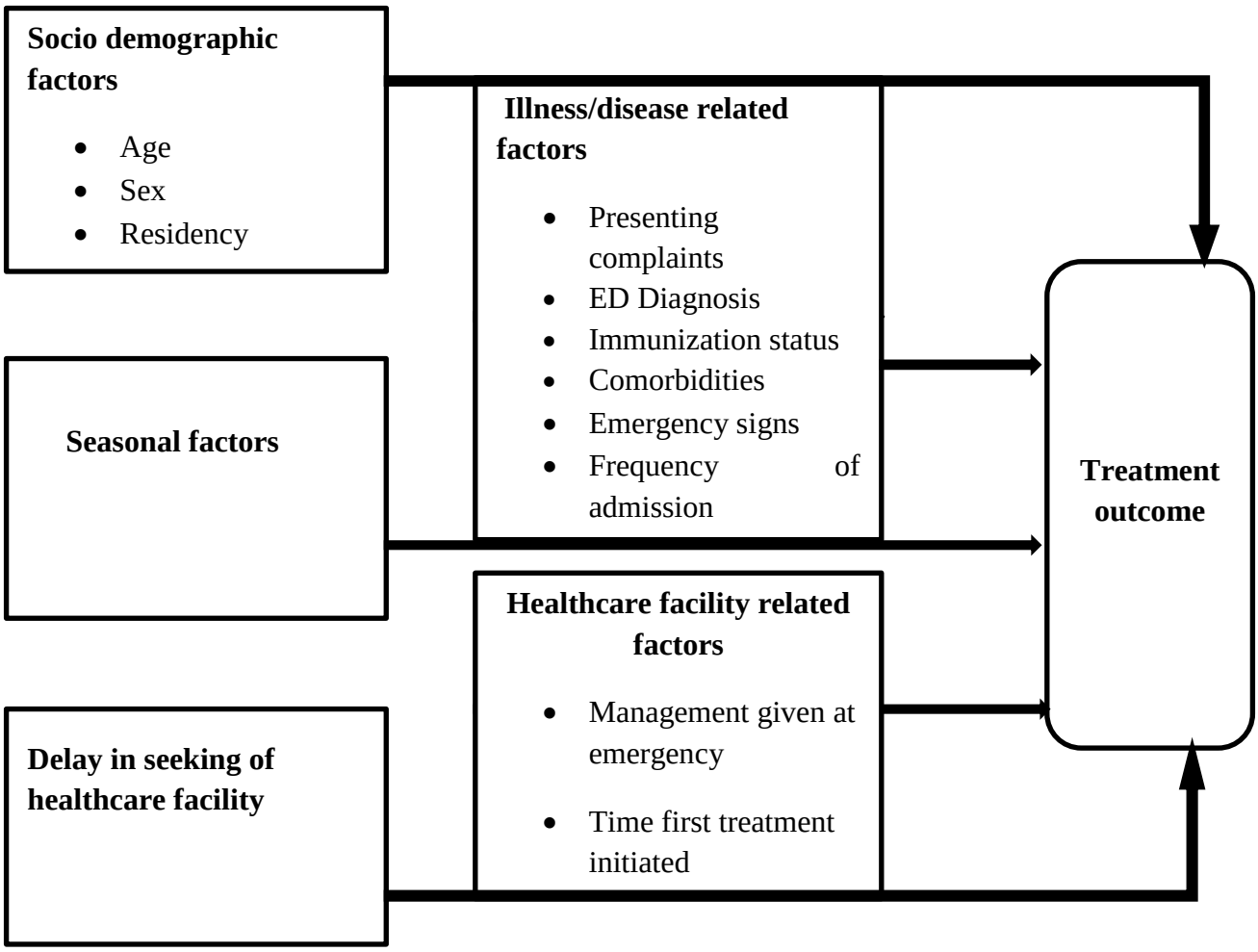


Figure 1: The conceptual framework adopted after reviewing similar literatures for treatment outcome and associated factors among children admitted in pediatrics emergency (Ambaye and Tefera, 2016, Jofiro et al., 2018, Mussa, 2020, Sbarigia et al., 2016).

CHAPTER THREE

3. OBJECTIVES

3.1. General objective

- To assess treatment outcome and associated factors among children admitted to pediatric emergency unit of Dilla university referral hospital in the last one year, Ethiopia, 2023.

3.2. Specific objectives

- To determine treatment outcome among children admitted to pediatric emergency unit of Dilla university referral hospital, Ethiopia, 2023.
- To identify factors associated with treatment outcome among children admitted to pediatric emergency unit of Dilla university referral hospital, Ethiopia, 2023.

CHAPTER FOUR

4. MATERIALS AND METHODS

4.1. Study design

Institution-based cross-sectional study design was employed.

4.2. Study area and period

The study was conducted at Dilla University Referral Hospital (DUTRH) in Southern Ethiopia, from May 8, 2023 – June 8, 2023. Dilla university referral and teaching hospital is found in Gedeo zone Dilla town (administrative city of Gedeo zone) which is 359 km from capital city of Ethiopia Addis Ababa to south west. The Hospital was established in 1977 E.C as a District Hospital(town, 2010). Since 2005 E.C, Dilla University has been in charge of running the government-owned hospital. Then finally it got the name DURH (hospital, 2011).

Currently, it is providing preventive, curative, and rehabilitative services for greater than two million (2000000) populations from South Ethiopia, Oromia and Sidama regional state. Based on the type of care provided, it is subdivided into five major wards (medical, surgical, pediatrics and oby/gyne and orthopedics) and four units (adult ICU, NICU, adult emergency and pediatric emergency). Among the different units/wards of the hospital, pediatric emergency unit is a unit that gives first and immediate care for children with acute illnesses. However, pediatric emergency started the service as a separate unit five years ago, formal triage system like coding or categorizing the patient based on clinical conditions started last year. There are totally 9 health professionals in the pediatric emergency unit, 6 professional nurses, 2 pediatric nurse specialists (MSc level) and 1 general practitioner. The unit has 8 beds and admits on average five to ten patients per day and 250 patients per month.

4.3. Populations

4.3.1. Source population

- All pediatric patients admitted to pediatric emergency unit of Dilla university referral hospital.

4.3.2. Study population

- Those pediatric patients admitted to pediatric emergency unit in the last one year (from October 2021 to September 2022) at Dilla university referral hospital.

4.3.3. Study unit

- Each chart or medical record of the children after excluding incomplete charts.

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion criteria

- All children (aged 29 days to 14 years) admitted to a pediatric emergency.
- Children who were discharged within 24 hours of emergency unit admission in the past one year were included (October 2021 to September 2022).

4.4.2. Exclusion criteria

- Incomplete charts were excluded.

4.5. Sampling

Due to objective of the study, all charts of pediatric patients (aged 29 days to 14 years) that were admitted in the last one year were reviewed. A total of 1648 patients were admitted to the pediatric emergency unit in the last year. Among these, about 463 patients were not discharged from the pediatric emergency unit within 24 hours (stayed there beyond 24 hours). The remaining 1185 charts showed the 24-hour outcomes of the patient, but about 300 charts from this did not have the full information that was necessary for this particular study. Finally, 885 charts were taken for final analysis.

4.5.2. Sampling (chart selection) procedure

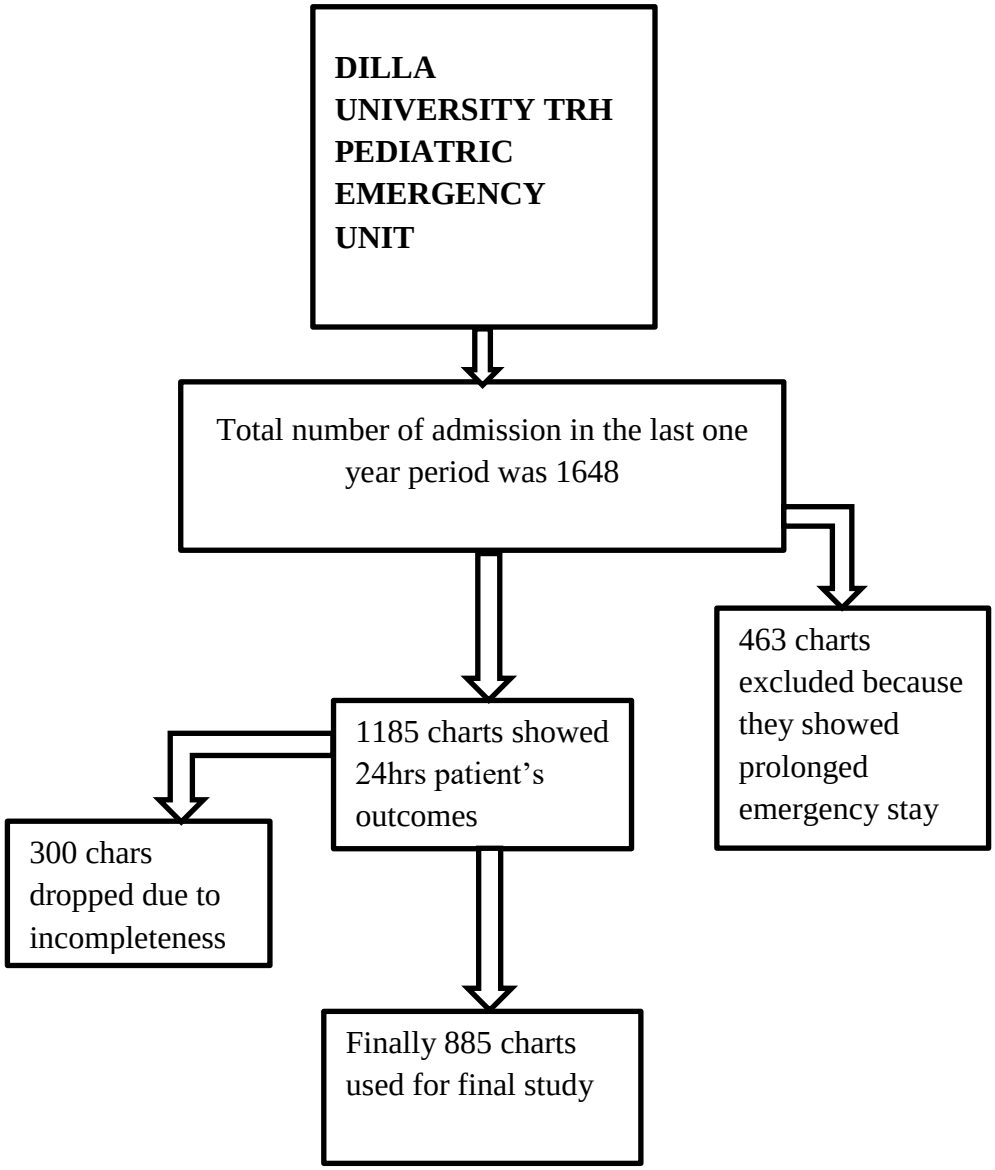


Figure 2: Schematic presentation of sampling procedure for the study of treatment outcome and associated factors among children admitted to pediatric emergency unit of Dilla university referral hospital, 2023.

4.5. Study variables

4.5.1. Dependent variable

- Treatment outcome during pediatric emergency unit discharge/leave (improved, transferred to ward, died, left the ED against medical advice and referred).

4.5.2. Independent variables

- **Socio demographic factors**: (Age, gender, residency).
- **Illness/disease related factors**: (clinical diagnosis at admission, frequency of admission, presence of comorbid illness, WHO emergency signs).
- **Delay in seeking of healthcare facility: (**duration of onset of signs and symptoms before visiting the health care facility for > 2 days).
- **Healthcare facility related factors: (**Time first treatment initiated, Management given at emergency)
- **Seasonal factors:** (summer, winter)

4.5.3. Data collection instruments and procedure

The necessary information that should be recorded on a structured checklist were adopted form similar studies based on the elements intended to study (Seifu et al., 2022, Jofiro et al., 2018, Ambaye and Tefera, 2016, Mussa, 2020). It had three main parts such as socio demographic characteristics, clinical characteristics and healthcare facility related factor.

A one-day brief training was given by the principal investigator to three professional (BSc) nurses and one supervisor on the information included in the checklist and the method of data collection from the records based on the KoBoToolbox data collection tool.

After training was given, all medical record numbers of children admitted in the specified time period were taken from the HMIS book. Then, based on the medical record number, charts were drawn out of the card room with the help of card room staff and made ready for data collectors. Finally, the data collectors reviewed the identified charts and filled in the data on the KoBoToolbox data collection tool accordingly.

4.5.4. Data quality assurance technique

Data quality was ensured during each step of data processing. Before actual data collection, 20 charts were pretested at the study hospital. Then, based on the pretest findings, the level of GCS and blood sugar were not recorded for every individual patient. Therefore, these variables were removed, and instead of the level of GCS, coma was assessed as a single variable based on WHO emergency signs.

One-day training was given by the principal investigator. Then, data was extracted by data collectors after checking each chart for its provision of full information and appropriate documentation. The completeness and accuracy of the data were checked by the supervisor during data collection. The collected data were combined into the principal investigator's KoBoToolbox account and were also rechecked again for completeness and appropriateness.

4.5.5. Data management and analysis

Data was collected, entered and cleaned with koBoToolbox mobile application. Then the collected data was received from data collectors via KoBoToolbox and exported into STATA version 14 for analysis. Descriptive statistics was used to summarize the data. The median and interquartile were also used to summarize continuous variable.

A multinomial logistic regression model was used to determine the association between independent and dependent variables. The degree of association between each independent and dependent variable was assessed by a bivariable multinomial logistic regression model. The variables with p-value < 0.25 during bivariable analysis were selected as candidate variables for multivariable multinomial logistic regression analysis. Multi-collinearity was also checked using VIF in order to prevent confounding effects between independent variables and all values were below 5 with a mean value of 1. 39. After multivariable analysis, variables with an adjusted odds ratio and a p-value of <0.05 a 95% confidence interval were declared as factors significantly associated with treatment outcome.

Model fitness for multinomial logistic regression was checked by the likelihood ratio test (Abdul Hamid et al., 2018). This test showed that there is a difference between model with reduced predictors(m1) and with full predictors(m2), with a p-value of .001, meaning that the reduced

model (m1) was a subset of the final model (m2) (at least a subset of the predictors has non-zero effects), which indicates good model fit.

4.6. Operational definitions

Treatment outcome: patient's clinical condition at the time of discharge form emergency unit within 24 hr. It was assessed as 'outcome of the patient at the time of discharge" and the possible options were (1. improved, 2. transferred to ward/ICU, 3 died, 4. left the ED against medical advice 5.referred to another facility) (Seifu et al., 2022, Ambaye and Tefera, 2016).

Incomplete chart: was the absence of necessary information (i.e., triage papers, discharge summaries, patient's full history and physician order) about patients based on the standard formats attached at the annex or without dated and signed entries (Tola et al., 2017). Absence of at least one of these was considered as incomplete and dropped.

Delay in health care seeking: is staying home for 48 hours or more before consulting any formal healthcare facility (Simbila et al., 2022). This was assessed as "Onset of signs and symptoms" and it had two items: 1. ≤ 2 days and 2. > 2 days.

Readmission: Is a subsequent hospital admission in the same or a different hospital within 30 days following an original admission (or index stay) and is clinically related to the index admission (Balane et al., 2023).

4.7. Ethical Consideration

Permission to carry out the study was obtained from Hawassa University College of medicine and health sciences Institution review committee (IRB). Then support letter was also taken from school of nursing and finally data was collected after the permission of Dilla University Referral Hospital office of medical director and card room. Since this study was from secondary data, it didn't require informed consent for the card review. But confidentiality of information for those participants whose documents reviewed was respected.

4.8. Dissemination of the Result

The result of this study will be presented to Hawassa University College of medicine and health sciences, school of nursing. Then final thesis document will be disseminated to Hawassa University College of medicine and health sciences, school of nursing. Furthermore the

manuscript will be submitted to be presented on workshop and different seminars and finally submitted to relevant scientific journals for publication.

CHAPTER FIVE

5. RESULT

5.1 Socio demographic characteristics of children.

A total of 1185 patients discharged within 24hrs. of emergency stay. Of these, 885 patient charts fulfilled the criteria for final analysis. The median age of children admitted to pediatric emergency was 1 (IQR: 1-2) year. Regarding sex, 501(56.6%) were males and also the majority of the patients 384 (68.5%) hailed from urban areas (Table1).

Table 1: socio demographic characteristics of children admitted to pediatric emergency unit of Dilla university referral hospital, 2023. (n= 885).

Variables	Category	Frequency	Percentage
Age	≤1yr	474	53.5
	1-5yrs	302	34.2
	>5yrs	109	12.3
Sex	Male	501	56.6
	Female	384	43.4
Residence	Urban	384	68.5
	Rural	606	31.5

5.2. Illness/disease related factors.

According to the findings of this study, it was observed that a majority of patients, 727 (82.1%) arrived at the emergency unit without being referred from other institutions. In terms of the frequency of admission, 123 children (14%) were readmitted to the unit within 30 days of their previous admission and in addition to these, majority of the children 698(78.9%) were fully vaccinated (Table 2).

Table 2: Illness/disease related characteristics of children admitted to emergency unit of Dilla university referral hospital, 2023. (n= 885).

Variables	Category	Frequency	Percentage
Source of referral	from health institution	158	17.9
	Self-referral	727	82.1
Frequency of admission	New admission	762	86
	Readmission	123	14
Immunization status	Not immunized	106	12
	Partially immunized	81	9.1
	Fully immunized	689	78.9
Onset of sign and symptom	≤ 2 days	474	53.6
	>2 days	411	46.4
Season during admission	Winter	447	50.5
	Summer	438	49.5
Treatment initiation time	Within 1-2 hr.	567	64.1
	> 2 hr.	318	35.9

5.3. Common chief complaints and identified emergency signs of children admitted to pediatric emergency.

The study findings revealed that the primary symptom observed in most cases was fever 517(58.4%). Regarding to WHO emergency signs, severe respiratory distress was the commonest 73(8.2%) identified emergency sign. In addition to these, 548(62%) children presented with more than two complaints (Table 3).

Table 3: Common chief complaints and identified emergency signs of children admitted to pediatric emergency unit of Dilla university referral hospital, 2023. (n= 885).

Variables	Category	Frequency	Percentage
Fever	Yes	517	58.4
	No	368	41.6
Diarrhea	Yes	264	29.8
	No	621	70.2
Cough	Yes	384	43.4
	No	501	56.6
Vomiting	Yes	353	39.9
	No	532	60.1
Shock	Yes	42	4.7
	No	843	95.3
Convulsion	Yes	10	1.15
	No	875	98.85
Severe respiratory distress	Yes	73	8.2
	No	812	91.8
Severe dehydration	Yes	39	4.4
	No	846	95.6
Coma	Yes	40	4.5
	No	845	95.5
Presenting complaints in number	Single complaints	337	38
	Multiple complaints	548	62

5.4. Causes of pediatric emergency admission (common diagnosis) of children admitted to pediatric emergency.

The most common reason for admission to the pediatric emergency unit of Dilla university referral hospital was pneumonia 368(41.6%). Of this 46% of children's were under one age group. Regarding with the age of children, pneumonia was more common in less than one year (46%). Meanwhile, 138(15.6%) patients presented with malnutrition (under nutrition) from which 132(95.6%) diagnosed with severe acute malnutrition. In addition to these, 265(30%)

children presented with comorbid illnesses, among these pneumonia was the most comorbid illness 222(83%) which was followed by malnutrition 120(45%) (Table 4).

Table 4: Causes of admission (common diagnosis) among children admitted to pediatric emergency unit of Dilla university referral hospital, 2023. (n= 885).

Variables	category	frequency	Percentage
Pneumonia	Yes	368	41.6
	No	517	58.4
Diarrhea	Yes	264	29.8
	No	621	70.2
Malaria	Yes	198	22.4
	No	687	77.6
Malnutrition	Yes	138	15.6
	No	747	84.4
TB	Yes	38	4.3
	No	847	95.7
Meningitis	Yes	71	8
	No	814	92
Comorbidity	Yes	265	30
	No	620	70
Acute tonsillitis	Yes	22	2.5
	No	823	97.5
Others		110	9.7

Others: Acute abdomen, burn, head injuries, sepsis, IP, GBS, HAAD, UTI and retropharyngeal abscess.

5.5. Treatments (managements) given at pediatric emergency unit.

Patients received different kinds of interventions during their emergency unit stays; among these, the most common type of treatment category was antibiotics 765 (86.4%) (Table 5).

Table 5: Treatments (management) given at the pediatric emergency unit of Dilla University referral hospital in 2023 (n = 885).

Variable	Frequency	Percentage
Antibiotics	765	86.4
Oxygen	188	21.3
Iv fluids	127	14.4
Rehydration agents and Zink	99	11
Anti-pains	74	8.3
Anticonvulsants	35	4
Formula feedings	23	2.6
Anti inflammatories	18	2
Others	18	2

Others: vasopressors, vit D, vit A and Lasix

5.6. Outcome of the children admitted to pediatric emergency unit.

Around half 451(51%) of patients admitted to pediatric emergency unit were improved whereas 67(7.6%) were died within 24hrs. Among died, majority of death occurred in age group of below 1 year 41(61.2%) and male had higher proportion 42(63%) (Figure 3).

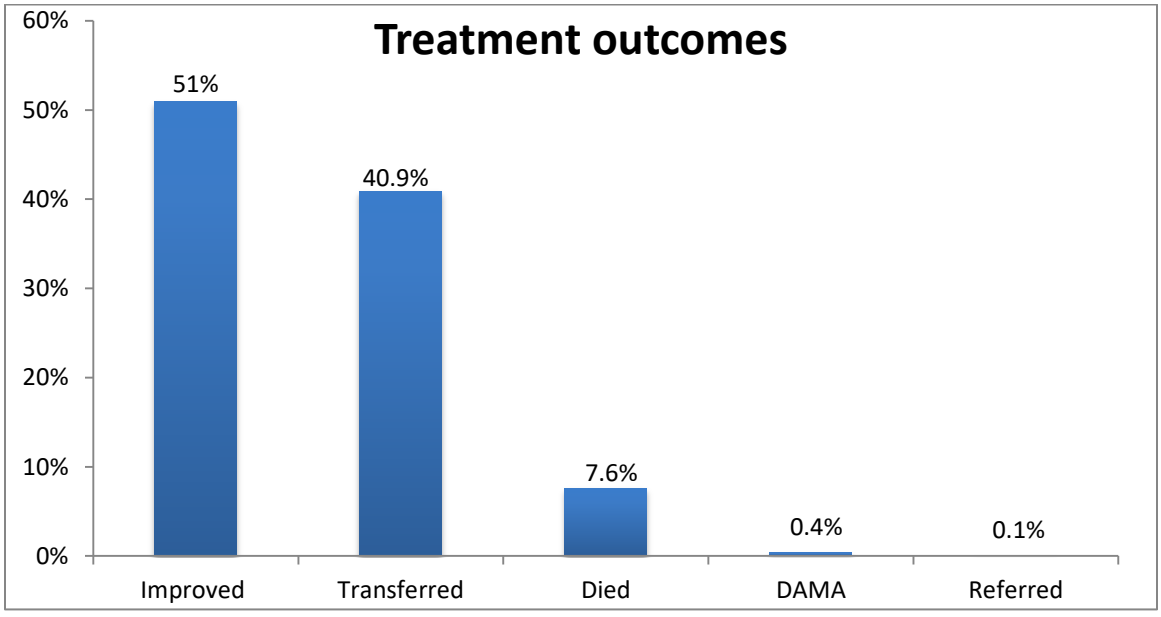
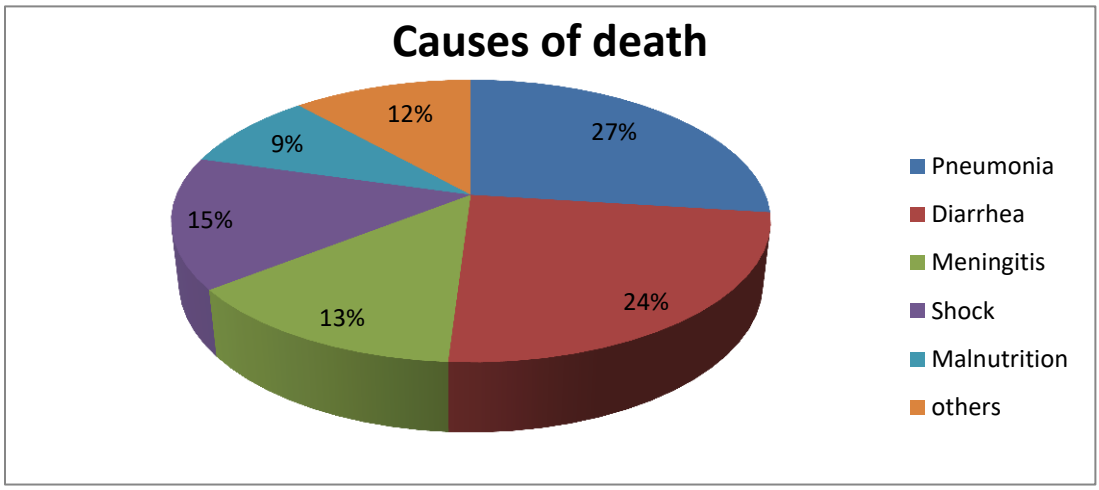


Figure 3: Outcomes of children admitted to pediatric emergency unit of Dilla university referral hospital, Ethiopia 2023. (n=885).

5.7. Primary diseases that cause a death.

This study showed that majority of pediatric emergency death was caused by pneumonia 18(27%) and followed by diarrhea16 (24%). In addition to these, others listed below were also identified as significant diseases contributing to pediatric mortality in emergency unit (Figure 4).



Others: sepsis, severe malaria, severe head injury and congenital heart disease

Figure 4: Primary diseases that cause a death at pediatric emergency unit of Dilla university referral hospital, Ethiopia 2023. (n=885).

5.8. Factors associated with treatment outcome among children admitted to pediatric emergency unit.

Two outcomes, discharge against medical advice and referral, were excluded from multinomial logistic regression analysis because they were analytically irrelevant. Consequently, only three outcomes (death, transfer, and improvement) were considered for Mlogit analysis. The category 'improved' was chosen as the reference category. The remained two categories were interpreted relative to ‘improved’ category.

Bivariable multinomial logistic regression was done to assess the association between each predictor variable and an outcome variable. Finally, residence, pneumonia, diarrhea, severe acute malnutrition, severe respiratory distress, cough, coma, comorbidity, duration of presenting signs and symptoms, shock, and multiple complaints were identified as candidate variables for multivariable multinomial logistic regression analysis, with a significance level of $p<0.25$.

After controlling for confounders, diarrhea, duration of signs and symptoms (>48 hours), presence of comorbidity, coma and severe respiratory distress remained significantly associated with pediatric emergency mortality, whereas pneumonia and severe acute malnutrition were significantly associated with transfer to other intrahospital units compared to improved children in multivariable multinomial logistic regression analysis with AORs at 95% confidence intervals.

Odds of death relative to improved children was almost 3 times higher among those who were presented with diarrhea compared to children without diarrhea [AOR=2.92, 95% CI (1.46-5.84)].

Children presented with severe respiratory distress were 5 times more likely to die at the emergency unit compared to those without severe respiratory distress [AOR=5.08, 95% CI (2.49-10.35)]. Whereas, children in a coma at the time of emergency admission were almost 4 times more likely to die relative to improved children when compared to children that weren’t in coma[AOR=3.71, 95%CI (1.24-11.13)].

The odds of death relative to improved children were almost 2 times higher among those children who were presented to the pediatric emergency unit after 48 hours of symptom onset compared to those presented earlier[AOR=1.99, 95CI (1.03-3.83)].

Relative to improvement, the odds of death was 3 times higher among the children admitted with comorbid illnesses when compared to those without comorbidity [AOR=3.33, 95%CI (1.49-7.41)].

The odds of transfer relative to improved children were more than 3 times higher among severely malnourished children compared to those not malnourished [AOR=3.46, 95%CI (2.06-5.81)]. Additionally, the odds of transfer relative to improved children were almost 2 times higher among children diagnosed with pneumonia compared to those without pneumonia [AOR=1.76, 95%CI (1.16-2.65)] (table 6.)

Table 6: Bivariable and multivariable multinomial logistic regression analysis on treatment outcome and associated factors among children admitted to pediatric emergency unit of Dilla University Teaching and Referral Hospital. (n= 880).

Variables	Died	Improved	Transferred	**Died**		**Transferred**	
				COR(95%CI)	AOR(95%CI)	COR	AOR
Residence							
Rural	26	125	128	1.65(0.97-2.81)	1.61(0.87-2.95)	1.42(1.06-1.92)	1.23(0.89-1.69)
Urban	41	326	234	1	1	1	1
Pneumonia							
Yes	36	141	191	2.55(1.51-4.29)	1.51(0.65-3.48)	2.45(1.84-3.27)	1.76(1.16-2.65)***
No	31	310	171	1	1	1	1
SRD							
Yes	23	32	20	6.84 (3.68-12.71)	5.08(2.49-10.35)***	0.76(0.43-1.36)	0.59(0.32-1.09)
No	44	419	342	1	1	1	1
Malnutrition							
Yes	13	29	96	3.51(1.71-7.14)	1.06(0.44-2.54)	5.25(3.37-8.17)	3.46(2.06-5.81)***
No	54	422	266	1	1	1	1
Onset of S/S							
>2 days	49	195	166	3.57(2.01-6.32)	1.99(1.03-3.83)*	1.11(0.84-1.46)	0.94(0.69-1.27)
≤ 2 days	18	256	196	1	1	1	1
Coma							
Yes	9	23	8	2.88(1.27-6.54)	3.71(1.24-11.13)*	0.42(0.18-0.95)	0.58(0.22-1.19)
No	58	428	354	1	1	1	1
Comorbidity							
Yes	40	82	143	6.66(3.87-11.48)	3.33(1.48-7.41)**	2.93(2.13-4.04)	1.41(0.91-2.21)
No	27	369	219	1	1	1	1

Diarrhea							
Yes	41	118	84	4.45(2.60-7.59)	2.92(1.46-5.84)**	0.85(0.61-1.17)	0.75(0.51-1.12)
No	26	333	278	1	1	1	1
Cough							
Yes	31	180	173	1.29(0.77-2.17)	0.51(0.23-1.11)	1.37(1.04-1.82)	0.73(0.49-1.08)
No	36	271	189	1	1	1	1
Shock							
Yes	13	18	11	5.79(2.68-12.47)	2.23(0.86-5.77)	0.75(0.35-1.61)	0.78(0.35- 1.74)
No	54	433	351	1	1	1	1
Multiple S/S							
Yes	56	258	234	3.81(1.94-7.46)	1.79(0.76-4.22)	1.36(1.02-1.81)	1.21(0.82-1.74)
No	11	193	128	1	1	1	1

Key: *p<0.05, **p<0.01, ***p<0.001, SRD= severe respiratory distress, S/S = sign and symptom, 1=reference category.

CHAPTER SIX

6. DISCUSSION

Periodic evaluation of the emergency unit generally provides an excellent means of measuring institutional performance as well as assessing the quality of services given to the clients. The aim of this study was to assess treatment outcome and identify factors associated with treatment outcome in pediatric emergency unit.

The current study identified the magnitude of each pediatric emergency outcome (improved, transferred, died, referred and discharged against medical advice) and also determined factors associated with these outcomes. Severe respiratory distress, coma, having comorbid illnesses, diarrhea and presenting to pediatric emergency unit after 2 days since the onset of signs and symptoms were factors associated to pediatric emergency mortality. Whereas pneumonia and severe acute malnutrition were two factors that independently associated with patient transfer to wards or other units.

This study showed that 51%[95%CI:(47.6-54.2)], 40.9%[95%CI:(37.7-44.2)], 7.6%[95%CI:(5.99-9.51)], 0.4%[95%CI:(0.16-1.20)] and 0.1%[95%CI:(0.01-0.80)] were improved, transferred to wards, died, discharged against medical advice and referred to other health institutions respectively.

As shown above, more than half of the children had a good outcome (improved), but a significant number of children were being transferred to wards or units within 24 hours for further management. The magnitude of these two outcomes (improved and transferred to ward), was in agreement with the previous study conducted in Nigeria which was 50.4% and 44.1% respectively (Ibeziako and Ibekwe, 2022). In contrast, the magnitude of patient transfer to the ward was higher, whereas improvement was lower than the findings of a study conducted in Addis Ababa (TASH) in which 69.1% were improved and 12.3% were transferred to wards within 24hrs (Ambaye and Tefera, 2016). This discrepancy might be due to differences in sociodemographic characteristics, particularly the residence of the patients. The patients in this particular study area were more rural when compared to those in TASH. Those patients who were from rural areas might be at a higher risk for negative outcomes since their medical conditions may be influenced by poor infrastructural and socioeconomic conditions.

According to this study, the magnitude of patients discharged against medical advice was 0.4% [95%CI: (0.16-1.20)]. This value implies an expected and acceptable magnitude of DAMA at the emergency unit because many attendants may not decide to leave a hospital against medical advice within 24 hours. Since DAMA has potentially deleterious effects on the health of children, such as readmission, prolonged morbidity and even sudden death, it is expected to be a rare outcome of pediatric emergency unit (Albayati et al., 2021). This finding was comparable with the findings of a study conducted in Addis Ababa (0.3%) (Ambaye and Tefera, 2016). However it is lower than the findings of the studies from different parts of Nigeria in which it was reported 1%, 4.1% and 2.3% (Ijaz et al., 2018, Onubogu et al., 2022, Umar et al., 2018, Okoronkwo et al., 2018). This discrepancy might be due to a difference in national-level community-based health insurance coverage: 28.1% in Ethiopia and 3% in Nigeria (Merga et al., 2022, Sasu, 2022). This system protects financial risks for health care costs and thereby, reduces discharge against medical advice.

Furthermore, the current study revealed that pediatric emergency mortality within 24hrs was 7.6% [95%CI: (5.99-9.51)]. This indicates how it was a rare outcome but a significant health problem for the children at the pediatric emergency unit, has the potential to cause fear among families of children, and it needs more efforts from healthcare providers to reduce it. This finding was in line with findings of studies conducted in Italy and Switzerland which was 7% and 7.2% respectively (Bressan et al., 2021, Lutz et al., 2014). Conversely, this finding was higher than findings from the study of Addis Ababa, Pakistan and Nigeria which was 1.3%, 4.3% and 5.9 respectively (Jofiro et al., 2018, Ijaz et al., 2018, Onubogu et al., 2022). The reasons for this difference could be due to the difference in resources availability at a given hospital and other hospitals and also presence of other tertiary level hospitals in the community.

This study also showed that diarrhea and pediatric emergency mortality had a strong association. Children with diarrhea were almost three times more likely to die compared to without diarrhea. This finding implies the fatality of diarrhea if proper action is not taken promptly at the pediatric emergency unit. This report was in agreement with the studies conducted in Addis Ababa and Nigeria (Jofiro et al., 2018, Ezeonwu et al., 2014). Scientifically, this was justified that diarrhea causes the body to lose fluid, which can quickly lead to dehydration, particularly in young children who have low fluid reserves and unless treated promptly, severe dehydration can result

in electrolyte imbalances and organ failure which is finally leads to death(Thiagarajah and Martin, 2019).

A current study identified that children with severe respiratory distress were five times more likely to die compared to children without respiratory distress. This finding was supported by studies conducted in Tanzania, Saudi Arabia and Addis Ababa (Bashaka et al., 2019, Albuali and Alghamdi, 2022, Jofiro et al., 2018). Scientifically, this could be justified as severe respiratory distress can alter how oxygen and carbon dioxide are exchanged in the lungs, resulting in oxygen and carbon dioxide imbalance in the body which in turn affects vital organs (Amigoni et al., 2017). In addition to this, children who presented with severe respiratory distress may also have underlying medical conditions. These conditions pave the way for further respiratory complications and increase the risk of mortality during emergency conditions.

The odds of death among children with coma were tripled when compared with their counterparts. This finding was consistent with the studies conducted in Egypt, Malawi, Tanzania and the USA (Ogunmekan, 2017, Fouad et al., 2019, Ngwalangwa et al., 2019, Muhanuzi et al., 2019, Song and Wang, 2017). It might be due to the fact that comatose children frequently have serious underlying medical issues that have contributed to their comatose state and they are also prone to aspiration and frequent hypoglycemia, which are serious conditions resulting in death if not managed promptly (Greer and Curiale, 2013).

Presenting to the pediatric emergency unit after 2 days since the onset of signs and symptoms showed significant association with children's mortality. The studies from Addis Ababa, Tanzania, Nigeria and Pakistan were supported this finding (Jofiro et al., 2018, Simbila et al., 2022, Mukhtar et al., 2021, Isezuo et al., 2020). Delay in presentation implies that the child is not getting appropriate medical care at a right time, which can then exacerbate their condition and make stabilizing them more difficult. As a result, clinical conditions become worsen and death can occur.

The current study also revealed that children with comorbid illnesses were three time more likely to die than those without comorbid illnesses. The previous studies findings from Pakistan, South Africa and Uganda supported this finding (Duke and Cheema, 2016, Fatima et al., 2021, Banga et al., 2020). This might be explained by the fact that children with comorbid conditions are

typically more susceptible and have additional health burden, which can impact their outcomes (Akoo et al., 2023). Comorbidities can also lower a child's physiological reserve and general health, which makes it harder for them to handle the stresses of a pediatric emergency. They may be more likely to die as a result of their diminished capacity to recover from severe insults.

On the other hand, the odds of transfer to the ward/ICU were doubled among children admitted with pneumonia when compared to children without pneumonia. This finding was supported by studies from the US, China and Switzerland (Shi et al., 2020, Williams et al., 2016, Simma et al., 2021). This could be because children with pneumonia are only stabilized and evaluated in the pediatric emergency department; however, they may need further monitoring and treatment, which is best given in ward/ICU settings where there is access to more extensive medical care. Conversely, a study from Taiwan showed that children with pneumonia at admission were less likely to be transferred to the ward or ICU within 24 hours (Liu et al., 2022). The reason for this discrepancy might be due to the differences in patient care protocols, the organization and setup of the emergency unit itself.

Moreover, children admitted to pediatric emergency room with a medical diagnosis of malnutrition were three times more likely to be transferred to pediatric ward/ICU compared with their counterparts. Reports from Italy, USA and Saudi Arabia showed similar findings (Pradelli et al., 2018, Beer et al., 2015, Ahmed et al., 2022). Perhaps this is due to the fact that children who suffer from malnutrition frequently need ongoing assistance and nutritional rehabilitation. To improve the patient's nutritional status and avoid relapses, the pediatric ward offers effective counseling, education, and follow-up treatment. Electrolyte imbalances, vitamin deficiencies, and impaired metabolic functions are other conditions that malnourished children may face. These conditions need to be closely monitored and adjusted in the inpatient services (Raza et al., 2020).

CHAPTER SEVEN

7. STRENGTHS AND LIMITATIONS OF THE STUDY

7.1. Strengths of the study

- This study tried to assess all possible outcomes independently with determining predictors for each outcome.

7.2. Limitation of the study

- It was a retrospective study in which some very important factors that may determine treatment outcome were missed.
- Only a one year charts were reviewed due to incompleteness of charts.

CHAPTER EIGHT

8. CONCLUSION AND RECOMMENDATIONS

8.1. Conclusion

The findings of this study showed that the magnitude of mortality, transfer to ward and discharge against medical advice was relatively higher than the findings of study conducted in Addis Ababa and some other countries. Children presented with respiratory distress, coma, comorbidity, diarrhea and delay in presentation to the emergency unit were factors that were significantly associated with pediatric emergency mortality. Whereas pneumonia and severe acute malnutrition were two factors associated with hospitalization or transfer from pediatric emergency to the ward or ICU.

8.2. Recommendations

For health professionals

- It is crucial to prioritize the management of diarrhea cases by ensuring appropriate and prompt interventions like fluid replacement, giving rehydration agents, managing underline causes and giving awareness for families on preventive mechanisms and measures to be taken at home before presenting to the emergency unit.
- Children with severe respiratory distress should be managed properly by maintaining oxygenation by incorporating more advanced ways of respiratory support and treating underlined causes.
- Comatose children should be strictly followed by frequent oral secretion suctioning, managing hypoglycemia and evaluating underlined causes.
- Giving health education (awareness) on early recognition of signs and symptoms and timely healthcare seeking practices for caregivers (relatives) is paramount.
- Special attention should be given to children with comorbidity by ensuring comprehensive diagnosis and coordinated management to optimize treatment outcomes.

For hospital managers and health officers

- Based on treatment guidelines and timely reports from the unit, evaluating patients' outcomes and giving appropriate responses with respective interventions as much as possible is mandatory.

For researchers

- Multicenter based and Prospective studies should be employed on this area.
- More than 28% of patient charts showed > 24hrs emergency stay which needs further study on prolonged length of stay at pediatric emergency unit.

REFERENCES

ABDUL HAMID, H., BEE WAH, Y., XIE, X.-J. & SENG HUAT, O. 2018. Investigating the power of goodness-of-fit tests for multinomial logistic regression. *Communications in Statistics-Simulation and Computation,* 47**,** 1039-1055.

AHMED, M. A. A., MUSA, I. R., MAHGOUB, H. M., AL-NAFEESAH, A., AL-WUTAYD, O. & ADAM, I. 2022. Patterns, Outcomes and Predictors of Pediatric Medical Admissions at Gadarif Hospital in Eastern Sudan. *Frontiers in Pediatrics,* 10**,** 764028.

AKOO, T. K., AWANDU, S. S., OLUOCH, F., KEMUNTO, L., OCHUNG, A. & AYODO, G. 2023. Comorbidities Associated With Increased Risk of Death among Children Aged 2-59 Months with Severe Pneumonia in Western Kenya. *African Journal of Health Sciences,* 36**,** 2-9.

ALBAYATI, A., DOUEDI, S., ALSHAMI, A., HOSSAIN, M. A., SEN, S., BUCCELLATO, V., CUTRONEO, A., BEELITZ, J. & ASIF, A. Why do patients leave against medical advice? Reasons, consequences, prevention, and interventions. Healthcare, 2021. MDPI, 111.

ALBUALI, W. H. & ALGHAMDI, A. 2022. The Pattern of Pediatric Acute Respiratory Distress Syndrome over 10 Years Period and Related Risk Factors of its Outcome Mortality. *The Open Nursing Journal,* 16.

ALWALLAN, N. S., AL IBRAHIM, A. M. I., OSMAN HOMAIDA, W. E., ALSALAMAH, M., ALSHAHRANI, S. M., AL-KHATEEB, B. F., BAHKALI, S., AL-QUMAIZI, K. I., TOIVOLA, P. & EL-METWALLY, A. 2021. Prevalence of discharge against medical advice and its associated demographic predictors among pediatric patients: A cross-sectional study of Saudi Arabia. *Int J Crit Illn Inj Sci,* 11**,** 112-116.

AMBAYE, M. & TEFERA, M. 2016. Pattern of admissions to the pediatric emergency unit of Tikur Anbessa Hospital in Addis Ababa, Ethiopia (2012-2013 GC). *Ethiopian Journal of Health Development,* 30**,** 88-93.

AMIGONI, A., PETTENAZZO, A., STRITONI, V. & CIRCELLI, M. 2017. Surfactants in acute respiratory distress syndrome in infants and children: past, present and future. *Clinical drug investigation,* 37**,** 729-736.

ANYANWU, O. U., EZEANOSIKE, O. B. & EZEONU, C. T. 2014. Pattern and outcome of admissions at the children emergency room at the Federal Teaching Hospital Abakaliki. *Afr J Med Health Sci,* 13**,** 6-10.

BALANE, J. A. L., YAP, C. D. D. G., VILLANUEVA, C. A. G., PALILEO-VILLANUEVA, L. A. M. & TAMONDONG-LACHICA, D. R. 2023. Predictors of readmission in a medical department of a tertiary university hospital in the Philippines. *BMC Health Services Research,* 23**,** 617.

BANGA, D., BAREN, M., SSONKO, N. V., SIKAKULYA, F. K., TIBAMWENDA, Y., BANGA, C. & SSEBUUFU, R. 2020. Comorbidities and Factors Associated with Mortality among Children under Five Years Admitted with Severe Acute Malnutrition in the Nutritional Unit of Jinja Regional Referral Hospital, Eastern Uganda. *International Journal of Pediatrics,* 2020**,** 7809412.

BASHAKA, P. J., SAWE, H. R., MWAFONGO, V., MFINANGA, J. A., RUNYON, M. S. & MURRAY, B. L. 2019. Undernourished children presenting to an urban emergency department of a tertiary hospital in Tanzania: a prospective descriptive study. *BMC pediatrics,* 19**,** 1-8.

BASSEY, E.-O. U. & IJEZIE, E. 2016. Pediatric emergencies seen in a tertiary Hospital in Uyo, Akwa Ibom state of Nigeria: a two year review. *International Journal of Scientific Study,* 4**,** 42-45.

BEER, S. S., JUAREZ, M. D., VEGA, M. W. & CANADA, N. L. 2015. Pediatric malnutrition: putting the new definition and standards into practice. *Nutrition in Clinical Practice,* 30**,** 609-624.

BRESSAN, S., DA DALT, L., CHAMORRO, M., ABARCA, R., AZZOLINA, D., GREGORI, D., SERENI, F., MONTINI, G. & TOGNONI, G. 2021. Paediatric emergencies and related mortality in Nicaragua:

results from a multi-site paediatric emergency registry. *Emergency Medicine Journal,* 38**,** 338-344.
BRUGNOLARO, V., FOVINO, L. N., CALGARO, S., PUTOTO, G., MUHELO, A. R., GREGORI, D., AZZOLINA, D., BRESSAN, S. & DA DALT, L. 2020. Pediatric emergency care in a low-income country: characteristics and outcomes of presentations to a tertiary-care emergency department in Mozambique. *Plos one,* 15**,** e0241209.
CHEN, C. C., STRAUBE, S., VO, H., GEORGE, U., SAWE, H. & TENNER, A. G. 2020. A mixed methods needs assessment of pediatric emergency and critical care in Tanzanian providers: a model for curriculum development. *Journal of Global Health Reports,* 4**,** e2020057.
COZZI, G., PASSAGLIA, L., AGRUSTI, A., GIANGRECO, M., GIORGI, R. & BARBI, E. 2022. Adolescents' Utilization of a Tertiary-Level Pediatric Emergency Department in Italy. *Frontiers in Pediatrics,* 10.
DÍAZ, S., SETTELE, J., BRONDÍZIO, E. S., NGO, H. T., AGARD, J., ARNETH, A., BALVANERA, P., BRAUMAN, K. A., BUTCHART, S. H. & CHAN, K. M. 2019. Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science,* 366**,** eaax3100.
DUKE, T. & CHEEMA, B. 2016. Paediatric emergency and acute care in resource poor settings. *Journal of paediatrics and child health,* 52**,** 221-226.
EDELU, B., IGBOKWE, O. & ILOH, O. 2020. A review of pediatric mortalities in the emergency units of Nigerian tertiary hospitals. *International Journal of Medicine and Health Development,* 25**,** 1-1.
ENYUMA, C. O., ANAH, M. U., POUSSON, A., OLORUNFEMI, G., IBISOMI, L., ABANG, B. & IMOKE, E. 2019. Patterns of paediatric emergency admissions and predictors of prolonged hospital stay at the children emergency room, University of Calabar Teaching Hospital, Calabar, Nigeria. *African health sciences,* 19**,** 1910-1923.
EZEONWU, B. U., CHIMA, O., OGUONU, T., IKEFUNA, A. & NWAFOR, I. 2014. Morbidity and mortality pattern of childhood illnesses seen at the children emergency unit of federal medical center, Asaba, Nigeria. *Annals of medical and health sciences research,* 4**,** 239-244.
FATIMA, S., HAIDER, M., HAMEED, A., SALEEM, S. G. & KARIM, S. 2021. Comorbidities and their outcomes in children with severe acute malnutrition visiting pediatric emergency department at a tertiary care hospital in urban slums of Karachi, Pakistan. *Ann Pediatr,* 4**,** 1068.
FOUAD, H., HARON, M., HALAWA, E. F. & NADA, M. 2019. Nontraumatic coma in a tertiary pediatric emergency department in Egypt: etiology and outcome. *Journal of child neurology,* 26**,** 136-141.
GREER, D. M. & CURIALE, G. G. End-of-life and brain death in acute coma and disorders of consciousness. Seminars in neurology, 2013. Thieme Medical Publishers, 157-166.
HANDS, C., HANDS, S., VERRIOTIS, M., BUNN, J., BAILEY, E., SAMUELS, R. J., SANKOH, K., MUSTAPHA, A., WILLIAMS, B. & TAYLOR, S. 2021. Emergency Triage Assessment and Treatment Plus (ETAT+): adapting training to strengthen quality improvement and task-sharing in emergency paediatric care in Sierra Leone. *J Glob Health,* 11**,** 04069.
HOSPITAL, D. U. G. 2011. Hospital based annual plan.
IBEZIAKO, S. & IBEKWE, R. 2022. Pattern and Outcome of Admissions in the Children's Emergency Room of the University of Nigeria Teaching Hospital, Enugu. *Nigerian Journal of paediatrics,* 29**,** 103-108.
IJAZ, N., STREHLOW, M., EWEN WANG, N., PIRROTTA, E., TARIQ, A., MAHMOOD, N. & MAHADEVAN, S. 2018. Epidemiology of patients presenting to a pediatric emergency department in Karachi, Pakistan. *BMC Emergency Medicine,* 18**,** 1-9.
ISEZUO, K., ONANKPA, B., ADAMU, A., JIYA, F., AMODU-SANNI, M. & GARBA, B. 2020. Socio-demographic factors associated with late presentation and outcome of febrile children admitted in a tertiary facility in North-Western Nigeria: a comparative study. *Int J Pediatr Res,* 6**,** 063.

JOFIRO, G., JEMAL, K., BEZA, L. & BACHA HEYE, T. 2018. Prevalence and associated factors of pediatric emergency mortality at Tikur Anbessa specialized tertiary hospital: a 5 year retrospective case review study. *BMC pediatrics,* 18**,** 1-10.

KULA, R., POPELA, S., KLUČKA, J., CHARWÁTOVÁ, D., DJAKOW, J. & ŠTOURAČ, P. 2023. Modern Paediatric Emergency Department: Potential Improvements in Light of New Evidence. *Children,* 10**,** 741.

LABRAGUE, L. J., DE LOS SANTOS, J. A. A., TSARAS, K., GALABAY, J. R., FALGUERA, C. C., ROSALES, R. A. & FIRMO, C. N. 2020. The association of nurse caring behaviours on missed nursing care, adverse patient events and perceived quality of care: A cross-sectional study. *Journal of nursing management,* 28**,** 2257-2265.

LAHMINI, W. & BOURROUS, M. 2020. Mortality at the pediatric emergency unit of the Mohammed VI teaching hospital of Marrakech. *BMC Emergency Medicine,* 20**,** 57.

LIU, Y.-C., CHENG, H.-Y., CHANG, T.-H., HO, T.-W., LIU, T.-C., YEN, T.-Y., CHOU, C.-C., CHANG, L.-Y. & LAI, F. 2022. Evaluation of the need for intensive care in children with Pneumonia: machine learning approach. *JMIR Medical Informatics,* 10**,** e28934.

LOPEZ, E., UDAONDO, J., OLABARRI, M., MARTINEZ-INDART, L., BENITO, J. & MINTEGI, S. 2017. Mortality in Spanish pediatric emergency departments: a 5-year multicenter survey. *European journal of emergency medicine,* 24**,** 392-397.

LUTZ, N., VANDERMENSBRUGGHE, N. G., DOLCI, M., AMIET, V., RACINE, L. & CARRON, P.-N. 2014. Pediatric emergencies admitted in the resuscitation room of a Swiss university hospital. *Pediatric emergency care,* 30**,** 699-704.

MAHAJAN, V., KAUR, A., SHARMA, A., AZAD, C. & GUGLANI, V. 2014. Modifiable factors for prevention of childhood mortality. *Indian pediatrics,* 51**,** 45-47.

MCDERMOTT, K. W., STOCKS, C. & FREEMAN, W. J. 2018. Overview of pediatric emergency department visits, 2015: Statistical Brief# 242.

MERGA, B. T., BALIS, B., BEKELE, H. & FEKADU, G. 2022. Health insurance coverage in Ethiopia: financial protection in the Era of sustainable development goals (SDGs). *Health Economics Review,* 12**,** 43.

MONTORO-PÉREZ, N., RICHART-MARTÍNEZ, M. & MONTEJANO-LOZOYA, R. 2023. Factors associated with the inappropriate use of the pediatric emergency department. A systematic review. *Journal of Pediatric Nursing,* 69**,** 38-46.

MUHAMMAD, F. 2022. Child Mortality in Africa: An Infectious Disease Perspective.

MUHANUZI, B., SAWE, H. R., KILINDIMO, S. S., MFINANGA, J. A. & WEBER, E. J. 2019. Respiratory compromise in children presenting to an urban emergency department of a tertiary hospital in Tanzania: a descriptive cohort study. *BMC emergency medicine,* 19**,** 1-7.

MUKHTAR, S., SALEEM, S. G., ALI, S., KHATRI, S. A. & YAFFEE, A. Q. 2021. Standing at the edge of mortality; Five-year audit of an emergency department of a tertiary care hospital in a low resource setup. *Pakistan Journal of Medical Sciences,* 37**,** 633.

MUSSA, R. Y. 2020. *Incidence and Risk Factors for Paediatric Mortality within 24-Hours of Presentation at Emergency Medicine Department Muhimbili National Hospital.* Muhimbili University of Health and Allied Sciences.

NEGASI, K. B., TEFERA GONETE, A., GETACHEW, M., ASSIMAMAW, N. T. & TEREFE, B. 2022. Length of stay in the emergency department and its associated factors among pediatric patients attending Wolaita Sodo University Teaching and Referral Hospital, Southern, Ethiopia. *BMC Emergency Medicine,* 22**,** 203.

NGWALANGWA, F., PHIRI, C. H., DUBE, Q., LANGTON, J., HILDENWALL, H. & BAKER, T. 2019. Risk factors for mortality in severely ill children admitted to a tertiary referral hospital in Malawi. *The American journal of tropical medicine and hygiene,* 101**,** 670.

NIELSEN, B. U., BYBERG, S., AABY, P., RODRIGUES, A., BENN, C. S. & FISKER, A. B. 2017. Seasonal variation in child mortality in rural Guinea-Bissau. *Tropical Medicine & International Health,* 22**,** 846-856.

OGUNMEKAN, A. O. 2017. Non-traumatic coma in childhood: etiology, clinical findings, morbidity, prognosis and mortality. *Journal of Tropical Pediatrics,* 29**,** 230-232.

OKORONKWO, N. C., ONYEARUGHA, C. N. & OHANENYE, C. A. 2018. Pattern and outcomes of paediatric medical admissions at the Living Word Mission Hospital, Aba, South East Nigeria. *Pan African Medical Journal,* 30.

ONUBOGU, U. C. & WEST, B. A. 2022. Pattern and Outcome of Diseases among Children Presenting in the Emergency Room of a Tertiary Hospital in Port Harcourt, Nigeria. *Open Journal of Pediatrics,* 12**,** 538-553.

ONUBOGU, U. C., WEST, B. A. & AZUBOGU, U. S. 2022. The pattern of mortality among children hospitalized in the children emergency ward of a single tertiary hospital in Nigeria. *Pediatric Emergency Medicine Journal,* 10**,** 3-10.

PANDEE, U., VALLIPAKORN, S. A.-O. & PLITPONKARNPIM, A. 2015. The profile of pediatric patients visit emergency department at urban University Hospital in Thailand. *J Med Assoc Thai,* 98**,** 761-7.

PHATTHARAPORNJAROEN, P., SITTICHANBUNCHA, Y., ATIKSAWEDPARIT, P. & SAWANYAWISUTH, K. 2021. Characteristics of pediatric emergency and risk factors for life-saving interventions. *Global Pediatric Health,* 8**,** 2333794X21990340.

PRADELLI, L., ZANIOLO, O., DIAMANTI, A., AGOSTONI, C. & LEZO, A. 2018. PIH25-BE AWARE OF PEDIATRIC MALNUTRITION AT ADMISSION! ECONOMIC CONSEQUENCES OF DIFFERENT HOSPITAL SCREENING AND NUTRITIONAL TREATMENT APPROACHES. *Value in Health,* 21**,** S217.

RAZA, M., KUMAR, S., EJAZ, M., AZIM, D., AZIZULLAH, S. & HUSSAIN, A. 2020. Electrolyte imbalance in children with severe acute malnutrition at a tertiary care hospital in Pakistan: a cross-sectional study. *Cureus,* 12.

RICE, A., DUDEK, J., GROSS, T., ST MARS, T. & WOOLRIDGE, D. 2017. The impact of a pediatric emergency department facility verification system on pediatric mortality rates in Arizona. *The Journal of Emergency Medicine,* 52**,** 894-901.

SASU, D. D. 2022. Health insurance coverage in Nigeria 2018, by type and gender.

SBARIGIA, U., DENEE, T. R., TURNER, N. G., WAN, G. J., MORRISON, A., KAUFMAN, A. S., RICE, G. & DUSHEIKO, G. M. 2016. Conceptual framework for outcomes research studies of hepatitis C: an analytical review. *Infection and drug resistance***,** 101-117.

SEIFU, A., ESHETU, O., TAFESSE, D. & HAILU, S. 2022. Admission pattern, treatment outcomes, and associated factors for children admitted to pediatric intensive care unit of Tikur Anbessa specialized hospital, 2021: a retrospective cross-sectional study. *BMC anesthesiology,* 22**,** 1-8.

SHAH, G., SHAH, S. & THAPA, A. 2022. In-patient mortality analysis following establishment of a separate pediatric emergency care in Eastern Nepal. *J Pediatr Neonatal Care,* 12**,** 151-155.

SHI, T., CHEN, C., HUANG, L., FAN, H., LU, G., YANG, D., ZHAO, C. & ZHANG, D. 2020. Risk factors for mortality from severe community-acquired pneumonia in hospitalized children transferred to the pediatric intensive care unit. *Pediatrics & Neonatology,* 61**,** 577-583.

SIMBILA, A. N., KILINDIMO, S. S., SAWE, H. R., KALEZI, Z. E., YUSSUF, A. O., MANJI, H. K., LEYNA, G., MFINANGA, J. A. & WEBER, E. J. 2022. Predictors and outcome of time to presentation among critically ill paediatric patients at Emergency Department of Muhimbili National Hospital, Dar es Salaam, Tanzania. *BMC pediatrics,* 22**,** 1-8.

SIMMA, L., STOCKER, M., LEHNER, M., WEHRLI, L. & RIGHINI-GRUNDER, F. 2021. Critically ill children in a Swiss pediatric emergency department with an interdisciplinary approach: a prospective cohort study. *Frontiers in Pediatrics,* 9**,** 721646.

SOLEBO, C. 2014. *The first 24 hours: mortality and other outcomes of paediatric emergency care in Lagos, a case study.* University of Warwick.

SONG, J. L. & WANG, V. J. 2017. Altered Level Of Consciousness: Evidence-Based Management In The Emergency Department. *Pediatric emergency medicine practice,* 14**,** 1-28.

THIAGARAJAH, J. & MARTIN, M. 2019. Pathogenesis of acute diarrhea in children. *Uptodate. Waltham, MA: UpToDate Inc.[internet]*.

THIONGANE, A., NDONGO, A. A., SOW, A., KEITA, Y., BOIRO, D., DIENG, Y. J., BASSE, I., SECK, N., HILAIRE, L. A. & FAYE, P. M. 2022. Epidemiology of Admissions in a Pediatric Emergency Department in Albert Royer Hospital Dakar. *Open Journal of Pediatrics,* 12**,** 188-195.

TOLA, K., ABEBE, H., GEBREMARIAM, Y. & JIKAMO, B. 2017. Improving completeness of inpatient medical records in Menelik II referral hospital, Addis Ababa, Ethiopia. *Advances in public health,* 2017.

TOWN, D. 2010. Road Authority Office Report

UMAR, U. I., MUHAMMED, I. L. & GWARZO, G. D. 2018. Pattern and outcome of admissions at the Emergency Pediatric Unit of Federal Medical Centre Nguru, Yobe State, Nigeria. *Pyramid Journal of Medicine,* 1.

UNICEF, W. 2020. Mortality rate, under-5 (per 1,000 live births) - Ethiopia.

WHITEHEAD, P. R. 2014. The lived experience of physicians dealing with patient death. *BMJ Supportive & Palliative Care,* 4**,** 271-276.

WHITFILL, T., AUERBACH, M., SCHERZER, D. J., SHI, J., XIANG, H. & STANLEY, R. M. 2018. Emergency care for children in the United States: epidemiology and trends over time. *The Journal of Emergency Medicine,* 55**,** 423-434.

WHO 2016. Barriers to access to child health care, regional Office for the

Western Pacific World Health Organization United Nations Avenue 1000

Manila, Philippines wwwwprowhoint.

WILLIAMS, D. J., ZHU, Y., GRIJALVA, C. G., SELF, W. H., HARRELL, F. E., REED, C., STOCKMANN, C., ARNOLD, S. R., AMPOFO, K. K. & ANDERSON, E. J. 2016. Predicting severe pneumonia outcomes in children. *Pediatrics,* 138.

ZHU, C.-P., WU, X.-H., LIANG, Y.-T., MA, W.-C. & REN, L. 2015a. The mortality of patients in a pediatric emergency department at a tertiary medical center in China: An observational study. *World Journal of Emergency Medicine,* 6**,** 212.

ZHU, C. P., WU, X. H., LIANG, Y. T., MA, W. C. & REN, L. 2015b. The mortality of patients in a pediatric emergency department at a tertiary medical center in China: An observational study. *World J Emerg Med,* 6**,** 212-6.

ANNEX I: INFORMATION SHEET

Date _____

Title of the Research Project: pattern of admission treatment outcome and associated factors of pediatric emergency unit in Dilla University Referral Hospital.

Name of Investigator: Samuel Jigso (BSC in Nursing)

Name of the Organization: Hawassa University College of medicine and health sciences.

Name of the Sponsor: Dilla University.

Introduction: This information sheet is prepared for Dilla University Referral Hospital pediatrics emergency (ETAT) coordinating office. The aim of the form is to make the above-concerned office clear about the purpose of research, data collection procedures and get permission to conduct the research.

Purpose of the Research Project: To assess the pattern of admission treatment outcome and associated factors of pediatric emergency unit of Dilla University Referral hospital.

Procedure: In order to achieve the above objective, necessary information which is necessary for the study will be taken from pediatrics emergency unit.

Risk and /or Discomfort: Since the study will be conducted by taking necessary information from medical chart, it will not cause any harm on the patients. The name or any other identifying information will not record on the questionnaire and all information is taken from the chart will kept strictly confidential and in a safe place. The information retrieved will be only used for the study purpose.

Benefits: The research have no direct benefit for one whose document/ record are included in this research. But the indirect benefit of the research for the participant and other clients in the program is clear. This is because if program planners are preparing predicted plan there is a benefit for clients in the program of getting appropriate care and treatment services for those survived and other newly admitted ones. In all, the research work has a principal direct benefit for health care planners, providers and managers.

Confidentiality: To reassure confidentiality the data on the chart will be collected without the name of the clients and the information collected from this research project will be kept confidential and stored in a file cabinet. In addition, it will not be shown to anyone except the investigator and it has been kept in a key and locked system with computer password.

Person to contact: The following contact address will be given to contact the investigator at any time

Principal investigator: Samuel jigso

Cell phone: +251-927063548

E-mail: samueljigso@gmail.com

ANNEX II. CHECKLIST

Data collection checklist for the study of treatment outcome and associated factors among children admitted to pediatric emergency unit of DURH, Ethiopia.

Part one socio demographic characteristics			
No	Questions	Code	
1	Age in month	……months	
2	Gender	1. Male 2. Female	
3	Residence	1. Urban 2. Rural	
part two: seasonal factors			
4	Season during admission	1. Winter 2. Summer	
Part three: clinical characteristics of the patient			
5	Immunization status(for < 5 years)	1. Not immunized 2. Partially immunized 3. Fully immunized	
6	Frequency of admission	1. New admission 2. Readmission(2 times and above)	
7	Source of referral	1. From health institution 2. Self-referral	
Chief complaints during admission			
8	Fever	0. No 1. Yes	
9	Diarrhea	0. No 1. Yes	

10	Cough	0. No 1. Yes	
11	Vomiting	0. No 1. Yes	
	Other specify ……		
Identified emergency signs(according to WHO)			
12	Obstructed breathing	0. No 1. Yes	
13	Central cyanosis	0. No 1. Yes	
14	Severe respiratory distress	0. No 1. Yes	
15	Shock	0. No 1. yes	
16	Coma	0. no 1. yes	
17	Convulsion	0. no 1. yes	
18	Severe DHN	0. No 1. yes	
19	Onset of signs and symptoms	0. ≤ 2day 1. >2day	
Causes of admission by their diagnosis			
20	Pneumonia	0. No 1. Yes	

21	Diarrhea	0. No 1. Yes	
22	Heart diseases	0. No 1. Yes	
23	Malaria	0. No 1. Yes	
24	Meningitis	0. No 1. Yes	
25	Tb	0. No 1. Yes	
26	Malnutrition	0. No 1. Yes	
	If yes, specify	……	
27	Comorbidities	0. No 1. Yes	
	Part four: Healthcare facility related factors management given at PED		
28	Oxygen therapy	0. No 1. Yes	
29	Antibiotic	0. No 1. Yes	
30	IV fluids(RL/NS)	0. No 1. Yes	
31	Blood transfusion	0. No 1. Yes	
32	Anticonvulsants	0. No 1. Yes	
	Others……		

33	Time first treatment initiated	0. Within 1-2hr 1. > 2hr	
34	Outcome during discharge	1. transferred 2. improved 3. died 4. discharge against medical advice 5, referred	
35	If the response for Q.35 is death, what was the Primary disease that Causes a death?		
		Pneumonia	
		Congestive heart failure	
		Sepsis	
		Meningitis	
		Hypovolemic shock	
		Hematological malignancy	
		Anemia	
		Tuberculosis	
		Other specify…….	