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A ONE YEAR RETROSPECTIVE STUDY ON OUTCOME AND FACTORS AFFECTING THE OUTCOMES OF SEVERE PNEUMONIA IN CHILDREN AT WOLKITE UNIVERSITY SPECIALIZED TEACHING HOSPITAL, AUGUST 2023

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AUGUST 2023

WOLKITE, ETHIOPIA

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ABSTRACT

Background: Pneumonia is the common cause of morbidity and mortality of children. Globally, more than 2 million children die from pneumonia each year, accounting 20% of under 5 mortality

Objective: To assess the treatment outcome and the factors affecting the treatment outcome among children with severe pneumonia admitted to pediatric critical ward WUSTH

Method: Institutional based cross-sectional retrospective study through card review was conducted from August 1,2022-August 30,2023. Data was collected by a questionnaire-based review of medical records. The collected data was entered and edited into Epi-data manager version 4.4.1.0, and the analysis was performed by SPSS-25. Logistic regression analysis was used to identify factors associated with the treatment outcome and P-value <0.05 was considered as statistically significant".

Result: A total of 340 patients was included and majority of the patients show improvement 324 (95.2%), This finding showed that children who have malnutrition (AOR=2.4, 95% CI: 1.67–4.37, p = 0.000), duration of hospital stay (AOR=1.46, 95% CI: 3.2–11.13 P=0.007) and duration of illness prior to hospital admission (AOR=1.17, 95% CI: 1.8–6 p=0.043) were statistically significant with the treatment outcome.

Conclusion and recommendations: -This study showed that among patients admitted with severe pneumonia, most of the patients show improvement. Being malnourished, prolonged hospital stays and prolonged duration of illness prior to hospital stay were identified as the factors affecting the treatment outcome.

Even though the study revealed good treatment outcome among the pediatric patients, particular consideration should be given to children in need of other interventions.

Keywords: severe pneumonia, children, hospital admission, treatment outcome.

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LIST OF ABBREVIATION

AOR: Adjusted odd ratio

ARI: Acute Respiratory Infection

CAP: community acquired pneumonia

CI: confidence interval

HIV: Human immunodeficiency virus

JUMC: Jimma university medical center

SAM: Sever Acute Malnutrition

TAH: Tikur Anbessa hospital

URTI: upper respiratory tract infection

WHO: World Health Organization

WUSTH: Wolkite University Specialized Teaching Hospital

CHAPTER ONE: INTRODUCTION

1.1 Back ground

Pneumonia is a severe form of acute respiratory infection known to affect the lungs [1, 2]. It remains the leading cause of hospitalization and mortality in young children in low and middle-income countries as per the 2016 UNICEF annual report and is estimated to cause 896,000 deaths of the total 5.6 million deaths [3, 4]. In Ethiopia, pneumonia is a substantial cause of morbidity and mortality in the pediatric population, and regardless of improved preventive strategies, approximately 4 million childhood pneumonia cases are occurring annually [5].

A number of infectious agents are responsible for childhood pneumonia, including viruses, bacteria, and fungi [1, 2]. The respiratory syncytial virus, Streptococcus pneumonia, and Haemophilus influenza are the leading causes of childhood pneumonia, with the latter two being preventable through administration of vaccines [6]. The main risk factors for pediatric pneumonia include poor socioeconomic status, not being able to breastfed, malnutrition, indoor air pollution, household crowding, low birth weight, incomplete immunization schemes, HIV, prolonged duration of illness, and the presence of underlying chronic illness such as underlying heart disease [7–9].

Although under-five mortality was consistently reduced over the past 20 years, few progresses in reducing neonatal mortality have been done [10]. Pediatric patients who receive effective and timely treatment recover without complication. However, patients with no access to effective intervention are at high risk of developing complications and death. (major complications of pneumonia include lung abscess, pleural effusion and empyema, and pneumothorax [11].

Most guidelines recommend the use of a combination of β-lactam antibiotics with a macrolide or monotherapy with respiratory fluoroquinolone, but not β-lactam monotherapy in treatment of pneumonia cases. This is especially for patients who are admitted to medical ward of the health institutions [12]. Likewise, treatment regimens are needed to be chosen based on their efficacy in local settings; for instance, some areas may have a high burden of resistance to certain antibiotics, rendering these antibiotics are less effective for management of pneumonia. It is also recommendable to consider high-risk groups, such as malnourished or HIV-positive children to adapt their treatment approaches according to their medical cases for the better outcome [13, 14].

Despite the availability of effective management and treatment tools for pneumonia [15], poor response to initial empirical treatment of community-acquired pneumonia represents a major challenge for clinicians and requires early identification and intervention. The incidence of treatment failure in community-acquired pneumonia (CAP) is 10 to 15%, and the mortality is increased nearly fivefold. Resistant and unusual microorganisms and noninfectious causes are responsible for the treatment failure. Risk factors for the poor treatment outcomes are related to the initial severity of the disease, the presence of comorbidity, the microorganism involved, and the antimicrobial treatment administered during pharmacotherapy [16].

1.2 Statement of the problem

Acute respiratory infections (ARI) kill more children under five than any other infectious disease - accounting annually for almost 2 million deaths among them. Most of these deaths (> 95%) occur in developing countries and pneumonia is the leading ARI cause of death. Pneumonia accounts for almost one in five deaths in children under the age of five years worldwide each year, the largest from a single disease. Serious infection account for 30-50% of neonatal mortality in different regions and it is difficult to disaggregate deaths from pneumonia and sepsis amongst these. pneumonia is the single largest contributor to child mortality, accounting for almost 28-34% of all under 5 deaths globally (5).

The incidence and severity of childhood pneumonia was highest in Africa and South East Asia, which accounted for 30% and 39%, respectively, of the global burden of severe cases. In these two regions, 15 countries accounted for two-thirds of all childhood pneumonia episodes and severe cases (5,6). The African region has, in general, the highest burden of global child mortality—50% of worldwide deaths from pneumonia in this age group. More than 490,000 under-five children died by pneumonia in 2016 in Sub-Saharan Africa (5). In contrast, less than 2% of these deaths take place in the European region and less than 3% in the region of the Americas (3). The widespread nature of the problem in Ethiopia has already killed thousands of children which need to look for lasting solution to end the problem. Despite the sustained effort to stop the problem, pneumonia continues to be common cause of mortality of children which calls for innovative strategies that will come about only through systematic researches.

Several studies have reported variation in extent of treatment outcome among pediatric populations admitted with pneumonia [5, 17]. Furthermore, the

investigation of treatment outcome among patients with pneumonia would have paramount importance to demonstrate the extent of pneumonia management and care in health care settings [5]. Identifying factors that affect the treatment outcomes among pediatric patients hospitalized with pneumonia also play a crucial role for proper planning and intervention, particularly in developing countries like Ethiopia where prevalence of infectious diseases is high.

Data on the outcome of severe pneumonia and their related risk factors are important for planning child health care services but scarce in Ethiopia. Therefore, pneumonia is one of common public health problem and contributes significant proportion of children death in the developing countries Gurage zone is one of the areas that share this public health problem.

The treatment outcome and pattern of severe pneumonia in children among hospitalized patient in Gurage zone, wolkite University specialized teaching hospital was not well assessed and documented. Therefore, this study aimed to determine the treatment outcome and pattern of severe pneumonia among children hospitalized patient of this study area.

1.3 Significance of the study

Review of hospital admissions is not the best method of studying the disease pattern in a community. However, study done in hospital admissions may provide a bird's eye view on common disease that may lead patients to be admitted to the hospital and may also be useful back ground material for health professional working in similar community either in prevention or in treatment.

This study will provide input for policymakers, and other stakeholders to develop appropriate interventions and remedial actions. The findings will also help the clinicians to appreciate the pattern & treatment outcomes of severe pneumonia among children. The study will also provide input for other researchers, as baseline data for further investigations.

CHAPTER TWO
LITERATURE REVIEW

Globally, pneumonia is the leading cause of child mortality from infectious diseases, accounting for approximately 16% of the 5.6 million under-five deaths, killing around 900,000 children in 2016.

Pneumonia kills nearly 1 million children under the age of five around the world, according to WHO approximations, there are 156 million cases of pneumonia each year in under-five children, with as many as 20 million cases severe enough to require hospital admission and 1.2 million deaths annually. (4,5) More than 90% of all deaths due to pneumonia in children aged less than 5 years take place in 40 countries.

From the total of admission reviews from September 2010- August 2010 at Chiro hospital (western Hararghe), severe pneumonia accounts for 481(51.2%) admission and it was also the leading cause of death (3).

At Tikur Anbessa pediatric emergency ward there were a total of 2, 522 admissions in one year 1, 459 (59.9%) of them were males and 1063(42.1%) were females; male to female ratio was 1.4. The mean age for male and female study subject were 2.9 & 2.8 years respectively. The maximum age was 13 years for both sexes. Severe pneumonia, which accounted for 38.6% of the total admissions was the most common cause of admissions and also responsible for 41.9% of the total deaths (3). There was no significant difference in mortality rate between female, (15.3%) and male (14.1%).

Based on retrospective analysis on pattern & out comes among pediatric emergency ward admissions in JUMC, from Sep 2013- Aug 2013 E.C the leading cause of admission were severe pneumonia 228 (44.4%) from the total of 639 children admitted. And from 174 of the children who had secondary diagnosis severe pneumonia was the leading (32(18.4%)) diagnosis. Out of total sample, more than one-third, 204 (39.1%), of the cases had malnutrition and it had strong association to the outcome, children who had malnutrition were seven times more likely to die by severe pneumonia than children who had no malnutrition. From a total of 639 admissions, outcome was recorded for 613 admissions on the discharge log book and 551 of the charts out a total of 228 children admitted with severe pneumonia, outcome was recorded for all as 3 deaths (17.6%) 225 discharged with improvement and no self-discharge case was recorded.

This finding is nearly similar with the estimation of the under-five pneumonia death (18%) of the Ethiopia (2). studies conducted in the Philippines, 4.7 %(13); India, 10.5%; (18) and China, 12%. (19). this may be due to the study setting, quality of health care system, and deference of socio-demographic factors.

In the study done TAH based on retrospective study of September 2012 to August 2012, severe pneumonia accounts for 937 (38.6%), of which complete record was found for 966 (38.3%) cases of severe pneumonia for assessment of outcomes. And the outcome was, 754 (78.1%) improved, 151 (15.6%) death & outcome was unknown for 61(6.3%) of the cases.

Prospective cross-sectional study design was conducted on 222 hospitalized pediatric patients in Pediatrics ward of Nekemte Referral Hospital from March 1 to May 30, 2015. Structured questionnaires and medical chart were used to determine

clinical treatment outcome, the study identified 144(64.9%) patients had severe pneumonia. The study showed 130 (58.6) patients had co-morbid disease along with pneumonia. The patients who had immunized were 106(47.75%) while 116(52.25) had been not immunized. The clinical treatment outcome was found to be 154 (69.4%) cured without development of any complications but 57(25.7%) had deteriorated condition developing one or more complications.

The study conducted in Philippines, Brazil, and Tanzania, which indicates that malnutrition is significantly associated with the mortality of severe pneumonia. This may be due to the fact that malnutrition weakens a child's overall immune system, as an adequate amount of protein and energy is needed for proper immune system functioning. In addition, undernourished children have weakened respiratory muscles, which inhibit them from adequately clearing secretions in their respiratory tract (8).

The study conducted in Tanzania which shows HIV infection is one of the predictors of the severe pneumonia treatment failure. This is because HIV infection weakens the immune system which leads the children to serious or life-threatening and increases the mortality of severe pneumonia. The study conducted in the Philippines (13) showed that the previous history of URTI is significantly associated with death of under-five severe pneumonia. Study conducted in India which showed that use of conjugate vaccines against pneumonia, particularly Streptococcus pneumonia and Haemophilus influenza, appears to be justified for the prevention of pneumonia morbidity and mortality in children younger than 5 years (18).

CHAPTER THREE

OBJECTIVES

3.1 General Objectives

To assess the outcome and factors affecting the outcome of severe pneumonia in children admitted to the pediatric critical ward in WUSTH.

3.2 Specific Objectives

- To assess treatment outcomes of patients admitted with severe pneumonia
- To study the factors that influence the outcome of treatment of severe pneumonia

CHPATER FOUR

METHODS & MATERIALS

4.1 Study area

The study was conducted at Wolkite University specialized teaching hospital which is found around 158 km to south west from the capital Addis Ababa.

The hospital provides both outpatient and inpatient services of these the department of pediatrics is one. It has an outpatient department, 1 referral clinic, emergency and ward.

4.2 Study Period:

The study was conducted from August 1– August 19,2023.

4.3 Study design:

A retrospective institution based cross sectional study was conducted on 340 children severe pneumonia cases for a 1-year period.

4.4 Population:

1. **Source population** – The source population were all severe pneumonia patients who were admitted to the critical wards of pediatrics of WUSTH from August1,2022 to July,30 2023.
2. **Study population**

The study population were patients who are admitted with a diagnosis of severe pneumonia during the study period.

4.5 Inclusion and Exclusion criteria

Inclusion criteria

Patients with age 3 months-14 years old admitted with clinical diagnosis of severe pneumonia in a pediatric ward of WUSTH.

Exclusion criteria

Patients with uncertainty in the diagnosis of pneumonia.

Patients who died before they start treatment, and

Patients referred to other health care facilities were excluded from the study.

4.6 Sample size and Sampling technique

Sample size was estimated by using a formula for a single population proportion

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

$$n = \frac{(1.96)^2 0.44(1-0.44)}{(0.04)^2} = 591$$

Where= P= Proportion of severe pneumonia among children admitted, which is 0.44 taken from study conducted in JUMC

d= Margin of error (4%)

$z\alpha/2$= Critical value at 95% confidence level (1.96)

n= Calculated sample size

Since number of severe pneumonia patients admitted to WUSTH pediatrics ward is 798, which is < 10,000 the following correction formula is used

Corrected sample size = $\frac{n}{1 + n/N.}$ Where, N is No of severe pneumonia patients admitted to WUSTH pediatrics ward

Corrected sample size = $\frac{591}{1 + \frac{591}{798}}$

Corrected sample size $\approx \underline{\underline{340}}$

Sampling technique

To select the study participants, a simple random sampling technique was used. Sampling frame was prepared by using lists of from the registry book then lottery method was used to select the study participants.

4.7 Data collection procedures

The data extraction format was developed to extract any relevant information from patient and the information was collected from medical records of patients & discharge log book using structured questionnaire prepared to be filled by the principal investigator.

4.8 Data Quality Assurance

Some possible measures were employed to maintain the quality of the data for this research. Before conducting the research, we were discussing on the overall purpose of the study and items of the questioners to ensure the validity, reliability and internal consistency. The quality of the data was maintained by conducting a pretest on 5% of the sample. Training was also given for data collectors. Moreover, the collected data were checked daily to safeguard its completeness.

4.9 Data processing and Data Analysis

After completion of data collection, the information was cleared and data will be analyzed using computer with SPSS program version 25. P-value was set at <0.05 for statistical significance. Then multivariate logistic regression analysis was carried out for the selected variables with p-value < 0.20 in the bivariate logistic regression analysis and the corresponding adjusted odds ratios (AOR) with 95% confidence

intervals (CI) were used to identify factors independently associated with pneumonia. P-value with < 0.05 was considered as statistically significant.

4.10 Study Variables

4.10..1 Dependent variables

- Outcome of pneumonia in children

4.10..2 Independent variables

- **Socio-demographic variables**
  - Age
  - Sex
  - Residence
- **clinical variables**
  - nutritional status
  - duration of hospital stay
  - duration of illness before admission
  - patient taken prior to hospital

4.11 Ethical consideration

Requested permission letter was obtained from WKU, college of medicine and health science department of medicine before the beginning of process of data collection.

4.12 Dissemination of the result

Based on the result that was obtained from the study, possible recommendation and intervention was given and final result of the study was submitted to the school of medicine and health science.

4.13 Operational Definitions

- **Severe pneumonia** -A child having history of cough or difficult breathing increased breathing rate & lower chest in drawing. i.e.
  - ❖ Cough or difficult breathing plus at least one of the following signs
    - Lower chest in drawing
    - Nasal flaring
    - Grunting (in young infants) (7, 8).
- **Very severe pneumonia**

  A child with a history of cough or difficult breathing plus at least one of the following
    - Central cyanosis
    - Inability to breastfed or drink
    - Vomiting everything
    - Convulsions, lethargy or unconsciousness
    - Severe respiratory distress e.g. head nodding (7&8).
- **Outcomes**
  - **Good outcome**: the patient discharged with improvement
  - **Poor outcome**: the patient develops complications and died after admission
- **Self-discharge or discharge against medical advice**
  - Discharge made by the patient or guardian against medical advice without the approval of the physician.
- **Death**
  - Patient who died in the ward after admission & for whom death summary was written or who was recorded in the ward log book as died.

CHAPTER FIVE

RESULT

5.1 Socio-demographic characteristics of the study participants

A total of 340 patients were selected in this study. However, 306 (90%) had complete records (both on charts & discharge logbook). Out of 340 children 159 (46.8%) are between age group 1 year to 5 years and 158 (46.5%) are between the age group 3 month to 1 year, and 317 (93.3%) were below the age of 5 years. The minimum age at admission for severe pneumonia was 3 months, and the maximum age at admission was 14 years for both sexes with the mean age at admission being 2.4 and 2.7 for male and female respectively. There was difference in admission rates between males and females. Males accounting for 190 (55.9%) of admission whereas females accounting for 150 (44.1%) and the male to female ratio was 1.3. From the total of 340 admissions of severe pneumonia patients, 128 (37.6%) of them were from rural, whereas, the rest (62.4%) were urban (Table 1).

Table 1: Socio-demographic characteristics of the study participants (n=340)

Variables	Category	Frequency	Percent
Sex	Male	190	55.9
	Female	150	44.1
Age	3-12months	158	46.5
	1-5years	159	46.7
	6-10years	16	4.7
	11-14years	7	2.1
Residence	Urban	128	37.6
	Rural	212	62.4

5.2 Treatment outcome

Outcome was recorded for 335 of patients on the discharge log book and on 306 of the charts, whose charts were found in the hospital record unit. From 335 patients where outcome was recorded in discharge log book, 11 (3.3%) had poor outcome and 324 (95.1%) had good outcome.

5.3 Factors associated with treatment outcome

The mortality rate among females was 7(63.6%) and males 4(36.4%) but there was no significant association between sex and outcome (P=0.286) (table 2)

Table 2:Out come by sex of the study participants

Sex	Outcome									
	Died		Improved		Self-discharge		Unknown results		Total	
	No	%	No	%	No	%	No	%	No	%
Female	7	63.6	141	43.5	-	-	2	40	150	44.1
Male	4	36.4	183	56.5	-	-	3	60	190	55.9
Total	11	100	324	100	-	-	5	100	340	100
P Value=0.286					X^2=2.5					

Nine (81.8%) of the deaths occurred in the age group between 3month and 1 year and 2(18.2%) occurred between 1 year and 5 years. But there was no significant association between age and outcome (P=0.395) (Table 3)

Table 3:Out come by age of the study participants

Age	Outcome						Total	
	Died		Improved		Unknown			
	NO	%	No	%	No	%	No	%
3 month - 11month	9	81.8	146	45.1	3	60	158	46.5
1 year -5 year	2	18.2	155	47.8	2	40	159	46.7
5 year -10 year	0	0	16	4.9	0	0	16	4.7
10 year- 14 year	0	0	7	2.2	0	0	7	2.1
Total	11	100	324	100	5	100	340	100
P-value =0.395				X^2=8.4				

Out of 306 children 23(7.4%) of them were taken to the health center prior to hospital admission 18(6%) were taken to private clinic 3(0.9%) of them were taken to different 3(0.9%) of them were taken to different hospitals and 262 (85.7%) were brought directly to WUSTH.

There was significant association between visit of other health sectors prior to hospital admission with the outcome. From a total of 44 (14.3%) children taken to other centers prior to hospital admission 6 (1.9%) children died and all were taken to different health centers which accounts for 54.5% of total deaths (P=0.043) (Table 4).

Table 4: Outcome by visiting other center prior to hospital admission the study participants

Prior to hospital visit	Out come					
	Died		Improved		Self-discharge	
Health center	6	54.5	17	5.6	-	-
Private clinic	0	0	18	6	-	-
Other hospital	0	0	3	0.9	-	-
None	5	45.5	262	875	-	-
Total	11	100	295	100		
P- value =0.043 AOR=0.38, 95% CI: 0.21–0.69				X^2=7.83		

The duration of illness prior to hospital admission has significant association with the outcome (P=0.043). Ten (90.9%) of the death occurred in children who were brought to the hospital after 48 hours whereas only 1(9.1%) of deaths occurred in patients brought to the hospital in less than 48 hours after the onset of illness (Table 5).

Table 5:outcome by duration of illness prior to hospital admission the study participants

Duration of illness prior to hospital admission	Outcome						Total	
	Died		Improved		Unknown status			
	No	%	No	%	No	%	No	%
<48 hours	1	9.1	31	9.6	1	20	35	10.3
48-72hrs	5	45.5	120	37	1	20	125	36.8

>72 hours	5	45.5	173	53.4	3	60	180	52.9
Total	11	100	324	100	5	100	324	100
P value =0.04 AOR=1.17, 95% CI: 1.8–6				X^2=6.27				

From a total of 306 children, 44 (14.4%) were malnourished and from a total of 11 deaths ,7 were among malnourished children. There was a significant association between the outcome and severe acute malnutrition (p value= 0.001) (Table 6).

Table 6: outcome by nutritional status of the study participants

Nutritional status	Outcome							
	Died		Improved		Self-discharge			
	No	%	No	%	No	%	No	%
Malnourished (SAM)	7	63	37	1.5	-	-	44	14.4
Non-malnourished	4	37	258	98.5	-	-	262	85.6
Total	11	100	295	100	-	-	306	100
P=value =0.001AOR=2.4, 95% CI: 1.67–4.37					X^2=36.1			

The maximum duration for hospital stay was 45 days and the minimum was 36 hrs. The mean duration of hospital stay was 4 days for those patients discharged with improvement.

Table 7: Outcome by duration of hospital stay the study participants

Duration of Hospital stay	Outcome						Total	
	Died		Improved		Self-discharge			
	No	%	No	%	No	%	No	%
<48 hours	3	27.2	31	9.6	1	20	35	10.3
48 -72 hrs	4	36.4	120	37	1	20	125	36.8
>72hrs	4	36.4	173	53.4	3	60	180	52.9
Total	11	100	324	100	5	100	340	100
P-value =0.007 AOR=1.46, 95% CI: 3.2–11.13					X^2=9.84			

Outcome was not recorded for 5(1.5%) patients. 34 charts were missing and duration of illness prior to hospital admission, visits to other health sector prior to hospital admission and nutritional status of the patients were not recorded in the discharge log book for these patients.

CHAPTER SIX:

6.1 Discussion

This study revealed a high proportion of good treatment outcome among pediatric patients diagnosed with severe pneumonia 324(95.2%). It is comparable with studies done at JUMC in which 225(98%) were discharged with improvement but greater than studies done at TAH and Nekemet referral hospital.

The result showed that majority of the patients were in the age group 1year to 5 years and which is comparable with the study findings of both JUSH & TAH 2013 and 2012 E.C respectively. The Mean age at admission was 2.7 & 2.4 years for female & male respectively. The minimum was 3 months for both sexes the maximum was 14.

In this study there is male predominance in the admission in which male were accounting for 190 (55.9%) of severe pneumonia admission whereas females where 150 (44.1%) and male to female ratio was 1.3 which is comparable with chiro hospital in which case male were 61% and females 39% and male to female ratio was 1.5 and it was also comparable with TAH, which had male admissions of 57.9% and female admissions of 42.1 and male to female ratio of 1.4 (3,4).

The data yields a male to female ratio of 1.3, this finding independently doesn't permit conclusion as whether this tendency results from active health care avoidance or from institutional barriers to health care access that disparity in health care utilization by sex is greater enough that further study is warranted (3,4).

The duration of illness prior to Hospital admission has significant association in the study with the outcome, since duration of illness was not included in the studies done on similar topic it was not possible to make comparison.

Duration of hospital stay was found to be significantly associated with the outcome which is comparable with TAH result in which case. This could be due to the fact that longer duration of hospital stay could be related to overcrowding, higher risk of developing hospital-acquired infection, and complications of bacterial pneumonia like persistent effusions, empyema, pulmonary abscess, and respiratory distress sepsis. Besides, the finding is slightly concurrent with the study done in Rabat, Morocco, that reported 9.96 days of hospital stay were significantly (P=0.001) associated with poor treatment outcomes [18].

There was a significant association between the outcome and severe acute malnutrition whereby from 11 deaths 7 of them were found malnourished which is comparable with the studied that was studied at JUMC, in which Out of total sample, more than one-third, 204 (39.1%), of the cases had malnutrition and it had strong association to the outcome, children who had malnutrition were seven times more likely to die by severe pneumonia than children who had no malnutrition.

6.2 Limitation Encountered

- Poor record keeping (Incomplete patient records)
- As the data were collected retrospectively, a result does not show a strong causal effect between the variables of interest.

6.3 Conclusion

This study showed that among patients admitted with severe pneumonia, most of the patients show improvement. Being malnourished, prolonged hospital stays, visiting health center prior to hospital admission and prolonged duration of illness prior to hospital stay were identified as the factors affecting the treatment outcome whereas age, sex and residence were not associated with the treatment outcome.
The hospital record keeping system was found to be poor.

6.4 Recommendation.

1. Delay in Hospital visit has been shown to have strong association with the outcome so parents should be informed the importance of early treatment seeking behavior for any health problem. And this could be achieved by primary health care providers.

2. In order to develop evidence based recommendations, more research is required in various areas such as the etiologies of severe cases and the reasons for the complications, the type of medication given.

3. The hospital record keeping system should be improved to help obtain complete information on patient records for further similar study as well as follow up and to ensure the usefulness of pediatric charts and log books administrator should timely monitor records, complied and disseminate results for planning, implementation and monitoring health service. It is also another area which needs further study on impact of record keeping on quality of care and follow up of patients.

4. Committed, harmonized, and integrated intervention needs to be taken to reduce mortality from severe pneumonia by enhancing child's nutrition status.

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ANNEX

Questioner Format

The pattern and outcome of severe pneumonia admissions from September 2022– August 2023 at WUSTH pediatric ward

S. No	*Card number*	*Age*	*Sex*	*Address*	*Duration of illness prior to hospital admission*	*Duration of hospital stay*	*Patient taken prior to hospital visit*				*comorbidity*	*Anthropometry (nutritional status)*	*Outcome(condition on discharge)*
							HC	*Private*	*Traditional*	*Others (specify)*			

Declaration (assurance of investigator)

We the undersigned student, declare that this research result work is our original work in partial fulfillment of the requirement for the degree of medicine.

Name: Dr. Melkamzer Sebsbew,

Dr. Megbaru Demis,

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Signature: _____

Place: Wolkite University College of Medicine and health sciences

Date of Submission: September, 2023

The research result work has been submitted for examination with my approval as a university advisor.

Name of Principal advisor: Mr. Abate L.(Ass,Proff)

Signature: _____ Date _____

Name of Co-advisor: Mr. Mitiku

Signature: _____ Date _____