COLLEGE OF MEDICINE AND HEALTH SCIENCE

DEPARTMENT OF NURSING

ASESSMENT ON THE OUTCOME OF MECHANICALLY VENTILATED PATIENTS AT CENTRAL INTENSIVE CARE OF GURAGE ZONE PUBLIC HOSPITALS, ETHIOPIA IN 2022 G.C.

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TITLE

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Table of Contents

ABSTACT

Background: Mechanical ventilation is an important life support technology that is a whole component of critical care and the primary method of supporting organ function in patients treated in intensive care units, and is a main stay of supportive therapy for patients with acute respiratory failure, both to maintain adequate systemic oxygenation and to rest the respiratory muscles.

Objective: The study was usedto assess the outcome of mechanically ventilated patients in Central Intensive Care Unit of Wolkite University Specialized Hospital and butajira general hospital in 2022.

Method: Retrospective cross sectional study design was carried out to assess the outcome of patients put on mechanical ventilation in central intensive care unit of Wolkite University Specialized Hospital and Butajira general hospital. The study data was collected from May 17, 2022 to May 25, 2022 on designed for this purpose. Sampling technique was systematic sampling used all admission in intensive care unit will be taken. The sample size was313 number of patients expected in intensive care unit. A pretest and structured questionnaire was used to collect data and entered SPSS 22 version software.

Result: In this study 313 patients mechanically ventilated patients 83 (26.5%) were died,50(16%) were transferred to respective wards, discharged 79(25.2%) against medical advice account, referred 38(12.1%),and cured were 63 (20.1%). In this study the highest mortality cause was related with sever pneumonia, congestive heart failure, acute abdomen and trauma respectively.

Conclusion and recommendation: The mortality rate of patients who required mechanical ventilation was higher, the highest mortality cause was sever pneumonia, congestive heart failure and Acute abdomen, and trauma which may have been related to the severity of illness of the patients admitted to our central intensive care unit. This implies for Wolkite university specialized hospital and Butajira general hospitalan urgent need for extensive

improvement in protocols for intensive care unit setup in low resource settings, trained man power, appropriate record of the patient data, and best follow up and care of patients.

Key words: outcome of patients mechanically ventilated in central intensive care unit.

List of figure

List of table

ABBREVIATIONS AND ACRONYMS

ARDS………….Acute respiratory distress syndrome

APACHE………Acute physiology & chronic health evaluation

ARF.....................Acute respiratory failure

ALS…………….Amyotrophic Lateral Sclerosis

ALI……………..Acute Lung Injury

BGH…………….Butajira general hospital

CHF…………….Congestive heart failure

COPD…………...Chronic obstructive Lung Disease

CPAP……………Continuous positive air way pressure

ICU………………Intensive care unit

MV……………… Mechanical Ventilation

MR……………....Mortality rate

NIV……….........Noninvasive ventilation

PCV………………pressure controlled ventilation

PEEP…………......Positive End Expiratory Pressure

PSIMV……….......Pressure synchronized intermittent mechanical ventilation

SPSS……………...Statically package for the social sciences

TASH…………….Tikur Ambessa Specialized Hospital

VAP………………Ventilator Associated Pneumonia

WUSH…………….Wolkite university Specialized Hospital

1. INTRODUCTION

1.1. Background

Ventilation is the process of moving air in and out of alveoli which is important for the exchange of oxygen and carbon dioxide. Mechanical ventilation (MV) is used for many reasons including to protect air way due to mechanical or neurologic cause to ensure adequate oxygenation, or to remove excess carbon dioxide from the lung. This mechanical ventilation can be achieved with many instruments most commonly through an endotracheal tube. Face or Nasal masks are used for Noninvasive ventilation (NIV) in appropriately selected people who are conscious. The simplest form of artificial ventilation is provided by manually squeezing an Ambu-bag or Anesthesia (1).

Mechanical ventilation (MV) is a frequent reason for admission to an intensive care unit (1). The Main indications for Mechanical ventilation (MV) are airway protection and respiratory failure(2). Which is the most common vital organ failure seen in critically ill patients. Among Intensive care unit (ICU) patients, 40–65% need Mechanical ventilation (MV) during their Intensive care unit (ICU) stay(3), Patient’s Mechanical ventilation (MV) require a complex, and technically sophisticated level of care (4), Now the use of noninvasive techniques of ventilator treatment has increased, and patients treated with these modalities need to be included in epidemiological study concerning acute respiratory failure (5).

Mechanical ventilation can cause significant and often permanent mental, physical and behavioral impairments requiring long-term access to health care. However, predicting the health care service utilization and mortality rate associated with invasive mechanical ventilation is difficult because of its widely varying rate and extent of recovery. Although Invasive Mechanical Ventilation (IMV) patients consume significant medical resources, their outcomes tend to be poor, especially in the elderly population(6).

Mechanical ventilation is often a life-saving intervention, but carries potential complications including pneumothorax, airway injury, alveolar damage, ventilator-associated pneumonia, and ventilator-associated tracheobronchitis. Other complications include diaphragm atrophy, decreased cardiac output, and oxygen toxicity. One of the primary complications that presents in patients mechanically ventilated is acute lung injury (ALI)/acute respiratory distress syndrome (ARDS). Acute lung injury/ acute respiratory distress syndrome are recognized as significant contributors to patient morbidity and mortality(7).

1.2. Statement of the problem

The need for Mechanical ventilation (MV) is a frequent reason for admission to an Intensive care unit (ICU)(8). In some Intensive care unit (ICU) settings, ≥75% of patients requires Mechanical ventilation (MV) during their Intensive care unit (ICU) stay. Respiratory failure (RF) is one of the most common reasons for patients admitted to the Intensive Care Unit (ICU). Because so many underlying causes contribute to it, Respiratory failure is a common and major cause of illness and death (9).The Incidences of Acute Respiratory Failure (ARF) 88.6 per 100,000 populations per year (9). It is the main cause of death from pneumonia and chronic obstructive pulmonary disease (COPD), which together comprise the third-leading cause of death in the United States today (10). It is also the main cause of death from acute lung injury (ALI) and acute respiratory distress syndrome (ARDS), several studies that were conducted all around the world and used the definitions provided by the American–European Consensus Conference on cute respiratory distress syndrome (ARDS) found incidence ranges of 17.9–34.0 and 12.6–28.0 cases per 100,000 population per year, respectively (11-13), and in many neuromuscular diseases, such as Lou Gehrig disease, because these diseases weaken the respiratory muscles, rendering them incapable of sustaining breathing (10).

Epidemiologic studies suggest that respiratory failure will become more common as the popular ages, increasing by 80 % for the next 20 years (8).

Because respiratory failure is such a common cause of illness and death, the cost to society in terms of lost productivity and shortened lives is enormous. However, it is hard to quantify because the cause of death is more likely to be listed as pneumonia, chronic obstructive pulmonary disease (COPD), or another underlying condition, rather than respiratory failure (10).

Despite advances in the management of Acute Respiratory Failure (ARF) with Mechanical ventilation (MV), mortality has not decreased significantly and costs remain high (4). The reason for this is Patients admitted Intensive care unit (ICUs) who need Mechanical ventilation (MV) are expected to have higher mortality rates compared with those who do not require respiratory support (4). This because the severity of the underlying conditions for example the Mortality Rate (MR) of Acute Respiratory Distress Syndrome (ARDS) is 41-61%. Those patients are also at risk of developing ventilator associated and non-ventilator associated fatal compilation for example Sepsis is a significant problem in the care of critically ill patients. It is the leading cause of death in no coronary Intensive Care Unit (ICUs) in the United States. Current estimates suggest that 750,000 patients are affected with this condition each year (2).Although Mechanical ventilation (MV) provides an essential life support, it can also degrade lung condition through regional over distension, atelectasis trauma and oxygen toxicity (3).

In Ethiopia only Some hospitals have Intensive Care Unit (ICU) services that operate with varying levels of equipment and staff. The zonal(general) and regional hospitals usually send their sickest patients to these referral hospitals for Intensive Care Unit (ICU) and other specialized care. Wolkite University Specialized hospital (WUSH) and Butajira general hospitals (BGH) are one of those hospitals which provide such services.

The use of ventilators also implies doctors and nurses with sufficient training to care for mechanically ventilated patients. The latter implies the assessment of oxygenation status, the ability to recognize and correct problems (e.g. Endotracheal tube obstruction), and skills in routine maintenance of ventilated patients, such as sterile suctioning, physiotherapy and postural drainage to reduce the risk of pneumonia, but this and high cost of Mechanical ventilation (MV) is the main problem in low and medium income countries (14). For example the Intensive Care Unit (ICU) of Wolkite University Specialized hospital (WUSH) and butajira general hospital (BGH) has no even a single Anesthesiologist.

1.3. Significance of the Study

The study was useful to put base line information about treatment outcome and causes of mortality of patients on mechanical ventilation in central Intensive Care Unit (C-ICU) of Wolkite University specialized hospital (WUSH) and butajira general hospital (BGH). As well as to forward recommendations to initiate other investigators to work further on the same and/or other related issues. It may also attract the attention of policy makers and Hospital administrators to have specific guidelines for management of patients who need Mechanical ventilation (MV) and improve Intensive Care Unit (ICU) facility of Wolkite University specialized hospital (WUSH) and Butajira general hospital (BGH).

2. LITERATURE REVIEW

2.1. Out come

Mechanical ventilation (MV) is a core support for patients in the Intensive Care Unit (ICU) affecting up to 50% of ICU patients (≈800 patients per year in Christchurch and 8000 per year in New Zealand) with a considerable associated cost approximated near $1800 per patient per day (1). The primary objective of Mechanical ventilation (MV) is to support the breathing of patients with respiratory failure such as acute lung injury (ALI) or acute respiratory distress syndrome (ARDS) (3).

According to Epidemiology of Mechanical Ventilation(MV): Analysis of the SAPS 3 Database13,322 admitted patients, 53% were mechanically ventilated at admission, with the majority being invasively (48.8%), and only a small number of patients (4.2%) noninvasively ventilated. 61.5% (8,196) were mechanically ventilated during the first 3 days of intensive care, with 7.3% being managed by Non Invasive ventilation (NIV). Of the 5,970 patients still in the Intensive Care Unit (ICU) by day 3, still 59.1 % (3,527) were ventilated Hospital mortality was not different whether Tidal Volume was higher or lower than 8ml/kg in the whole cohort (35.7 vs.37.4%; n's., O/E ratio 1.01 (0.97-1.05) and 1.02 (0.971.06), respectively (3).

According to JAMA 2002 a 28 day international prospective cohort study shows 33% of patients admitted to Intensive Care Unit (ICU) were received Mechanical ventilation (MV) for a mean duration of 7.2 days. Overall mortality of patients admitted to ICU is 30.7% and 52% for mechanically ventilated patients. the most common events patients experience was barotraumas 3%, ARDS 4.4%, pneumonia 9.8%, sepsis 9.7%, AKI 18.7%, hepatic failure 6.3%, DIC 10.6% respiratory acidosis 5.6% but in this study the only documented complications are sepsis 9.3%.

According to A 1-d point-prevalence study conducted in North America, South America, Spain, and Portugal showed that 75% of patients used endotracheal tube for access to the airway for delivery of mechanical ventilation. 96 percent of endotracheal tube passed through the mouth and 4 percent through the nose.The most frequently used ventilator mode was assist/control (A/C) (47%) and synchronized intermittent mandatory ventilation (SIMV) (46%). The most common weaning approach was PS, which was used in 36 percent of patients, and 28 percent of patients used the combination of SIMV and PS (4).

A study in Poland in which 83 Intensive Care Unit (ICU) took part in the study. The rate of ventilated patients was 73.6%. The indications for mechanical ventilation (MV) were: acute respiratory failure (40%), coma (40%), chronic obstructive pulmonary disease (COPD) exacerbation (14%), and neuromuscular diseases (5%). Patients were ventilated by or tracheal tube (58%), tracheostomy tube (41%), and mask/helmet (1%). The mean tidal volume was 8 ml/kg and positive end-expiratory pressure was commonly used. Ventilation monitoring with biomechanical methods was used at 53% of center (15).

Another study conducted in 45 Brazilian intensive care units indicated that 622(80 percent) of 773 patients were received mechanical ventilation. The source of admission for the entire admitted patients was emergency room, ward and operation room (47%, 31% and 22%) respectively. The main reasons for the ventilator support were Pneumonia (27 percent), neurologic disorders (19 percent) and non-pulmonary sepsis (12 percent). The most commonly used mechanical ventilation mode was pressure-controlled ventilation 371(60%) followed by volume-controlled ventilation 186(30%) and pressure-support ventilation 54(9%) (5).

According study in Cairo, Egypt indicated that the mortality rate among the mechanical ventilation patients was 696(64.4%). Mortality was significantly higher in patients ventilated because of heart disease (41.8%) followed by respiratory diseases (31.8%), central nervous system (13.8%), and septic shock (12.6%). another study conducted in Abbassia Chest Hospital, Egypt also reported that 223(54.79%) patients on mechanical ventilation were died. 184(45.2%) patients were survived. Out of the 184 patients, 111(27.27%) patients were transferred to the ward, 70(17.2%) were discharged without recommendation, and 3(0.74%) were discharged with home on O2 therapy.(14).

According to a prospective research conducted by Kinfu Betemariam and Gebreyesus Hagos on pattern of admission to Central Intensive care unit (C-ICU) of Tikur Ambessa Specialized Hospital (TASH) for Mechanical ventilation (MV) and the study shows that 47.7% of patients are mechanically ventilated for a mean duration of 5.4 days (16).

Another study conducted in 138 patients in Maharashtra, India revealed that the most common etiology for MV was poisoning (53.6%). The mean age of patients was 43.22 years, ranging from 14 to 75 years with male predominance (73.91%). The average length of stay in ICU before MV, on MV and the cumulative length of stay in ICU were 0.78, 5.9 and 6.4 days in non-survivors. 17 patients were having Brady cardiac, 41 were having normal heart rate while 80 patients were having tachycardia. Out of 138 patients, 77 (55.7%) had normal B.P. 27 (19.5%) had hypertension and 34 (24.6%) had hypotension. 56 patients were having hyperthermia, 17 were having hypothermia and 65 were having normal temperature and Another study conducted in Philippines stated that out of 191 intubated patients 39% were died while, 54% were intubated from the mechanical ventilation. From the intubated patients 35% were planned Extubation, and 19% were unplanned Extubation. Of those, 191 intubated patients 7% left against medical advice. The main factors associated with the unplanned Extubation were male sex (Crude OR: 2.25, 95%CI: 1.10 - 4.63) and age (Crude OR 0.976, 95%CI: 0.957 - 0.996)(17).

A total of 128 patients were admitted into the ICU over the six month period and 44 patients constituting 34.4% were mechanically ventilated. The average duration of mechanical ventilation was 12.30 ± 10.10 days. Duration of mechanical ventilation, use of arterial blood gas measurement and inotropic support had significant effect on weaning from ventilation with p values of 0.005, 0.05 and <0.001 respectively. Mechanically ventilated patients had >4 times chance of death than non-ventilated patients(18).

According to prospective study in Nigeran hospital of indications and factors that affect outcome revealed the total of 128 patients got hospitalized in the intensive care units during six months out of which 44 patients were put on mechanical ventilators . The average days the patients kept on ventilators were 12 to 22 days. Measurement of arterial blood gases and use of inotropes has affected the outcome significantly. There fourfold increase of chance of death among ventilated patients over non-ventilated clients (19).

A study conducted in ayder specialized hospital indicates that the overall Intensive Care Unit (ICU) mortality rate for patients was 28.6 percent. Over 60 years of age and new septic shock development was associated with a significantly increased mortality risk (20).

3. OBJECTIVE

3.1. General Objective

- To assess the outcome of mechanically ventilated patients at central intensive care unitof gurage zone public hospitals in 2022.

4. METHODOLOGY

4.1. Study Area and Study Period

4.1.1. Study Area

The study was conducted in gurage zone public hospitals and we have selected from those two hospitals; Wolkite University Specialized hospital and Butajira general hospital; both hospitals located Central South Ethiopia. Wolkite University Specialized Hospital its administration was accountable for Wolkite University. It has nine main departments; Medical & Surgical, gynecology and obstetrics Surgery, Pediatric, ophthalmology, Dentistry, Central intensive care unit. Central Intensive Care Unit is one of the Departments in Wolkite University Specialized Hospital and it staffed with General practitioners, nurses, trained intensive care unit professionals and medical interns. The Central Intensive Care Unit of Wolkite University Specialized Hospital has 5 beds and 5 mechanical ventilators. Butajira general hospital one of the general hospital in gurage zone its administration accountable for gurage zone health department and it has eight departments from those central intensive care unit is the main department of the hospital the intensive care unit was staffed with general practitioners, nurses, and trained health professionals.

4.1.2. Study period

- The study was conducted from on data sheet designed for this purpose.

4.2. Study Design

- A retrospective cross sectional study was conducted on patients who were put on mechanical ventilation in central ICU of Wolkite University Specialized Hospital and Butajira general hospital.

4.3. Sources of Population and Sampled Population

4.3.1. Sources of Population

All patients who were admitted in central intensive care unit of Wolkite University Specialized Hospital and Butajira general hospital are considered as source population.

4.3.2. Study population

All patients who used mechanical ventilation and were filled on data collection format and fulfill the inclusion criteria.

4. 4. Inclusion and Exclusion Criteria

4.4.1. Inclusion Criteria

- Patients whose chart is complete.
- All patient age greater than 14 years.

4.4.2. Exclusion Criteria

- Patient with incomplete chart records.
- Age less than 14 years.

4.5. Sample Size Determination and Sampling Techniques

4.5.1 .Sample Size Determination

The sample size was calculated single size population formula and determined number of patients who are managed in central ICU during the study period

1. To determine the outcomes patients put on mechanical ventilator

We use proportion hospital mortality rate 28.6 %

$n = \underline{(Z\alpha 1/2)^2\ p\ (1-P)}$

w2

$n = \underline{(1.96)^2\ 0.286\ (1-0.286)}$

(0.05)2

n=313

4.5.2. Sampling Techniques

Probability sampling method: -a systematic random sampling technique wasused.

- Total admitted in two hospitals 685 numbers of patients.
- N/n=685/313=2.18 by this method we use every 2 interval for data collection then selected 1 by lottery method.

4.6. Data Collection Instruments and Techniques

All patients supported with Mechanical ventilation (MV) respective records. First Total admissions of Intensive care unit (ICU) during the study period counted.Data was collected from Intensive care unit (ICU) registration. The information obtained from the above mentioned sources wasentering into specialized defined data collection forms (data collection form attached as annex).

Health professionals specifically 2 BSc nurses student was assist for data collection and they were be given training on the process of data collection checklist and procedures. The principal investigator was providing orientation before the data collection begins to the data collectors on the objectives of the study and the overall stepwise retrieving of data collection.

All data was collected by using questioners which include socio demographic data, cause of mechanical ventilation, complication related to mechanical ventilation, outcome, and duration of weaning in a day. At the last data was summarized by a dummy table.

4.7. Data Analysis

The collected data was processed and analyzed with computer using SPSS 22 version software, Also cross checked by the study group and putted the result by using tables, graphs, and comparing with previous researches.

4.8. Data Quality Control

Before starting the data collection we have given short training about Questionnaires and how to collect data from registration.

Data collecting format was cross matched with available information on records; then the study questions were rearranged. Daily completeness of the data was cross checked, for incompletely filled, the card was reassessed and filled.

4.9. Variables

4.9.1. Dependent variables

- Referred
- death
- discharge
- cured
- transfer to in patient

4.9.2. Independent variables:

- Age
- Sex
- Length of stay on - ICU -MV and - in Hospital
- Diagnosis at admission
- Mode of air way

4.10. Operational Definitions

ICU (intensive care unit):- is a special department of a hospital or health care facility that provides mechanical ventilation and a place where our study is undertake.

Ventilation: - is the process of moving air in and out of alveoli which is important for the exchange of oxygen and carbon dioxide.

Mechanical ventilation: - is the primary method of supporting organ function in patients treated in intensive care units (ICU).

Treatment:-is a medical care given to a patient for an illness or injury.

Outcome:-a result or effect which is expected after mechanical ventilation, also events.

Cured: improved from the illness and Free from MV/WEANED

Death: when the patient expired from MV and after 24hrs.

Referred: when the patient unable to respond for MV and transferred to other health facility.

Sepsis: is a body extreme response to an infection.

Renal failure: in ability of the kidney to perform excretory function.

VAP: is pneumonia that develops 48 hours or longer after mechanical ventilation.

Barotrauma: injury to your body because of changes in air pressure.

Self-discharge: is when a patient lives an ICU and refuse MV by himself or her family (1).

4.11. Ethical Considerations

The research proposal was submitted to wolkite University research committee forethical consideration. Then official letter was obtained from wolkite University College of health science, nursing department .This official letter was submitted to WUSH and BGH authorized body for their cooperation and permission. To have log books and card room personals and others if necessary and the objective of study was explained.

5. RESULT

There were a total of 313 patients were intubated and mechanically ventilated in WUSH 168(53.7%) and BGH 145(46.3%) of these a total of two hospital 165 (52.7%) were male and 148 (47.3%) were female with a male to female ratio of 1:1. The median age group of those patients was 35 -39 years.

Table1:sex and age distribution of patients on MV in CICU OF WUSH and BGH.

Character	Frequency	Percent
Age(in years)		
14-19	48	15.3%
20-24	31	9.9%
25-29	16	5.1%
30-34	37	11.8%
35-39	26	8.3%
40-44	20	6.4%
45+	135	43.1%
Sex		
Male	165	52.7%
Female	148	47.3%

5.1. THE REASON FOR MV

The predominant cases for mechanical ventilation administration was sever pneumonia 84 (26.8%), congestive heart failure 44 (14.1%), acute abdomen 38(12.1%), trauma 32(10.2%),meningitis 15(4.8%) respectively.

Table 2: patients in that used mechanical ventilation among intensive care unit

s.no	Cases in ICU	Frequency	%
1	Pneumonia	84	32.1%
2	Pre Eclampsia	8	2.6%
3	Eclampsia	2	0.6%
4	CHF	44	14.1%
5	Meningitis	15	4.8%
6	Septic shock	14	4.5%
7	Liver disease	2	0.6%
8	Trauma	32	10.2%
9	Acute abdomen	38	12.1%
10	Neuromuscular disease	11	3.5%
11	AKI	11	3.5%
12	Esophageal cancer	1	0.3%
13	Poisoning	5	1.6%
14	Other disease	40	12.8%

5.2. **Complication Developed During stay on MV**

In this study the highest recorded complication was acute respiratory distress syndrome 26(8.3%), and sepsis 21(6.7%), barotrauma 3(1%) and renal failure 2(0.6%) respectively.

Table: 3 complications related to mechanical ventilation among intensive care unit patients

s.no	**complications**	**Frequency**	**%**
1	**ARDS**	**26**	**8.3%**
2	**Sepsis**	**21**	**6.7%%**
3	**Barotrauma**	**3**	**1%**
4	**Renal failure**	**2**	**0.6%**

5.3. **Outcome**

From 313mechanically ventilated patients 83 (26.5%) were died transfer were to respective wards 50 (16%), and discharged 79(25.2%)against medical advice account, cured were `63(20.1%), referred were 38 (12.1%) respectively.

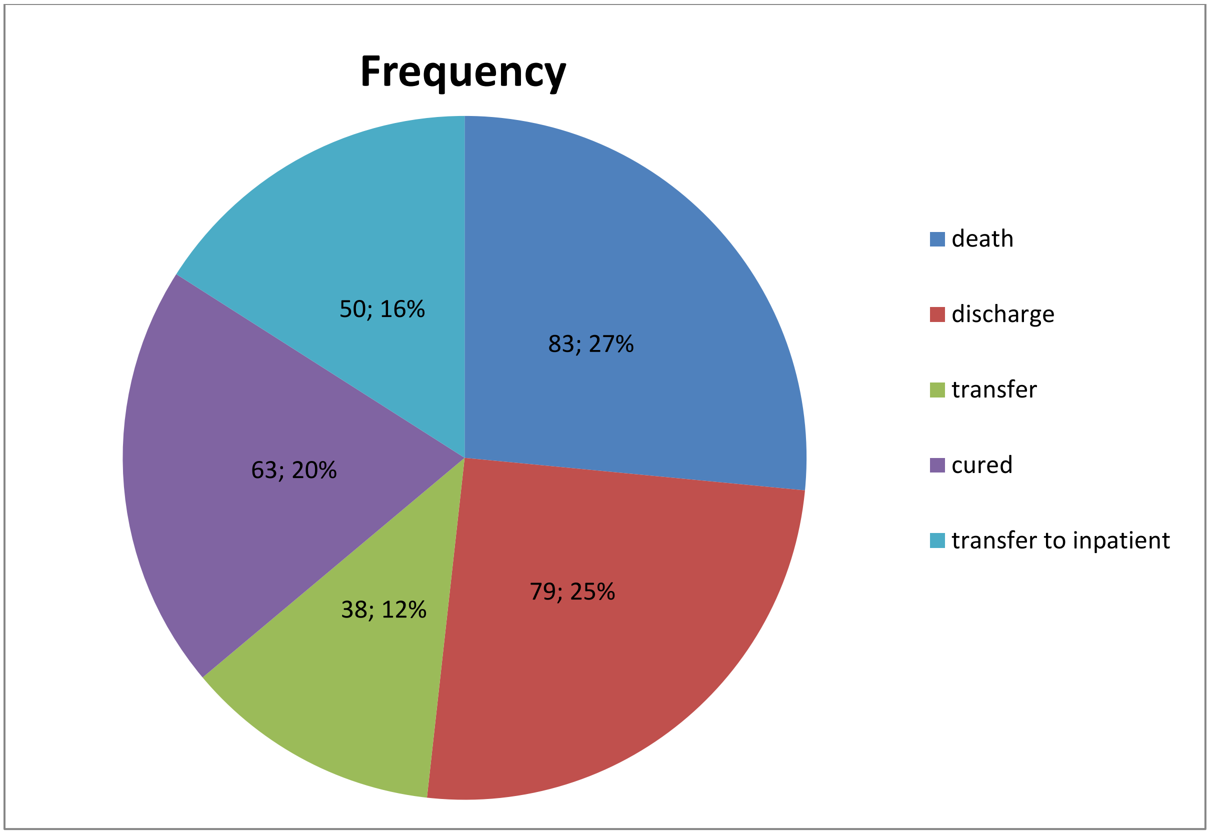

Figure 1: outcome of mechanical ventilation

Table 4: cause of death of patients on MV in CICU ofWUSH and BGH from November 1, 2021 to April 30, 2022.

According to our study cause of death related to sepsis 26.5%, heart failure, 38.5%, ARDS 25.3%, hepatic failure0.01%, and other causes 0.08%.

Cause of death	frequency	Total no of death (%)
Sepsis	22	26.5%
Heart failure	32	38.5%
ARDS	21	25.3%
Hepatic failure	1	0.01%
Other cause	7	0.08%

6. DISCUSSION

According to this study the commonest reason for the initiation of mechanical ventilationwas sever pneumonia which accounts for 26.8% which is less than comparable to the study in TASH (78%) and JAMA (68.8%) followed by cardiac disease (14.1%), which is lower than the study in Poland (40%) and the other rare reason for MV are Neuromuscular disease (3.5%) which is higher than the study done by JAMA (1.8%) (16). The sex ratio in our study is 1:1 which shows approximately equal proportion of female and male patients in this study.

This shows respiratory, cardiac, trauma, and acute abdomen was need special concern of mechanical ventilation in WUSH and BGH.

According to study mortality rate 26.5% was similar to 28.6%study that conducted inayderhospital and lowers than 52% JAMA 2002(4). Discharge from hospital 25.24% this was higher than study conducted in Cairo Egypt 17 % (16).

Transfer to inpatient 12.14% lower than study conducted Egypt.The commonest reason for the initiation of MV in this study respiratory problem which accounts for 26.8% which is less than comparable to the study in TASH (78%) and JAMA (68.8%) followed by cardiac disease (14.1%), which is lower than the study in Poland (40%) and the other rare reason for MV are

Neuromuscular disease (3.5%) which is higher than the study done by JAMA (1.8%)(16). The sex ratio in our study is 1:1 which shows approximately equal proportion of female and male patients in this study.

In the study done by JAMA, the most common events patients experience was barotraumas 3%, ARDS 4.4%, pneumonia 9.8%, sepsis 9.7%, AKI 17.7%, hepatic failure 6.3%, but in this study the only documented complications are sepsis 9.8%, ARDS 8.3%, renal failure 0.6% ,barotrauma 1% and sepsis 6.7% which is comparable to that of in JAMA 2002 AKI 9.3% and pneumonia 6.5% which are both lower that mentioned JAMA 2002 and this difference is probably due to poor documentation in our study. In our set up which predisposes to post -operative ALI, higher rate of ARF secondary to CHF (14.1%), pneumonia (32.1%) which was higher than in JAMA because most patients in our study were from rural areas which may delay early detection of add the above disease and its complication.

Mechanical ventilation is a supportive measure for all patients in any form of respiratory failure until the primary cause is reversed. The cause for respiration failure ranges from a failure of central nervous control to the peripheral mechanical failure and or problem in the lungs primary affecting gas exchange (16). Although studies have shown higher mortality in ventilated patients, ventilator support is essential in cases like acute severe asthma, multiple trauma &abdominal sepsis. Accurate record keeping is part of the high standard of care required of medical personnel and admission and discharge summaries should be documented for every patient. Accurate records are helps for the purpose of audit, teaching and research and for medico-legal issues (14). In our ICU documents were entered on log book by muses, some being illegible to read. Some patient’s cards were also not found or lost due to various reasons. Computerization of the records would have been considerable in maintaining accuracy & retrieving relevant data.

7. CONCLUSION

The mortality rate of patients who required mechanical ventilation was higher; the highest mortality cause was respiratory disease, congestive heart failure, acute abdomen, and trauma which may have been related to the severity of illness of the patients admitted to our intensive care unit. This implies an urgent need for extensive improvement in protocols for intensive care unit setup in low resource settings. Reason lead to worse outcomes can be hypothesized due to delayed presentation of patients, lack of resources, inadequate health care infrastructure, and financial constraints. Risk factors for hospital mortality included conditions present at the start of mechanical ventilation conditions that occurred during mechanical support. The findings of this study could help in improving health care services in rural hospitals in future.

8. RECOMMENDATION

Based on the results of this study the following recommendations have been made:-

- To Wolkite University specialized hospital and butajira general hospital managements
    - To maximize specialized doctors,anesthesia, and trainedintensivist. To standardize the intensive care unit and appropriate record of the patient document separately. To add number of mechanical ventilation machines and to train nurses on intensive care unit and how to manipulate the machines.
- To hospital doctors, nurses, and other staffs
    - Confirm on the correct diagnosis and to nurses follow and give appropriate care for the patients.
- To both hospital area government leader
    - To support on budget for buying essential materials and to support manpower of hospital.

9. LIMITATION OF THE STUDY

- Lack of training of on intensive care unit fornurses that leads to poor documentation.
- Information obtained from patient charts might not be adequate and complete.
- Patients vital signs and treatment given might not be well registered
- The document lacks some important information.

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Table5: Data collection Format of patients put on MV in Wolkite University specialized hospital and butajira general hospital. November 1, 2021 to April 30, 2022 in

s.no	Variables	
1.1. Socio demographic		
1	Age	
2	Sex	
3	Date of admission to CICU	
1.2. Clinical profiles of mechanically ventilated patients		
4	GCS at Admission	
5	Admission Source	A. Adult emergency B. Inpatient C. Postop D. Another Hospital E. Other
6	Cause for ICU admission	A. Respiratory B. Cardiac C. Sepsis D. Renal

		E. Neuromuscular F. Other
7	Diagnosis at admission	
8	Indications for ICU	A. Medical B. Surgical
9	Date of initiation of MV	
10	Mode of airway access	A. Oro tracheal Intubation B. Naso tracheal intubation
11	Length of stay on MV in days	
12	Length of stay in ICU in days	
13	Modes of mechanical ventilation initially used	A. VCV (volume control ventilation) B. PCV (pressure control ventilation) C. Other
14	Is complication occurred	A. Yes B. No
15	VAP develop	A. Yes B. No
16	Sepsis Developed	A. Yes B. No
17	Barotrauma	A. Yes B. No
18	Renal failure	A. Yes B. No

19	Date of discharge from mechanical ventilation	
1.3. Outcomes of patients on mechanical ventilation		
20	Outcomes in ICU	A. Death B. Discharge C. Transfer D. Cured
21	Cause of death	A. Sepsis B. Heart C. Brain death D. ARDS E.Hepaticfailure F. Other
22	Date of discharge from ICU	
23	Date of discharge from hospital	
24	Duration of weaning in a day	
25	ARDS	A .yes B.no

Annexes

Table 7: this table shows socio-demographic distribution of patients on MV in CICU of WUSH AND BGH from November 1, 2021 to April 30, 2022

Characteristics	**Frequency**	**Percent**
Age group(years):		
14-19		
20-24		
25-29		
30-34		
35-39		
40-44		
45+		
Total		
Sex:		
Male		
Female		
Total		

Table 6: this table shows Reason for MV, Cause of ARF, Complication and outcome of patients on MV in CICU of. Of WUSH from WUSH and BGH from November 1, 2021 to April 30, 2022

Reason for MV	Number	Percent
Pneumonia		
Poisoning		
Burn		
Pre Eclampsia		
Eclampsia		
CHF		
Meningitis		
AKI		
Esophageal cancer		
Trauma		
Septic shock		
Liver disease		
Burn		
Poisoning		
Acute abdomen obstruction		
Neuromuscular disease		
Other		

Complication		
Barotrauma		
Ventilator associated pneumonia (VAP)		
Sepsis		
Renal failure		
Outcome		
Cured		
Referred		
Death		
Transfer to inpatient		
Discharge		

Approval Sheet

WOLKITE UNIVERSITY COLLEGE OF MEDICINE

AND HEALTH SCIENCE NURSING DEPARTMENT

ASESSMENT ON THE OUTCOME OF MECHANICALLY VENTILATED (MV) PA TIENTS AT CENTRAL INTENSIVE CARE UNIT OF WOLKITE UNIVERSITY AND BUTAJIRA GENERALHOSPITAL SPECIALIZED HOSPITAL FROM November 1, 2021 – APRIL 30, 2022 GC.

Name of student: Mohammed Hussen: ____________

Yonas Bitew: ____________

Ayelech Beyene: ___________

Date: ______ /______ /______

Name of advisor: Mr. Haile .W (MSc in AHN) Signature: __________

Mr. Tadesse .T (MSc in AHN) Signature: __________

Date _____/______/______