ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF EMERGENCY MEDICINE

ASSESSMENT OF ADULT INTENSIVE CARE UNIT NURSES' KNOWLEDGE, PRACTICE AND ASSOCIATED FACTORS REGARDING WEANING OF PATIENT FROM MECHANICAL VENTILATION IN SELECTED GOVERNMENTAL HOSPITALS OF ADDIS ABABA, ETHIOPIA.

BY: - SEBLE BECHENI (BSC)

A THESIS SUBMITTED TO THE DEPARTMENT OF EMERGENCY MEDICINE, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN EMERGENCY MEDICINE AND CRITICAL CARE NURSING.

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This is to certify that the thesis entitled "Assessment of adult ICU nurses' knowledge, practice and associated factors regarding weaning of patient from mechanical ventilation in selected governmental hospitals of Addis Ababa Ethiopia..'' is submitted in partial fulfillment of the MSc. with specialization in "Emergency and Critical care nursing" to the Graduate Program of the college of health sciences of Addis Ababa University and has done by Seble Becheni ID No: GSR/2934/11 under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the thesis to the Department.

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Declaration

I hereby declare that this MSc 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.

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ABBREVATIONS AND ACRONYMIES

AA: Addis Ababa

AAU: Addis Ababa University

CHS: College of health science

CIP: Critically ill patients

$Co_{2:}$ Carbon dioxide

GC: Gregorian calendar

ICU: Intensive Care Unit

KP: Knowledge and Practice

MV: Mechanical ventilation

O_2: Oxygen

PEEP: Positive end expiratory pressure

PICU: Pediatric intensive care unit

SPSS: Statistical Package for Social Sciences

SIMV: Spontaneous intermittent mandatory ventilation

TV: Tidal volume

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ABSTRACT

Weaning from mechanical ventilation defined as the process of brusquely or slowly discontinues ventilator support after a patient is able to sustain spontaneous breathing. The success of weaning depends on the resolution of the conditions that have caused the patient to be mechanically ventilated, daily ventilator performance assessment for weaning the patient, the patient readiness and effective application of weaning protocol and the weaning process.

Objective: - The aim of this study was to assess knowledge, practice and associated factor regarding weaning patients from mechanical ventilation among nurses working in adult ICU of selected governmental hospitals Addis Ababa, Ethiopia, 2020 GC.

Methodology: -Descriptive cross-sectional study design was conducted to determine adult ICU nurses' knowledge, practice and associated factors on weaning patient from mechanical ventilation in selected government hospitals. A total of 156 nurses were recruited by convenience sampling method. The data were collected by using semi structured self-administered questionnaires. SPSS version 25 was used for data entry and analyses. Descriptive statistics, bivariate and multivariate logistic regression were used to analyze the data.

Result: - The finding revealed that, 89 (51.9%) of respondent had poor knowledge and 88 (56.41%) of them had poor practice toward weaning patient from mechanical ventilation. On bivariate logistic regression $P<0.05$, factors that had significant association on knowledge was an ICU work experience and training on weaning guideline. Also ICU work experience, educational status and availability of weaning protocol had a significant association with $P <0.05$ on the practice of ICU nurses.

Conclusion and recommendation: The participants of this study had poor knowledge and practice. Work experience, weaning protocol training and availability of protocol had statistically significant with practice of ICU nurses. Therefore, to improve the levels of knowledge and practice, the investigator recommends continues on job training, preparation of protocols and supportive supervision is important.

Keywords: -knowledge, weaning, protocol, mechanical ventilation.

1. INTRODUCTION

1.1 Background

Mechanical ventilation (MV) is one of the most commonly used treatment modalities and key component in the treatment of critically ill and injured patients. It is also a procedure that is widely used in intensive care units (ICU) (1). Up to 90% of patients globally require MV during some or most part of their stay in the ICU. Mechanical ventilation is considered as a live support system for critically ill-intubated adults and children that help to maintain oxygenation and ventilation (2-6). Although most of the patients need mechanical ventilation for a short period of time, some patients may need ventilator support for a long time (7).

Even though, there is no local data regarding patients, who need mechanical ventilation, studies from the United States has showed that, almost 800,000 patients who are hospitalized each year require mechanical ventilation. This estimate excludes neonates (8). Prolongation of ventilator support may potentiate the risk of lethal complications, so discontinuing mechanical ventilation as soon as patients are capable of breathing independently, in a timely and safe manner should lead to a better outcome (9-10).

Ventilator weaning is the process of abruptly or gradually withdrawing artificial ventilation from intubated patients to spontaneous breathing (11-12) .Weaning patients from the ventilator is complex as the nurses needs to discontinue ventilation while providing continuous care, executing individualized weaning care plans and highlighting the expanding role of the ICU nurse. Delays in weaning the patient from mechanical ventilation increase the number of complications and may lead to increased expenditure. The nurses must be well trained, should develop sound knowledge and practical skills (13).

Weaning covers the entire process of liberating the patient from mechanical support and from the endotracheal tube, including relevant aspects of terminal care. Readiness for weaning from mechanical ventilation may include many criteria that include treating the underlying cause that

made the patient to require mechanical ventilation. Adequate respiratory efforts, the presence of cough and gag reflex, the absence of profuse bronchial secretions; stabilization of hemodynamic status, stabilization of metabolic functions; adequate oxygenation and the requirement of no sedation to ensure patient's cooperation effectively (14-15). If weaning is conducted properly it reduces the number of reintubations, length of hospital stay, the risk of respiratory infections and improves survival of patients undergoing MV (1).

In addition weaning Guidelines, checklists, and protocols are decision support tools used to reduce practice variation and instill evidence-based practice into clinical care. Protocols are, considered “adequately explicit” in that they contain enough details to help different clinicians to reach at arrive at same decision for the same clinical scenario. Weaning protocols, if well-developed to ensure the effectiveness of the weaning process, thereby reduce complications and may improve outcomes. If protocols are available, but not followed, the positive outcome from the process will nullify. Therefore, a good knowledge and practice are successful for effective weaning. Even with good knowledge negative attitudes towards the weaning process the overall outcome of patients could be negative (10,16).

Knowledge and attitude itself does not ensure safe practice but safe practice is not possible without good knowledge. Safe practice is a moral and professional duty of the nurse. Therefore, knowledge is an important first attempt to safe patient care. Assessing the knowledge and practice of ICU nurses allows for the introduction of suitable education protocols in ICUs. This could raise both patient safety and the individualized care of patients receiving protocol-directed care (2).

1.2 Statement of the problem

Mechanical ventilation is used daily as a life-saving technique in intensive care units (ICUs). Its application, however, is associated with serious complications and costs, often directly linked to the duration of ventilation, prolonged weaning and extubation failure contributes to impaired outcomes. Longer length of ventilation, longer length of stay in the ICU and in the hospital associated with higher mortality. In addition, the specific impact of weaning difficulties is still poorly understood. This is an important problem, because general recommendations regarding the entire weaning process may encompass completely different causes and consequences of its prolongation and therefore may be totally inappropriate for individual patients (12,17). Approximately 30% of mechanically ventilated patients, experience difficult or prolonged weaning (13).

Report of the sixth International Consensus Conference in Intensive Care Medicine shows, there are complications that occur with delayed weaning, for example, it creates discomfort, expose the patient to increased cost of care. Increased time spent in weaning process represent 40-50% of total duration that patient stay in mechanical ventilation. As the duration of mechanical ventilation is prolonged mortality increase. weaning failure reported to be 26-34% and if delayed in the extubetion mortality was 27% and 20% of medical ICU remain dependent on ventilator after 21 days (14,18). In Egypt study shows that 42% of mechanically ventilated patient failed weaning trial and only 58% of patient are weaned successfully (19).

It is well known that, ICU nurses are highly participated in weaning of mechanically ventilated patients. They are the one responsible person to initiate and perform weaning by using the protocol; also mechanical ventilation and weaning require collaborative decision making to minimize complication and weaning prolongation. However, there are limited data available on knowledge, attitude and practice towards weaning of mechanically ventilated patient and associated factors in ICU nurses. If nurses do not have adequate knowledge, positive attitude and practice on which to base decision-making, patients in ICU may be exposed to unsafe practices leading to complications, increased length of ICU stay, increased morbidity and mortality, as nurses are accountable for all their actions (10). But the question is; do have most of

the ICU nurse the necessary weaning mechanically ventilated patient knowledge, attitude and practice?

Some study shows there is inadequate knowledge and practice. In Nepal more than half of ICU nurses inadequate knowledge regarding weaning criteria of mechanically ventilated patient (13). In addition to this study which is conducted in Egypt shows 56% and 58% 0f nurse are inadequate knowledge and practice respectively (20).

Therefore, this study will focus on finding an answer for the above listed, questions by assessing the knowledge and practices of ICU nurses in Addis Ababa selected governmental hospitals, and identify the gap, which will give an insight for managers & policy makers to take a correction actions and also which can be used as an input to researchers for further study on the improvement of health professionals knowledge and practice.

To my knowledge, there are no published studies about ICU nurses' knowledge and practice toward weaning patient from mechanical ventilation in Addis Ababa, Ethiopia. Therefore, the aim of the study is to fill this gap by examining the adult ICU nurse' knowledge, and practice toward weaning mechanically ventilated patient in Addis Ababa, Ethiopia selected government hospitals. Also investigate the major factors that affecting the nurse' knowledge, and practice that hinders not to implement to the protocols and process of weaning mechanically ventilated patient.

1. 3 Significance of the study

Nurses who are working in ICU need to have adequate knowledge and practice of weaning a patient on mechanical ventilation, because they are highly participate in weaning of patients. Therefore, the finding obtained from this study will be helpful to identify knowledge and practice status of nurse toward weaning patient on mechanical ventilation.

The finding obtains from this study may also help to identify the gap and identify factors that affect knowledge and practice of ICU nurses regard weaning patient on mechanical ventilation.

The result obtained from this article may have significant input for responsible bodies of ICU units and nurse managers on how to improve their nurse's knowledge and practice, also it help to develop appropriate guidelines and protocol by giving strong attention for weaning patient on mechanical ventilation.

Lastly, the finding of this study may be used as a secondary data source for researchers who went to research on the same iquiry.

2. LITERETURE REVIEW

2.1 Knowledge of ICU nurses regarding to weaning of patient from MV

Knowledge is a core to the process of weaning mechanically ventilated patients. Knowledgeable nurse is expected to be able to screen, wean based on protocol and identify weaning intolerance sign. A descriptive cross sectional study which was conducted in Chitwan teaching hospital, Nepal, fifty seven nurses were participated and the finding revealed that 75.4% participants had never had in service training on weaning criteria of mechanical ventilation, 49.1% of them are said there was no guideline on weaning criteria. Participant reported that 54.4% of nurses had inadequate knowledge regard to weaning criteria (13).

Another descriptive study was conducted in five teaching hospitals of Baghdad on intensive care unit nurses toward weaning patient from mechanical ventilation, 50 nurses were enrolled. From the study participants 50% of nurses had training on weaning of patient from mechanical ventilation. The study also revealed that all nurses had moderate level of knowledge toward weaning (21). Also, another study was done in Johannesburg, there were 56 nurses was participated, In this study 16.2% of the participant were knowledge deficit, while 64.5% had inadequate knowledge and 19.8% had adequate knowledge on weaning patient from mechanical ventilation (10).

Further study was performed on knowledge of ICU nurse regard weaning patient from mechanical ventilation of three academic and two private hospitals in Johannesburg, there were 136 nurses was participated, from those, 53.99% had intensive care unit training. Also this study shows more than half of nurses were inadequate knowledge (22). A study conducted in Egypt on 2018 with an aim of Nurses Performance about Safety Weaning from Mechanical Ventilation of Critically Ill Adults and Children were 50 nurses participated. Finding revealed that more than two third (68%) of the studied nurses don't attend training courses related to mechanical ventilation weaning and all of them said there was no protocol about weaning at the unit. In addition, this research revealed that 60% participant had less than 5 years of ICU work experience and more than half 56%. of studied nurses had un satisfactory knowledge level (2).

2.2 Practice of ICU nurses regarding weaning of patient from mechanical ventilation

Cross sectional survey study was conducted to determine the practice of nurse concerning weaning mechanical ventilation during the annual congress of the Flemish in Germen from 2014-2015. In this study 3442 intensive care unit nurses were included 73% of participant are employed in general hospitals, 27% are were work in university hospitals. Regarding the ventilator weaning modes, 76.9% of participant use continuous positive pressure, 58.9% of nurses use pressure support ventilation and 25.7% of them are use synchronized intermittent mandatory ventilation. From this study less than half of nurses use weaning protocols (23).

Study done among nurses' performance about safety weaning from mechanical ventilation in Port Said general hospital, Egypt, revealed that, 29(58)% participant had unsatisfactory practice and 21(42%) of participants were satisfactory. In this study, 19 nurses satisfactory practice of T-piece weaning trial, 4(30.8%) satisfactory practice and 9(69.2%) satisfactory practice of IMV and SIMV weaning method and 1(5.6%) unsatisfactory and 17(94.4%) of satisfactory practice of CPAP trial in general, this study concludes that, there is inadequate practices of nurses regarding safety weaning from mechanical ventilation (2).

2.3 Factors affecting knowledge and practice of weaning mechanically ventilated patient.

The study which is conducted in Sweden in 2015GC, making process when weaning a patient from mechanical ventilation is challenging nursing condition it influence by different factors ;experience is the one which affect weaning decision making .Experience facilitate good decision making an enable the ICU nurse to fast as much as possible to make decision about the patient’s condition and when to initiate weaning. In this study other factor which mentioned is collaboration between the team (24).

In other study which is conducted in Nepal Chitwan teaching hospital shows that, age total professional experience, ICU unit experience and clinical environment, where significant influence level of knowledge and weaning criteria (10). The study which is conducted in Egypt, shows that, lack of knowledge and practice of the participant nurse related with the greater number of the study group don’t attend training course related to weaning of mechanically ventilated us reported by 68% the study nurse there was statistically significant relationship between knowledge ,practice with training course (2).

2. 4 Conceptual framework

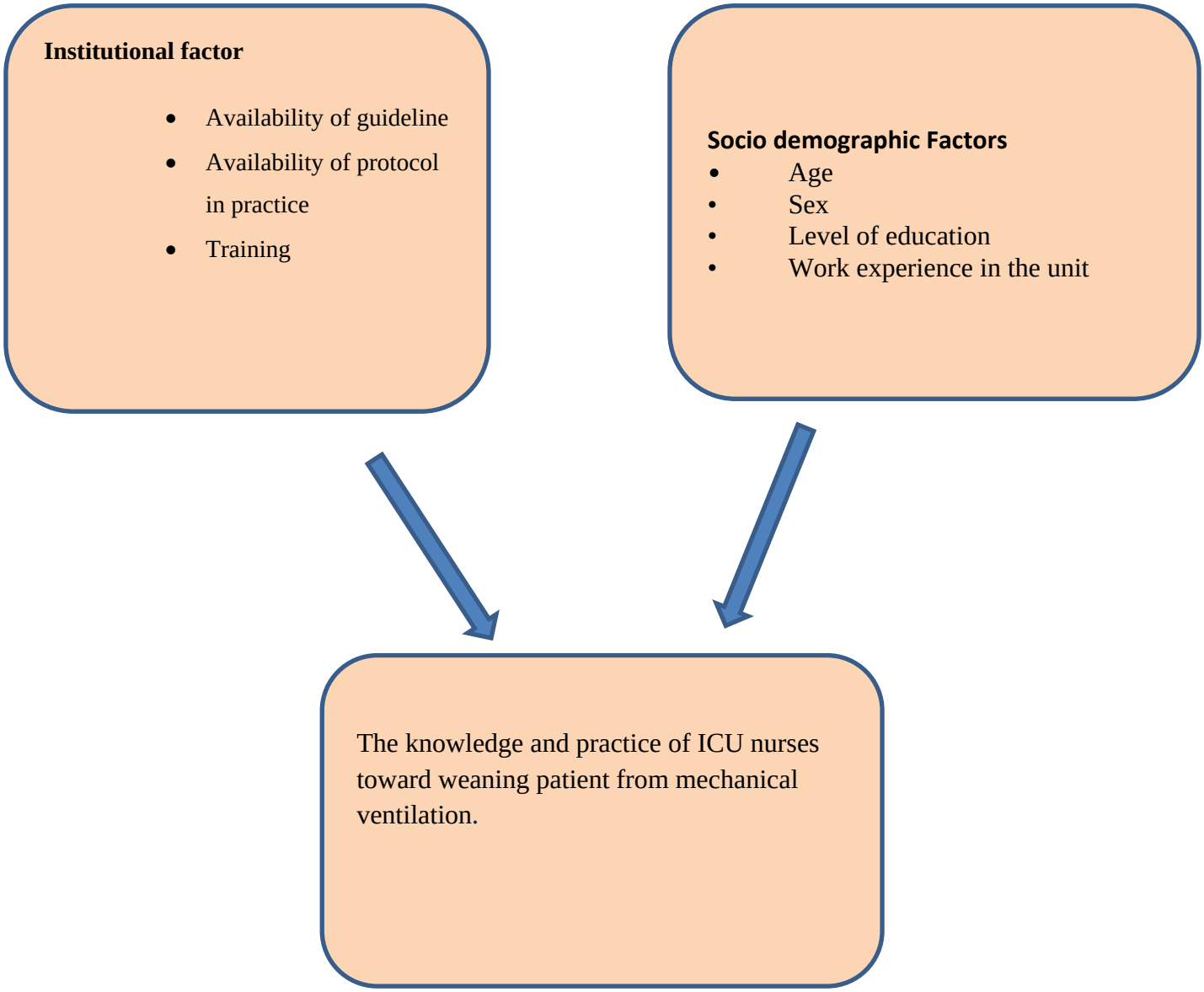

Figure 1: conceptual framework

The different literature review shows that educational level , ICU work experience ,training, availability of protocol affect knowledge and practice of ICU nurses(2,11,20).

3. OBJECTIVE

3.1 General objective

- Assessment of adult ICU nurses' knowledge, practice and associated factors regarding weaning of patients from mechanical ventilation in selected governmental hospitals of Addis Ababa Ethiopia, January-Jun 2020 GC.

3. 2 Specific objectives

- To assess the knowledge of adult ICU nurses toward weaning patient from mechanical ventilation.
- To assess the practice of adult ICU nurses towards weaning of patients from mechanical ventilation.
- To identify factors that affecting nurses knowledge and practice towards weaning of patients from mechanical ventilation.

4. METHODOLOGY AND MATERIAL

4.1 Study area

Addis Ababa is the capital city of Ethiopia, and seat of the African Union. The Economic Commission for Africa is in the heartland of Ethiopia, with a population of 3.384,569 of people in an area of 540 square Kilometers. The city comprises 10 sub cities and 116 woredas. The population pyramid is broad based, typically of a developing world. People from different regions of Ethiopia populate the city. The city consists of a total of 79 health facilities including Hospitals; out of which 6 hospitals owned by the Addis Ababa Health Bureau, 4 hospitals owned by the Federal Ministry of Health (central), 1 Addis Ababa University, 2 ministries of defense and 1 police force hospitals which provide different health services. In addition, there are about 26 health centers, 9 clinics, and 34 health posts. From the hospitals, 12 of them state runs, and more than 40 private (24).

The governmental hospitals, which located in Addis Ababa city are; Black Lion hospital, Tirunesh Bejing hospital, Ras Desta hospital, Zewditu memorial hospital, Menellik II hospital, Alert hospital, St Peter hospital, Yekatit 12 hospital, St Paulose and AaBET hospital. The total number of nurses in these governmental hospitals is 254.

I have used 6 governmental hospitals; Black Lion hospital with 42 nurses, Zewditu memorial hospital with 20 nurses, Menellik II referral hospital with 16 nurses, Alert hospital with 30 nurses, St Peter hospital with 20 nurses and AaBET hospital 39 nurses, in this study all the adult ICU nurses in selected governmental hospitals were included. From these governmental hospitals St Paulose hospital has been used as a pilot study area by simple lottery method.

4.2 Study period

The study was conducted from January - June, 2020GC.

4.3 Study Design

A descriptive cross sectional study design was conducted to assess the knowledge and practice of nurses and its associated factors regarding weaning patient from mechanical ventilation.

4.4 Source Population

All nurses working in selected Governmental hospitals of Addis Ababa city.

4.5 Study population

All nurses working in adult ICUs of selected governmental hospitals in Addis Ababa city.

4.6 Eligibility Criteria

4.6.1 Inclusion criteria

- Nurses who were working in the adult ICU included.
- Nurses who were not available during the study period.
- Nurses who were willing to participate in the study.

4.6.2 Exclusion criteria

- Nurses who were not available during the study period.
- Nurses who were not willing to participate in the study.

4.7 Sample size determination

From the total of 177 nurses in these selected hospitals whereas the 16 nurses not available on job during the data collection period for different reasons. A total 161 nurses who are working in Adult ICU of selected governmental hospitals in Addis Ababa city was included in the study and 156 nurse's willingness to participate in the study with a response rate of 96.8%.

4.8 Sample technique

Convenient sampling technique had been used. .

4.9 Study Variables

4.9.1 Dependent variables

- Knowledge of adult ICU nurses toward weaning patient from mechanical ventilation.
- Practice of adult ICU nurses toward weaning patient from mechanical ventilation.

4.9.2 Independent variables

Sociodemographic factors

- Age, sex, work experience in the unit and educational status.

Institutional factor

- Availability of guideline, availability of protocol in practice and
- Training on weaning protocol and guideline

4.10 Data collection tools and procedure

Semi structured questioner is adopted from different literatures (10,13,22,23).The researcher had used a self-administrated questioners for nurses to collect data in order to answer the objectives of the study related to weaning of patient on mechanical ventilation. Three Data collectors who had BSC in Emergency and critical care nurse and 2 supervisors who had EMS have been trained for the procedure.

4.11Data Quality Control

In addition to the training given to the data collectors, 5% of the questionnaires were pre-tested before actual data collection days to make sure that the data collecting sheet is capable of yielding the required data for the study and some modifications was done according to the results found. At the end of each data collection day the principal investigator have checked the completeness of filled questionnaires and whether recorded information makes sense to ensure the quality of data have been collected.

4.12 Data analysis

All questionnaires were checked for completeness of responses. Data were entered in to epi manager data client entry version 4.4.2 then processed and analyzed using SPSS version 25 statistical program for analysis. Frequency tables, graphs and text were used to present the data Also, Binary logistic regression was used to estimate the crude odds ratio of all independent variables on practice and knowledge of weaning with p-value of <0.25 and Multiple logistic regression was also be used to estimate the adjusted odds ratio of knowledge and practice to control confounders and predict the final predictor at 95% confidence interval and 0.05 level of significance.

4.13 Ethical considerations

Ethical clearance was obtained from department of Emergency Medicine School of medicine Addis Ababa University. An official letter of permission from the department was submitted to the hospitals, at which the study was conducted. The research purpose, its benefits and the procedures were explained for each potential respondent. The respondents were signed an informed consent and any respondent seeking further clarification have been assisted. Any person unwilling to participate was not forced. All the collected data were kept confidential and the names/or other personal information has not been notified in any report.

4.14 Dissemination of findings

Main findings, conclusion and recommendations of the study will be presented and reported to responsible bodies. It will be disseminated to AAU Emergency medicine and critical care department, FMOH, Addis Ababa health bureau, Hospital ICU administrators. The paper will also be submitted to national or international peer reviewed scientific journals for possible publications.

4.15 Operational Definitions

Mechanical ventilator: Mechanical ventilators are devices that provide ventilation (respirations) for the patient who are unable to breathe effectively on their own.

Knowledge: In this study knowledge refers to the level of understanding of nurses regarding weaning ventilator as evidenced by their scores on their response to the items on a structured knowledge questionnaire. The percentage scores were graded as Good and poor to determine the knowledge level. Grading was classified as follows; <60% poor and ≥60 good in the previous study done in Egypt.

Practice: is a skill to manage and provide a weaning mechanically ventilated patient, but the required activity can be done by having all the mandatory knowledge apart from the skill to provide the necessary mechanically ventilated patient. Research has done in Egypt, if the nurse total score at the level of ≥60 value, so their stratification be judged as adequate practice, If the total scored less than 60% score was considered as inadequate practice.

5. RESULT

This chapter showed the study finding on nurse's knowledge and practice on weaning patients from mechanical ventilation (MV) and associated factors that affect the knowledge and practices of nurses in the six selected governmental hospitals. From 177 nurses, 16 nurses were not available during the data collection period for different reasons. A total 161 nurses who are working in adult ICU of selected governmental hospitals in Addis Ababa city was included in the study and 156 nurses were willingness to participate in the study with a respondent rate of 96.8%.

5.1 Socio demographic characteristics of adult ICU nurses of selected governmental hospitals.

Out of the total 156 respondents, 97 (62.2%) were females and 59 (37.8%) were males. The respondents' age was ranged from 23-55 years. The minimum age was 23 and the maximum age was 55 with a mean age of 29±4.9. The highest 84 (53.8%) was within the age group of 26-30 years were as the least was presented by the oldest 5 (3.2%) within the age group of >40 yrs.

Regarding to educational status, 119 (76.3%) respondents had a basic nurse degree and the rest 18 (11.5%), 7 (4.5%), and 12 (7.8%) were post basic degree in emergency medicine and critical care nursing, master's degree in nursing, and basic nurse diploma respectively. The Majority of the study unit 127 (81.4%) had between 1-5 years of work experience and 8 (5.1%) respondent were more than five years in the critical care unit.

Based on the participant training status, 80 (51.2%) were not trained and 76 (48.8%) of them trained in the daily weaning assessment. Also, 64 (41.0%) participants had taken training, whereas 92 (59%) didn't gate training about weaning protocol. Concerning training of weaning guideline, 73 (46.8. %) of ICU nurses trained, and 83 (53.2%) were not trained (Table 1).

Table 1: - Distribution of Socio demographic characteristics of adult ICU nurses in selected governmental hospitals; Addis Ababa, Ethiopia, Jun 2020 GC (n=156).

Variable	Response		Frequency (n=156)	Percentage (%)
Sex	Male		59	37.8
	Female		97	62.2
Age Mean age =29±4.9	21-25yrs		31	19.9
	26-30yrs		84	53.8
	31-35yrs		27	17.3
	36-40yrs		9	5.8
	>40yrs		5	3.2
Educational status	Basic nurse diploma		11	7.2
	Diploma in ICU nurse		1	0.6
	Basic nurse degree		119	76.3
	Post basic degree in ICU		18	11.5
	Master's degree in nursing		7	4.5
Work experience	<1year		23	14.7
	1-5years		125	80.2
	>5years		8	5.1
Training	Protocol	Yes	64	41.0
		No	92	59.0
	Daily assessment	Yes	76	48.8
		No	80	51.2
	Guideline	Yes	73	46.8
		No	83	53.2

5.2 Knowledge of adult ICU nurses toward weaning patient from mechanical ventilation in selected governmental hospitals, Addis Ababa Ethiopia Jun 2020GC

This portion includes self-rating knowledge of weaning protocols, weaning guideline, weaning process and case scenario that assess weaning knowledge of the nurses. In this knowledge measurement part we used a numeric self-rating scales were grouped together and forming part of a Likert scale.

From the total participants of 156 nurses, 25 (16%), 72 (46.2%), 59 (37.8%) rated themselves having very poor, good and excellent knowledge respectively regarding to weaning process. Also out of the total nurses, 34 (21.8%), 74 (47.4%) and 48 (30.8%) admitted to have very poor, good and excellent knowledge of the weaning protocol respectively. On the capacity of nurses, decision making on daily weaning plan 72 (46.2%), 43 (27.5%) and 41 (26.3%) nurses were very poor, good and excellent consecutively.

Based on the alternative questions majority of participants 108 (69.2%) hade good and 48 (30.8%) had poor knowledge of the normal respiratory rate that accepted during weaning. For cardiovascular sign that indicate weaning intolerance 98 (62,8%) of respondents couldn't got the correct answer. Around 108 (69.2%) of the participants selected the option CPAP and 48 (30.8%) were answered wrongly in question, of which one is the best way to perform spontaneous breathing. The result revealed that 189 (95.5%) of the respondents couldn't got the correct answer

On other way the participants were asked to decide whether the patient is comfortable or not for weaning. Based on this 82 (52.6%) and 74 (47.4%) of the participants answered correctly (uncomfortable) and incorrectly (comfortable) respectively. This result showed that the majority of participants had a good knowledge of blood gas analysis and respiratory failure. The question provided for participants to choose on how to improve partial pressure of oxygen, only 36 (23.1%) answered correctly whereas 120 (76.9%) answered incorrectly.

Based on the case, given as a scenario (Annex III), 108 (69.2%) answered correctly by saying it is possible to correct the partial pressure of carbon dioxide, while the rests said no need of correcting pressure of carbon dioxide which account around 48 (30.8%). And the participants also answered the question how to improve the partial pressure of carbon dioxide as 41 (26.3%) correctly and 115 (73.7%) incorrectly.

For the questions that raised to participant on which setting of ventilation that can change without physician order, 69 (44.2%) answered correctly and 87 (55.8%) incorrectly, the participants asked duration of the first spontaneous breathing trial during weaning, only 36 (23.1%) responded correctly. Finally, 63 (40.4%) of participant were responded correctly regarding rate of nurses perform spontaneous breathing trial (Table 2).

Table 2 :- Adult ICU nurses' responses for each knowledge questions on weaning of patient from mechanical ventilation, selected governmental hospitals; Addis Ababa Ethiopia, Jun 2020 GC (N=156).

S.N	Statements	Correct	%	Incorrect	%
1	What range would you accepted as a normal parameter for RR during weaning	108	69.2	48	30.8
2	What Cardiovascular sign indicates to you not tolerating weaning?	58	37.2	98	62.8
3	Which one is the best way to perform spontaneous breathing?	108	69.2	48	30.8
4	Is Mr Green suitable for weaning?	74	47.4	82	52.6
5	How would you improve Mr. Green's partial pressure of oxygen?	36	23.1	120	76.9
6	Would you want to correct the partial pressure of carbon dioxide?	108	69.2	48	30.8
7	How would you correct partial pressure of carbon dioxide?	41	26.3	115	73.7
8	Which setting of ventilation that you change without physician order?	69	44.2	87	55.8

9	Duration of the first spontaneous breathing trial is	36	23.1.	120	76.9
10	At what rate nurse perform spontaneous breathing trial mostly?	63	40.4	93	59.6

A Total scores that measure knowledge of the respondents' showed that out of 156 nurses about 75(48.1%) had good knowledge, whereas about 81(51.9%) had poor knowledge.

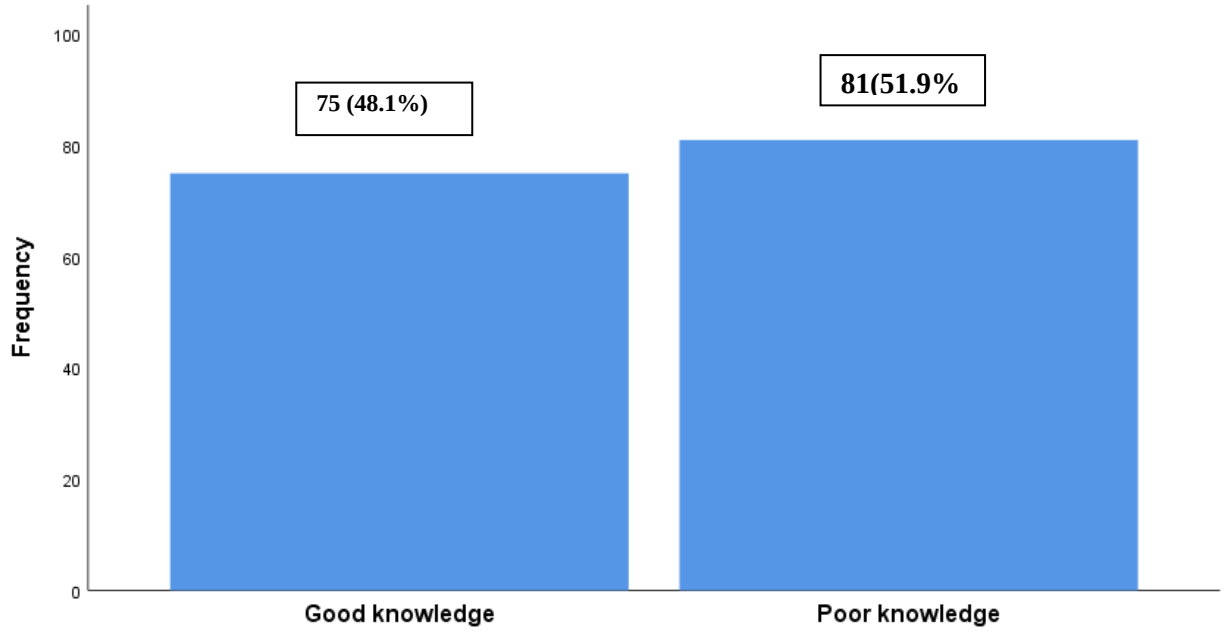

Figure 2: General Knowledge of adult ICU nurses regarding weaning of patient from mechanical ventilation of selected governmental hospitals, Addis Ababa Ethiopia Jun 2020 G.C (N=156).

5.3. Practice of adult ICU nurses toward weaning patient from mechanical ventilation in selected governmental hospitals, Addis Ababa, Ethiopia, Jun, 2020G.C.

This section focused on the practical activities of the participants. From the given questions when we calculate their response rate about 91 (58.3%) of participants were practicing on weaning guideline, whereas the remaining, 65 (41.7%) were not practicing. And, also from the total participants, 76 (48.7%) were assessing their patients daily, whereas 80 (51.3%) did not.

When we see practice on the daily weaning protocol, from the total participants, 96(61.5%) nurses were performing daily, while the remaining 60 (38.5%) were not. And the respondents thought on the usefulness of orientation for protocol weaning was, 107 (68.6%) said it is useful

About 129 (82.7%) were participated in the daily weaning plan. As well as they react to the question that raised to know, whether they have practiced the assessment of patients regarding to weaning readiness as 121 (77.6%) practiced whereas the 35 (22.4%) were did not practice.

Surprisingly, only 14 (9%) participants were assesses patients pulmonary functional parameter and the majority, 142 (91%) did not assessing. Similarly, the majority 134 (85.9%) were not assess ABG before weaning. One hundred twenty one (77.6%) of respondents had communicate with a patient before weaning and 35 (22.4%) did not. Majority, 126 (80.8%) of participants had a trend of preparing patients for weaning from mechanical ventilation, and 30 (19.2%) were not. Most respondents, 133 (85.3%) had a practice of documentation and 23 (14.7%) did not document. Concerning to weaning modes, participants had indicated, CPAP (87.8%), T-tube (55.1%), and SIMV (47.4%) were the most applicable mode during their day-to day weaning activities (Table 3).

Table 3 : - Adult ICU nurses 'responses for each practice questions on weaning of patient from mechanical ventilation, selected governmental hospitals; Addis Ababa Ethiopia, Jun 2020 GC (N=156).

S.N	Statements	Yes	%	No	%
1	Do you practice weaning guideline?	91	58.3	65	41.7
2	Do you practice daily assessment?	76	48.7	80	51.3
3	Do you practice weaning protocol?	96	61.5	60	38.5
4	Do you participate in the daily weaning plan?	129	82.7	27	17.3
5	Do you practice patient assessment regard weaning readiness?	121	77.6	35	22.4
6	Do you assess pulmonary function parameters?	14	9	142	91
7	Do you assess ABG before weaning of patients? Starting weaning?	134	85.9	22	14.1
8	Do you communicate with a patient before	121	77.6	35	22.4
9	Do you Prepare patient for weaning from MV	126	80.8	30	19.2
10	Do you Document before, during and after weaning process?	133	85.3	23	14.7
11	Do you use T-piece weaning trial?	86	55.1	70	44.9
12	Do you use IMV and SIMV weaning method	74	47.4	82	52.6
13	Do you use CPAP trials (level 0 â€“ 10 cmH2O) with or without flow-by option	137	87.8	19	12.2

Generally from the questions which raised to assess the practical level of participants, 68(43.95%) of them had good practice and the rest 88(56.41%) were poor practice.

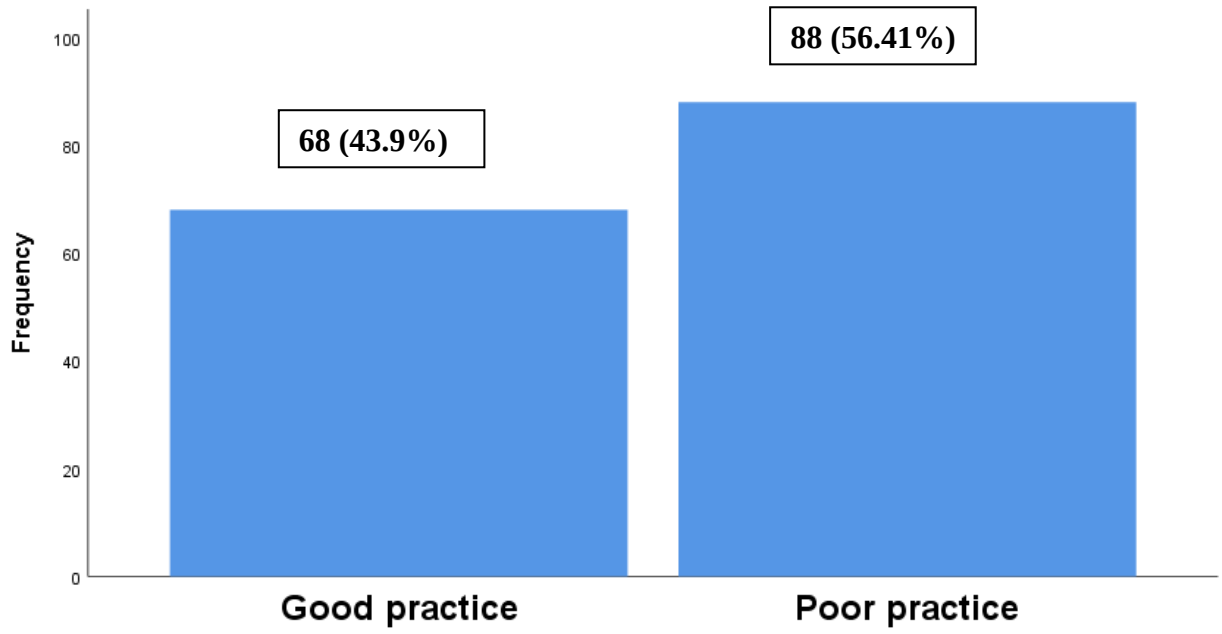

Figure 3: General practice of adult ICU nurses regarding weaning of patient from mechanical ventilation of selected governmental hospitals, Addis Ababa Ethiopia Jun 2020GC.

5.4 Factors associated with knowledge of adult ICU nurses toward weaning patient from mechanical ventilation in selected governmental hospitals, Addis Ababa, Ethiopia, jun2020GC.

In the bivariate logistic regression analysis, the factors found to be associated with knowledge of adult ICU nurses were educational status, training on weaning guideline, weaning protocol, and work experience. From the multivariate logistic regression; work experience found to be statistically significant with {P value=0.03, (AOR=9.9 (1.2,7.8)95%CI) and}, this implies those nurses having greater than 5 years of ICU work experience 10 times more likely to had good knowledge than those nurses having less than one year's of ICU work experience. In addition, those nurses having between 1-5 years of ICU work experience 4 times more likely to have good knowledge than those having less than one year of ICU work experience. Also, weaning guideline training were statistically significant, {Pvalue=0.00, (AOR=6.4 (2.89,13.5) 95%CI)}, this association tells us nurses working in the ICU who had training were 6.4 times more knowledgeable than nurses who didn't had training regard weaning guideline. Even though in bivariate analyses, there is an association between educational status, training on weaning protocol and knowledge there were not found significant association with multivariate analysis found (P value=0.27) and (P value=0.07) respectively. Age, sex and availability of protocol were not associated in the bivariate analysis, hence it was indicated that knowledge of ICU nurses were not influenced by the above mentioned variables (Table 4).

Table 4: Bivariate and multivariate analysis of factors associated with knowledge of adult ICU nurses 'on weaning patient from mechanical ventilation in selected governmental hospitals, Addis Ababa, Ethiopia, Jun 2020GC (n=156).

Variable	Category	Knowledge		P value (<0.25)	COR (95% CI)	P value (<0.05	AOR (95% CI)
		Good	Poor		(Lower, upper)		(Lower, upper)
Age	21-25yrs	13	18	0.411	2.2(0.3,15.54)		
	26_30yrs	42	42	0.589	1.66(0.26,10.5)		
	31-35yrs	14	13	0.77	1.3(0.2,8.62)		
	36-40yrs	3	6	0.34	3(0.31,28.8)		
	>40yrs	3	2	1			
Sex	Male	31	28	0.38	0.7(0.39,1.43)		
	Female	43	54	1			
Work experience	<1 yrs.	14	7	1			
	1-5 yrs.	57	70	**0.08***	0.7(0.16,311)	**0.009****	4.3(1.4,12.5)
	>5yrs	3	5	**0.16***	3.3(0.6,18)1	**0.03****	9.9(1.2,7.8)
Educational states	Diploma nurse	5	7	1		1	
	BSC nurse	51	68	0.93	0.95(0.28,3.17)	0.7	1.2(0.3,1)
	Post basic degree in ICU	14	4	**0.05***	2.04(0.04,1.00)	0.2	0.32(0.05, 1)
	Masters nurse	5	2	**0.227***	0.28(0.03,0.2)	0.3	004(3.3)
Training On weaning protocol	yes	41	24	**0.003***	0.36(0.19,0.7)	0.079	0.5(0.21, 1.2)
	no	34	57	1		1	
Training on weaning guideline	Yes	52	21	**0.00***	0.15(0.07,0.3)	**0.00****	6.4(2.7, 12.9)
	no	23	60	1			
Availability of weaning protocol	yes	27	33	0.45	1.2(0.6,2.33)	0.28	1.5(0.7,3.38)
	no	47	49	1			

(COR) =*pvalue is significant at P< 0.25 (AOR) =Pvalue is significant at P< 0.05**

5.4.2. Factors associated with practice adult ICU nurses' toward weaning patient from mechanical ventilation in selected governmental hospitals, Addis Ababa, Ethiopia, June, 2020GC.

In the bivariate logistic regression analyses the factors found to be associated with practice of adult intensive care nurses having P <0.25 were: work experience, educational status, training on weaning guideline and availability of weaning protocol. From the variables associated with the practice of nurses in the bivariate logistic regression with the P-values of < 0.05; ICU work experience, educational status and availability of protocol.

Participants having greater than 5 years of ICU work experience were less likely to had good practice by 94% compared to those having less than one year of ICU work experience {(AOR=0.06, P value = 0.023, 95%CI (0.005, 0.67)}, and nurses who had post basic degree in ICU were 95% times less likely to had good practice than diploma nurses (AOR=0.05, P value = 0.006, 95%CI (0.005, 3)). In addition, availability of protocol also significant association with practice {AOR = 5.6, P value = 0.00 , 95%CI (2.55, 11.6)}, this association indicates, nurses who had weaning protocol in the unit 5.4 times more likely to have good practice than nurses who don't had weaning protocol in the unit. Age and sex were not associated, hence it was indicated that the practice of ICU nurses was not influenced by the above mentioned variables (Table 5).

Table 5: - Bivariate and multivariate analysis of factors associated with knowledge of adult ICU nurses on weaning patient from mechanical ventilation in selected governmental hospitals, Addis Ababa, Ethiopia, Jun 2020GC (N=156).

Variable	Category	Practice		P value (<0.25)	COR(95%CI) (Lower, upper)	P value (<0.05)	AOR(95%CI) (Lower, upper)
		Good	Poor				
Age	21-25yrs	11	20	0.30	2.7(0.39,18.8)		
	26_30yrs	39	45	0.55	1.7(0.27,10.8)		
	31-35yrs	10	17	0.34	2.5(0.36,17.9)		
	36-40yrs	5	4	0.87	1.2(0.13,11)		
	>40yrs	3	2	1			
Sex	Male	26	33	0.92	0.9(0.5,1.8)		
	Female	42	55	1			
Work experience	<1 yrs.	6	15	1	17.5(1.75,17.44)	1	28(2.2,3.61)
	1-5 yrs.	72	55	**0.20***	0.5(0.19,1.4)	0.36	0.58(0.1.8)
	>5yrs	7	1	**0.015***	0.57(0.006,0.57)	**0.023****	0.06(.005,0.67)
Educational states	Diploma nurse	2	10	1		1	
	BSC nurse	45	74	**0.16***	0.32(0.06,1.56)	0.16	0.3(.05,1.79)
	Post basic degree in ICU	14	4	**0.003***	0.05(0.009,0.37)	**0.006****	0.05(0.005,0.3)
	Masters nurse	7	0	0.9	0.0	0.0	0.0
Training On weaning protocol	yes	34	30	**0. 046***	1.9(1.06, 3.69)	0.057	2(0.9,4.5)
	no	34	58	1		1	
Training on weaning guideline	Yes	40	34	**0.21***	0.46(0.24, 0.89)	0.19	1.7(0,86,3.65)
	no	29	53	1		1	
Availability of weaning protocol	yes	39	21	**0. 000***	4.2(2.160, 8.5)	**0.001****	5.6(2.558 11.6)
	no	29	67	1		1	

(COR) =*pvalue is significant at P< 0.25 (AOR) =Pvalue is significant at P< 0.05**

6. DISCUSSION

The majority of patient that admits in the ICU requires mechanical ventilation. Nurses who are caring a patient in ICU must be knowledgeable and skillful with the concept of surrounding mechanical ventilation to prevent prolonged mechanical ventilation that lead to complication, mortality and resource shortage, so this study is tried to find out the level of knowledge and practice of adult ICU nurses toward weaning patient from mechanical ventilation.

In this study 156 of respondents was participated, only 8 (5.1%) of nurses were working in ICU for >5 years, it is not comparable with similar study conducted in Egypt shows that, from the total 57, participants, 20 (40%) were >5 years of ICU work experience (2). This discrepancy might be due to frequent rotation and lack of conducive environment. Regarding to training in this study about 92 (59 %) of ICU nurses not have been trained in the weaning protocol, also the sum study that conducted in Egypt shows, 34 (68%) of the study nurse don't attend training related to MV weaning. Greater number 96 (58%) of this study nurses was respond, there is no weaning protocol in the unit. As indicated in this result, there is a lack of training and protocol of weaning in the majority of respondents this may be due to poor attention to weaning.

Knowledge scores and their level were; 51.9% scored below <60 % had inadequate knowledge where as 48.1% of nurses scored ≥ 60% hade adequate knowledge toward weaning patient from mechanical ventilation. Similar study which is conducted in Egypt, total score level of knowledge was more than half 28 (56%) them had un satisfactory and 22 (44%) were satisfactory associated critical care adult and children safety weaning (2).Also This discrepancy might be due to training and availability of protocol.

In similar study which was conducted in, Nepal, 31(54.4%) of nurses were inadequate and 26 (45.6%) of them had adequate knowledge regarding to weaning patient from mechanical ventilation (13). This result is in line with our study. In other study that conducted in Johannesburg, South Africa on three hospitals. From total, (64.5%) of respondent have inadequate knowledge (10) .The present study is disagree with study done in University of the Witwatersrand, Johannesburg, South Africa on Knowledge of intensive care nurses in selected care areas commonly guided by protocols revealed that more than half of participant had

satisfactory knowledge regard weaning. This controversy might be due to types of hospitals which is different in setting and types of service delivery and opportunity for treating, level of training of nurses and availability of resource (protocol, guideline) (22). Knowledge is important for weaning mechanically ventilated patient. Knowledgeable nurse makes decisions without any barrier and with full confidence regarding to patient management. Lack of knowledge is said to be barrier to practice,

In this study, 68(43.95%) of participants had adequate and the rest 88 (56.41%) were inadequate practice level in weaning patient from mechanical ventilation and this result in line with study done in port said university, Egypt that more than half of nurses (58%) had unsatisfactory practice and (42%) were satisfactory practice regard weaning (2). This similarity of both countries may be due to low training opportunity, inaccessibility of protocol and guidelines, inadequate knowledge toward weaning and poor supportive supervision. Also majority of participant (87.8%) of them are uses CPAP weaning method. In other study which is conducted in Belgium, concerning nurse practice weaning patient from mechanical ventilation in the ICU, less than half of nurses have a good practice and the most participant(77%) uses CPAP method (23) .

This result reveals that ICU work experience has statistically significant association with the level of knowledge on weaning mechanically ventilated. In multi variant, {P value=0.03, (AOR=9.9 (1.2,7.8)95%CI) and}, this implies those nurses having greater than 5 years of ICU work experience 10 times more likely to had good knowledge than those nurses having less than one year's of ICU work experience. In addition, those nurses having between 1-5 years of ICU work experience 4 times more likely to have good knowledge than those having less than one years of ICU work experience. This result indicates, as the level of their experience increased, the level of knowledge also increases.

This study was comparable with the study done in Egypt that tells critical care area experience statistically significant association with knowledge (P value = 0.001) (2). Training of weaning guideline significant association with knowledge {Pvalue=0.00,(AOR=6.4(2.89,13.5) 95%CI)}, this association tells us nurses working in ICU who have training were 6.2 times more knowledgeable than nurses who don't have training regard weaning patient from mechanical

ventilation, this association is comparable with the study done in south Africa that tells training was statistically significant with knowledge(P value = 0.0063) (22)

This study reveals nurse who having greater than 5 years of ICU work experience were less likely to had good practice by 94% compared to those having less than one year of ICU work experience {(AOR=0.06, P value = 0.023, 95%CI (0.005, 0.67)}, and nurses who had post basic degree in ICU were 95% times less likely to had good practice on weaning than diploma nurses (AOR=0.05, P value = 0.006, 95%CI(0.005,3)). In addition, availability of protocol also significant association with practice {AOR = 5.6, P value = 0.00 , 95%CI (2.55, 11.6)}, this association indicates, nurses who had weaning protocol in the unit 5.4 times more likely to have good practice than nurses who don't had weaning protocol in the unit.

7. STRENGTH AND LIMITATION

7.1 Strength

It is the first study that attempts to assess level of knowledge and practice of adult ICU nurses toward weaning patient from mechanical ventilation in Ethiopia.

It is multicenter study

Found baseline information for future.

It can be uses as baseline data for future further study.

7.2 limitations

Lack of literatures hinders further discussion, comparison and assessment of participant's attitude.

Observational study was not done because of time and current situation.

The outcome does not include all governmental hospitals.

Cross-sectional study of its nature cannot establish cause and effect relationship

8. CONCLUSION

In general the overall study finding shows, the majority of participants had poor knowledge and practice regard weaning patient from mechanical ventilation, the greatest number of nurses does not had training on weaning and there was no weaning protocol in their unit. There is statistically significant relation between practice and weaning protocol training, availability of protocol and ICU work experience. Even though there is not significant association, there is a knowledge difference between different educational levels of participants; nurses who had high educational level had adequate knowledge than those had low educational level.

9. RECOMMENDATION

I would like to recommend:

To FMOH and Addis Ababa health bureau; to improve their knowledge and level of practice of ICU nurses, on job training and education should be provided. Availability of guideline and protocol concerning weaning patient from mechanical ventilation and follow strict acceptable evidence based practice is essential to improve the practice level of ICU nurses, so FMOH Addis Ababa health bureau expected to prepare guideline and strict follow up on the applicability.

To hospitals; - emphasize on preparation of updates, special training and refreshment programs, adopt and prepare acceptable guideline and protocol is recommended to improve knowledge and practice level of ICU nurses toward weaning mechanically ventilated patient. Also, it is better to emphasize on learning resources such as; article, journals, and electronic resources such as; computers and the internet should be made accessible into the unit to staff members.

To ICU nurses; -The nurse should, better to enhance their level of knowledge and practice on weaning of patient from mechanical ventilation for the sake of herself, professions and patients. Nurses, who had better knowledge and skill, should share their respective colleague.

Researcher; To conduct a wide area study on similar title include large sample size, and further assess the level of practice by using observational checklist and further research on factors affecting implementation of weaning patient from mechanical ventilation..

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ANNEXES

Annex I: Information sheet

Dear Participant:

This Study Is Prepared to Collect Data on assessment of adult ICU nurses' knowledge, practice and associated factors regarding weaning of patient from mechanical ventilation in selected governmental hospitals of Addis Ababa Ethiopia.

The study is being conducted by Seble Becheni Addis Ababa University, Department of Emergency Medicine, in Postgraduate Program. The objective of this study is to assess Adult ICU nurses knowledge, practice and associated factors toward weaning patient from mechanical ventilation in selected governmental hospitals of Addis Ababa, Ethiopia. The assessment is made for the partial fulfillment of Master's Degree in Emergency Medicine and critical care nursing. The results of the study will be used as baseline information to design appropriate intervention strategies to increase nurse's knowledge and practice on weaning patient from mechanical ventilation. The questionnaire contains self-administered closed ended questions. You are therefore kindly requested to provide genuine answers to the questions. The information you provide is confidential and is used only for the purpose of this study. If you have any question, don't hesitate to ask the data collector. Your cooperation and participation until the completion of the questionnaire is very necessary for the successful completion of the study.

If you have questions regarding this study or would like to be informed of the results after its completion, please feel free to contact the principal investigator through the following address:

Seble becheni

Phone number:-+251-913-63 42 24

E-mail:- semirabecheni@gmail.com

Annex II: Consent form

In signing this document, I am giving my consent to participate in the study entitled "Assessment of Adult ICU nurses knowledge, practice and associated factors on weaning patient from mechanical ventilation in selected government hospitals in Addis Ababa, Ethiopia".

I have understood that participation in this study is entirely voluntarily. I have been told that my answers to the questions will not be given to anyone else and no reports of this study ever identify me in any way. I have also been informed that my participation or non-participation or my refusal to answer questions will have no effect on me.

I understood that participation in this study does not involve risks, and Seble Becheni is the contact person if I have questions about the study or about my rights as a study participant. I agree to participate as a volunteer.

Signature: _____ Date: _____ of participant.

Date of data collection _____ Questionnaire SN _____

Name of data collector_____

Annex III: Questioner

SECTION A: Demographic Information

Please answer the following question by indicating the correct answer with an "**x"** in the block provided.

101	Sex	A)Male	
		B)Female	

102.	Age	..... years

103.Educational status

A) Basic nurse diploma	
B) Basic nurse degree	
C) Post basic degree in ICU	
D) Master's degree in nursing	

F) Others (Please specify) ----------

104.How long have you worked in an ICU? ----------

105.Marital status

A) Single	
B) Married	

C) Other (specify)----------

106.Have you received any training in the following?

A) Daily assessment ☐ Yes ☐ No

B) Weaning protocol ☐ Yes ☐ No

C) Weaning guideline ☐ Yes ☐ No

SECTION B: knowledge

107.Do you feel confident about managing a patient who is being weaned from mechanical ventilation?

☐ Yes ☐ No

108. Do you consider weaning as part of the nurse roll?

☐ Yes ☐ No

109.What's your level of knowledge about the weaning process?

1	2	3	4	5	6	7	8	9	10
Very poor								Excellent	

110.Is there a weaning protocol in the unit? ☐ Yes ☐ NO

111.If yes rate your knowledge of the weaning protocol.

1	2	3	4	5	6	7	8	9	10
Very poor								Excellent	

112.To what extent are you involved in the decision making regarding patients daily Weaning plan/goals.

1	2	3	4	5	6	7	8	9	10
Not extant								Greatly extent	

113.What range would you accept as a normal parameter for respiratory rate during weaning?

4-13Breath/minute	14-24Breath/minute	25-35Breath/minute	>35Breath/minute

114.What cardiovascular sign indicates to you not tolerating weaning?

A) Bradycardia and hypertension
B) Bradycardia and hypotension
C) Tachycardia and hypertension
D) Tachycardia and hypotension

❖ Mr. has had surgery for breast cancer, she has severed for weight loss and now the weight is 50kg. Following surgery, she develops chest infection and left side pleural effusion and was admitted to the ICU with respiratory distress. She requires antibiotic and drainage of the effusion.Currently Mr. green in on SIMV on a ventilator. The set TV is 300ml, respiratory rate is 10 breaths/minute, PEEP is 4, and Fio_2 0.8 sand pressure support is 10. She is breathing 28-33 spontaneous breath /minutes her actual tidal volume 250ml.

Her arterial blood gas result is as follows:-

Pao_2=66.75

$Paco_2$=54

PH=7.24

115.Is Mr. Green suitable for weaning? ☐ Yes ☐ NO

116.How would you improve Mr. Greens Pao_2?

A) Increase Fio_2
B) Reduce PEEP
C) Increase set respiratory
D) Increase PEEP

117.Would you want to correct the $Paco_2$? ☐ Yes ☐ No

118.How would you correct Mr. Greens Paco2?

A) Increase Fio2
B) Reduce PEEP
C) Increase set respiratory
D) Increase PEEP

119.Which setting of ventilation being changed by nurse frequently without physician prescription?

A) Ventilation mode
B) Pressure support
C) Respiratory rate
D) Fio_2 level
E) It is Impossible to changing without a physician order

120.How do you confirm readiness to wean before starting spontaneous breathing?

A) Positive evaluation of respiratory status
B) Maintenance of respiratory capacity
C) Adequate oxygenation
D) Physicians order is important to start spontaneous breathing

121.Which one is the best way to perform spontaneous breathing?

A) T -tube
B) CPAP
C) PSV
D) I don't know

122.Duration of the first spontaneous breathing trial is

A) 30-120 minuets

B) <30 minutes

C) >120 minutes

D) I don't know

123.At what rate nurse perform spontaneous breathing trial mostly?

A) 3 times/day

B) 2 times/ day

C) 1 times/day

D) I don't know

SECTION C: Practice

124.Do you practice weaning guideline?

- Daily assessment A) yes B) No
- Weaning protocol A) Yes B) No

125.To what extent do you feel confident with the explanation during implementation of weaning protocol in the unit?

1	2	3	4	5	6	7	8	9	10
Very poor								Excellent	

126.Do you think the orientation of protocol weaning has been useful in your weaning practice?

A) Yes

B) No

No	Activity	Never 1	Sometimes 2	Almost always 3	Always 4
127	Do you participate in daily weaning plan?				
128	Do you practice patient assessment regard weaning readiness?				
129	Do you assess pulmonary function parameters?				
130	Do you assess ABG before weaning of patient?				
131	Do you communicate with a patient before starting weaning?				
132	Preparation for weaning from mechanical ventilation				
133	Do you Document before, during and after weaning process?				
134	Do you use T-piece weaning trial?				
135	Do you use IMV and SIMV weaning method				
136	Do you use CPAP trials (level 0 – 10 cmH2O) with or without flow-by option				

THANK YOU FOR PARTICIPATING IN ANSWERING THIS QUESTIONAIRE!

Annex IV: Assurance of Principal Investigator

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as Per terms and conditions of the Research Publications Office in effect at the time of Grant is forwarded as the result of this application.

Name of Student: Seble bechani

Date._____ Signature _____

Approval of the primary Advisor

Name of the primary advisor: Mr. Wagari Tuli

Date._____ Signature _____