ADDIS ABABA UNIVERSITY

COLLEGE OF HEATH SCIENCES

DEPARTMENT OF EMERGENCY MEDICINE

A DESCRIPTIVE CROSS SECTIONAL STUDY ON KNOWELEDGE AND PRACTICE TOWARDS ENTERAL NUTRITION AND ASSOCIATED FACTORS AMONG NURSES WHO ARE WORKING AT ADULT INTENSIVE CARE UNIT OF GOVERNMENTAL HOSPITALS IN ADDIS ABABA CITY, ETHIOPIA.

BY:-TSIGE HADERA TIKUBET (BSC.)

A THESIS TO BE SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, DEPARTEMENT OF EMERGENCY AND CRITICAL CARE MEDICINE IN PARTIAL FULFILLMENT OF MASTER OF EMERGENCY AND CRITICAL CARE NURSING.

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RESEARCH THESIS SUBMISSION FORM

Name of investigator	Tsige Hadera Tikubet (BSC)
Name of Advisor(s)	Mr. Wagari Tuli (MSC in EMCCN)
Name of co-Advisors	Dr. Tigist Worku (Assistance professor of Emergency and critical care medicine)
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Address of investigator	Mobile phone:+251910559270 Email:tsigehadera16@gmail.com

Approval by the board of examination

This thesis by **Tsige Hadera** is accepted in its present form by the board of examiners as satisfying thesis requirement for the degree of master in emergency medicine and critical care.

External examiner:

_____ _____ _____

Name signature date

Internal examiner:

_____ _____ _____

Name signature date

Research advisors:

Mr. Wagari Tuli (MSc in EMCCN)

_____ _____

Signature date

Dr. Tigist Worku (Assistance professor of Emergency and critical care medicine)

_____ _____

Signature date

Department head:

_____ _____ _____

Name signature date

Addis Ababa University, College of Health Sciences

Department of Emergency and critical care medicine

Advisor's Approval Sheet

This is to certify that the thesis entitled "knowledge and practice towards enteral nutrition and associated factors among nurses who are working at Adult intensive care unit of governmental hospitals in Addis Ababa city, 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 Tsige Hadera ID No: GSR9143/10 under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the thesis to the Department.

_____	_____	_____
Name of Major Advisor	Signature	Date
_____	_____	_____
Name of Co advisor	Signature	Date

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.

Name: _____

Signature: _____

Date: _____

This MSc thesis had been submitted for examination with my approval as thesis advisor.

Name: _____

Signature: _____

Date: _____

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ABBREVIATIONS AND ACRONYM

A.A: Addis Ababa

AACN: American Association of Critical Care Nurses

AAU: Addis Ababa University

ASPEN: American Society of Parenteral and Enteral Nutrition

CHS: College of health science

CIP: Critically ill patients

EN: Enteral Nutrition

HDU: High Dependency Care Unit

ICU: Intensive Care Unit

KP: Knowledge and Practice

NGT: Nasogastric tube

NPO: Nothing by mouth

SCU: Special Care Unit

SPSS: Statistical Package for Social Sciences

WHO**:** World Health Organization

ABSTRACT

Background: The purpose of this study was to describe current tube feeding knowledge and Practices and associated factors to aim appropriate quality improvement interventions. The Synergy model of patient care was used as a conceptual basis for this study.

Methods: A cross-sectional study was used to assess knowledge and practice of enteral nutrition among nurses who works in ICUs of governmental hospitals in Addis Ababa city, Ethiopia. A total of 209 nurses that met the inclusion criteria, 192 (92% response rate) responded to the questionnaire. A self-administered data collection method was used and undertaken on May 2019.

Results: More than three fourth 167 (87 %) of respondents had poor knowledge of enteral nutrition and the result revealed that only 21(11%) have good practice. Participants who are first degree holder were less likely to had adequate knowledge by 76/100 than MSc. Holders. (AOR = .240, 95% CI: (.61, .936).

Participants in the age group of 20-28 were less likely to had good practice by 98% on enteral nutrition than age group of 46-61 (AOR = 0.023, 95% CI: (0.001,0.523). and nurses who got in school nutrition training were 2 times higher to had good practice on enteral nutrition than didn't got. (AOR = 1.951, 95% CI: (.063, .601). Also participants who were aware of protocol had 3 time of good practice than not aware of protocol about enteral nutrition. (AOR =3.401, 95% CI: (1.186, 9.789)

Conclusions and recommendation: Although the improvement of nurses' knowledge and practices regarding enteral nutrition will directly or indirectly lead to reduce the complications and side effects related to enteral feeding in the critical care units, Nurses have remarkable gaps and alarming skill performance related NGT feeding. Therefore periodic on-job and pre-service training regarding enteral nutrition , guidelines as well protocol should be provided to all ICU nurses and regular supportive supervision by experts is also needed to sensitize, update and motivate staffs to provide safe nutritional support in all intensive care units s.

Key words: Adult ICU, Enteral Nutrition, ICU nurse, KP on Enteral nutrition.

CHAPTER ONE: INTRODUCTION

1.1Background

Nutrition is one of the most important parts in medical care of hospitalized patients, especially those with critical conditions hospitalized in ICU. Descent of attention to nutrition and food needs causes catabolism of skeletal muscles and metabolism of fat, also leading to weakness of muscles especially respiratory muscles and long dependence to ventilator machine, disorders in deep breathing and cough and therefore causing infections and pneumonia in these patients(1–4).

Malnutrition is a common problem affecting up to 40% of hospitalized patients, increasing their morbidity and mortality. The problem of malnutrition is often not recognized, and patients can often remain malnourished throughout their hospital stay(5). The prevalence of malnutrition risk in patients admitted to hospitals across different countries ranges from 5% to 50%(6).

It is mandatory for all hospitalized patients to undergo an initial nutrition screen within 48 hours of admission. However, patients at higher nutrition risk in an ICU setting require a full nutrition assessment(7).

Enteral Nutrition (EN) refers to deliverance of all-inclusive nutritional feed into stomach, duodenum or jejunum by orally or using a tube(8,9). Enteral nutritional support refers to the prerequisite of calories, protein, electrolytes, vitamins, minerals, trace elements, and fluids via the gastrointestinal route. Enteral feeding is indicated for patients with a functional gastrointestinal tract whose oral nutritional intake is not enough to meet estimated needs (3,6).

The deliverance of food via a tube directly into the gastrointestinal tract has been described since pre-Christian times. In earliest Egypt, and later in Greece, feeds were introduced into the rectum, and in the nineteenth century, rudimentary tubes were used to infuse basic foods such as broths, eggs, milk, and even alcohol into the esophagus and stomach. Despite of the increasing difficulty in other areas of medical care over the past century, treatment with enteral nutrition had been slow to develop. However, over the past two decades, enteral nutrition therapy has undergone a new beginning(10).

The Canadian Critical Care Practice Guidelines (CCPGs, 2013) and The American Society of Parenteral and Enteral Nutrition (ASPEN, 2009) recommended that EN is the preferred feeding method for critically ill patients.

EN is better than parenteral nutrition due to its cost-effectiveness, Prevention of intestinal mucosal atrophy, Support of intestinal immunological function through maintenance of gut-associated lymphoid tissue; that contains more than half of the body's immune cells that prohibits the translocation of intestinal bacteria into dangerous forms which ultimately will decrease the infectious complications and enhance wound healing(11).

EN should be initiated within the first 24 – 48 hours of admission for patients who receive ventilator support and having stable hemodynamic states(12). Considerations in determining the type and amount of nutritional support depend on the patient's underlying medical condition, nutritional status and available route of nutrient delivery(13).

All ICU patients should be assessed for complication of EN especially for intolerance that should be monitored to prevent Abdominal Compartment Syndrome which occurs when the intra-abdominal pressure is greater than 20 mmHg leading to organ failure. This pressure also can decrease blood flow to nerve and muscle cells leading to ischemia and organ dysfunction. Patients with ACS have increased risk for developing gastrointestinal symptoms like diarrhea, constipation and distention(14).

In the preparation of EN feeds, specialized formulae are recommended to critically ill patients as formulas are less contaminated compared to handmade feeds(15). Energy (calorie) needs in adult patients in the ICU often vary considerably because of day to day changes in clinical conditions. Optimal caloric requirements in critically ill patients are unknown owing to the lack of data from rigorous randomized clinical trials.

Resting energy expenditure can be measured with the use of indirect calorimeter or more opportunely estimated with the use of standard predictive equations. The most common formula is the Harris–Benedict equation, which based on the patient's age, sex, weight, and height.

Current clinical practice guidelines suggest that an adequate energy goal for most ICU patients is approximately equivalent to the measured or estimated resting energy expenditure multiplied by 1.0 to 1.2. Another method is to use 20 to 25 kcal per kilogram of body weight as the total caloric target range for most adults in the ICU(8,16).

Intensive Care Unit (ICU) nurses take part in a major role in maintaining patients' nutritional status at a preferred level which should be closer to the nutritional goals. As even as accurate nursing practices on EN such as, using prokinetic agents, diminishing feeding rate, measurement of gastric residual volume, maintaining correct patient's position and checking tube placement are important to prevent consequences(complications) related to EN(17).This demonstrates that nurses have an impact on the outcome of enteral nutritional support but minimal attention has been paid to how enteral nutrition is experienced by nurses.

1.2 Statement of the problem

Nutrition support on intensive care units (ICUs) has gain a higher profile ever since the growth of published guidelines. However, there are limited data available on knowledge, and practice towards nutritional support and associated factors specifically to ICU.

Gaps in nursing practice are increased due to the inadequacy of attachment to evidence-based guidelines. At present EN treatment is suboptimal, causing serious complications in addition to a not a success of administration. Lack of team work, which is resulted from insufficient evidence-based resources, induces discrepancies in practice(18).

The malpractice and inadequate knowledge on nutritional care of patient may be one of the contributing factors to the high prevalence of malnutrition in hospitalized patients. The finding revealed a need for raising awareness on the importance of nutrition and inappropriate practice and problem with the nurse's time availability regarding nutritional care of patients(19).

The American Society for Parenteral and Enteral Nutrition (ASPEN) guidelines highlighted EN as the preferred route of feeding over parenteral nutrition (PN).In critically ill patients who requires nutrition support therapy, EN should be started early within the first 24–48 hr following ICU admission. The best clinical outcomes are achieved when over 85% of the prescribed caloric intake is provided(7).

However, insufficient enteral feeding continues to exist in ICUs worldwide. and unsatisfactory enteral feeding occur in more than half of the patients(20). A series of international studies also have shown that in many ICUs, EN is not started in all eligible. In European countries, the EN rate ranges from 34% to 60% (21).

Different literature on nurses' practices regarding enteral feeding is available in developed countries, and has demonstrated poor knowledge(22). The literature concerning enteral nutrition in developing countries, where nurses also play a role in feeding the critically ill is very scanty. Literature in the developed world shows that nurses' practices in nutritional support are not evidence-based.

In a cross-sectional, observational study in eight Latin American countries among 1053 patients from 116 hospitals, caloric intake failed to meet the daily target in 40% of patients on day 1. Other explanation were reported from the Nutrition Day ICU study regarding a 7-year worldwide prevalence study of nutrition practices in ICUs; more than 40% of the patients were not feed during the first day.

A Study done in Malawi on Adult ICU nurses knowledge and practice towards enteral feeding estates that there is a variation in their knowledge ranging from the majority having adequate knowledge in many aspects, to a similar greater part lacking knowledge in some aspects. Poor practice has also been revealed by the majority, especially in checking gastric residual volume, daily inspection of nostrils and in documentation. Some tube feeding practices are poorly done and are not evidence based.

The results have also discovered some environmental factors such as lack of guidelines, a nutrition committee, and tube/feed shortage, together with patient factors such as refusal of tube feeding which may affect nurses' practice. There is a difference between the nurse characteristics, patient characteristics and the environment in which tube feeding practice is taking place which may lead to a poor outcome in enteral nutrition support(23).

There are noticeable observed problems was identified in some of governmental hospitals located in Addis Ababa city like that of Black lion hospital. The problems were observed when I was in practical attachment.

These problems are, like not measuring gastric residual volume, inappropriate positioning during feeding, feeding non formulated foods which is inconsistency with regard to enteral nutritional practices. These variations in practice could be related to gaps in knowledge and attitude(24).Also there is no any research done towards EN in Ethiopia specific to ICU. Studies were not also found to consider investigating the barriers of EN that affects knowledge and practice nurses working in ICU. Thus, this study aims to explore knowledge and practice of nurse and associated factors which affect their knowledge and practice from utilizing the recommended EN guidelines. Specifically, this study aimed to answer the following questions: What are the level of their knowledge, and practice towards EN and what are the factors that affects their knowledge and practice towards EN? Based on the results responsible bodies will be communicated for proper and better solutions.

1.3Rationale of the study

The decision to choose tube feeding as a study area was based on my experience when I was working in my previous work place outside Addis Ababa. There was a good outcome of patient improvement when they start enteral feedings. This enteral feeding is prepared by staff nurses at ICU department based on their kilocalorie requirement of each patient. Each staff nurse was trained by nutritionist who came from Spain and nothing food from the outside is allowed to feed patients with NGT feeding.

It is important to find out, first what is in practice before improving practice related to nutritional support to identify the gap between best practice and current practice(7) will then help strategic intervention in the governmental hospitals in Addis Ababa city, Ethiopia.

Problem should therefore begin with identifying the current status of nurses' Knowledge, Attitude and Practices. Without good enteral nutritional knowledge and Attitude nurses may not provide appropriate nutritional support.

Therefore it is necessary to investigate nurses' current level of Knowledge and Practice of EN and associated factors at governmental hospitals of Ethiopia located in Addis Ababa city that aimed to narrow the guideline-practice gap through multifaceted implementation strategies.

1.4 Significance of the study

The findings of the study may provide for responsible bodies of ICU units and nurse managers with an in-depth understanding of the nurses' competencies which could help to develop appropriate guidelines and procedures by giving strong attention for enteral nutritional practices in adult critically ill patients department.

The findings may also help to identify the internal and external problems encountered by nurses during their tube feeding practices. Awareness of these problems by nurse managers will help them to support their nurses and to communicate with hospital administrators to give emphasis for enteral nutrition.

The findings may also help to provide recommendations to training institutions to review the curriculum and close the gaps identified therein, ensuring that upon qualification, nurses are well equipped with current knowledge and skills in enteral nutrition.

Lastly, the findings may lay a foundation for research studies which focus more on nurses competencies in patient nutritional practices.

CHAPTER TWO: LITERETURE REVIEW

Administration of enteral feeding has long been considered the standard of care for patients not able to meet their energy and protein requirements orally. Enteral tube-feeding is thus a common practice in the ICU and is routinely administered to between 27% and 92% of all ICU patients of worldwide (25,26).

The patho physiologic changes are complex and commonly exist in three different states in critically ill patients in ICU. They are simple Starvation, Major medical complication or Trauma with or without sepsis(27).

In critically ill patients, malnutrition results in damage immunological function, impaired ventilator drive, and weakened respiratory muscles, leading to prolonged ventilator dependence and increased infectious morbidity and mortality. Furthermore the metabolic response to serious illness (hyper catabolism) can lead to severe wasting of the lean body mass, impairment of visceral organ function, and a decrease in the body's reparative and immune function(12).

Critical care nurses are responsible for delivering prescribed nutrition, fluid and medication safely and effectively(28). They are also responsible for ascertaining enteral nutrition (EN) volume and quality of given formulae(18).

Studies suggest that, although using EN protocols, intensive care unit (ICU) patients still receive 50% of the prescribed nutrition, leading to suboptimal nourishment due to the frequent feeding cessation. Gastric residual volume (GRV) measurement was introduced as the most influential factor associated with under-feeding(18,29).

There are approximately 70 available nutritional screening/ assessment tools aimed to identify those who are malnourished, or are at risk of being malnourished Examples of nutritional assessment tools translated into Swedish are subjective global assessment and mini nutritional assessment However, little is known about to what extent such nutritional tools are used in usual care(6).

An international multicenter observational study conducted in 158 ICUs from 20 countries also reported that the average adequacy of energy intake in patients was 52% .This is a serious problem in critically ill patients because underfeeding and protein depletion are associated with the loss of lean body mass, including cardiac and respiratory muscles, prolonged weaning from mechanical ventilation, delayed wound healing, impaired immune host defenses', increased rates of nosocomial infections, organ failure and increased hospital length of stay(13).

At least one million NG feeding tubes are purchased by the National Health Service in England each year, has been widely practiced since the early 1980s. Complications of nutrition tube misplacement include malnutrition, pulmonary aspiration, and even death. For blind insertion, the rate of respiratory placement is usually 1-3%. Inadvertent tube placement in the esophagus was observed in 19 out of 100 blind NG tube insertions(30).

A study done at Alexandria, Egypt on ICU patients revealed that 76% of patients were severely underfed, 22% of patients were moderately underfed, and 2% of patients were mildly underfed. In addition, patients have been received only 25% of their caloric requirements and 68% of their prescribe calories. In relation to protein intake, patients received only 14% of their protein requirements and 50% of their prescribed proteins. Additionally, regarding enteral volume intake, patients received only 22% of their enteral volume requirements and 55% of their prescribed enteral volume(11).

2.1 Knowledge on enteral nutrition

The study conducted in Malawi between June and July 2010 out of the 53 nurses, 51 agreed to participate and the findings revealed that 96.1 % participants had never had in-service training in enteral feeding. Participants reported that nutritional assessment (29, 56.9%), insertion of the nasogastric tube (45, 88.2%), and tube feeding (42, 82.4%) was within the scope of their practice(22).

Also Orogastric tube feeding was not reported by any nurse. Participant reported adequate knowledge in this area, insertion of a nasogastric tube 51(100%), checking for proper tube placement 47(92.2%) and give bolus feeds 35(68.8%) and inadequate knowledge was reported in the following areas: assessment of nutritional status (22, 43.1%), aspirating gastric residual volume (22, 43.1%). The findings show that 31 (60.8%) participants position their patients in a semi fowler/ sitting during tube feeding.

To confirm proper tube placement; 47 (92.2%) of participants reported that by using the water bubbling method. On procedures to prevent tube feeding complications; 41 (80.4%) participants reported that they always confirmed tube placement and 38 (74.5%) always flushed the tube after feeding. Checking gastric residual volume was reported as never done by 23 (45.1%) of participants and always done by 16 (31.4%). Daily inspection of nostrils in a patient with a nasogastric tube was reported as never done by 10 (19.6%) of participants and sometimes done by 18 (35.3%) participants.

2.2 Practice on enteral nutrition

EN is established to be better in ICUs that follow EN clinical practice guidelines. Nursing care for patients with EN has a major role in ensuring the success of EN. In spite of their crucial role in providing EN, nurses' practices are measured one of the factors that lead to underfeeding in critically-ill patients and subsequent malnutrition. Recent nurses' practices of EN have been found to be based on opinions rather than on evidence-based practices, leading to variability in providing this vital care(24).

A number of studies showed a gap between the recommended guidelines and the actual practices at bedside .One of the broadest study was a cross sectional survey conducted among 383 ICU nurses from 20 European countries using a 51-item self-administered questionnaire to evaluate EN practices in the European ICUs. The results showed a discrepancy in practices across different ICUs and discrepancies in following the European EN recommendations. The same discrepancy in following the guidelines was reported among Egyptian nurses specifically regarding nasogastric tube (NGT) insertion and administration of medications and among Jordanian nurses particularly regarding tube placement confirmation and assessment of gastric residual volume (31).

A study done in Sri Lanka revealed that, 63.8% and 96.4% of the study participants sometimes practice prepare feeds according to the calorie requirement of patients and to use prokinetic agents in promoting gastric motility respectively. Confirm tube placement by both auscultation and abdominal X ray methods (41.3%).They followed special diet menus when preparing feeds while 33.3% and 30.4% of the participants followed them sometimes and rarely respectively(32).

Also a study done in Malawi on ICU nurses shows that the results of 'Checking gastric residual volume' showed poor practice by the majority as 45.1 % (n=23) indicated that this is 'Never' done, and 19.6 % (n=10) indicated that this is 'Sometimes' done. Only a few demonstrated good practice with 3.9 % (n=2) indicating that this is 'Almost always' done and 31.4 % (n=16) indicating that this is 'Always' done(22).

2.3 Factors affecting knowledge and practice of EN

A study done in Saudi on EN of mechanically ventilated patients revealed that there is a highly significant difference between the patients required energy and daily energy intake due to factors that impede delivery of enteral feedings include those related to feeding intolerance (e.g. vomiting) and those associated with standard nursing practice(e.g. interruption of tube feeding during changes in body position or routine orders like NPO before and after procedure)(33).

The study done in Egypt, Ismailia general hospital showed that factors affecting nurse's practice regarding nasogastric tube feeding were the absence of learning, physical exhaustion, stress to be contaminated, lack of nursing staff, diminished pay, non-appearance defensive garments, expanded workload, and there were no prizes or redesigns for effective medical attendants. This may be attributed to lack of institutional guidelines, lack experience, lack of a role model and lack of rewards and lack of encouragement(30).

According to(Bloomer et al., 2017; Kim et al., 2012; Michelle Kozeniecki, et al., 2016; Martins et al., 2012; Ventura &Waitzberg, 2015 The main factors of the enteral feeding barrier) include (1) delay in the start of EN and slow infusion rate; (2) lack of EN practice guidelines; (3) failure to follow medical advice, and frequent disruptions to EN (e.g., diagnostic testing, surgery, gastrointestinal intolerance, and accidental pull-out of nasogastric tubing); and (4) nurse's flow management and other aspects of patient care are prioritized over EN(34).

Also A study conducted in Malawi reveals that the majority of nurses, 68.6% (n=35) reported feed/tube shortage as a major challenge experienced during tube feeding practices. However, it was surprising to note that only 5.9 % (n=3) mentioned staff shortages. It was also marked from the findings, that patient/family members refusal of tube feeding was the second most common represented challenge faced by 35.3% (n=18) of the nurses(22).

2.5 Conceptual frame work

The conceptual model was drawn from the American Association of Critical Care Nurses (AACN) Synergy Model for Patient Care which incorporates patient characteristics, nurse competencies (characteristics) and the health care environment or system to attain optimal patient outcome.

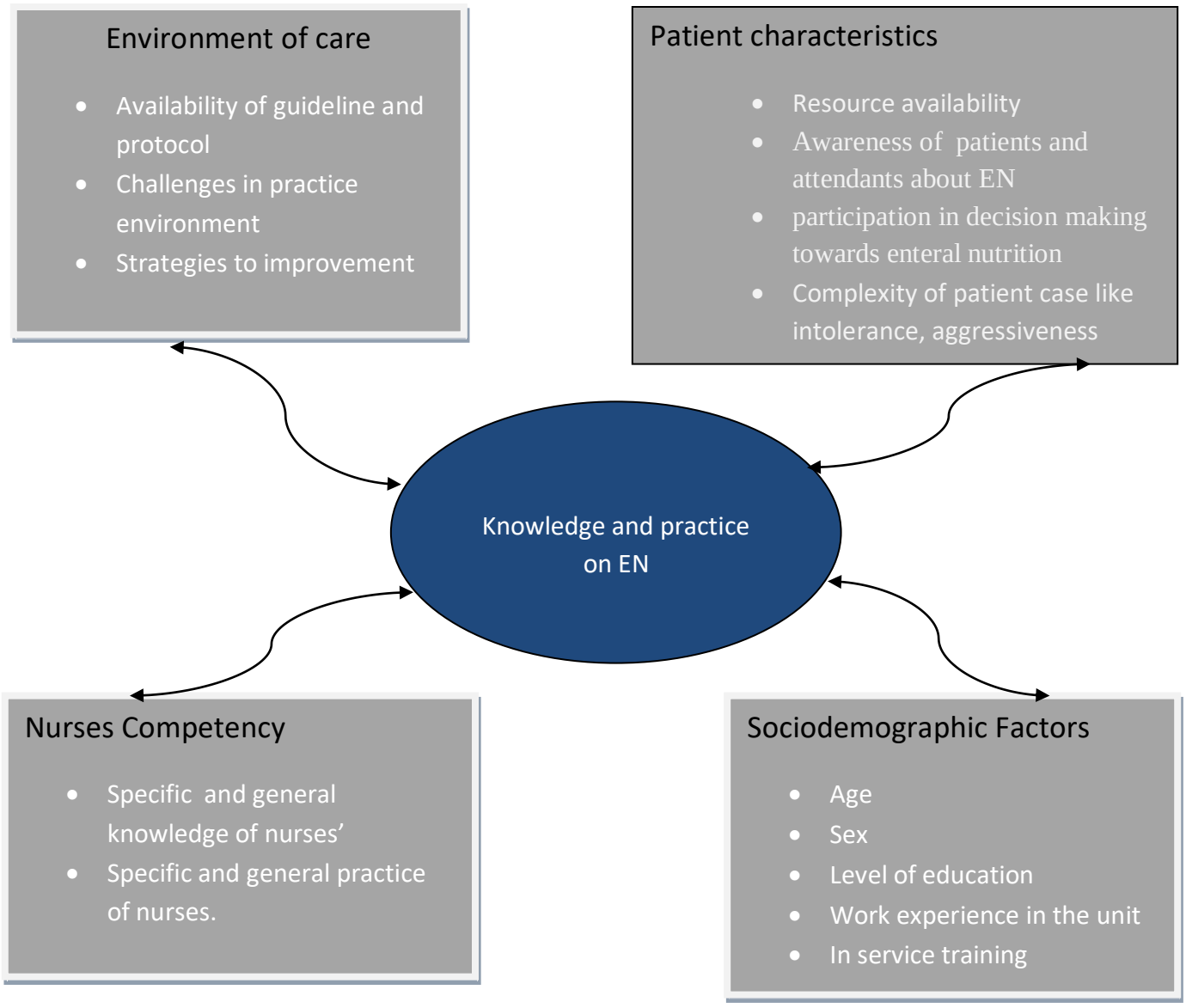

Figure 1 conceptual frame work reflects relationship b/n KP of nurses about EN and associated factors adopted from different literatures(22).

CHAPTER THREE: OBJECTIVES

3.1General objective

To assess of knowledge and practice towards enteral nutrition and associated factors among nurses who are working at adult intensive care units of governmental hospitals in Addis Ababa city, Ethiopia.

3.2Specific objectives

- To assess knowledge of ICU nurses about adult enteral nutrition at governmental hospitals in Addis Ababa city, Ethiopia.
- To compare the current practice of nurses in enteral nutritional support with the standard and guidelines.
- To determine factors that are associated with nurse's knowledge and practice.

3.3 Research questions

- What is the level of nurses' knowledge of adult enteral nutritional support for the critically ill adults in the Adult ICU?
- How do nurses provide enteral nutrition to adult critically ill patients in the Adult ICU?
- What are the factors affecting nurses' practice in enteral nutritional support in the Adult ICU towards EN?

3.4 The research hypothesis

The following were the research hypotheses:

- There is poor enteral nutritional knowledge among nurses providing care to critically ill at adult ICU.
- Poor knowledge in enteral nutrition is likely to cause poor feeding practices by nurses.
- There are environmental factors that are likely to associate with nurses' tube feeding practices in these units.

CHAPTER FOUR: METHODOLOGY

4.1Study area and Study period

Addis Ababa is capital city of Ethiopia, and seat of African Union and Economic Commission for Africa is at the heartland of Ethiopia, with a population of 3.384,569 of people in an aria 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 Addis Ababa Health Bureau, 4 hospitals owned by Federal Ministry of Health (central), 1 Addis Ababa University, 2 ministry of defense and 1 police force hospitals which provide different health services. In addition there are about 26 health center, 9 clinic, and 34 health posts. From the hospitals, 12 of them state run, and more than 40 private(35).

The governmental hospitals located in Addis Ababa city are; Black Lion hospital with 41 nurses, Tirunesh Beijing hospital with 17 nurses, Ras Desta hospital with 12 nurses, Zewditu memorial hospital with 11 nurses, Menellik hospital with 17 nurses, Alert hospital with 27 nurses, St Peter hospital with 20 nurses, Yekatit 12 hospital with 16 nurses, St Paulose and AaBET with 90 nurses. The total number of nurses in these governmental hospitals is 251.

I was used all the 10 governmental hospitals nurses who work at adult ICU. From these hospitals, Yekatit memorial hospital was used as a pilot study area. The study was conduct in these ICU of governmental hospitals from November, 2018 to June 2019 Addis Ababa, Ethiopia.

4.2 Study Design

A descriptive cross sectional quantitative study design was conducted to determine knowledge and practice of nurses and its associated factors working at ICUs of Governmental Hospitals in Addis Ababa city, Ethiopia from October 2018-June 2019.

4.3 Population

4.3. 1 Source population

All health professionals working at governmental hospitals of Ethiopia.

4.3.2 Target Population

All nurses working in Governmental hospitals of Addis Ababa city.

4.3.3 Study population

All nurses working in adult ICUs of governmental hospitals in A.A city.

4.4 Eligibility Criteria

4.4.1 Inclusion criteria

Nurses who are working on a fulltime were included. These nurses who present during the study period and enough to give reliable information were included in the study.

4.4.2 Exclusion criteria

- Nurses who were not available during the study period
- Nurses who were on annual leave during the study time
- All nurses who are employed in managerial positions (head nurses, directors)

4.5 Sampling method

Since all the total of 209 nurses was `included in the study, census was used as a method.

4. 6 Sample size determination

From 251 nurses, 13 nurses were in the managerial position, 16 nurses were from yekatit16 memorial hospital which pilot study was done and 13 nurses were not available during the data collection period for different reasons. A total 209 nurses who are working in Adult ICU of governmental hospitals in Addis Ababa city was included in the study and 192 nurses were willingness to participate in the study with a respondent rate of 92%

4.7 Sampling techniques

There are14 governmental hospitals in A.A, From these 10 of them was included in this study .The remaining 04 hospitals was excluded because of providing specific services like that of Amanuel Hospital, Gandhi memorial hospital for psychiatric and obstetric patients respectively. Police referral hospital and armed force federal hospital was also excluded because of ethical issues. From the 10 hospitals Yekatit 12 memorial hospital was used as a pilot study area by simple lottery method to take 5% of participants and necessary corrections was made to some of the questions of the questionnaires that are not clear to participants.

4.9 Study Variables

4.9.1 Dependent variables

- Knowledge and Practice of nurses towards EN

4.9.2Independent variables

Sociodemographic factors

- Age
- Sex
- Level of education
- Work experience in ICU
- In school training about enteral nutrition
- In service training about enteral nutrition

Environment of care

- Availability of guideline and protocol
- Challenges in practice environment
- Strategies to improvement

Patient//family characteristic

- Resource availability
- Awareness of patients and attendants towards EN
- Participation in decision making
- Complexity of patient case like intolerance, Irritability

4.10 Data collection tools and procedure

Semi structured questioner was adopted from different literatures.(22,26,31,32).The questions were prepared in English language based on the study objective focusing on background information of EN. The researcher was used a self-administered structured questionnaire tools for nurses to collect data in order to answer the objectives of the study relating to enteral nutrition. Two Data collectors who have diploma and above in nursing as well as 2 supervisors who have BSC in nursing and above was trained for the procedure.

4.11 Data Quality Control

In addition to the training given to the data collectors, the questionnaires was pre-tested 4 days before the actual data collection days on 5% nurses who were not selected for the study.

As a result of the pretest necessary corrections was made to some of the questions of the questionnaires. Moreover, during data collection supervisors were checking in the study area how the data collector was doing his/her task. The principal investigator was also closely supervising the activity on daily basis.

At the end of each data collection day the principal investigator was also checking the completeness of filled questionnaires and whether recorded information makes sense to ensure the quality of data collected. Besides this, the principal investigator was carefully enter and thoroughly cleaned the data before the commencement of the analysis.

4.12Data analysis

All questionnaires were checked for completeness of responses/ticks. Data were entered in to epi manager data client entry version 4.4.2 win 64 then processed and analyzed using SPSS verssion20 for windows statistical program for analysis. Frequency tables, graphs and proportions were used to present the data. Binary logistic regression was used to estimate the crude odds ratio of all independent variables on practice and knowledge of enteral nutrition 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 Data management and methodology

The data to be taken was consists self-administered questioners taken by the researcher. Researcher transfer filled questioner to personal computer to save backup. Trustworthiness of the findings was assured through member checking, peer debriefing, investigator triangulation.

Before starting the actual data collection, the researcher was taken few days to get familiarize with the hospitals to create a rapport with relevant people for the study. Member checking was used to test data interpretation at the end of each person questioners'.

Peer debriefing was used during data analysis and interpretation to obtain trustworthy findings by ensuring that the findings are confirmable by other peers .Report of study findings will be presented to academic staff members of the study hospitals and relevant peoples to receive their comments to improve its quality.

4.14 Ethical considerations

Ethical approval for the study was obtained from Addis Ababa University College of Heath Sciences, Institutional Review Board (IRB).

A support letter was taken to the study hospitals for permission to conduct the study. From these hospitals Participants was informed about the voluntary nature of the study and rapport will be built before conducting the data collection. Privacy of participants during the data collection was assured by conducting in comfortable private place and by helping their workload other than enteral feeding during the data collection time. Participants were also assured that all their personal information was protected from public and secured by the researcher.

4.15 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, Hospital administrations, FMOH, Journals all possible.

4.16 Operational Definition

Knowledge: This refers to expertise and skills acquired through education or experience, and the theoretical or practical understanding of enteral nutrition issues. Based on the research done in Egypt, The percentage scores were graded as 'Adequate' and 'Inadequate' to determine the knowledge level. Grading was classified as follows: 0 to 64% - Inadequate and 65% and above - adequate (above average) in previous study done in Egypt.

Practice: This describes the nurses' methods of providing tube feeding, Open ended questions ,multiple choice and Likert scale were used to assess their practice level which was intend to determine the frequency of performing certain interventions to prevent complications and communication of care.

The response categories were coded as 1 to 4 for Never, Sometimes, Almost always and always respectively for the likert scales and in order to discuss these in a more meaningful way, the categories never and sometimes (1 and 2) was grouped together while Almost Always and Always (3 and 4) was grouped together. The multiple choices and open ended questions were coded 1 for correct answer and 0 for incorrect answer. A total score of ≥70% was interpreted as good practice and score of <70% was interpreted as poor practice. This was also based on the research done in Egypt.

CHAPTER FIVE: RESULT

This study represents participants that were working in Adult ICUs in 9 governmental hospitals in Addis Ababa city, Ethiopia. From 251 nurses, 13 nurses were in the managerial position, 16 nurses were from yekatit16 memorial hospital which pilot study was done and 13 nurses were not available during the data collection period for different reasons. A total 209 nurses who are working in Adult ICU of governmental hospitals in Addis Ababa city was included in the study and 192 nurses were willingness to participate in the study with a respondent rate of 92%

5.1 Socio-demographic characteristics

Out of 192 respondents, 99(51.6%) were female and this is a normal tendency, as traditionally the nursing profession has always been female dominates. The respondents' age was ranged from 20 to 61 years. The minimum age was 20 and the maximum age was 50 with a mean age of ±27.96. The highest proportion 135(70.3%) was within the age group of 20-28 years but the least was presented by the oldest 2(1%) within the age group of 46-61 yrs. The majority of the participants129 (67.2%) had more than 1 year of work experience in the critical care unit. [table.1]

Regarding to training of enteral nutrition in their nursing school, the majority 146(76.0%) of participants responded that it was included and majority of participants, 140(72.9%) didn't get in service training about enteral nutrition.

Table.1 Frequency of socio-demographic characteristics of study participants, Addis Ababa city, Ethiopia, June 2019

Variables(n=192)	Category	Number	%
Sex	Female	99	51.6
	Male	93	48.4
Age	20-28	135	70.3
	29-34	39	20.3
	35-45	16	8.3
	46-61	2	1.0
Educational status	Diploma	11	5.7
	First degree	169	88.0
	Second degree	11	5.7
	Other	0	0
Work experience in ICU	< 1Year	63	32.8
	> OR = 1 Year	129	67.2
EN part in nursing school	Yes	146	76.0
	No	46	24.0
In service training on Enteral nutrition	Yes	52	27.1
	No	140	72.9

5.1 Knowledge of the study participants' on enteral nutrition

5.1.1 Specific Knowledge of the study participants' on enteral nutrition

About 104(54.8%) of study participants are not aware that guideline is available in their ICU and majority, 116(60.4%) of study participants responds that their ICU department didn't have protocol. The majority, 139 (72.4%) respondents knew the preferable route of nutritional administration.

The result revealed that 189 (95.5%) of the respondents couldn't got the correct answer for amount of gastric residual volume to be withheld and most of the participants, 148(77.1%) demonstrated inadequate knowledge when they decided with the statement that ' absence of bowel sound is complete contraindication for enteral nutrition'.

Almost similar number of participants, 124 (64.6%) demonstrated poor knowledge when they agreed that passage of flatus is a must prior initiating enteral nutrition. The study findings revealed that the majority of the participants are competent enough in the procedures outlined (Table 2). Almost all participants, 183(95.3%) and 190(99.0%) are competent in inserting a nasogastric tube and checking for proper tube placement. However, the participants indicated that they are not competent enough in nutritional assessment, 40(20.8%); choosing the appropriate formula to feed, 69(35.9%) and giving continuous tube feeding, 33 (17.2%)

Almost all number of participants demonstrated inadequate knowledge on absolute contraindication enteral nutrition, 151(78.6%) bowel obstruction, 177(92.2%) Paralytic illus., 184(95.8%) intestinal ischemia/sever shock, 169(88.5%) Sever GI bleeding and also 71(37.0%) didn't write at all.

Table 2 Knowledge score of participants for specific knowledge questions Addis Ababa city, Ethiopia, May 2019.

S.N	Statement	Correct	Incorrect
		N(P)	N(P)
1	Which should be the preferable route of nutrition in ICU unless contraindicated?	139(72.4%)	53(27.6%)
2	How early enteral nutrition should be started (unless contraindicated)?	181(94.3%)	11(5.6%)
3	Is absence of bowel sound is complete contraindication for enteral nutrition?	44(22.9%)	148(77.1%)
4	Is passage of flatus is a must prior initiating enteral nutrition?	68(35.4%)	124 (64.6%)
5	How do you confirm Ryle's tube position in your ICU?	4(2.1%)	188(97.9%)
6	How is Ryle's tube feed supplied in your ICU?	136(70.8%)	56(29.2%)
7	Amount of residual gastric volume for Ryle's tube feed to be withheld?	8(4.2%)	184(95.8%)
8	After how much time is the supplied bottle feed discarded (if left unused)?	78(40.6%)	114(59.4%)
Are you competent enough in			
9	Assessment of patient nutritional status	152(79.2%)	40(20.8%)
10	Checking for proper tube placement	190(99.0%)	2(1%)
11	Insertion of a nasogastric tube	183(95.3%)	9(4.5%)
12	Giving continuous tube feeding?	159(82.8%)	33 (17.2%)
13	Giving bolus (intermittent) tube feeding?	168(87.5%)	24(12.5%)
14	Choosing the appropriate formula to feed?	123(64.1%)	69(35.9%)

What are the absolute contraindications to EN?		Correct	Incorrect
15	Bowel obstruction	40 (20.8%)	151(78.6%)
16	Paralytic illus.	14 (7.3 %)	177(92.2%)
17	Intestinal ischemia/sever shock	7 (3.6%)	184(95.8%)
18	Sever GI bleeding	22(11.5%)	169(88.5%)
19	Didn't write	71(37.0%)	121(63.0%)
20	Sever GI bleeding	22(11.5%)	169(88.5%)
21	None of them was written	5(2.6%)	185(97.4%)

5.1.2 General Knowledge of the study participants' on enteral nutrition

Regarding knowledge assessment questionnaire, the correct and incorrect answers were scored 1 and 0 respectively. Some of the multiple choice questions were having more than one correct answer and were scored 1 on each correct answer chosen. Accordingly the overall score of the questionnaire ranges from (0-21) degrees with a cut-score at 65%.The nurses were considered as having adequate knowledge if they scored at least≥65% out of 21 in the knowledge assessment questionnaire. Also the nurses were considered as having inadequate knowledge if they scored less than 65% out of 21.

The result revealed that more than (3/4) 167 (87. %) of respondents had poor knowledge of enteral nutrition.

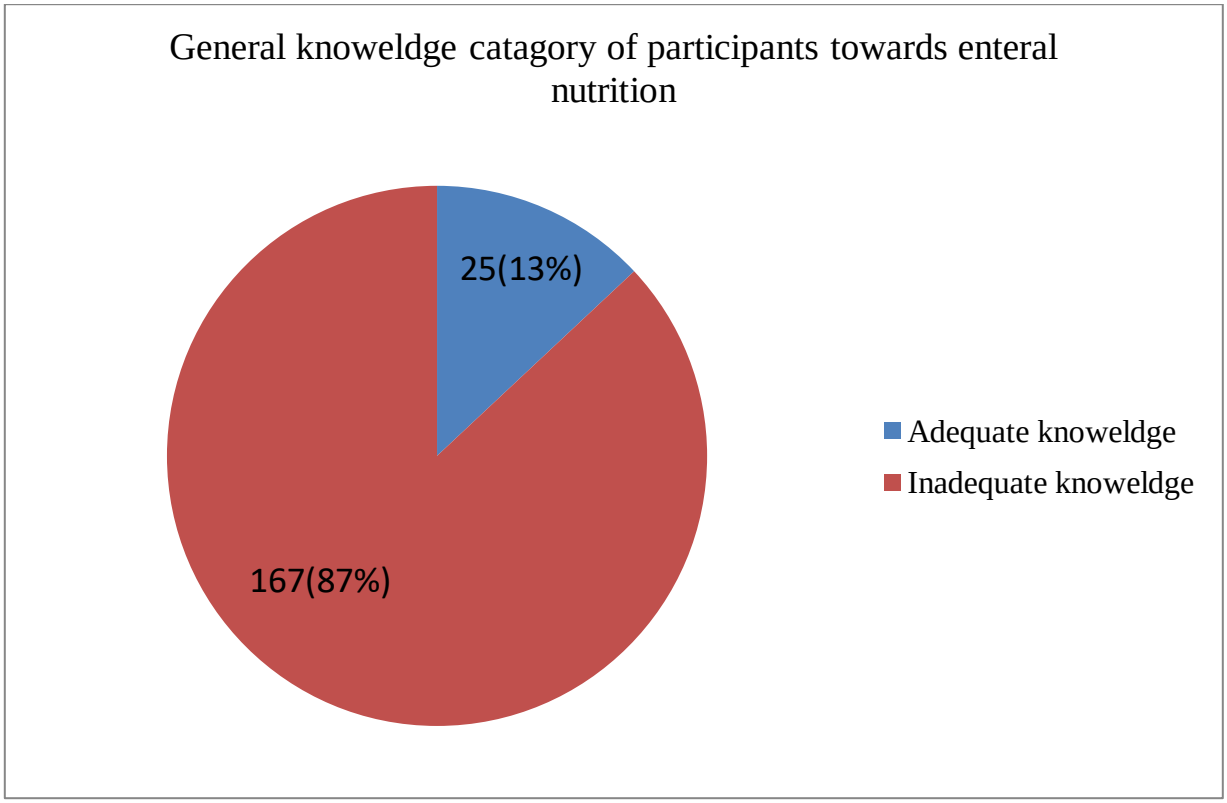

Fig 2 the overall knowledge of ICU nurses towards enteral nutrition in Addis Ababa city, Ethiopia, May 2019

5.2 Practice of the study participants' on enteral nutrition

5.2.1 Specific practice of participants towards enteral nutrition

When considering the nurses' scope of practice, the majority of participants admitted that all three intervention areas are within the scope of their practice (Table.3). However, 72(37.5%) of the participants agreed that nutritional assessment is not within the scope of their practice.

Majority 117(60.9%) was reported as being used small bore, 108(56.3 %) was reported as being the large bore which is recommended for good practice of enteral nutrition. The findings show that the majority of the participants, 153(79.7%) know that patients are placed in a specific position during tube feeding (Table 3). The specified positions was indicated by them and described as correct or not.

The study findings have also revealed that the majority of the participants, 156(81.3%) rely on the doctor to prescribe the feeding regimen, while 36(18.8%) indicated that they give any amount and rate depending on feeds available, and only 67(34.9 %)of the participants indicated that they give 20 to 50mls of feed per hour.

The results revealed that the common type of feed given to patients by tube feeding is hospital kitchen feed chosen by a larger proportion of participants, 136(70.8%) followed by feed brought in by the patient's relatives, 122(63.5%) and 42(21.9%) of participants said from commercial food. Participants had more than one answer for this category of question.

The results of 'Checking gastric residual volume' showed poor practice by the majority as 21(10.9%) indicated that this is 'Never' done, and 62(32.3%) indicated that this is 'Sometimes' done. Only a few demonstrated good practice with 34(17.7%) indicating that this is 'Almost always' done and 75(39.1%) indicating that this is 'Always' done. Similarly, the results of 'Daily inspection of nostrils' showed that this practice is poorly done by the majority with 12(6.3%) indicating that this practice is 'Never' done, and 49(25.5%) of the participants who indicated that this is 'Sometimes' done. A few demonstrated good practice with 64(33.3%) of the participants responding that this practice is 'Almost always' done, and 67(34.9%) indicating that this is 'Always' done.

Also the results of ‘discuss nutritional management of patients during ward rounds’ indicated good practice by a smaller proportion with 36(18.8%) indicating that this practice is 'Almost always' done, and 63(32.8%) indicating that this is 'Always' done. 15(7.8%) demonstrated poor practice who indicated that this is 'Never' done, and 78(40.6%) who indicated that this is 'Sometimes' done.

Table 3 Participants' level of practice of the enteral nutrition, Addis Ababa city, Ethiopia, May 2019.

		Yes	No
Scope of practice **(Q1-Q3)**	Nutritional assessment	**120(62.5%)**	**72(37.5%)**
	Inserting a nasogastric tub	172 (89.6 %)	20(10.4%)
	Tube feeding the patient	167(87.0%)	25(13.0)
Choice of Tube Size **(Q4)**	Small bore	117(60.9%)	75 (39.1%)
	Large bore	108(56.3%)	84(43.8%)
Type of feed **(Q5)**	Hospital kitchen made	136(70.8%)	56(29.2%)
	Feed brought by relatives	122(63.5%)	70(36.5%)
	Commercial foods	42(21.9%)	150(78.1%)
Type of feed administration**(Q6)**	Intermittent feeding	166(86.5%)	24(13.5%)
	Continuous feeding	26(13.5%)	24(13.5%)
Method of proper tube position **(Q7)**	Bubbling method	100(52.1%)	92 (47.9%)
	Ph. indicator	22(11.5%)	170(88.5%)
	Auscultation	177(92.2%)	15(7.8%)
Rate of providing enteral nutrition(**Q8)**	Any amount and rate depend on feed available	36(18.8%)	156(81.3%)
	Depends on doctors prescription	156(81.3%)	36(18.8%)
	20-50ml per hr (300-500ml 5-8 times	67(34.9 %)	125(65.1%)
Specific position during tube feeding **(Q9)**		153(79.7%)	(20.3%)

Table 4 Participants' level of part of practice to prevent complication during enteral nutritional support in likert scale, Addis Ababa city, Ethiopia, May 2019.

Statements		Never	Sometimes	Almost always	Always
Q10	Do you Confirm tube placement before delivery of feed?	7(3.6%)	37(19.3%)	34(17.7)	114(59.4%)
Q11	Do you Flush tube before and after administration of feed?	3(1.6%)	27(14.1%)	47(24.5%)	115(59.9%)
Q12	Do you Check gastric residual volume before initiating feed?	21(10.9%)	62(32.3%)	34(17.7%)	75(39.1%)
Q13	Do you conduct daily inspection of nostrils?	12(6.3%)	49(25.5%)	64(33.3%)	67(34.9%)
Q14	Do you document any nutritional support or complication about your patient?	8(4.2%)	29(15.1%)	57(29.7%)	98(51.0)
Q15	Do you discuss nutritional management of patients during ward rounds	15(7.8%)	78(40.6%)	36(18.8%)	63(32.8%)

5.2.2 Nurses' General Practice in Enteral Nutrition

This describes the nurses' methods of providing tube feeding, Open ended questions ,multiple choice and Likert scale were used to assess their practice level which was intend to determine the frequency of performing certain interventions to prevent complications and communication of care.

The response categories were coded as 1 to 4 for Never, Sometimes, Almost always and always respectively for the likert scales and in order to discuss these in a more meaningful way, the categories never and sometimes (1 and 2) was grouped together while Almost Always and Always (3 and 4) was grouped together. The multiple choices and open ended questions were coded 1 for correct answer and 0 for incorrect answer.

A score of ≥70% from total 15 practice related questions was interpreted as good practice and score of <70% was interpreted as poor practice. This was also based on the research done in Egypt.The overall result practice revealed that only 21(11%) have good practice.

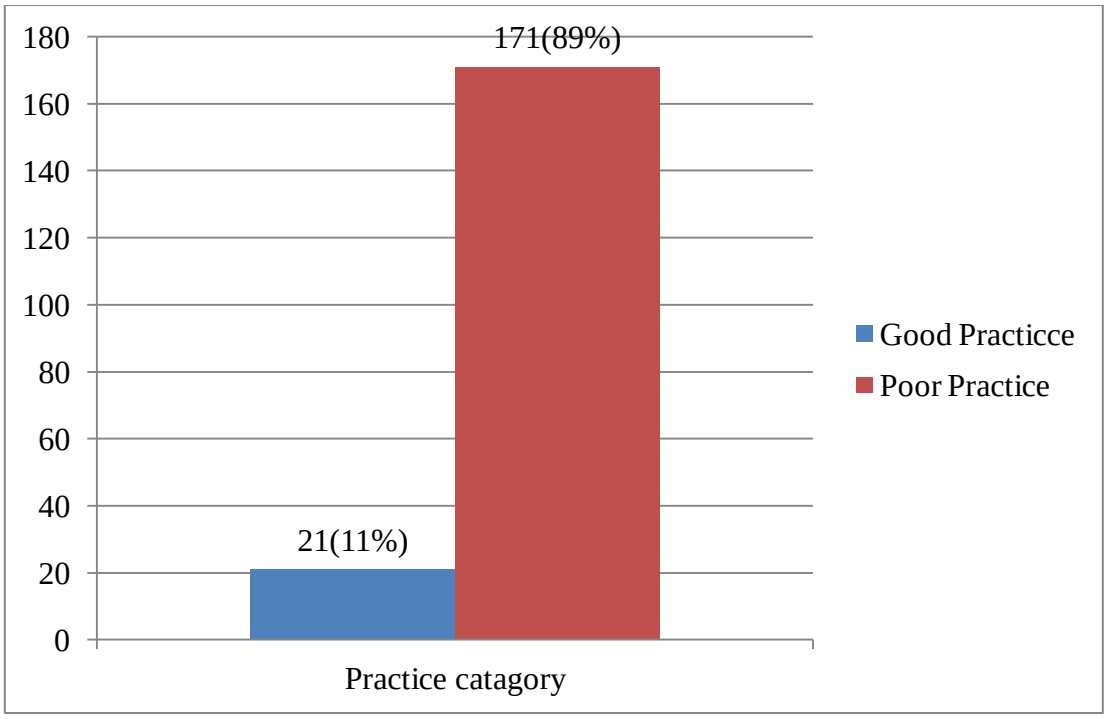

Fig 3 Participants' level of practice of the enteral nutrition, Addis Ababa city, Ethiopia, May 2019.

5.3 Factors affecting knowledge and practice of nurses towards enteral nutrition

Availability of Guidelines and protocols

Majority 104(54.2%) of participants stated that there are not aware of guidelines in the units, and the findings also showed that the majority, 116(60.4%) responded that there is no protocol.

Challenges towards effective nutritional support

Almost more than half (102(53.1%) of participants stated that resource shortage affect their practice to effective enteral nutrition and also 36(18.8%) of participants that lack of knowledge is the main challenge for their practice next to resource shortage.

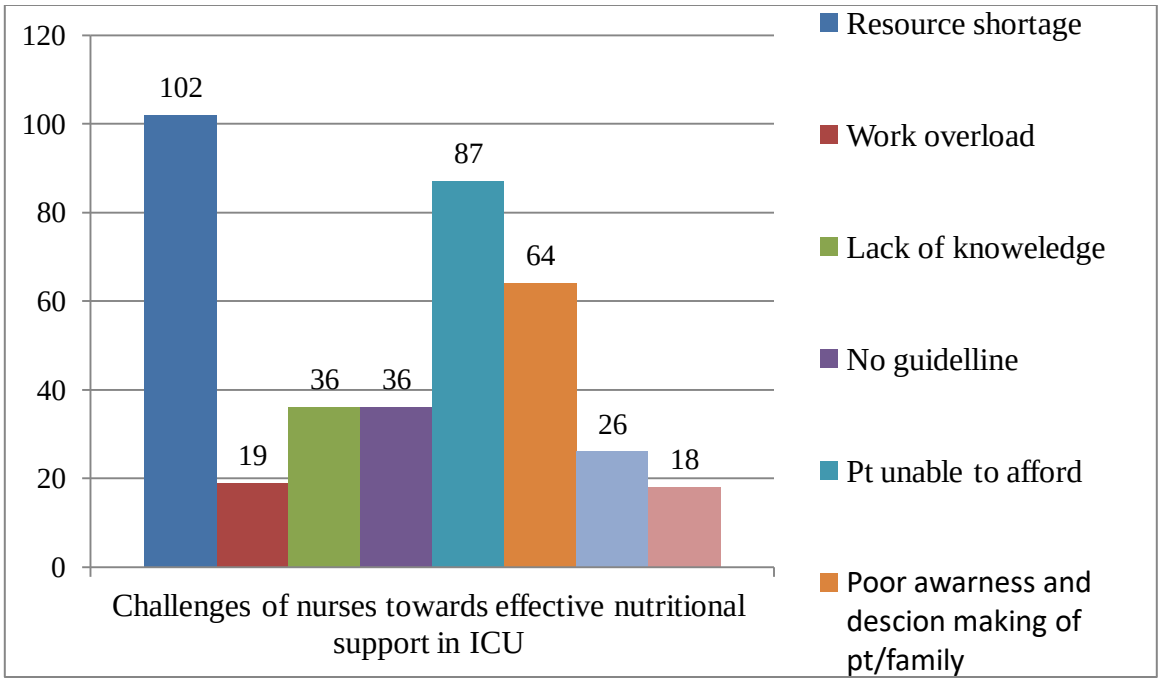

Fig 4 Challenges of ICU nurses towards enteral nutrition in Addis Ababa city, Ethiopia, May 2019

Strategies for improvement

When analyzing the item 'how to improve', the majority 1049(54.2%) indicated having adequate resources like guideline, feeds as a strategy for improvement, 61(31.8%) indicated training as another strategy for improvement.

27(14.1 %) of the participants indicated having adequate staff as a way of improving tube feeding practice, while 35(18.2%) indicated launching of ICU feeding room could help to improve the practice.

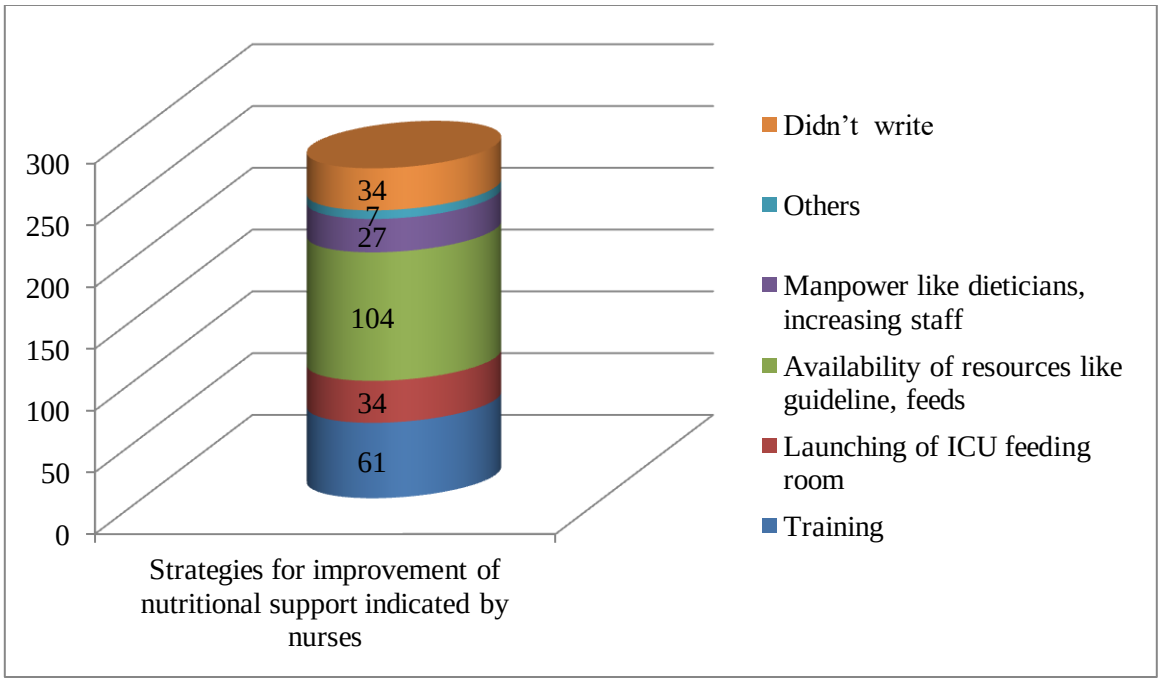

Fig 5 strategies for improvement of nutritional support indicated by nurses Addis Ababa city, Ethiopia, May 2019

5.4 Factors associated with level of knowledge on enteral nutrition

In the Bivariate logistic regression analysis the factors found to be significantly associated with knowledge of nurses with p-value of <0.25 were: sex and educational status. From the variables associated with knowledge of nurses in the bivariate logistic regression; educational status was statistically significant to predict knowledge of nurses in the multivariable logistic regression with p-value of< 0.05.

Female were less knowledgeable than males by 80/100 (COR .478 (.197, 1.158) and participants with degree holder were less likely knowledgeable by 88% than master holders (COR .222(.059, .828) in bivariate logistic Reggration.

Participants who are first degree holder were less likely to had adequate knowledge by 76/100 than MSc. Holders. (AOR = .240, 95% CI: (.61, .936).

Table.5. Bivariate and Multivariate analysis of factors associated with knowledge on enteral nutrition among participants in Addis Ababa city, Ethiopia, May 2019(n=192)

Variable category		**Knowledge**		**COR(95% C.I)**		**AOR(95% C.I)**	
		Good	**Poor**	**Sig**	**(n, lower, upper)**	**Sig**	**(n, lower, upper)**
Sex	Female	9	90	**.100**	**0.481(.0.201, 1.150)***	.102	.478 (.197, 1.158)
	Male	16	77	.00	1	.000	1
Age category	20-28	16	119	.999	217202523.714(.000		
	29-34	6	33	.999	293717049.113(.000		
	35-45	3	13	.999	293717049.113(.00)		
	46-61	0	2	.999	1		
In school training	Yes	20	126	.620	1.302 (.459, 3.688)		
	No	5	41	.000	1		
Service in year	< 1year	7	56	.583	1.297(.512, 3.289)		
	≥1Year	18	111	.000	1		
Educational status	Diplom	2	9	.292	.350(.050, 2.467)	.397	.405(.50,3.273)
	Degree	19	150	.025	**.222(.059, .828) ***	.040	**.240(.61,.936) ****
	Masters	4	7	.372	1	.108	
Inservice training	Yes	6	46	.710	.831(.312, 2.210)		
	No	19	121	.000	1		
Guidelin available	Yes	12	76	.816	1.105(.476, 2.564)		
	No	13	91	.000	1		
Protocol available	Yes	11	65	.629	1.233(.528, 2.881)		
	No	14	102	.000	1		

COR=*P<0.25; AORP<0.05**

5.4.1Factors associated with level of practice of enteral nutrition

In the Bivariate logistic regression analysis the factors found to be significantly associated with practice of nurses having p-value of <0.25 were: Age, In school training, Challenge pt of unable to afford resources, Launching of feeding room for improvement, Training for improvement, Resource supply and protocol.

From the variables associated with practice of nurses in the bivariate logistic regression with p-value of <0.05; Age, in school training and protocol were statistically significant to predict practice of nurses in the multivariable logistic regression.

Participants in the age group of 20-28 were less likely to had good practice by 98% on enteral nutrition than age group of 46-61 (AOR = 0.023, 95% CI: (0.001,0.523). and nurses who got in school nutrition training were 2 times higher to had good practice on enteral nutrition than didn't got. (AOR = 1.951, 95% CI: (.063, .601). Also participants who were aware of protocol had 3 time of good practice than not aware of protocol about enteral nutrition. (AOR =3.401, 95% CI: (1.186, 9.789)

Table.6. Bivariate and Multivariate analysis of factors associated with practice on enteral nutrition among participants in Addis Ababa city, Ethiopia, May 2019(n=192)

Variables Category		**Practice category**		**COR(95% C.I)**		**AOR(95% C.I)**	
		Good	**Poor**	**Sig**	**(n, lower, upper)**	**Sig**	**(n, lower, upper)**
Age	20-28	12	123	.108	**0.098 (0.006,1.661) ***	.018	**0.023 (0.001,0.523) ****
	29-34	8	31	.35	0.258 (.015,4.591)	.194	.128(.006.2.839)
	35-45	0	16	.998	000	.998	**000 (000)**
	46-61	1	1	1.000	1		1
In school training	Yes	12	134	.037	**.368 (.144,.940) ***	.004	**1.951(.063,.601) ****
	No	9	37	.000	1		1
Pt resource unafford	Yes	6	81	.110	**.444 (.165,1.200) ***	.131	**.**380 (.108,1.335)
	No	15	90	.000	1		1
Launching feeding room	Yes	1	34	.124	**.201 (.026,1.554) ***	.178	.216 (.023,2.010),
	No	20	137	.000	1	.	1
Training for improve	Yes	5	56	.409	**.642 (.224,1.841) ***	.0.743	.812(.234,2.818)
	No	16	115	.000	1		1
Resource supply improve	Yes	14	90	.228	**1.8 (.692,4.681)***	.247	1.904(.641,5.656)
	No	7	81	.000	1		1
Protocol available	Yes	13	63	.032	**2.786 (1.095,7.088)***	.023	**3.407(1.186,9.789)****
	No	8	108	.000	1		1

COR=*P<0.25; AORP<0.05**

CHAPTER SIX: DISCUSSION

In this study, we tried to find out the level of knowledge and practice of the participants about enteral nutrition factors associated with knowledge and practice towards enteral nutritional support of nurses. The current study revealed that more than three fourth 167 (87. %) of respondents had poor knowledge of enteral nutrition, while 25 (13%) of them had good knowledge of enteral nutrition.

This result implies that knowledge of nurses on enteral nutrition was bad for better nutritional support in governmental hospitals and this was comparable with the same study done in Alexandria, Egypt in which only 15 nurses out of 85 (17.6%) had adequate knowledge(36). Also this was comparable with the study done in Pakistan revealed that very few participants (10%) had adequate level of knowledge(37). The results were also consistent with a study of Al Kalaldeh(2011) who assessed 253 critical care nurses from three major hospitals in Jordan; the results revealed that around 70% of the participants' scored less than 60% in knowledge comprehension regarding enteral nutrition(36).

In this study, more 3/4 171(89%) of participants had poor practice and only 21(11%) have good practice and this result in line with the study done in Ismailia general hospital ,Egypt that more than half of the studied nurses had an unsatisfactory level of practice regarding care given before NG tube feeding administering(30). About 104(54.8%) of study participants are not aware that guideline is available in their ICU and majority, 116(60.4%) of study participants responds that their ICU department didn't have protocol. This is also contradicted with the study done in Australia that observance to protocols has been shown to improve enteral nutrition delivery (Marshall, Cahill, 2012) and improve clinical outcomes in critically ill patients (Bourgault et al. , 2007). This study found that most respondents had access to an enteral nutrition protocol to guide delivery (38).This result also in line with the study done in Pakistan revealed that only a few nurses had adequate level of performance. With regard to practice(37).

Even though it is recommended that all facilities should provide safe nutritional support based on guidelines and protocols only 76(39.6%) and 88(45.8%) of participants were aware of protocol and guideline respectively. This was not in line with Hyeland et al(39) demonstrates that protocol can significantly improve nutritional support.

There are many major contributing factors to unintentional underfeeding practices and in this study almost more than half (102(53.1%) of participants stated that resource shortage affect their practice to effective enteral nutrition and also 36(18.8%) of participants that lack of knowledge is the main challenge for their practice next to resource shortage. This study goes in line with a study done at Jordan revealed that Participants moderately perceived barriers with more focus on insufficient resources in ICU (31). Findings in this study also show the same. The majority of nurses, 68.6% (n=35) reported feed/tube shortage as a major challenge experienced during tube feeding practices.

The present study is not comparable with the study done in Egypt Ismailia general hospital revealed s that factors affecting nurse's practice regarding nasogastric tube feeding as the nurses perceived were the absence of learning, physical exhaustion, stress to be contaminated, lack of nursing staff, diminished pay, non-appearance defensive garments, expanded workload, and there were no prizes or redesigns for effective medical attendants. This may be attributed to lack of institutional resources , lack experience, lack of rewards and lack of encouragement to wards enteral nutrition in our country(30).

The present study revealed no statistical significant difference between males and females in practice and knowledge by multi vitiate. This result agrees with the results of AlKalaldeh (2011) study which was conducted on nurses from 3 hospitals in Jordan, no significant difference was found between male and female nurses regarding their knowledge, practice or nursing documentation of enteral nutrition (36).

This result revealed that educational status has strongly associated with level of knowledge of nurses on enteral nutrition. In multi variant, Participants who are first degree holders were less likely to had adequate knowledge by 76/100 than MSc. Holders. (AOR = .240, 95% CI: (.61, .936) These observations could be explained by the fact that as the level of their education increased, the level of knowledge increases and this finding was not consistent with a previous study done in Malawi (22) which revealed that there was no statistically significant difference between the knowledge of certificate nurses and state registered nurses. This discrepancy could be due the fact that all of the nurses were not taken training about enteral nutrition in their nursing school, Lack of adequate resources like guidelines, protocols and there was no a good supportive supervision supported by the responsible bodies.

Participants in the age group of 20-28 were less likely to had good practice by 98% on enteral nutrition than age group of 46-61 (AOR = 0.023, 95% CI: (0.001,0.523).This study is not comparable with the study done in Egypt that tells majority (61.42%) of the respondents was under 30 years of age but this variable was not correlate with any significant outcomes of knowledge and skills(37).

Participants who were aware of protocol had 3 time of good practice than not aware of protocol about enteral nutrition. (AOR =3.401, 95% CI: (1.186, 9.789)

This study reveals nurses who got in school nutrition training were 2 times higher to had good practice on enteral nutrition than didn't have. (AOR = 1.951, 95% CI: (.063, .601) and this in lines with a study done in Egypt, nurses who attended previous educational sessions regarding scored significantly higher than the others knowledge(30).

The present study showed that there was no significant correlation between total assessment of Nurses' Knowledge & Performance Regarding enteral nutrition and practice While this study had discrepancy with Ahmed and Mondal who reported that there was statistical signifies moderately positive correlation between knowledge and practice of staff nurses regarding(30). And also had a discrepancy with a study done in Pakistan, There was a positive strong association between knowledge and practice, as those who had adequate knowledge had adequate skills (100%)(37).

CHAPTER SEVEN: CONCLUSSION

Critically ill patients are hyper metabolic and have increased energy requirements, making nutritional support a vital intervention. The nurses' knowledge and practices regarding enteral nutrition at the critical care department were not enough with some unsafe practices. In the Intensive Care Units, enteral nutrition is based on opinions rather than evidence-based practices. Participants moderately perceived barriers with more focus on insufficient resources in ICU and among healthcare providers. Such barriers are modifiable and manageable, making their identification and management crucial for optimal patient care.

There was a lack of educational materials, policies and protocol about enteral nutrition in the critical care department and Participants moderately perceived barriers with more focus on insufficient resources in ICU. Such barriers are modifiable and manageable, making their identification and management crucial for optimal patient care.

Therefore, there is a need to identify the barriers to evidence based practice protocols for enteral feeding of patients in Addis Ababa governmental hospital ICU and this study confirms that enteral nutrition is a multidisciplinary responsibility.

CHAPTER EIGHT: LIMITATION OF THE STUDY

8.1 Strength of the study

The strength of this study was the inclusion of nurses from across Addis Ababa city who works in adult ICU departments.

From 209 participants, 192 of the participants accepted to participate in the study making a response rate of 91.86% ≈ 92% when there were too much work overload and different persons who done research on at that time which is acceptable. This might be because the researcher personally approached the participants and this facilitated the response (Polit& Beck, 2006).

Also there was nothing that was done in Ethiopia published about enteral nutrition and low attention was given to this area but this study may give some insight about enteral nutrition.

8.2 Limitation of the study

A small sample size may affect estimations of the parameters and power of the test. This cross sectional study by its nature cannot establish cause and effect relationship. However, findings from this study can show as a current knowledge and practice of enteral nutrition within the study area.

Only a self-administered questioner was used as a tool due time shortage and it was better to add a checklist for increasing the quality of the data. Instead some open ended questions were added to the administered questioner. Also the nurses were boredom because about more than 6 graduating students were doing their thesis on ICU nurses.

8.3Recommendation

8.3.1 Recommendation for FMOH and A.A health bearue

Based on the findings of this study, periodic on-job and pre-service training regarding enteral nutrition should be provided to all types of health care givers particularly nurses. Regular supportive supervision by experts is also needed to motivate, refresh to all nurses and to properly provide nutritional support.

It is recommended to establish a written updated protocol of enteral nutrition to ensure enough knowledge, unified and safe nursing practice and to emphasize the integration of evidence-based guidelines on enteral nutrition into existing tube feeding training and practice.

8.3.2 Recommendation for Education

Enteral nutrition content has to be revised to ensure that it is based on current evidence, and it should be the educational institutional policy to revise the content frequently.

8.3.3 Recommendation for hospital nursing managerial

It is recommended that the hospital nursing management take a leading role in developing guidelines, and have a policy in place for in-service training to orient nurses in this practice. Nursing practice should also focus on educating the patients/guardians about tube feeding so as to improve informed consent which will help with compliance in respect of this care.

8.3.4 Recommendation for further Research

To the researcher's knowledge this study is the first to be done in the country and serves as a baseline study. Further research to include more settings would be valuable. There are gaps identified for further research to strengthen findings. For example; there is a need to assess the kitchen feed preparation process and how much is given, how the nurses, doctors and dieticians work towards enteral nutrition support by checklist . It’s also recommended to implement this study on other hospitals in Ethiopia outside Addis Ababa city.

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ANNEXES

AnnexI.: English version information sheet

Title: Assessment of knowledge and practice towards enteral nutrition and associated factors among nurses who are working at adult ICU of governmental hospitals in Addis Ababa city Ethiopia.

Principal investigator: Tsige Hadera Tikubet

Name of the institution: Department of Emergency and critical care, School of Emergency medicine, College of Health Sciences, Addis Ababa University.

Introduction of investigator

Greetings! My name is Tsige Hadera. I am a master's student in Addis Ababa University, school of Emergency medicine. Currently I am doing a research on Knowledge and Practice towards EN and its associated factors among nurses who are working at ICU department of governmental hospitals in Addis Ababa city. This information sheet is prepared to enable ICU nurses to understand purpose of the study consciously, ask for further explanation and participate voluntarily. The study involves self-Administer questioner for nurses y who works in Adult ICU.

Purpose of study: The purpose of this research is to understand the KP of ICU nurses towards enteral feeding and associated factors in adult ICU departments of governmental hospitals in Addis Ababa city .If you agree to take part in this study, you will be answer the questioner for about 10-15 minutes.

Study procedure: Volunteer participants in this study will be given a questioner on a few questions regarding their KAP on entral nutrition. In addition you will be asked to sign on the consent form for your voluntariness. Findings of this study will be shared through presentation, but your name will not be mentioned with the report.

Possible risks/ discomforts: The study is not associated with any harm. However you might feel uncomfortable in answering the questions when you take your time on it associated with work over load. In case you experience any severe discomfort please let me know and you will stop the questioner and will be continued if you fell like.

Possible benefits: At the moment, this study will not be of direct benefit to you, but I hope that findings from this study may help the policy makers to make decisions in designing appropriate programs, strategies and policies that will of advantage indirectly to you and directly to your patients admitted to ICUs.

Data confidentiality: All collected data will be handled so as to protect your confidentiality. No names will be mentioned and the information will be coded. I would like to assure you that all information about you will be protected from the public and your personal identity will not be mentioned in any report of this study.

All details of your information will be stored and secured in a pass ward protected files in the researchers personal computer.

Voluntary participation and right to leave the research

Participation to this study is voluntary and you have the right to decide whether to participate or not. You also have the right not to participate in this study or withdraw from the study if you wish without any worry.

Payment: there is no payment for study participants since; the research is to be conducted while the participants are attending care in the ICU wards.

Contact for additional information

If you need more clarification about this study, you can call or contact the researcher;

Tsige Hadrea *Mobile: 0910559270,*

Email: tsigehadera16@gmail.com

Annex II: Written consent form

The above information sheet describing the study purpose and procedure, benefits and risks, confidentiality issues, voluntary participation and rights to withdraw for the research title **"Assessment of knowledge and practice towards enteral nutrition and associated factors among nurses who are working at adult ICU of governmental hospitals in Addis Ababa city Ethiopia. "** has been read and explained to me. I have been given an opportunity to ask any question for more explanation about the research. I agree to participate as a volunteer.

_____

_____

Date Name and signature of volunteer

I certify that purpose of the study, potential benefits and possible risks associated with participating in this study was explained to the above individual.

_____

_____

Date, Name and signature of researcher

Annex III: Semi structured questionnaire guide

THANK YOU FOR TAKING YOUR TIME TO HELP WITH THIS QUESTIONNAIRE

A Descriptive Study of Knowledge and Practice towards EN and associated factors among nurses who are working at adult ICU of Governmental hospitals in Addis Ababa city, Ethiopia

SECTION A: SOCIO-DEMOGRAPHIC DETAILS (Please tick where applicable)

101. Sex

A)Male	
B)Female	

Age	\ ..... years

103. What is your highest level of nursing training?

A) Diploma	
B) Degree	
C) MSC (Master's degree)	
D) Others (Please specify) ----------	

	Yes	No
104. Was enteral nutrition a part of your training in your nursing school?		
105. Apart from the nursing school training; have you had any in service training on enteral nutrition?		

106. How long have you practiced in this unit? ----------

SECTION B: KNOWLEDGE DETAILS

201. Are you aware of any guideline on enteral nutrition?

A) Yes B) No

202. Does your ICU have any protocol on nutrition A) Yes B) No

203. Which should be the preferable route of nutrition in ICU unless contraindicated?

A) Enteral nutrition B) Parenteral nutrition

205. How early enteral nutrition should be started (unless contraindicated)?

A) 24-48 hrs. C) After 2 weeks

B) After 1 week D) after a month

206. Is absence of bowel sound is complete contraindication for enteral nutrition?

A) Yes B) No

207. Is passage of flatus is a must prior initiating enteral nutrition? A) Yes B) No

208. Do you give intermittent boluses or continuous Ryle's tube feed in your ICU?

A) Intermittent boluses B) Continuous infusion/ by feeding infusion pumper

209. How do you confirm Ryle's tube position in your ICU?

A) Auscultation C) Both

B) Chest X-ray D) None

210. How many degree did you elevate the head of bed during feeds?

A) 15-30 degree C) 10-20 degree

B) 30-40 degree D) None

211. How is Ryle's tube feed supplied in your ICU?

A) Blenderised feed B) Pre manufactured feed

212. Amount of residual gastric volume for Ryle's tube feed to be withheld?

A) Greater than 50 ml C) Greater than 200 ml

B) Greater than 100 ml D) Greater than 500ml

213. After how much time is the supplied bottle feed discarded (if left unused)?

A) 2hrs C) 6hrs

B) 4hrs D) 24hrs

214 Are you competent enough in the following procedures?

A)Assessment of patient nutritional status	Yes	No
B)Insertion of a nasogastric tube		
C) Checking for proper tube placement		
D) Giving continuous tube feeding?		
E) Giving bolus (intermittent) tube feeding?		
F) Choosing the appropriate formula to feed?		
G) Aspirating gastric residual volume		

215. What are the absolute contraindications to enteral nutrition?

A) ----------

B) ----------

216. Do you want to upgrade your knowledge on enteral nutrition? A) Yes B) No

216 If yes, which way?

A) Nursing tutorials C) ICU manual

B) Preprinted materials D) other (specify) ----------

SECTION C: PRACTICE DETAILS

301. What is your scope of practice in enteral nutrition? (Tick all that apply)

1)Nutritional assessment	
2)Inserting a nasogastric tube	
3)Tube Feeding the patient	

302. What kind of feeding tube do you normally use?

Small bore	
Large bore	

303. How do you confirm proper tube placement when you have inserted a nasogasric tube?

(Please tick one that applies)

1) Using bubbling method when tube is placed in water	
3)Using PH indicator strips(litmus paper)	
3)Auscultation of abdomen for air	
4)Other(specify ----------	

304 .How much do you do the following procedures during enteral feeding for your patient?

	Never **1**	Sometimes **2**	Almost always **3**	Always **4**
Do you Confirm tube placement before delivery of feed?				
Do you Flush tube before and after administration of feed?				
Do you Check gastric residual volume before initiating feed?				
Do you conduct daily inspection of nostrils?				
Do you document any nutritional support or complication about your patient?				
Do you discuss nutritional management of patients during ward rounds				

305. Are patients placed in a specific position during tube feeding? Yes..... No....

(If yes specify position)----------

306. At what rate do you provide enteral nutrition? (Tick only one that applies)

1)Any amount and rate depending on amount of feed available	
2)Depends on doctor's prescription	
3)20 to 50 ml per hour (or 300-500mls 5-8 times a day)	

307. What feeds do you normally give to patients on tube feeding? (Please tick one type commonly used)

1) Hospital Kitchen feed i.e. soups, milk	
2) Feed brought by patients relatives	
3) Commercial formulas	

308. What patient/family characteristics affects during your EN practice? (Please list of them)

A) Lack of awareness by patients and attendants about enteral nutrition

B) Inadequate resources (Lack of affordability)

C) Poor participation in decision making towards enteral nutrition

D) Patient complexity like irritability, Intolerance etc

E) Other

309. What are the challenges you face in your enteral nutrition practice? (Please list the most two)

A) ----------

B) ----------

309. How do you think enteral nutritional support of the critically ill can be improved in your ward? (Please give your suggestions)

A) ----------

B) ----------

C) ----------

D) ----------

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 the student: Tsige Hadera

Date._____ Signature _____

Approval of the primary Advisor

Name of the primary advisor: Mr. Wagari Tulu

Date._____ Signature _____