

St. Paul's Hospital Millennium Medical College School of Nursing



Assessment of Knowledge and Practice of Enteral and Parental nutrition Among Nurses working in Adult Intensive Care Unit (ICU) in Public Hospitals in Addis Ababa, 2023

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Research Proposal Submitted to St. Paul's Hospital Millennium Medical College, Department of Nursing in Partial Fulfillment for the degree of Bachelor of Science in Emergency and Critical Care Nurse

January 2023

Addis Ababa, Ethiopia

Acknowledgement

We are extremely grateful to my advisor Mr. Solomon Oljira (Msc) who helped us in all stages of the study research with full interest, encouragement and constructive criticism .He made us feel more confident and be hard working than ever before.

We sincere thanks also go to our Friend Thomas Q. (MPH) for his edition, comments and time invested on the completion of this research proposal.

We would also like to pass my gratitude to the library staffs of SPHMMC department of Nursing for arranging internet and library services.

List of Acronyms

AAHB	Addis Ababa Health Bureau
BMI	Body Mass Index
BSc	Bachelor of Science
EBR	Ethiopian Birr
EN	Enteral Nutrition
EPSA	Ethiopian Pharmaceutical Supply Agency
FMOH	Federal Ministry of Health
GIT	Gastrointestinal Tract
HCP	Health Care Providers
ICU	Intensive Care Unit
IM	Intra Muscular
IV	Intra Venous
IRB	Institutional Review Board
LOS	Length of Hospital Stay
NGT	Nasogastric Tube
PN	Parenteral Nutrition
SC	Sub Cutaneous
SPHMMC	Saint Paul Hospital Millennium Medical College
SPSS	Statistical Package Social Science
WHO	World Health organization

Abstract

Background: In critically ill patients, enteral and parenteral nutrition is recommended as a route for nutrient delivery. Nurses' knowledge and practice of enteral and parental nutrition influence patients' clinical outcomes.

Objective: To assess nurses' knowledge, practice, and associated factors regarding enteral and Parental nutrition in adult intensive care unit patients in public hospitals in Addis Ababa, Ethiopia December/2022 to January/2023.

Methods: A cross-sectional study design was used to collect data from 207 nurses working in public hospitals in Addis Ababa from December/2022 to January/2023. The data were entered into and analyzed with SPSS version 26. The correlation between independent variables and dependent variables was estimated using bivariate and multivariate logistic regression at a 95% confidence level. P-value of less than 0.05 was considered as statistically significance in multivariate.

Results: The level of adequate knowledge and good practice of nurses relating to enteral and parenteral nutrition was 131(63.29%) and 119 (57.48%) respectively. Diploma Nurses holders were less likely to be knowledgeable (AOR= 0.24, 95% CI: (0.04, 0.93)). Nurses' practice about enteral and parenteral nutrition was significantly associated with nurses' age (AOR = 0.073, 95 % CI: (0.003, 0.52), nurses receiving training on parenteral and enteral nutrition (AOR = 1.215 % CI: (0.05, 1.71)), and nurses from ICUs having a guideline and protocol on parenteral and enteral feeding practice (AOR = 2.39, 95 % CI: (1.326, 4.211)).

Conclusions: In the study, it was revealed that a substantial proportion of nurses had inadequate knowledge of enteral and parenteral nutrition and practiced poor enteral and parenteral nutrition. Therefore, our study recommended that the FMOH, AAHB and Hospital Administrators should work on improvement of nurse knowledge and practice on enteral and parenteral nutrition.

Keywords: Enteral and parental, nutrition, ICU nurse; Knowledge, practice

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1. Introduction

1.1. Background

Critical illness is associated with many complications such as anorexia, hyper metabolism, mal absorption; atrophy of muscles, liver, kidney, gastrointestinal tract & heart; impaired cell mediated immunity susceptibility to infections, poor wound healing, anemia, death. Oral feeding is not usually administered with critical care patients because of their clinical situation. Therefore, a large proportion of these patients require artificial nutrition, given either as parenteral or enteral nutrition (1).

In the intensive care unit (ICU), nutrition is one of the most important aspects of medical care for critically ill patients. A high prevalence of morbidity and mortality is associated with malnutrition, affecting up to 40% of hospitalized patients (2).

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 due to its cost effectiveness, prevention of intestinal mucosal atrophy, and maintenance of intestinal immunity through gut-associated lymphoid tissue (3).

In patients with functional gastrointestinal tracts, EN is indicated when oral nutritional intake is inadequate to meet estimated nutritional needs. The use of EN should begin within the first 24 to 48 hours of admission for patients who receive ventilator support and have stable hemodynamic states with an adequate total caloric intake of 20 to 25 calories per kilogram of body weight for most adults in the ICU (4, 5).

It is crucial to consider the underlying medical condition, nutritional status, and available routes of nutrient delivery when determining the type and amount of nutritional support. The ICU nurses play an important role in maintaining the daily nutritional status of patients. To prevent complications related to enteral feeding and improve outcomes, effective nursing practices such as the use of prokinetic agents, decreasing feeding rate, measurement of gastric residual volume, and maintaining the correct positioning of patients are required (6).

Although few data are available on nursing knowledge and practice regarding nutritional feeding in ICU, some studies have shown that nurses working in ICU have inadequate knowledge and poor practice that leads to the highest prevalence of malnutrition among hospitalized patients (15-18). In some studies, factors such as lack of guidelines and protocols on EN, no established nutrition

committee, a shortage of feeding tubes, patient characteristics such as refusal of tube feeding, differences in nurses' characteristics, and the environment where tube feeding practice is conducted may affect nurses' knowledge and their practice (7, 8).

The investigators are unaware of any study conducted on nurses' knowledge and practice, associated with enteral and Parental nutrition in ICUs of public hospitals in Addis Ababa, Ethiopia. So, this study aimed at assessing nurses' knowledge, Nurses' practice, and associated factors with enteral and Parental nutrition in ICU of public hospitals in Addis Ababa, Ethiopia.

1.2 Problem of the statement

World Health Report Working Together for Health, the World Health Organization (WHO) indicated a dramatic shift from understanding poor health worker performance as being caused by lack of knowledge and skills to a focus on improving their knowledge and practice. The report emphasized the need to develop capable, knowledgeable and supported health workers. This is an essential ingredient in overcoming bottlenecks to achieving national and global health goals (9).

Study done in Egypt showed that Nurses' lack of knowledge is considered to be one of the most significant factors contributing to medication administration errors. The frequency of medication errors made by nurses and the consequences of these errors affect not only the health of the patient but also the overall cost of health care. These medication errors and the reactions that result from them cause increased length of stay, cost, patient disability, and death. These include harm to the nurse involved, in regard to his or her personal and professional status, confidence, and practice (10).

The study done in Ethiopia by Silashi et.al showed that there are 23175 patients were admitted in the ward in the last three months at selected government hospital. During the assessment there are not constant ways of food / nutrition service in all selected government hospitals. There is no standardized menu for each types of illness. The budget which is allocated for the admitted patients is not enough to provide quality diet s for patients. One CEO of selected government hospital during the study time reported that: "The government didn't allocate enough budgets for our admitted patients. We have asked both at federal and regional health bureau. Nutrition service in health facilities fail to be noticed by hospital administrators and government ministries that is the main focus area for a patient's hospital experience or a patient's recovery from injury and illness.

Poor nutrition also has adverse effects on the clinical course of many acute illnesses and communicable diseases (11).

Despite the benefits of EN and PN to critically ill patients, this process is usually associated with many complications, particularly if performed without an adequate level of knowledge. Inappropriate delivering and poor management of EN and PN can result into several complications, such as tube blockage or mal-positioning, nausea, vomiting, pulmonary aspiration, overfeeding, diarrhea, treatment-related complications and delivery-site related complications like infection and agitation (12).

ICU nurses play a significant role in preventing such complications because they are responsible for identifying patients' nutritional risk, the calories needed, initiating and managing EN and monitoring any potential complications^{16,17}. Accordingly, they must be knowledgeable enough to administer EN to critically ill patients safely. Providing nutritional support for critically ill patients via EN encounters some obstacles. Patients who receive EN might suffer several complications such as diarrhea (defined as more than three defecations a day), vomiting, constipation, lung aspiration (verified by clinical or radiological signs), tube dislodgment, tube clogging, nasal ulcer, hyperglycemia (blood glucose level above 200 mg/dl), electrolyte alterations (e.g. Na, K, and Ca) and anxiety (13).

Studies conducted on knowledge and practice of Enteral and parenteral nutrition have influence on health care providers who have directly related to the quality of health service in Ethiopia like others developing countries were understudied.

1.3 Significance of the study

Critical illness is typically associated with a catabolic stress state in which patients commonly demonstrate a systemic inflammatory response. This response is coupled with complications of increased infectious morbidity, multi-organ dysfunction, prolonged hospitalization, and disproportionate mortality. Traditionally, nutrition support in the critically ill population was regarded as adjunctive care designed to provide exogenous fuels to support the patient during the stress response. This support had three main objectives: to preserve lean body mass, to maintain immune function, and to avoid metabolic complications. Recently, these goals have become more focused on nutrition therapy. Delivering early nutrition support therapy by using the parental or Enteral, is seen as a proactive therapeutic strategy that may reduce disease severity, diminish complications, decrease length of stay in the ICU, and favorably impact patient outcome. As a critical care nurse, the researcher noticed some nursing noncompliance with the parenteral nutrition instructions and protocols regarding parenteral nutrition; such as amount and frequency of parenteral nutrition, checking solution bag and many other observations. At the same time, little is known about the nurses' knowledge regarding total nutrition administration in the critical care units; moreover, few studies handled the daily nursing practices regarding parenteral nutrition in critical care settings, especially in Egypt. As the basic knowledge and nursing activities regarding enteral and parental nutrition can differ from health care institution to another and even within the same institution; therefore, special studies should be carried out to explore nurses' knowledge and identify their practices regarding enteral and parental nutrition in order to determine the gaps, defects and work necessary to overcome the defects. This study provided information that is important to practice administration and policy maker.

For Policy Maker: This study will provide input for policy maker on changing quality of care and working environment adjustment. Again, for education and training of staff this study may indicate the area of interest for provision of problem solving education.

For Health Manager and Patient Outcome: Administrators could use this information to build solid and supportive units. This is important because the culture of the unit and the quality of health care professionals affects every aspect of the patients' care. Health care managers and practitioners should be aware of the hardships that health professionals face in trying to give quality care to patients.

2. Literature Review

2.1 Introduction

This chapter focuses on the Knowledge and practice regarding Parenteral and Enteral Nutrition among nursing personnel. Malnutrition is defined as: acute, sub-acute or chronic state of nutrition, in which a combination of varying degrees of over nutrition or under nutrition with or without inflammatory activity have led to a change in body composition and diminished function. Malnutrition is a serious challenge to hospitalized patients. Enteral nutrition is defined as feeding through the GIT via a tube, catheter or stoma that delivers nutrients distal to the oral cavity. Management of malnutrition is a low-risk and cost-effective strategy that requires a multidisciplinary approach. Parental nutrition means feeding intravenously (through a vein). Parenteral means outside of the digestive tract. Enteral nutrition (EN) is a delivery system that supplies all the essential nutrients - including water and minerals - into the gastrointestinal tract (by mouth or tube) and then into the stomach, duodenum, or jejunum (14).

Nurses in intensive care are in a key position to maintain patients' nutritional status at an optimal level and closer to the nutritional goals (15).

2.2 Knowledge and practice of Enteral and Parental nutrition

Literature reports that poor interaction and ineffective nursing involvement are obstacles in the optimal provision of nutrition care in patient management. Although evidence-based practice is emphasized by nurses as an important tool, the lack of resources and ineffective aspiration-reduction measures are found to impede adherence to these guidelines. In addition, the majority of staff nurses are found to understand the advantages of EN, when EN should be initiated and the indication therefore. Lack of knowledge in administering proper nursing care, the poor recording of nutritional information and the understanding of nurses' responsibilities with regard to Parenteral and Enteral Nutrition are the greatest challenges observed. The study by Gupta et al. that assessed EN practices and perspectives in an intensive care unit (ICU), revealed a great interest in the upgrading of knowledge, with the majority of participants preferring an updated manual in their working environment and others preferring nursing tutorials (16,17).

The study conducted in Pakistan, showed that 10% of participants had appropriate levels of expertise (18). The research conducted by Al Kalaldehy et al(2015), who evaluated 253 critical

care nurses from three major Jordanian hospitals; the results revealed that almost 70% of the participants scored less than 60% in enteral nutrition knowledge understanding (19).

The study done in Yemen showed that the ICU nurses exhibited an inadequate level of knowledge concerning EN management. However, only 10.90% of the ICU nurses had an overall adequate level of knowledge regarding the EN management as a whole and the levels of adequate knowledge of it before administration, during administration and after administration were (16.10%, 5.80% and 9.20%, respectively) (20). Studies stressed on the regular checking for tube position which is strongly associated with low complication incidences. Feeding tube should be checked regularly before each feeding administration or at least every day using a reliable indicator such as radiographic confirmation (X-ray) which is still considered as a 'gold standard' (21). It was evident that nurses well perceived the knowledge and responsibility for nutritional assessment and claimed competency in undertaking nutritional assessment while examining the effectiveness of delivered feeding (22).

Research conducted in Australia, which found that following procedures improved enteral feeding delivery and improved clinical outcomes in critically ill patients. The majority of the people polled said they didn't have access to an enteral nutrition protocol to help them supply nourishment (23).

The study conducted in Iran showed that the nurses' poor PN administration performance can be attributed to several factors. First is the limited training in Iran's nursing education system. For example, nurses with bachelor's degrees are permitted to work in an ICU. However, they only receive a 2-week internship in the ICU during their schooling. This limits their education, especially in the area of PN administration. However, during the past decade, Iran's Ministry of Health and Medical Education has launched a postgraduate nursing care program that includes critical care nursing concepts. Another factor for poor performance is the lack of implementation of standardized nutrition guidelines for patients in the ICU. In Iran, the physicians order the nutritional therapies, while nurses both administer the nutrition and monitor the patients. Lack of resources and, in some cases, inadequate management of resources in health care also contribute to poor performance (24).

The research conducted in Egypt's Ismailia General Hospital, which found that more than half of the nurses examined had an acceptable level of skill when it came to providing care prior to NG

tube feeding administration. This was in line with research conducted in Egypt, which found that nurses who had previously attended knowledge-related educational sessions scored much higher than those who had not (25).

Malnutrition is a debilitating and highly prevalent condition in hospital settings. During hospitalization, malnourished patients continue to deteriorate due to their nil per os (NPO) status and interruptions to feeding due to medical and surgical procedures. Globally, malnutrition affects 20–50% of hospitalized patients, with other studies reporting a prevalence rate of 13– 69% worldwide (26, 27)

International studies have reported a 40% prevalence of malnutrition cases, with European hospitals reporting rates of 23.7% (one in four patients) (23). The study in Spain of dysphagia patients reported a total cost of malnourished patients to be $8\,004 \pm 5\,854 \text{ €}$ ($\pm \text{R}121\,180$) vs. $6\,967 \pm 5\,630 \text{ €}$ ($\pm \text{R}105\,480$) of well-nourished; $p = 0.11$. 28 In geriatric hospitalized patients, the prevalence of malnutrition is between 12% and 75% (28).

The Study conducted in Ethiopia Haile et al. found that in Amhara National Regional State Referral Hospitals in Ethiopia, approximately 55.6% of hospitalized patients were malnourished, and this was mainly due to weight loss associated with HIV/AIDS (25). The prevalence of malnutrition in Ecuadorian hospitals is 37.1%, and this is associated with patient age, education level, length of hospital stay and the presence of a chronic disease such as cancer, which is exacerbated by the status of malnutrition prior to admission (29).

Study participants in the age group of 20-28 were 0.02 times less likely than the age group of ≥ 46 to have a good practice on enteral nutrition (AOR = 0.02, 95 % CI: (0.001,0.52). The majority of study participants said that a lack of feeding tubes, a lack of understanding, and work overload were primary obstacles they faced during enteral nutrition procedures. According to the findings, almost two-thirds of the respondents 130 (67.7%) had insufficient understanding, while just 62 (32.3%) had acceptable knowledge of enteral nutrition (30).

The risk of malnutrition increases each day after admission, even in patients who were well nourished prior to admission. Furthermore, a lack of nutritional screening on admission to hospital, unavailability of feeding protocols, inadequate in-service training sessions for healthcare workers, especially for nurses who are the first contact for patients on admission, and a limited number of

nutritionist/dietician posts available in hospitals may further contribute to the development and worsening of hospital malnutrition (31).

2.3 Conceptual Framework

For a Conceptual framework of Assessment of Knowledge and Practice of Enteral and Parental nutrition Among Nurses working in Adult Intensive Care Unit (ICU) in Public Hospitals. Depending on the Literature reviewed on ICU Nurse the structural conceptual framework developed below to discuss the findings from the empirical data that will be generated.

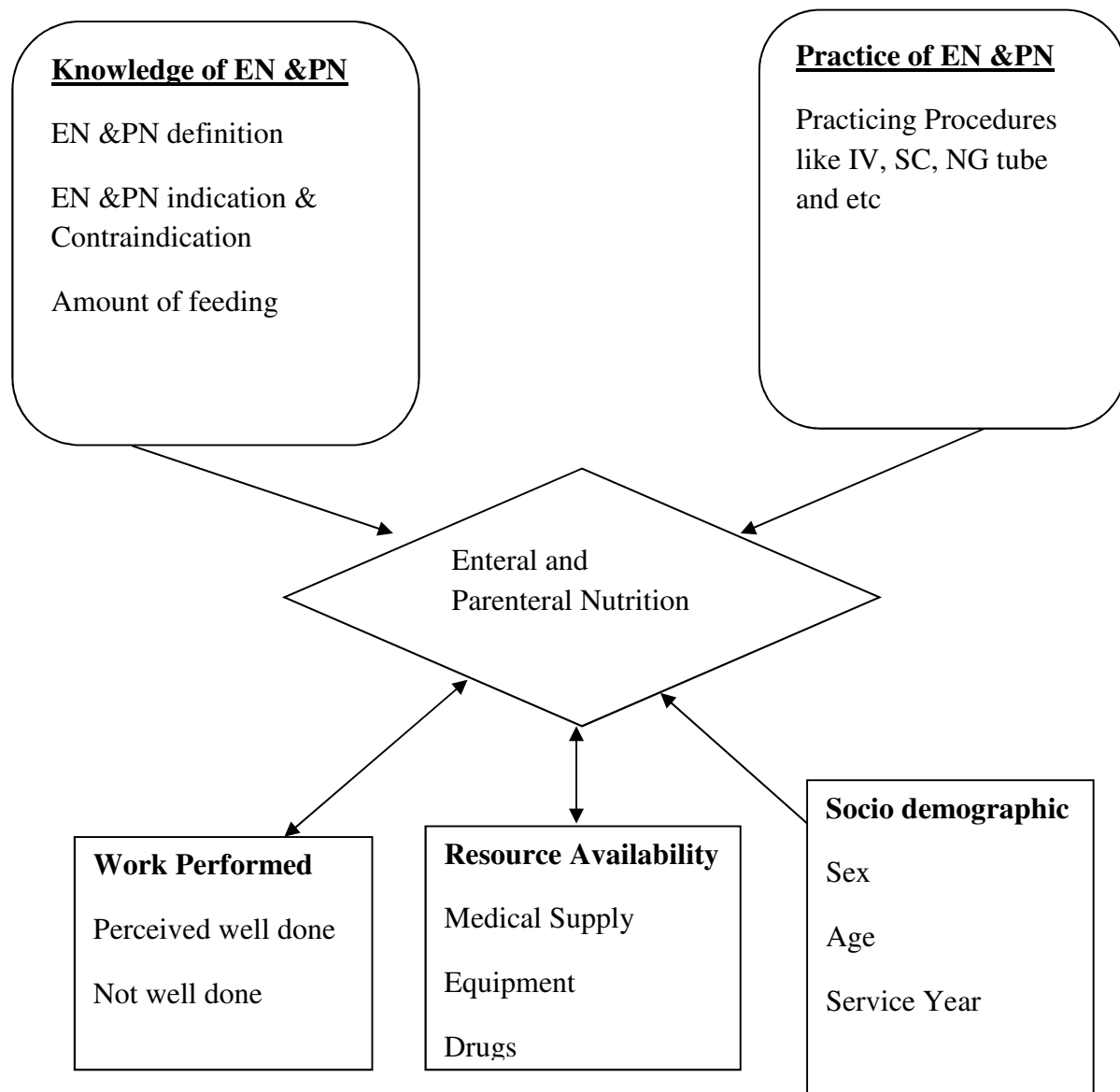


Figure 1: Conceptual framework that articulates Parental and enteral nutritional feeding).2: 432).

3. Objectives

3.1 General objective

To assess the knowledge and Practice of Parental and Enteral Nutrition among nurses working in Adult ICU Public hospitals in Addis Ababa, Central Ethiopia from October/2022 to November 2022

3.2 Specific objectives

- 1.To assess the knowledge of Parental and Enteral Nutrition among nurses working in Adult ICU Public hospitals in Addis Ababa, Central Ethiopia from October/2022 to November 2022
2. To assess the Practice of Parental and Enteral Nutrition among nurses working in Adult ICU Public hospitals in Addis Ababa, Central Ethiopia from October/2022 to November 2022

4. Methods and Materials

4.1 Study area and period

The study was conducted from December/2022 to January/2023, in six public hospitals in Addis Ababa, the capital city of Ethiopia. There are 10 public hospitals in Addis Ababa. Those are Tikur Anbessa Specialized Hospital, St. Paul Millennium Medical College and Hospital (SPMMCH), Addis Ababa Burn, Emergency and Treatment (AaBET) Hospital, Yekatit 12 Hospital, Tirunesh Beijing Hospital, Ras Desta Damtew Hospital, Zewditu Memorial Hospital, Menelik II Hospital, All Africa Leprosy, Tuberculosis, Rehabilitation, and Training Center (ALERT) Hospital and St Peter Hospital. From these hospitals the study will be conducted on six public hospitals in Addis Ababa. Simple random sampling was used to select this hospitals. The total number of ICU nurses in 10 public hospitals is 409.

4.2 Study Design

A cross-sectional quantitative study design was conducted to assess knowledge, practice, and factors associated with enteral and parental nutrition among nurses working at ICUs of public hospitals in Addis Ababa, Ethiopia.

4.3 Population

4.3.1 Source Population

All nurses who are working at ICUs of public hospitals in Addis Ababa was be taken as the source population

4.3.2 Study Population

Nurses who was on the duty during data collection time and who fulfilled the inclusion criteria was included in our study population.

4.3.3 Inclusion criteria and exclusion criteria

Inclusion Criteria: Those nurses who was present during the study period and volunteer to participate in the study will be included

Exclusion Criteria: Those did not available (annual leave, maternal leave) during the study period will be excluded from the study

4.4 Sample Size Determination and Sampling Procedure (Technique)

Sample size (n) was determined based on a single proportion formula with the following assumption. Since there was no similar study done in Ethiopia, we took the prevalence of nurses´

knowledge and nurses' practice on enteral and parental nutrition as 50%. The level of confidence (α) was taken at 0.05 ($Z (1 - \alpha/2) = 1.96$); the margin of error was taken as 0.05. By consideration of the 10% non-response rate, the final sample size (nf) of this study will be 218. Also, the number of study units to be sampled from each ICU will be determined using the proportion to size allocation formula. Lists of nurses will be taken from each unit of hospitals and simple random sampling will be used to select respondents from each ICU of the public hospitals in Addis Ababa.

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

Where, n= Minimum sample size required

$Z \alpha / 2$ =Standard deviation corresponding to 95% confidence interval = 1.96

d=error of precision or degree of accuracy (5%) =0.05

P=is the estimated proportion of Enteral and Parental which is 50 %

$$n = \frac{(1.96)^2(0.5)(1 - 0.5)}{(0.05)^2} = 384$$

Because the total population is less than 10,000 which is 409, sample size will be determined by using the correction formula as follow:-

$$N = \frac{n}{1+n/N}$$

$$N = \frac{384}{1 + 384/409} = 198.060 \approx 198$$

By adding 10% non-response rate total sample size will become $(198+20) = \underline{\underline{218}}$

4.5 Sampling Procedure

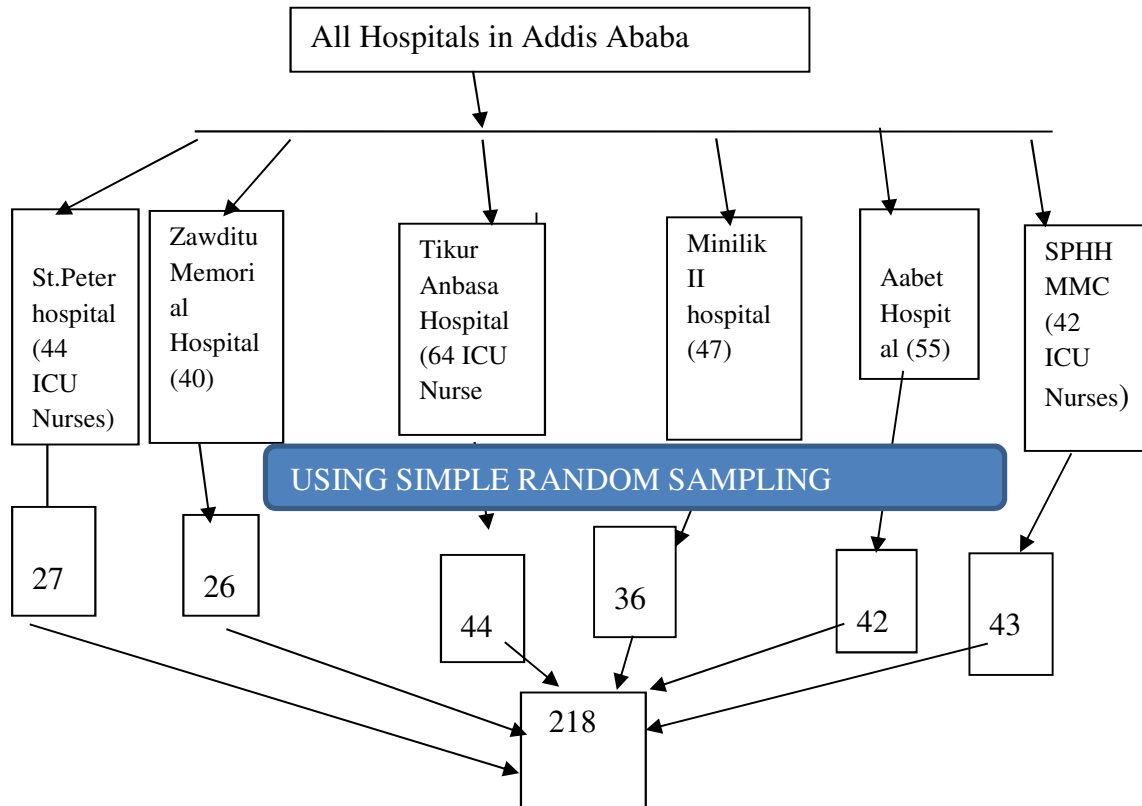


Figure 2: - Diagrammatic representation of sampling procedures

4.5 Data collection method

Data was collected from respondents by using structured questionnaire, which was prepared in English. Structured self-administered questionnaire was used to collect data. The questionnaires have three parts. Part one has some closed-ended questions that help to assess socio-demographic characteristic, part two questions are to assess knowledge of enteral and parenteral feeding and part three practice assessment of enteral and parenteral feeding to helps to determine practice of Nurses doing in Adult ICU.

4.6 Study Variables

Dependent variable: Enteral and Parenteral Nutrition

Independent variables:

Age, Sex, Level of Education, Training, Availability of medical Equipment, Service year, Knowledge, Practice

4.7 Data Collection Procedure

4.7.1 Development of data collection instrument

Data collection tools development was mainly based on the issues the study wish to investigate particular Enteral and Parental Nutrition from a literature review and some of them were adopted and modified from the Development of Tools to Measure the knowledge and practice of Enteral and parenteral nutrition on Developing Countries, a guide Enhancing malnutrition: a Toolbox for Self-Assessment published by the International Development Research Centre (22, 27).

4.9 Data Quality Control

The data collectors was recruited and trained for one day on the objectives of the study; instrument, how to collect data and how to conduct supervision on each Hospital. One data collector from each hospital was selected with respect to his/ her experience to data collection and communication skill to others staffs.

Questionnaires was checked by principal investigator for omissions and incomplete answers. Responses was then carefully coded; with verification. After checking all questionnaires for consistency and completeness the supervisors have submit the filled questionnaire to the principal investigator. And, prior conducting the actual study, 5% (11 participants) of the questionnaire was pre-tested in Bishoftu Hospital, which is not, included in study health facilities for precision, sequence, simplicity and soundness.

4.10 Data Analysis Procedure

The data collected was captured using Excel on a predesigned spread sheet. In order to achieve the results, descriptive statistics was used to analyses the demographic profiles of the participants, using frequencies and percentages presented by means of tables. Chi-Square tests was used to determine the level of association between the number of years of experience, knowledge and practices of nurses with regard to Parental and Enteral Nutrition. Descriptive statistics was used to describe each individual variable using mean, standard deviation and other methods. Results was

summarized and presented by tables and in narration form. The Statistical Package for the Social Sciences (SPSS) software was used to analyses the data.

4.11 Ethical Considerations

At the time of data collection verbal consent was obtained from the participant and confidentiality of the respondents will maintain. We also informed the participants that there will be no penalty or denial of services for not participating in the study and no payment for participating in the study. The proposal was submitted to St. Paul's Hospital Millennium Medical College (SPHMMC) Institutional Review Board (IRB) for ethical clearance. Having secured the ethical clearance, the IRB approval and SPHMMC's support letters was submitted to Addis Ababa Health Bureau and support letter to respective Hospitals. The data collection was started after official permission is secured from the respective hospitals.

4.12 Operational definitions of terms

Level of knowledge: Each answer for knowledge questions was given a “1” score for correct answers and “0” for incorrect answers. Those who scored <65% were considered as having inadequate knowledge whereas those who scored $\geq 65\%$ were having adequate knowledge (31).

Level of practice: Each answer for practice questions was given a “1” score for correct answers and “0” for incorrect answers. Those who scored <65% were considered as having inadequate practice whereas those who scored $\geq 65\%$ were having adequate practice (12, 31).

4.13 Dissemination Plan

The findings of the study was submitted to SPHMMC school of Nursing. Following submission, the results will be defended in the SPHMMC. After the approval of the findings by the Nursing department and Examiners copies will be distributed to Addis Ababa Health Bureau and respective hospitals study carried on.

5. Result of the Study

A total of 218 self-administered questionnaires were distributed to Nurse Professionals working in six public hospitals in Addis Ababa, the capital city of Ethiopia. Those are St.Peter hospital, Zawditu Memorial Hospital, Tikur Anbasa Hospital, Minilik II hospital, Aabet Hospital and SPHMMC.

From the distributed questionnaires 207 was returned with a response rate of 94.95%. Non response rate of this study was found to be 5.05% which accounts 5(five) of them refused to participate in the study and 6(six) was incomplete.

5.1 Socio -demographic characteristics of the respondents

From the respondents of the total of 207 Nurse Professionals, the males were 135(65.2%) and females made up the rest 72(34.8%). The median age of the respondents were 28(SD 3.65), work experience 5(SD 3.29). The frequency distribution of respondents by age showed that most of them 127 (61.4%) were in the age category 20-29 years followed by 30-39 years which is 44(21%).

The largest group 99(47.8%) of the respondents have one to five years of experience. About 78(37.2%) of the respondents have 6-10 years' experience, 26(12.6%) of the respondents have 11-15 years' experience and 4(3.9%) have 16 and above years of experience.

The Highest academic qualification of the respondents was BSC nurses 117(56.5%) followed by diploma 59(28.5%), master's degree 23(11.1%) and other education level 8(3.8%).

From the respondents 61(29.5%) has taken formal training concerning the enteral and parenteral nutrition training and the remaining 146(70.5%) has not taken. 173(83.5%) has no protocols regarding enteral and parenteral nutrition (table 1).

Table 1: Socio-demographic characteristics of the respondents, 2023(N=207).

Variables (N=207)	Categories (N=207)	Frequency	Percentage (%)
Gender	Male	135	65.2
	Female	72	34.8
Age Category	20-29 years	127	37.2
	30-39 years	59	28.5
	40-49 years	16	7.7
	50-59 years	5	2.4
Level of Education	Diploma Nurse	59	28.5
	BSC Nurse	117	56.5
	Masters in Nursing	23	11.1
	Other	8	3.8
Experience	1-5 years	99	47.8
	6-10 years	78	37.2
	11-15 years	26	12.6
	16 and above	4	3.9
Training	Yes	61	29.9
	No	146	70.5
Having protocols/ guideline on	Yes	34	16.44
Enteral and parental nutrition			
	No	173	83.56

5.2 Knowledge of the study participants on enteral and parenteral nutrition (N=207)

Participants were asked eighteen (18) questions about enteral and parenteral nutrition in the ICU in order to assess their knowledge. They were categorized into two groups based on their responses to each question. According to the results, 76 (36.71%) of respondents had inadequate knowledge; however, 131(63.29%) of respondents had adequate knowledge. Approximately 34 (16.44%) of study participants were aware that guidelines existed in their ICU, and the majority 173 (83.56%) said that their ICU department has no EN and PN protocol. In most cases, 174 (84.06%) respondents knew which route to use to administer nutritional supplements. There were 107

participants in the study (51.7%) who answered incorrectly about the amount of gastric residual volume to be withheld, and most of the participants had an inadequate understanding of the absolute contraindications of EN and PN (Table 2).

Knowledge of Enteral and Parental nutrition Among Nurses working in Adult Intensive Care Unit (ICU) in Public Hospitals in Addis Ababa, 2023 (N=207)

Variables (N=207)	Categories (N=207)	Freq uenc y	Perce ntage (%)
EF is feeding through GI tube	Yes	126	60.87
	No	81	39.13
Enteral feeding is part of medical treatment	Increase length of stay	46	22.22
	Increase risk of mortality	19	8.69
	Provides bacterial growth	13	6.28
	Reduce risk of malnutrition	129	62.31
Complication of Enteral feeding	Hypoglycemia	163	78.74
	Aspiration	191	92.27
	Tube dislodgment	158	76.32
	Diarrhea	19	9.12
	All	169	81.64
Indication of Enteral feeding	Patients able to feed	44	21.25
	patients tolerate PO	57	27.53
	Patients with good swallowing reflex	18	8.69
	Patients with functioning of GIT unable to maintain oral intake	88	42.51
Absence of bowel sound is contra indication for feeding	Yes	143	69.08
	No	64	30.91

How long feeding set should be utilized before being changed	12hrs	116	56.03
	24hrs	73	35.26
	48hrs	84	40.57
Patients receiving ETF bed is elevated to 60'	Yes	168	81.16
	No	39	18.84
Common Route of parenteral feeding is	IM	2	0.98
	IV	201	97.10
	SC	4	1.92
Benefits of parenteral feeding	To maintain health of GIT	153	73.91
	Maintain normal bowel elimination	177	85.51
	To provide nutrition	184	88.89
Complication of Parenteral nutrition	Infection	138	66.67
	Adverse metabolic effect	61	29.46
	Venous complication	8	3.86

5.3 Practice of the study participants on enteral nutrition (207)

In assessing their level of practice about enteral and Parenteral feeding in the ICU, participants were asked 17(seventeen) questions. According to the results of the current study, more than half 119 (57.48%) respondents had good enteral and parenteral feeding practices, while 88 (42.52%) had poor practices. One hundred ninety nine (96.13%), 206 (99.56%), and 167 (80.67 %) of the participants responded that they always confirm tube placement before delivery of feeding, Using bubble with water, and documenting any nutritional support or complication about their patient respectively (Table 3).

Practice of Enteral and Parental nutrition Among Nurses working in Adult Intensive Care Unit (ICU) in Public Hospitals in Addis Ababa, 2023 (N=207)

Variables (N=207)	Categories (N=207)	Frequency	Percentage (%)
Scope of practice of Enteral nutrition	Nutrition assessment	204	98.55
	Inserting NG tube	205	99.03
	Tube feeding	203	98.07
When do you confirm proper tube placement	Never	0	0
	Sometimes	8	3.87
	Always	199	96.13
Do you confirm proper placement before feeding	Yes	198	95.65
	No	9	43.47
Do you check gastric residuals before initiate feeding	Yes	202	97.58
	No	5	2.42
Do you check daily inspection of nostril	Yes	200	96.61
	No	7	3.39
Do you document what you did during procedure	Yes	167	80.67
	No	40	19.32
Is V/S mandatory during parenteral feeding?	Yes	198	95.65
	No	7	3.35
At what rate you provide enteral feeding?	Any amount	2	0.96
	Depend on physician order	201	97.11
	300-500ml	4	1.93
What family characteristics affect you during parental and enteral practice?	Lack of awareness	201	97.11

	In adequate resources	32	15.46		
	Patient irritability	16	7.73		
How do you confirm proper NG tube placement	Using bubble with water	206	99.52		
	Litmus paper	4	1.96		
	Auscultation	197	95.17		
When do you practice parenteral feeding	In Emergency situation	194	93.71		
	During anaphylactic shock	13	6.28		
What is your scope of practice in parenteral feeding	IM	200	96.61		
	SC	23	11.11		
	IV	207	100		
IM	Intra muscular	SC	Subcutaneous	IV	Intra Venous

6. Discussion

According to the results, 76 (36.71%) of respondents had inadequate knowledge; however, 131(63.29%) of respondents had adequate knowledge. The findings were inconsistent with a study conducted in Pakistan, which indicated that just 10% of participants had appropriate levels of expertise (19). Again this study is inconsistent with the study done in Yemen showed that the ICU nurses exhibited an inadequate level of knowledge concerning EN management. However, only 10.90% of the ICU nurses had an overall adequate level of knowledge regarding the EN management as a whole and the levels of adequate knowledge of it before administration, during administration and after administration were (16.10%, 5.80% and 9.20%, respectively) (20). This may be due to socio demographic characteristics, different health system strengthening method and different tool for collecting data.

The findings were similarl with that of of Al Kalaldehy et al(2015), who evaluated 253 critical care nurses from three major Jordanian hospitals; the results revealed that almost 70% of the participants scored less than 60% in enteral nutrition knowledge understanding. The similarity may be due to similar nearly similar sample size.

According to the results of this study, more than half 119 (57.48%) respondents had good enteral and parenteral feeding practices, while 88 (42.52%) had poor practices. This conclusion was consistent with research conducted at Egypt's Ismailia General Hospital, which found that more than half of the nurses examined had an acceptable level of skill when it came to providing care prior to NG tube feeding administration (25). This similarity may be due to similar health system of Egypt and Ethiopian health system.

6.1 Strength and Limitation of the study

Strength:

Since study cannot be conducted on this topic in Addis Ababa it will be a good input for policy makers, health service managers and other health professionals.

Limitation:

- The cross sectional study design may not guarantee the exact assessment of cause-effect relationship.
- This study may be limited to the nursing staff working in Adult ICU setting only
- This study will be conducted in Hospitals and therefore cannot be generalized in public Health Centers and private health facilities.

7. Conclusion

In conclusion, the nurses' knowledge and practices related to enteral and parenteral nutrition in public hospitals in Addis Ababa, Ethiopia, were found to be inadequate, with certain dangerous procedures. Enteral and parenteral nutrition was dependent on views rather than evidence-based methods in these ICUs. Therefore, FMOH, Addis Ababa health Bureau and Hospital administrators should give attention for further improvement of enteral and parenteral nutrition.

8. Recommendation

Based on the study finding the following recommendations are proposed.

For Hospitals managers and Hospitals Boards of the Addis Ababa Health Bureau

- The hospital should need to improve the availability and quality of hospital medical equipment and supplies at all levels. Essential drugs, medical, furniture's should consistently, timely and adequately available because it decreases quality of care
- Most of study participants were not trained and no protocols. Thus the hospital management needs to set training programs and job descriptions for workers at all levels and recognize best performer health professionals.
- Hospital should regularly arrange training opportunities for health professionals.

For Ethiopian pharmaceutical supply Agency:

- As low medical Equipment and drugs, ICU nurses was most de motivated for their work. So that the EPSA should consider regular way of increasing medical Equipment's and Drugs for health professionals.

For FMOH and Addis Ababa Health Bureau

The FMOH and AAHB have to enhance the promotion have to increase the knowledge and practice of ICU nurses on Enteral and Parenteral nutrition through different training, Implementing Guideline, protocols and Investigating different research on the topic.

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8. Annexes

Participant's consent form

St. Paul's Hospital Millennium Medical College (SPHMMC)

Department of Nursing

Dear Respondent we are the Emergency and critical care nursing students from SPHMMC (Saint Paul's Hospital Millennium Medical College), Addis Ababa. This Research is to assess nurses' knowledge, practice, and associated factors regarding enteral and Parental nutrition in adult intensive care unit patients in public hospitals in Addis Ababa, Ethiopia. It is in partial fulfilment of the requirements in Partial Fulfillment for the degree of Bachelor of Science in Emergency and Critical Care Nurse. We would be grateful if you could be part of my research subjects. The research is for academic purposes and your opinion would be treated as confidential. You have the right to withdraw from this process at any stage you wish with no negative consequence to you, but it would be appreciated if you fully complete it. We will protect information about you taking part in this research to the best of our ability. We will neither use your name in any reports nor discuss your participation with anyone outside the research team. No payments will be made for your participation. This research proposal has been reviewed and approved by the ethical review board (IRB) of SPHMMC.

I understand all that has been explained to me about the study – objectives, benefits, risks and my rights, and I agree to participate in this study.

Signature of respondent

Date

Thanks for your cooperation

Thank for your willing to participate in this research study

SECTION A: Socio demographic Information

1. Hospital Name-----

2. Please indicate your gender

		Tick (√)
A	Male	
B	Female	

3. Please indicate your age.

		Tick (√)
A	Less than 20 years	
B	20 -29 years	
C	30 – 39 years	
D	40 – 49 years	
E	50 – 59 years	

4. Please indicate your highest level of qualification attained.

		Tick (√)
A	College Diploma	
B	BSC Nurse (University Degree)	
C	Master's degree	
D	Other (please specify)	

5. How long have you been working as a nurse professional.

		Tick (√)
A	< 1 year	
B	1 - 5 years	

C	6 – 10 years	
D	11 – 15 years	
E	16 – 20 years	
F	> 25 years	

6. Have you received formal training at the institution or in other institution on how to administer Parenteral and Enteral Feeding?

		Tick (√)
A	Yes	
B	No	
C	I don't know	

7. Are protocols/policy documents available regarding parenteral and enteral feeding in your workplace?

		Tick (√)
A	Yes	
B	No	
C	I do not know	

SECTION B: Knowledge assessment of enteral and parenteral feeding

8. Enteral Tube Feeding (ETF) is defined as “feeding through the gastrointestinal tract(GIT) via a tube, catheter, or stoma that delivers nutrients distal to (or beyond) the oral cavity”.

		Tick(√)
A	True	
B	False	
C	I do not know	

9. Does ETF form part of the medical treatment?

		Tick(√)
A	Yes	
B	No	
C	Unsure	

10. What are the benefits of ETF?

		Tick(√)
A	It increases length of hospital stay	
B	It increases risk of mortality	
C	It promotes bacterial growth	
D	Reduce the risk of malnutrition in hospitalized patients	
E	It symbolizes care for the patient from the medical team	
F	A, B, C and D are correct	

11. Which of the following are regarded as complications of ETF?

		Tick(√)
A	Hyperglycemia	
B	Aspiration	
C	Tube dislodgement	
D	Diarrhea	
E	A, B and C	
F	All the above correct	

12. Which of the following are indications for ETF?

		Tick(√)
A	Patient presenting with adequate oral food and beverages intake	
B	Patient presenting with no feeding difficulties	
C	Patients whose GIT is not functioning	
D	Patent with good swallowing reflex	
E	Patients with a functioning GIT unable to maintain oral intake	

13. Gastric residual volume of > 500ml per day is an indication that the patient is tolerating the feed well.

		Tick(√)
A	Agree	
B	Disagree	
C	I do not know	

14. Indicate which of the following situations increases the need for ETF in a patient unable to consume orally.

		Tick(√)
A	BMI < 16	
B	BMI > 30	
C	Nil per os > 1 day	
D	All of the above	
E	Only A and C	

15. When the patient was on Total Parenteral Nutrition (TPN) how do we wean them to ETF?

		Tick(√)
A	Stop TPN and start the ETF at full feeding rate	
B	Slowly reduce the TPN at the same time slowly introducing ETF	
C	Slowly reducing the TPN and start ETF on full feeding rate	
D	I do not know	

16. The absence of bowel sounds is a strong contra-indication for tube feeding?

		Tick(√)
A	True	
B	False	

17. Tick the three most common causes of delayed initiation of tube feeding in your workplace.

		Tick(√)
A	Hemodynamic instability	
B	Delayed prescription by the physician	
C	Delays in inserting the tube	
D	GIT complications	
E	Insufficient / broken feeding pumps	
F	Feeds stock shortages	

18. How long a feeding set should be utilized before being changed?

		Tick(√)
A	12 hours	
B	24 hours	
C	48 hours	

D	It does not matter as long as it is not blocked	
---	---	--

19. Patients receiving ETF should have the head of their bed elevated to 60 degrees?

		Tick(✓)
A	Yes	
B	No	

20. How long can mixed feed powders products stand after reconstitution at roomtemperature and still be safe for use by patients?

		Tick(✓)
A	4 – 6 hours	
B	6 – 8 hours	
C	At least 12 hours	
D	12 – 24 hours	
E	24 – 48 hours	

21. How long can a mixed feed powder product stay in a refrigerator and still be safe to be administered in a patient?

		Tick(✓)
A	Immediately	
B	0 - 12 hours	
C	12- 24	
D	24 – 48	
E	I do not know	

22. Parenteral nutrition (PN) is used when the gastrointestinal (GI) tract is not functioning and the person is not able to be fed enough nutrition orally or by tube feedings

A	True	
B	false	

23. Which of the following is not common route of Parenteral Route? You can circle more than one

A	intramuscular	
B	subcutaneous	
C	intra venous	
D	Other(specify)	

24. What do you know the benefits of parenteral feeding?

A	to maintain the health of the gastrointestinal tract	
B	promote normal bowel elimination	
C	used to provide nutrition	
D	Other(specify)	

25. What do you know the complications of parenteral nutrition?

A	Infections	
B	Adverse metabolic effects	
C	Venous access complications:	
D	Other(specify)	

SECTION C: practice Assessment enteral and parenteral feeding

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

A	Nutritional assessment	
B	Inserting a nasogastric tube	
C	Tube Feeding the patient	
D	Other(specify)	

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

A	Small bore	
B	Large bore	
C	Other(specify)	

28. How do you confirm proper tube placement when you have inserted a nasogastric tube?
(Please tick one that applies)

A	never	
B	sometimes	
C	always	
D	Other(specify)	

29. Do you Confirm tube placement before delivery of feed?

A	yes	
B	no	

30. Do you Flush tube before and after administration of feed?

A	yes	B. No
---	-----	-------

31. Do you check gastric residual volume before initiating feed?

A	yes	B. No
---	-----	-------

32. Do you conduct daily inspection of nostrils?

A	Yes	B. No
---	-----	-------

33. Do you document any nutritional support or complication about your patient?

A	Yes	B. No
---	-----	-------

34. Are patients placed in a specific position during tube feeding?

A	Yes	
B	No	
C	If yes specify position)	

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

A	Any amount and rate depending on amount of feed available	
B	Depends on doctor's prescription	
C	20 to 50 ml per hour (or 300-500mls 5-8 times a day)	
D	Other specify	

36. 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 specify	

37. How do you confirm proper tube placement when you have inserted a nasogasric tube?
(Please tick one that applies)

A	Using bubbling method when tube is placed in water	
B	Using PH indicator strips(litmus paper)	
C	Auscultation of abdomen for air	
D	Other specify	

38. Do you Confirm tube placement before delivery of feed?

A	Yes	
B	No	

39. Do you check gastric residual volume before initiating feed?

A	yes	
B	No	

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

A	Any amount and rate depending on amount of feed available	
B	Depends on doctor's prescription	
C	20 to 50 ml per hour (or 300-500mls 5-8 times a day)	
D	Other(specify)	

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

A	intramuscular	C intra venous
B	subcutaneous	D Other(specify)

42. When do you practice parenteral feeding system?

A	in emergency situations of cardiac arrest	
B	During anaphylactic shock	
C	Other specify	

43. Is checking vital sign is mandatory during parenteral nutrition?

A	yes	B. No
---	-----	-------

44. Which of the following is considered during parenteral feeding?

A	Assess vital sign	
B	Maintain input and output	
C	Checking sign of complication	
D	Assess weight of the patient	
E	Other(specify)	

45. What are the most common complication during parenteral feeding in your area of practice?
(Please list the most two)

A	infection	
B	Hypoglycemia	
C	Hyperglycemia	
D	Fluid balance disturbance	
E	Other(specify)	

The End