Addis Ababa University
College of Health Sciences
School of Medicine
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Knowledge and Attitude towards Nutritional Support among Emergency and Critical care Medicine Residents at adult intensive care unit, Addis Ababa, Ethiopia

A Research Thesis Submitted to Addis Ababa University, College of Health Sciences, School of Medicine, Department of Emergency Medicine
In Partial Fulfillment of the Requirements for Postgraduate Specialty Certificate in Emergency Medicine and Critical Care

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November, 2024
Addis Ababa, Ethiopia

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Full research project title	Knowledge and Attitude towards Nutritional Support among Emergency and Critical care Medicine Residents at adult intensive care unit, Addis Ababa, Ethiopia
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ACRONYMS AND ABBREVIATIONS

AAU –Addis Ababa University

CHS –College Of Health Sciences

ECCM – Emergency and Critical Care medicine

ED - Emergency Department

EN - Enteral nutrition

E.S.P.E.N - European Society of Parenteral and Enteral Nutrition

ICU –Intensive Care Unit

IRB - Institutional Review Board

KAP - knowledge, attitude, and practice

MD - Medical Doctor

NGT – Nasogastric tube

NST - Nutrition Support Team

PN – Parenteral nutrition

SPHMMC -Saint Paul Hospital Millennium Medical College

TASH - Tikur Anbessa Specialized Hospital

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to the following individuals and organizations for their invaluable support in the development of this research thesis:

- AAU, CHS department of emergency medicine and critical care**:** I'm grateful to our department for providing the academic environment and resources necessary for this research.
- Dr.Birhanu and Dr. Biruk I'm particularly grateful for their guidance and mentorship throughout the development of this research thesis. Their expertise and insights were instrumental in shaping the research design.
- For all who have contributed to the success of this research work,

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ABSTRACT

Background Nutritional support is a crucial component of care for critically ill patients in the intensive care unit (ICU). It can improve clinical outcomes, reduce complications, and shorten hospital stays. However, studies suggest gaps exist in knowledge and attitude regarding nutritional support among healthcare professionals.

Objectives This study aims to assess the knowledge and attitude towards nutritional support among emergency and critical care medicine residents at Tikur Anbessa Specialized Hospital (TASH) and St. Paul's Hospital Millennium Medical College (SPHMMC) in Addis Ababa, Ethiopia.

Methodology Two facilities cross sectional observe have been carried out amongst EMCC resident's in-education in TASH and SPHMMC, Addis Ababa, from September to October in 2024. Pretested and based self-administered questionnaire became used to evaluate the residents' Knowledge and Attitude closer to Nutritional Support in ICU Settings with the aid of using the usage of followed evaluation tool. The finished facts became gathered thru net hyperlink after being organized we used Kobo Toolbox (kobtoolbox.org) to gather our data. Each response was then coded and manually reviewed to ensure accuracy before we analyzed the findings in SPSS version 27 Descriptive statistics, chi square take a look at and binominal logistic regression have been used to investigate the facts.

Results A total of 118 ECCM residents of TASH and SPHMMC were invited. Out of these, 105 residents responded, resulting in a response rate of 88.9%. A total of 105 residents (Male: n=77, 73.3%; Female: n=28, 26.7%) with a median age of 29 years (Interquartile Range: 28-40 years) participated. we found that53.3% of the participants had inadequate knowledge about nutritional support in the adult intensive care unit, while 46.7% had adequate knowledge. and the post-graduating institution attended and receiving bedside teaching on nutritional support were significantly associated with better knowledge. Additionally, years of experience and attendance at nutritional support lectures were positively correlated with higher knowledge scores. Attitudes towards nutritional support were also varied, 48.6 % had a positive attitude on nutritional support at adult intensive care unit, whereas 51.4% had a negative attitude notably, having nutritional support lectures during residency, being a resident at TASH, and the year of residency were significantly linked to more positive attitudes.

Conclusion Our study highlights the considerable knowledge gaps and varied attitudes towards nutritional support among ECCM residents in the adult intensive care unit (ICU). It is clear that there is a need for improved educational strategies.

1 INTRODUCTION

1.1 Background

Over 2 millennia ago ‘‘Hippocrates: Father of Medicine’’ (460 to 377 BC) once said ‘‘If we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health.’’ That is true even now with various nutrition surveys in hospitals continue to suggest that upwards of 40% to 50% of patients, particularly those in the intensive care unit (ICU), have a moderate to severe degree of malnutrition,[1]

Malnutrition is a change of body composition in which deficiencies of macronutrients and micronutrients result in progressive decline in body cell mass, various organs dysfunction, and abnormal serum chemistry values. Nutrition support plays a vital role in the prevention and treatment of nutritional deficiencies in at-risk, critically ill patients. [2]

where multiple studies have shown that more than 35% of Intensive care unit (ICU) patients are malnourished [3] and underfeeding is common in the ICU with patients receiving an average of only 60% of the calories that they are prescribed which rises their risk of infection, delays wound healing [4], leads to extended hospital stay and is associated with higher medical costs.

Malnutrition in critically ill patients may be pre-existing or may result from the pathophysiological effects of critical illness, which include the acute inflammatory response resulting in increased nutritional demands; starvation of patients which may be due to physical inability to take food or a requirement after some hospital procedures such as major surgeries; and malabsorption [5]

Nutritional support for critically ill patients is considered a standard of care; they are hyper metabolic and have increased energy needs. For the critically ill, nutritional support is a vital aspect of care, considered historically as a supportive care’s adjunct but more recently relocated as a therapeutic intervention [6]

Enteral nutrition (EN) is the most favored method of nutritional support for critically ill patients. It improves clinical outcomes and reduces costs associated with treatment compared to parenteral nutrition [7].

It is conceivably agreeable that EN is preferred over PN, as the former is more physiologic, less likely to be associated with biliary stasis or hyperglycemia, and certainly less expensive. [8] In addition, many studies have demonstrated that PN is associated with higher infection rates than is EN. [9] Medical nutrition therapy shall be considered for all patients staying in the ICU, mainly for more than 48 h

Ideally, a multidisciplinary team called Nutrition Support Team (NST) consisting of a physician, clinical pharmacist, dietician, and nurse delivers EN to patients where they combine their efforts to optimize patients' care [10]. Guidelines, such as those developed by the European Society of Parenteral and Enteral Nutrition (E.S.P.E.N.) emphasize the importance of cooperation between health care providers including physicians, clinical pharmacists, nurses, dietitians, and kitchen staff [11].

Multiple studies have indicated that clinicians frequently lack adequate knowledge about nutrition support. These investigations have revealed that between 47% and 88% of clinicians perceive a deficiency in their knowledge and training. Despite this lack of expertise, the studies also highlight that many clinicians still feel confident in making decisions related to nutrition support. [12]

1.2 Statement of the problem

There are still major global problems with insufficient feeding where observational studies have repeatedly shown substantial gap between guideline recommendations and real nutrition practice [13].

Critically ill patients in adult intensive care units (ICUs) have high nutritional needs due to increased metabolic demands and catabolism. Providing optimal nutritional support is a crucial component of their care and can significantly impact patient outcomes, including morbidity, mortality, and length of hospital stay [4].

Emergency and Critical Care Medicine Residents (ECCM Residents) play a vital role in managing critically ill patients in the ICU, including decisions around nutritional support. Residents' knowledge and attitudes regarding nutritional support may influence the quality of care provided.

In Ethiopia, studies have identified limitations in nurses' knowledge and practices related to enteral nutrition in ICUs [14]. There is a paucity of data regarding the knowledge and attitude of ECCM Residents regarding nutritional support for critically ill adults.

1.3. Significance of study

This study expected to

- Identifying Knowledge Gaps and Educational Needs:

- The study will assess residents' current knowledge base on nutritional support.
- The study will evaluate residents' attitudes regarding nutritional support
- Informing Local Healthcare Systems:
- The findings can inform the development of educational programs and guidelines for residents specifically focused on nutritional support
- This can contribute to improved standards of care for critically ill patients
- We hope to support future researchers and later improve patient care and support nutritional support.

2. LITERATURE REVIEW

Research conducted in London in July 2010 revealed that 44% of clinicians, 26% of nurses, 76% of dietitians, and 67% of other healthcare staff had a sufficient understanding of nutrition support guidelines. Overall, 59% of staff expressed a desire for more education on various aspects of nutrition support in the ICU. Less than half of the clinicians (44%) and a quarter of the nurses (26%) met the required knowledge levels as outlined by the National, European, and American guidelines. Despite this, 63% of clinicians and 60% of nurses reported feeling confident in making changes to nutrition support protocols. This finding is consistent with data from two recent studies: in one study, 47% of doctors reported inadequate knowledge of nutrition support, yet 65% admitted to regularly making decisions about it, while in another study, 90% of participants advised on nutritional practice despite 48% admitting limited knowledge. [15] Additionally, 24% of dietitians and 33% of pharmacists and speech and language therapists did not meet the required knowledge threshold, as specified in the guidelines. [12]

Another Cross-sectional study was performed at governmental (n=5) and nongovernmental (n=4) hospitals in the North West Bank of Palestine. From April 1 to June 31, 2019, Data were collected using a structured self-administered questionnaire from physicians and nurses a total of 405 physicians and nurses were participated in the study. Only 56% of participants strongly agreed that nutrition was important, only 27% strongly agreed that there should be nutrition screening, only 25% felt food helped with recovery. The median knowledge/attitude score was 71, with an IQR ranging from 65.00 to 75.0,.The mean knowledge and attitude score was 85.62 out of 128 with SD (9.50. Respondents with younger age categories, working in non-governmental hospitals in the ICU as practical and staff nurses, showed the highest KAP score ($p < 0.05$). Significance positive correlations were found between respondents' knowledge/attitude and practice scores regarding the quality of nutrition care in hospitals (r=0.384, p value < 0.05). . The research revealed that inadequate knowledge was perceived as a barrier to effective nutrition care to the patient Although the KAP of physicians and nurses is lower than in some other countries/studies, it highlights a strong need for more nutrition professionals in the hospital and increasing nutrition education to improve nutrition care in hospitals in Palestine.

Furthermore, establishing a nutrition task force in hospitals elaborated by dietitians as the unique nutrition care provider will assure to implementation of a standardized nutrition care process. [17]

Another descriptive, cross-sectional study with an analytical component was used to collect data from military nurses at South Africa through self-administered questionnaires. A score of 80% and above was rated as adequate knowledge, and questions regarding attitude were measured by means of a Likert scale. A p-value of <0.05 was used to test the hypothesis. Shows that in total, 207 (86.2% response rate) questionnaires were completed and captured. The average knowledge score was 46.3%. The most common sources of nutrition knowledge are in-service training (24.9%) and the nursing college (20.6%). Participants prefer lectures (45.4%) provided by the dietician to upgrade their nutrition knowledge. No significant differences were found between knowledge and professional rank or in the relationship between knowledge and years of working experience ($r = -0.01$; $p=0.85$).Nursing personnel have inadequate enteral nutrition knowledge, irrespective of their professional rank and experience. However, they are perceived to have positive attitudes towards the importance and administration of enteral nutrition. Future research should focus on whether continual in-service training improves the knowledge and practice of enteral nutrition among nurses. [18]

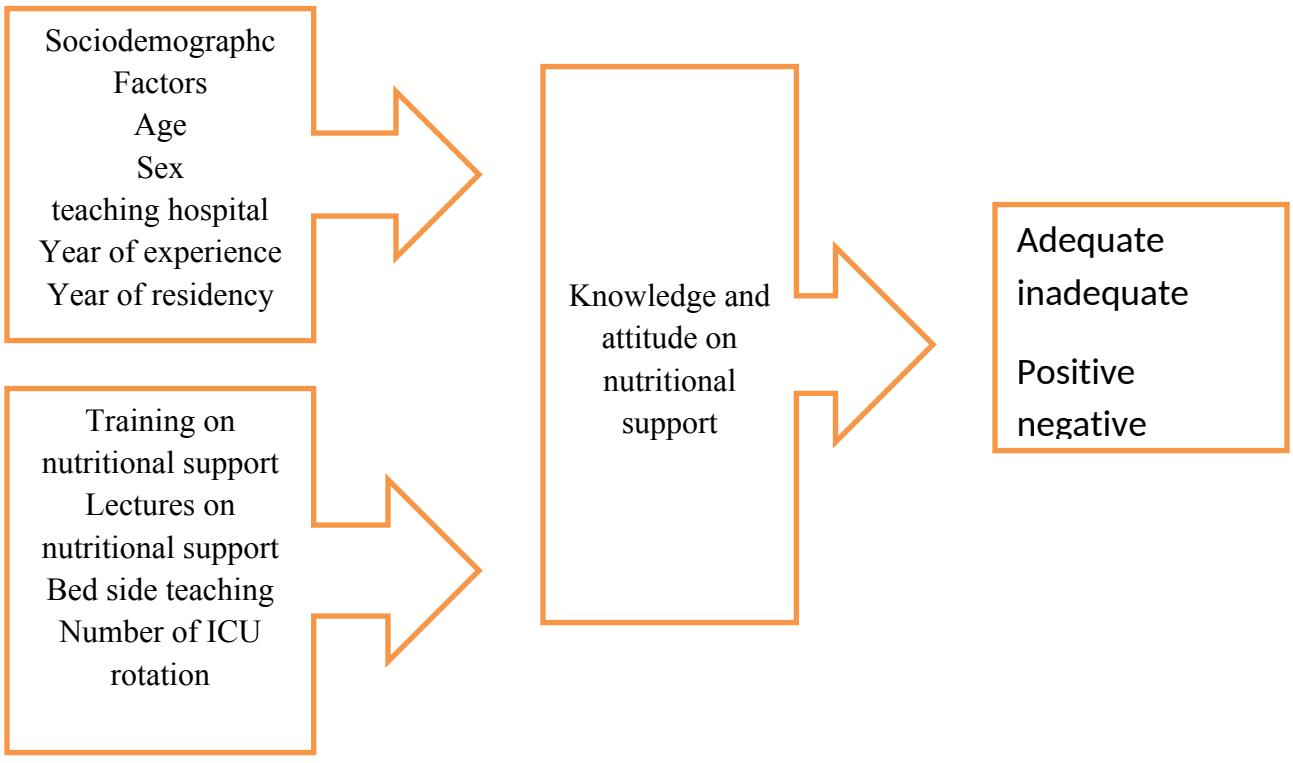
Another cross-sectional study was used to assess knowledge and practice of enteral nutrition among nurses who works in ICUs of governmental hospitals in Addis Ababa city, Ethiopia. A total of 209 nurses that met the inclusion criteria, 192 (92% response rate) responded to the questionnaire. A self-administered data collection method was used and undertaken on May 2019.shows that**:** 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). 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[14].

There is a paucity of research specifically examining the knowledge and attitude of ECCM residents in Ethiopian ICUs regarding nutritional support. Understanding the current state of knowledge, and attitudes in this specific context is essential to identify areas for improvement and develop targeted interventions.

2.1. Conceptual framework

Figure 1: The Relationship between knowledge and attitude of ECCMR toward nutritional support and associated factor



3. OBJECTIVE

3.1. General objective

To assess the Knowledge and Attitude towards Nutritional Support among Emergency and Critical Care Medicine Residents working in adult intensive care units (ICUs) of Addis Ababa, Ethiopia.

3.2. Specific objectives

- To evaluate the level of knowledge of Emergency and Critical Care Medicine Residents regarding nutritional assessment, enteral and parenteral feeding modalities, including indications, contraindications, and potential complications in adult critically ill patients.
- To explore residents' attitudes towards the importance of nutritional support in improving patient outcomes in the ICU setting.

4. METHOD AND MATERIALS

4.1. Study setting

Our study was done in 2024 at TASH and SPHMMC, which are both in Addis Ababa, the capital of Ethiopia

TASH is the largest hospital in Ethiopia, founded in Lideta Sub City established in 1972. Since 1998, faculty has served as the leading teaching hospital managed by Addis Ababa University.

The Emergency and critical Care Medicine launched in October 2010, providing services primarily in emergency rooms.

TASH has major intensive care units representing six medical units, four PICUs and six surgical intensive care units. EMCCS residents have their enrolling in all intensive care units, including the intensive care units at Zewditu Memorial Hospital (Addis Ababa hospital) during training. Training courses are present in both setups.

SPHMMC was founded in 2010. It is controlled by the board of directors as part of the Ministry of Health.

The Department of Emergency Medicine and Critical Care at Saint Paul's University was established in 20111

The Emergency Medicine and Critical Care (EMCC) Department at Saint Paul's Hospital Millennium Medical College (SPHMMC) have 2 intensive care units at the Addis Ababa Burn Emergency and Trauma Hospital (AaBET), a facility with 12 ICU beds, and the main intensive care unit at SPHMMC, which provides 13 ICU beds.

4.2. Study design

our study was a cross-sectional survey of two institutions

4.3. Population

4.3.1. Target population

All EMCC residents practicing in Ethiopia

4.3.2. Source population

All EMCC residents working at TASH and SPHMMC

4.3.3. Study population

All EMCC residents at TASH and SPHMMC who are assigned to the Intensive Care Unit

4.3.4. Study unit

Every single ECCM resident at TASH and SPHMMC

4.3.5. Sampling frame

List of EMCC residents at TASH and SPHMMC who were available and willing to participate

4.4. Eligibility Criteria

4.4.1. Inclusion criteria

All EMCC residents currently enrolled in the residency program at TASH and SPHMMC

4.4.2. Exclusion criteria

ECCM residents who were not affiliated with the ICU during the study period, either due to unwillingness or because they were temporarily out of training at that time (due to illness, leave, or maternity leave, for example).were excluded from the study

.**4.5. Sample size determination and sampling technique**

4.5. 1. Sample size determination

We use the single population proportion formula to calculate sample size of cross-sectional study

$$n = (Z^2 * p * (1-p)) / E^2$$

Where:

- **n:** is the required sample size
- **Z:** is the Z-score corresponding to the desired confidence level (e.g., 1.96 for a 95% confidence level)
- **p:** is the estimated proportion of the population with the characteristic of interest (if unknown, a conservative estimate of 0.5 is often used)
- **E:** is the desired margin of error (expressed as a proportion)(0.05).

$$n= (1.96)2(0.5(0.5)/ (0.05)2=384$$

Since the sample frame is less than 10000, we use the adjustment formula,

$$Nadj = n / (1 + (n - 1) / N)$$

Where:

- n is the initial sample size calculated in step 1. , n = 384
- N is the total population size , N=**119**

$$Nadj. = 384/ (1+384/119) \approx \mathbf{90}$$

Adding 10 % non-response rate sample size will be **99**.

We figured out our ideal sample size, and it turned out to be almost the same as the total number of EMCC residents at TASH and SPHMMC. So, we included everyone who was available at the time

4.5.2. Sampling technique and procedures

We purposefully selected TASH and SPHMMC, and because we had a complete list of the 118 residents at each hospital, we were able to enroll them all.

Table 1: allocation of proportion of study participants

	TASH	**SPHMMC**
R 1	**18**	**19**
R 2	**19**	**18**
R 3	**25**	**19**

4.6. Study Variables

4.6.1. Dependent variables

Knowledge and attitude of ECCM residents on nutritional support

4.6.2. Independent variables

Age

Sex

Teaching hospital

Year of experience

Year of residencies

Training on nutritional support

Lectures on nutritional support

Bedside teaching on nutritional support

Number of ICU rotation

4.7. Operational definitions

- **Emergency and Critical Care Medicine Residents:** Residents enrolled in a postgraduate training program specializing in emergency and critical care medicine.
- **Adult Intensive Care Unit (ICU):** A specialized department within the hospital dedicated to providing intensive care to critically ill adult patients.
- **Knowledge:** Residents' understanding of nutritional assessment, principles of enteral and parenteral nutrition, and complications associated with nutritional support in critically ill patients. This was measured through a validated multiple-choice questionnaire. Individuals who scored at or above the mean on knowledge questions about nutritional support at ICU are considered to have adequate knowledge. Those who scored below the mean are considered to have inadequate
- **Attitude:** Residents' beliefs and feelings towards the importance of nutritional support in critically ill patients. This was assessed through a questionnaire using a Likert scale, where residents rate their level of agreement with statements regarding the role of nutrition in patient outcomes. A positive attitude was defined as having an attitude score that is higher than or equal to the mean

4.8. Data collection tool and procedure

To collect our data, we created a structured questionnaire focused on self-management. This questionnaire was carefully developed by reviewing relevant research and keeping our study goals in mind. We also pre-tested the questionnaire to ensure it was clear and effective.

The survey was divided into three sections. The survey has been closed and some open questions

Section 1: Demographics (age, gender, year of residency, etc.)

Section 2: Knowledge (multiple-choice questions) on various aspects of nutritional support, including:

- Nutritional assessment in critically ill patients
- Indications and types of enteral and parenteral nutrition
- Monitoring and complications of nutritional support
- Current guidelines and best practices

Section 3: Attitude (Likert scale questions) to assess residents' beliefs and perceptions about the importance of nutritional support in patient care.

The questionnaire became organized in English. Informed consent, in written form, became acquired earlier than facts collection. It became offered to every resident after organized with the aid of using kobotoolbox.org thru on line hyperlinks to their telegram for every resident. Data became now no longer being accumulated from the ones who aren't cooperative to offer consent.

The number one investigator became the data collector and the completeness of the facts became checked earlier than finishing touch of data collection. Pretest became executed on 3% of the look at population. The questionnaire became pilot examined on a small pattern of residents to evaluate its clarity, validity, and reliability.

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4.9. Data quality control

The survey was clearly articulated by the respondents. The main researchers were heavily responsible for collecting data. Respondents had to answer all required questions. During the data collection period, regular monitoring was presented to ensure that all tasks were acquired and the total quality of the collected data was collected. Most of the data collection took place in person, with the data collector present to assist participants. We used KoboToolbox.org links to administer the survey, and we ensured that each respondent completed the survey only once Responses to data integrity were checked before entering information into the SPSS program.

4.10. Data processing and analysis

The completed data was coded, and entered into Excel, and exported to SPSS version 27 for analysis by the principal investigator. The descriptive statistics was described using frequency, median with interquartile range to characterize the study population using socio-demographic and background characteristics. Two categorical variables were analyzed using the chi-square test and fisher exact test. To identify factors associated with Knowledge and attitude on nutritional support binomial logistic regression analysis, adjusted odds ratios were computed. P-value less than 0.05 were considered statistically significant.

4.11 Ethical consideration.

A formal letter was taken from Addis Ababa University College of health sciences, Department of Emergency medicine and Critical care to get approval to conduct this and conducted after ethical clearance is obtained from the ethical Institutional Review Board (IRB) of SPHMMC. Then, data was collected after getting an official letter of permission. Participants declared consent when filling out the survey the information's confidentiality was ensured through a survey. All the collected data was organized and analyzed by the principal investigator. Study participants' identification was not be disclosed to the third party

5. RESULTS

5.1 Responses

A total of 118 online invitations have been sent to EMCC residents at TASH and SPHMMC via kobotoolbox.org. Of these, 105 residents responded, leading to a response rate of 88.9%

5.2 Characteristics of study Participants

A total of 105 residents (Male: n=77, 73.3%; Female: n=28, 26.7%) with a median age of 29 years (Interquartile Range: 28-40 years) participated. Fifty-six of the residents (53.3%) were from TASH, and forty-nine residents (46.7%) were from SPHMMC. Among the participants, 22.9% were 1st-year residents, 35.2% were 2nd-year residents, and 41.9% were 3rd-year residents. Eighty-one residents (77.1%) had less than 5 years of experience, while twenty-four residents (22.9%) had more than 5 years of experience. For ECCM residents, the total ICU experience during residency had a median of 4 months with an interquartile range (IQR) of 3 months (1-8).

Most participants (n=91, 86.7%) had not successfully completed at least one training focused on nutritional support, while others (n=14, 13.3%) had successfully completed at least one training. Regarding nutritional support lectures in the residency program, sixty-eight residents (64.8%) had not attended any lectures on nutritional support in the ICU, while thirty-seven (35.2%) had attended such lectures. However, sixty-three residents (60%) had received bedside teaching on nutritional support during standard ICU rotations, while forty-two residents (40%) had not received bedside teaching.

Among those who received bedside teaching, the majority were from ECCM consultants (87.5%) and ECCM senior residents (85.9%). Others included intensivists (35.9%), pulmonologists (17.2%), and anesthesiologists (6.3%).

Among those who received bedside teaching, 57.8% felt substantial changes were needed, 40.6% thought the teaching was adequate but required some changes, and 1.6% found it very helpful with no major changes needed.

Table 2: background characters of study participants (n=105)

Variables		Frequency	Percent
Sex	Male	77	73.3%
	Female	28	26.7%
Which post graduating institution are you in?	TASH	56	53.3%
	SPHMMC	49	46.7%
Year of residency?	1st	24	22.9%
	2nd	37	35.2%
	3rd	44	41.9%
Year of experience in medical practice?	< 5 yrs.	81	77.1%
	> 5 yrs.	24	22.9%
Have you successfully completed training focused on nutritional support?	No	91	86.7%
	Yes	14	13.3%
Did you have any Nutritional support lectures in your residency program?	No	68	64.8%
	Yes	37	35.2%
Do you ever have bedside teaching on Nutritional support during standard ICU rotations	No	42	40%
	Yes	63	60%

5.3. Knowledge of Respondents towards Nutritional Support at adult intensive care unit

Participants' knowledge was classified as adequate or inadequate using the mean of the group as a cutoff point. As a result, 53.3% of the participants had inadequate knowledge about nutritional support in the adult intensive care unit, while 46.7% had adequate knowledge.

All respondents answered two questions: the preferable route of nutrition in the ICU unless contraindicated and how early enteral nutrition should be started unless contraindicated. They indicated that enteral nutrition is preferred and should be initiated within 24-48 hours.

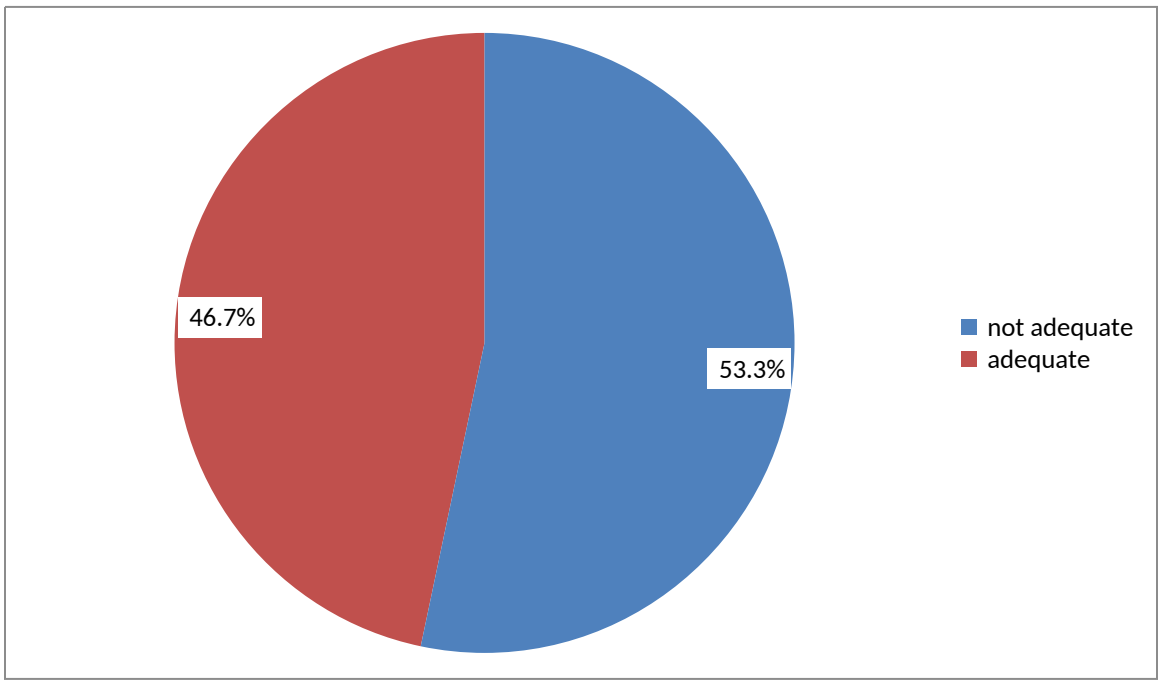

Figure 2: Percentage of adequate knowledge score and not adequate knowledge score

Table 3: frequencies and percentage of answers on knowledge questions

Questions	Correct answer		Incorrect answer	
The primary outcome measures impacted by nutrition support?	18	17.1%	87	82.9%
Which should be the preferable route of nutrition in ICU?	105	100%	0	0%
How early enteral nutrition should be started?	105	100%	0	0%
What level of energy intake would you target in the early stages of patient care?	60	57.1%	45	42.9%
Which of the following are regarded as complications of ETF?	93	88.6%	12	11.4%
A patient on nasogastric feeding has had 350 mL aspirated from their tube. How would you proceed?	19	18.1%	86	81.9%
Under what circumstances would you opt for parenteral nutrition?	81	77.1%	24	22.9%
When the patient was on Total Parenteral Nutrition (TPN) how do we wean them to ETF?	87	82.9%	18	17.1%

Table 4: Cross tabulation of knowledge score with socio-demographic variables

Crosstab					Chi-square Value at 95% Significance level	
		Knowledge total recoded				
		not adequate	adequate	Total	Value	P value
Sex	Male	42	35	77	0.17	0.68
	Female	14	14	28		
Which post graduating institution are you in?	TASH	13	43	56	43.738	**0.001**
	SPHMMC	43	6	49		
Year of residency?	1st	12	12	24	3.181	0.204
	2nd	24	13	37		
	3rd	20	24	44		
Year of experience in medical practice?	< 5 yrs.	46	35	81	1.701	0.192
	> 5 yrs.	10	14	24		
Have you successfully completed training focused on nutritional support?	No	50	41	91	0.712	0.399
	Yes	6	8	14		
Did you have any Nutritional support lectures in your residency program?	No	40	28	68	2.337	0.126
	Yes	16	21	37		
Do you ever have bedside teaching on Nutritional support	No	27	15	42	3.374	**0.05**
	Yes	29	34	63		

Cross-tabulation of socio-demographic variables and respondents' knowledge scores suggests a statistically significant association between the post-graduating institution attended and having received bedside teaching on nutritional support on respondents' knowledge scores

Table 5: Logistic regression analysis showing factors associated with knowledge of participants

Variables		**Knowledge**		**AOR (95%CI)**	**p-Value**
		Adequate	**Inadequate**		
Age IQR	29	29	29	0.834 (.622-1.120)	0.228
Sex	Male	35	42	0.508 (.136-1.900)	0.314
	Female	14	14		
Which post graduating institution are you in?	SPHMMC	6	43	1.039 (.011-.136)	**<0.001**
	TASH	43	13		
Year of residency?	1st	12	12	1.584 (.463-5.422)	0.464
	2nd	13	24		
	3rd	24	20		
Year of experience in medical practice?	< 5 yrs.	35	46	4.395 (.955-20.233)	**0.05**
	> 5 yrs.	14	10		
Have you successfully completed training focused on nutritional support?	No	41	50	0.368 (.068-1.987)	0.245
	Yes	8	6		
Did you have any Nutritional support lectures in your residency program?	No	28	40	1.712 (.400-7.327)	**0.0468**
	Yes	21	16		
Do you ever have bedside teaching on Nutritional support	No	15	27	0.882 (.211-3.695)	0.864
	Yes	34	29		
Total experience (in months) working in ICU during residency IQR	3	3	3	0.760 (.433-1.331)	0.337

The above table shows the results of a study examining the relationship between different traits of residents and knowledge about nutrition support in adult intensive care units. Multivariable binary logistic regression was performed after conducting chi-square after the effects of the following factors were performed: the post-graduating institution attended, year of residency, years of experience in medical practice, completion of training focused on nutritional support, receipt of nutritional support lectures during residency, participation in bedside teaching on nutritional support, and total experience (in months) working in the ICU during residency. The results are presented as adjusted odds ratios (AORs), along with their 95% confidence intervals.

In our study of these characteristics receiving bedside teaching on nutritional support ($\chi^2 = 3.374$, $p = 0.05$) and being a resident at TASH ($\chi^2 = 43.738$, $p = 0.001$) showed a statistically significant association with adequate knowledge of nutritional support in the adult ICU.

In multivariate logistic regression, residents with more than 5 years of experience had 4.395 times higher odds of possessing adequate knowledge of nutritional support in the adult ICU compared to those with less than 5 years of experience (AOR = 4.395, 95% CI = 0.955 - 20.233, $p = 0.05$).

Residents who had any nutritional support lectures in their residency program have 1.712 times higher odds of possessing adequate knowledge of nutritional support in the adult ICU compared to those who did not have such lectures (AOR = 1.712, 95% CI = 0.400 - 7.327, $p = 0.0468$).

Residents from TASH have 1.039 times higher odds of possessing adequate knowledge of nutritional support in the adult ICU compared to residents from SPHMCC (AOR = 1.039, 95% CI = 0.011 - 0.136, $p = 0.001$).

No statistically significant differences were found between groups in terms of age, sex, year of residency, completion of training focused on nutritional support, participation in bedside teaching on nutritional support, and total experience (in months) working in ICU during residency.

5.3. Attitude of Participants towards Nutritional Support at adult intensive care unit

A total of fifty one participants or 48.6 % had a positive attitude on nutritional support at adult intensive care unit, whereas fifty four or 51.4% had a negative attitude. The final attitude score was determined by taking the mean and classifying the respondents' attitudes as positive or negative.

The majority of participants had a positive attitude towards the question of whether nutrition support would influence the clinical outcome for critically ill patients, with 86.7% strongly agreeing and 13.3% agreeing.

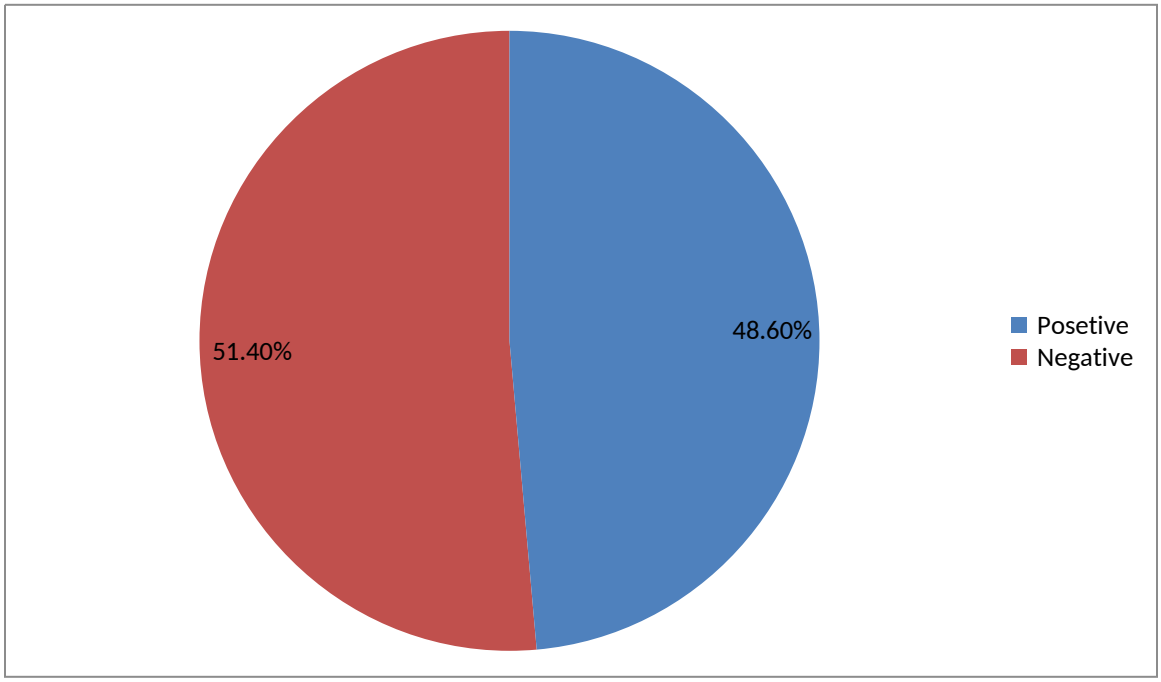

Figure 3: Percentage of positive attitude and negative attitude

Table 6: frequencies and percentage of answers on attitude question

Questions	Strongly agree		Agree		Uncertain		Disagree	
	frequency	Percentage	frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Nutrition support will impact the clinical outcome of a critically ill patient.	91	86.7%	14	13.3%				
Enteral feeding should be regarded as the primary method of nutrition support.	70	66.7%	33	31.4%	2	1.9%		
Monitoring tolerance to enteral feeding involves measuring nasogastric aspirates or gastric residual volumes.	36	34.3%	62	59%	5	4.8%	2	1.9%
Do you believe residents have to be involved in making decisions about nutritional support on your unit?	64	61%	41	39%				
What are your thoughts on making changes to the implemented nutrition support protocols?	37	35.2%	49	46.7%	19	18.1%		

Table 7: Cross tabulation of attitude score with socio-demographic variables

Crosstab					Chi-square Value at 95% Significance level	
		Attitude total recoded				
		Positive	Negative	Total	Value	P value
Sex	Male	36	41	77	0.382	0.536
	Female	15	13	28		
Which post graduating institution are you in?	TASH	36	20	56	11.863	**0.001**
	SPHMMC	15	34	49		
Year of residency?	1st	8	16	24	3.429	**0.05**
	2nd	18	19	37		
	3rd	25	19	44		
Year of experience in medical practice?	< 5 yrs.	41	40	81	0.594	0.441
	> 5 yrs.	10	14	24		
Have you successfully completed training focused on nutritional support?	No	42	49	91	1.597	0.206
	Yes	9	5	14		
Did you have any Nutritional support lectures in your residency program?	No	29	39	68	2.711	**0.05**
	Yes	22	15	37		
Do you ever have bedside teaching on Nutritional support	No	17	25	42	1.836	0.175
	Yes	34	29	63		

Cross-tabulation of socio-demographic variables and respondents' attitude scores indicates a statistically significant association between the post-graduating institution attended, year of residency, and receipt of nutritional support lectures on respondents' attitude scores

Table 8: Logistic regression analysis showing factors associated with attitude of participants

Variables		Attitude		**AOR (95%CI)**	**p-Value**
		Positive	Negative		
Age IQR	29	29	29	1.036 (.803-1.336)	0.784
Sex	Male	36	41	1.198 (.419-3.426)	0.736
	Female	15	13		
Which post graduating institution are you in?	SPHMMC	15	34	1.259 (.099-.679)	**0.006**
	TASH	36	20		
Year of residency?	1st	8	16	2.185 (.796-5.994)	**0.012**
	2nd	18	19		
	3rd	25	19		
Year of experience in medical practice?	< 5 yrs.	41	40	0.498 (.143-1.728)	0.272
	> 5 yrs.	10	14		
Have you successfully completed training focused on nutritional support?	No	42	49	1.424 (.354-5.724)	0.618
	Yes	9	5		
Did you have any Nutritional support lectures in your residency program?	No	29	39	1.452 (.457-4.611)	**0.05**
	Yes	22	15		
Do you ever have bedside teaching on Nutritional support	No	17	25	0.701 (.221-2.216)	0.545
	Yes	34	29		
Total experience (in months) working in ICU during residency IQR	3	3	3	0.844 (.520-1.369)	0.492

The above table shows the results of a study examining the relationship between different traits of residents and their attitudes to support nutrition in adults in intensive care units. Multivariable binary logistic regression was performed after conducting chi-square the effects of the following factors were performed: the post-graduating institution attended, year of residency, years of experience in medical practice, completion of training focused on nutritional support, receipt of nutritional support lectures during residency, participation in bedside teaching on nutritional support, and total experience (in months) working in the ICU during residency. Our findings include adjusted odds ratios (AORs) and their associated 95% confidence intervals..

Of the characteristics we studied,, having nutritional support lectures in the residency program ($\chi^2 = 2.711$, $p = 0.05$), being a resident at TASH ($\chi^2 = 11.863$, $p = 0.001$), and the year of residency ($\chi^2 = 3.429$, $p = 0.05$) showed a statistically significant association with a positive attitude towards nutritional support in the adult ICU.

In multivariate logistic regression, senior residents had 2.185 times higher odds of possessing a positive attitude towards nutritional support in the adult ICU compared to junior residents (AOR = 2.185, 95% CI = 0.796 - 5.994, $p = 0.012$).

Residents who had nutritional support lectures in their residency program have 1.452 times higher odds of possessing a positive attitude towards nutritional support in the adult ICU compared to those who did not have such lectures (AOR = 1.452, 95% CI = 0.457 - 4.611, $p = 0.05$).

Residents from TASH have 1.259 times higher odds of possessing a positive attitude towards nutritional support in the adult ICU compared to residents from SPHMCC (AOR = 1.259, 95% CI = 0.099 - 0.679, $p = 0.006$).

No statistically significant differences were found between groups in terms of age, sex, years of experience in medical practice, completion of training focused on nutritional support, participation in bedside teaching on nutritional support, and total experience (in months) working in the ICU during residency.

6. DISCUSSION

A total of 118 EMCC residents of TASH and SPHMMC were invited. Out of these, 105 residents responded, resulting in a response rate of 88.9%.

A total of 105 residents (Male: n=77, 73.3%; Female: n=28, 26.7%) with a median age of 29 years (Interquartile Range: 28-40 years) participated. Eighty-one residents (77.1%) had less than 5 years of experience, while twenty-four residents (22.9%) had more than 5 years of experience.

Our study revealed that a significant portion of participants (86.7%) had not completed any training focused on nutritional support, while only 13.3% had successfully completed at least one training program. Similarly, a considerable number of residents (64.8%) did not attend nutritional support lectures during their residency, compared to 35.2% who did. However, bedside teaching on nutritional support was more common, with 60% of residents having received it during their ICU rotations, while 40% had not.

In contrast, a descriptive, cross-sectional study conducted among military nurses in South Africa found that 74% of nursing personnel had received formal training in enteral nutrition (EN). This highlights the discrepancy in training opportunities across different regions and institutions.[18]

A similar cross-sectional study assessing the knowledge and practice of enteral nutrition among nurses working in ICUs of governmental hospitals in Addis Ababa revealed that 76% of participants reported receiving training on enteral nutrition during nursing school. Despite this, 72.9% of these nurses did not receive in-service training on enteral nutrition, pointing to a gap in continuous professional development.[14]

These findings underscore the need for improved and standardized nutritional support training across all healthcare institutions to ensure that all medical professionals possess the necessary knowledge and skills.

Our study showed that 53.3% of participants lacked sufficient knowledge about nutritional support in the adult intensive care unit (ICU), while 46.7% had adequate knowledge. This aligns with research from London ICUs, where a survey of clinicians, nurses, dietitians, speech and language therapists, and pharmacists identified similar knowledge gaps: 44% of clinicians, 26% of nurses, 76% of dietitians, and 67% of other staff exhibited a sufficient understanding of nutrition support guidelines12]

A qualitative study from a large Australian acute care hospital also highlighted that many nurses lacked the in-depth knowledge needed for proper nutritional care, regardless of their training background [19]

.

Additionally, a descriptive cross-sectional study among military nurses in South Africa reported an average knowledge score of 46.3%, which is comparable to our results.[18] Another study in Addis Ababa's governmental hospitals revealed that more than three-quarters (87%) of nurses had poor knowledge of enteral nutrition, indicating an even greater deficiency than observed in our study.[14] This may be due to the research conducted on nurses, as opposed to our study which focused on residents.

We identified a statistically significant association between the post-graduating institution attended and receiving bedside teaching on nutritional support. Additionally, years of experience and attendance at nutritional support lectures were positively associated with higher knowledge scores.

In contrast, a descriptive cross-sectional study conducted among military nurses in South Africa found no significant differences between knowledge and professional rank or years of working experience ($r = -0.01$; $p = 0.85$).[18] Another study in Addis Ababa's governmental hospitals showed that participants with a first degree were 76% less likely to have adequate knowledge compared to those with an MSc (AOR = 0.240, 95% CI: 0.61 - 0.936). Furthermore, younger participants (age group 20-28) were 98% less likely to have good practice and knowledge of enteral nutrition compared to the age group 46-61 (AOR = 0.023, 95% CI: 0.001 - 0.523).The study also revealed that nurses who received in-school nutrition training were twice as likely to have good practice and knowledge of enteral nutrition compared to those who did not receive such training (AOR = 1.951, 95% CI: 0.063 - 0.601). Additionally, participants who were aware of protocols had three times better practice and knowledge compared to those unaware of the protocols (AOR = 3.401, 95% CI: 1.186 - 9.789). Educational status was a statistically significant predictor of knowledge in the multivariable logistic regression model ($p < 0.05$).[14]

Our study revealed that 48.6% of participants had a positive attitude towards nutritional support in the adult intensive care unit (ICU), while 51.4% had a negative attitude.

In contrast, research conducted in London ICUs indicated that healthcare professionals' attitudes were more aligned with current nutrition guidelines, reflecting a more positive outlook.[12]Similarly, a study at a South African military hospital found that nursing personnel generally had a positive attitude towards enteral nutrition (EN), with 50.8% of participants believing that EN reduces hospital stay and is cost-effective.[18]Conversely, a survey conducted in hospitals in the North West Bank showed that only 56% of participants strongly agreed on the importance of nutrition,[17] suggesting varying levels of awareness and attitude across different regions.

Our study identified. Having nutritional support lectures during residency, being a resident at TASH, and the year of residency were all significantly linked to more positive attitudes.

Difference in teaching hospitals may be, with possible reasons of trend of nutritional support lectures, bed side teaching.

The differences in teaching hospitals might be attributed to the varying trends in nutritional support lectures and bedside teaching.

In contrast, a descriptive cross-sectional study among military nurses in South Africa found no significant differences between attitude and professional rank or years of working experience. [18]

Our findings are consistent with those of other studies, suggesting that attitudes towards nutritional support have remained relatively stable over the past decade. For instance, research conducted in London ICUs revealed that 63% of clinicians and 60% of nurses expressed confidence and a positive attitude towards providing nutritional support. However, this confidence was more closely linked to their professional group membership rather than their level of knowledge.[12]

A study conducted in hospitals in the North West Bank of Palestine revealed that younger nurses working in non-governmental hospitals had the highest knowledge, attitude, and practice (KAP) scores regarding nutrition care. Significant positive correlations were found between respondents' knowledge/attitude and practice scores, and the availability of protocols and policy documents was strongly associated with the perception of competence in administering enteral nutrition.[17]

This difference from our study can be explained by variations in sample size, research method, level of training, and health system.

7. CONCLUSION

Our study highlights the considerable knowledge gaps and varied attitudes towards nutritional support among residents in the adult intensive care unit (ICU). It is clear that there is a need for improved educational strategies.

We found that the post-graduating institution attended and receiving bedside teaching on nutritional support were significantly associated with better knowledge. Additionally, years of experience and attendance at nutritional support lectures were positively correlated with higher knowledge scores.

Attitudes towards nutritional support were also varied,

Notably, having nutritional support lectures during residency, being a resident at TASH, and the year of residency were significantly linked to more positive attitudes.

These findings underscore the importance of enhancing educational programs and training opportunities to improve both the knowledge and attitudes of residents towards nutritional support in the ICU. Implementing standardized and comprehensive training modules can potentially bridge these gaps, ultimately leading to better patient care outcomes.

8. RECOMMENDATIONS

Based on the findings, we recommended on

Standardize Nutritional Support Training: Implement standardized training modules across all residency programs to ensure uniformity in knowledge and practice.

Incorporate Regular Lectures and Bedside Teaching**:** Schedule regular lectures and bedside teaching sessions on nutritional support to reinforce theoretical knowledge with practical skills.

Continuous Professional Development: Encourage ongoing professional development in nutritional support, including workshops, seminars, and certification programs, to keep residents updated on best practices.

Future research is recommended by improving this study's limitation.

Limitations

Residents were assessed using an online survey. Because respondents could potentially guess answers and had unlimited time to complete the survey, these factors could have affected the accuracy of the responses

A limitation of the study is that we couldn't control whether residents used additional resources during the survey

Because the test survey used multiple-choice questions, respondents could have guessed some answers.

Another limitation of this study was that EMCC residents were not involved in other place in Ethiopia and other department residents did not involve eg anesthesia,

and the sampling technique was a convenient sample method that predisposed to selection bias. Data from SPHMMC residents respond to negligence without detailed reading, so the reported Data could be subject to recovery or social refinement.

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10. ANNEXES

Annex 1

Information and consent form

To Our Valued Participant

Hello, my name is Dr. Wolderufael Kassa. I'm a 3rd-year resident specializing in Emergency Medicine and Critical Care.

I am currently researching "Knowledge attitude and practice towards nutritional support among ECCMR at adult ICU Addis Ababa Ethiopia". The purpose of this study is to examine the attitudes and knowledge of EMCCR to nutritional support. The information you provide will be used solely for this research project. We are committed to protecting your privacy, and your responses will not have any impact on you

However, participation has been a great help to greatly increase knowledge in this field and is purely spontaneous that it is extremely important for the success of this study. , Your participation is completely voluntary. You can choose not to participate, or withdraw at any point, without any obligation. We appreciate you considering this research. Please feel free to contact us with any questions

respectfully,

Dr. Wolderufael Kassa
+251-953219504
E-mail; wolderufaelk@gmail.com

Consent form

I understand the purpose, procedures, risks, and benefits of this study, as explained to me. I agree to participate.

Annex 2

Questionnaires []

THANK YOU FOR TAKING YOUR TIME TO HELP WITH THIS QUESTIONNAIRE

Please mark the appropriate spaces, circle your selections, and provide any relevant comments. Please skip any questions that aren't relevant to your situation.

SECTION A: SOCIO-DEMOGRAPHIC DETAILS

1. Age _____

2. Sex
A. Male
B. Female

3. Which post graduating institution are you in?
A.TASH
B.SPHMMC

4. Year of residency?
A. 1st B. 2nd C 3rd

5. Year of experience in medical practice?
A. <5
B.>5

6. Have you successfully completed at least one training focused on nutritional support? .

A. yes
B.no

7. Were there any lectures on nutritional support during your residency?

A. Yes
B. No

8. During your standard ICU rotations, do you ever get bedside teaching on nutritional support?

A .yes
B.no

If you answered "yes" to the previous question, who do you typically learn from during these sessions?

- Senior Resident
- EMCC Consultant

- Intensivist
- Pulmonologist
- Anesthesiologist

Please rate the quality of the bedside teaching you receive on nutritional support.

A. Needs Significant Improvement
B. Adequate, but Some Improvements Could Be Made
C. Helpful and Effective, No Major Changes Needed

D Excellent.

9. What is your total experience (in months) working in ICU during resident ship?

(MICU, SICU, PICU, and CCU)?_____

SECTION B: KNOWLEDGE DETAILS

10 What are the primary outcome measures impacted by nutrition support?

A Length of stay
B Mortality
C Risk of infection
D All

11. Which should be the preferable route of nutrition in ICU unless contraindicated?
A) Enteral nutrition
B) Parenteral nutrition

12. How early enteral nutrition should be started (unless contraindicated)?
A) 24-48 hrs
B) after 1 week
C) After 2 weeks
D) after a month

13 What level of energy intake would you target in the early stages of patient care?
A 84–105 kJ (20–25 kcal)
B 105–126 kJ (25–30 kcal)
C 126–167 kJ (30–40 kcal)
D 167–209 kJ (40–50 kcal)

14. Which of the following are regarded as complications of ETF (enteral tube feeding)?
A Hyperglycemia
B Aspiration
C Tube dislodgement
D Diarrhea
F All the above correct
G None of the above are correct

15 A patient on nasogastric feeding has had 350 mL aspirated from their tube. How would you proceed?
A. Discontinue the feed
B. Continue the feed and recheck the next aspirate
C. Initiate parenteral nutrition
D. Unsure

16 Under what circumstances would you opt for parenteral nutrition?

A. Insufficient oral intake
B. Bowel perforation
C. Diarrhea less than 500 mL on the first day
D. Failing to meet enteral nutrition targets after 3 days
E. Unsure

17. When the patient was on Total Parenteral Nutrition (TPN) how do we wean them to ETF (enteral tube feeding)?
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 none

SECTION C: ATTITUDE DETAILS

18 Nutrition support will impact the clinical outcome of a critically ill patient.
A. Strongly agree
B. Agree
C. Unsure
D. Disagree
E. Strongly disagree

19 Enteral feeding should be regarded as the primary method of nutrition support
A. Strongly agree
B. Agree
C. Unsure
D. Disagree
E. Strongly disagree

20 Monitoring tolerance to enteral feeding involves measuring nasogastric aspirates or gastric residual volumes.
A. Strongly agree
B. Agree
C. Unsure
D. Disagree
E. Strongly disagree

21 Do you believe residents have to be involved in making decisions about nutritional support on your unit?
A. Strongly agree
B. Agree
C. Unsure
D. Disagree
E. Strongly disagree

22 What are your thoughts on making changes to the implemented nutrition support protocols?
A. Strongly agree
B. Agree
C. Unsure
D. Disagree
E. Strongly disagree

Thank you for offering your time to participate in this research study!

DECLARATION

I wrote this thesis myself, and I've given credit to everyone whose work I've used.

Name: Dr. Wolderufael Kassa Signature: _____ Date_____

This thesis, "Knowledge and Attitude towards Nutritional Support among Emergency and Critical Care Medicine Residents at the Adult Intensive Care Unit, Addis Ababa, Ethiopia," submitted by Dr. Wolderufael Kassa, is approved as meeting the requirements for a Certificate of Specialty in Emergency Medicine and Critical Care. This thesis meets the university's standards for originality and quality, and it also adheres to all university regulations.

The research was carried out by Dr.Birhanu (MD, Assistant professor of ECCM)
Dr.Biruk (MD, Assistant professor of ECCM)

Advisors Name

Dr.Birhanu T (MD, Assistant professor of ECCM) Signature _____ Date _____

Dr.Biruk G (MD, Assistant professor of ECCM) Signature _____ Date_____

Examiners Name

External: _____ Signature _____ Date _____/____/_____

Internal: _____ Signature _____ Date ____/____/_____