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Knowledge, Attitudes, and Practices of ICU Medical Staff toward Nutrition Care and its Impact on Patient Recovery in Taiz, Yemen

Pengetahuan, Sikap, dan Praktik Staf Medis ICU terhadap Perawatan Gizi dan Dampaknya terhadap Pemulihan Pasien di Taiz, Yaman

Haitham T. S. Mohammed[1], Lamia A. S. Ali[1,2], Malak Anwar Saif[1], Nada Khalid Al-Adeemy[1], Noha Kamel Al-Nadhary[1], Raghad Sameer Saif[1], Shaima Kamel Al-Nadhary[1], Yomna Mukarram Al-Dobai[1], Nur Mufida Wulan Sari[3]

[1]Department of Clinical Nutrition and Dietetics, Faculty of Medical Sciences, AL Rowad University, Taiz, Yemen
[2]Postgraduate Student of Reproductive Health, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia
[3]Department of Health, Population Control, and Family Planning, Trenggalek Regency, Indonesia

ABSTRACT

Background: Proper nutrition is essential for enhancing patient recovery, especially within hospital environments. ICU medical staff are instrumental in providing appropriate nutritional care, which significantly affects patients' health outcomes. However, in Yemen, the lack of knowledge for assessing nutritional requirements, and the importance of nutrients adequacy for patients underscores the importance of improving staff involvement in nutrition care quality management.

Objectives: The study aimed to determine the nutritional Knowledge, Attitude, and Practice (KAP) of medical staff in the Intensive Care Unit (ICU) in ninth selected hospitals in Taiz City.

Methods: This study used a descriptive cross-sectional design in both governmental and non-governmental hospitals from March 1st,2024 to August 10th,2024. The medical staff who work in ICU were invited to answer questionnaire to assess their knowledge, attitude, and practices related to nutrition care.

Results: Showed that from 87 personal of medical staff in ICUs. Gander and place of work had a significant correlation with their knowledge (p-value=0.049 and p-value=0.007, respectively). Medical staff attitude had no significant correlation. medical staff knowledge/attitude had a significant relationship with Gander and place of work (p-value=0.025 and p-value=0.055, respectively). medical staff practice had a significant relationship with education level and job title (p-value=0.029 and p-value=0.018, respectively). medical staff knowledge and attitude/practice had a significant relationship with Gander (p-value=0.024).

Conclusions: Findings demonstrate that respondents in Taiz, Yemen, had low nutritional KAP scores, indicating inadequate knowledge hindering effective nutrition care in ICUs. High-quality documentation and nutrition knowledge are crucial for improving ICU nutrition practice.

INTRODUCTION

Feeding is necessary not just for growth but also to keep the body operating properly throughout life. While a healthy adult can usually promise autonomous eating, this skill may be compromised by the presence of illnesses or related symptoms, such as nausea and vomiting[1]. Nutritional Therapy (NT), characterized as a collection of therapeutic interventions designed to preserve or rehabilitate patients' nutritional state, is accessible to tackle this concern. Nutritional treatments include oral supplements, Enteral Nutrition Treatment (ENT), and nutritional intervention following ICU admissions. The European Society for Clinical Nutrition and Metabolism (ESPEN) has recently issued evidence-based guidelines concerning medical nutrition therapy for critically ill patients. These guidelines advocate for the implementation of Early Enteral Nutrition (EEN), emphasizing its advantages over delayed Enteral Nutrition (EN) and early Parenteral Nutrition (PN)[2]. The most widely recommended tools for nutritional assessment encompass biophysical evaluations and anthropometric measurements, including Body Mass Index (BMI), mid-arm muscle circumference, and triceps skinfold thickness. These methods are pivotal in assessing body composition, identifying nutritional deficiencies or excesses, and guiding tailored nutritional interventions. Additionally, monitoring Gastric Residual Volume (GRV) and verifying proper tube placement are critical practices for patients receiving enteral nutrition. These measures help ensure the safety and effectiveness of feeding while

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minimizing the risk of complications such as aspiration and feeding intolerance[3].

The importance of nutrition for critically ill patients is increasingly acknowledged, particularly for those who experience prolonged stays in the ICU and often require extended life-sustaining support while undergoing severe catabolism[4]. For critically ill patients, nutritional support is a vital component of care, which has historically been regarded as an adjunct to supportive care but has more recently been reclassified as a therapeutic intervention[5]. In ICU patients, muscle breakdown frequently surpasses muscle synthesis, leading to skeletal muscle wasting and resulting in functional impairment for many survivors of critical illness[6]. Nutritional therapy is increasingly acknowledged as a fundamental component in the management of critically ill patients. Its implementation has been linked to a reduction in infectious complications, a shorter duration of hospital stays, and a decline in mortality rates, highlighting its pivotal role in improving patient outcomes. Currently, controversies exist regarding several aspects, such as the optimal administration route, the ideal initiation time, the appropriate caloric intake, and the types of nutrients to be provided[7].

The major goals of nutritional support are to significantly enhance treatment responses, avoid malnutrition and weight loss, lower the risk of complications, lower mortality and morbidity, and improve the overall quality of life for all patients[8]. Involvement of the Nutrition Support Team can prevent and/or treat malnutrition by selecting appropriate nutritional interventions and aiding in the early identification and prevention of central line infections[9]. Nutrition support nursing is a specialized profession dedicated to safeguarding, enhancing, and maximizing nutritional health and functional capabilities. It seeks to avert nutrition-related diseases and injuries, mitigate suffering via the diagnosis and treatment of nutrition-related human reactions, and promote the care of people, families, communities, and populations with recognized or prospective nutritional changes[10]. Enteral nutrition support is crucial in addressing malnutrition in hospitalized patients, with its administration predominantly being a responsibility of nursing staff. Consequently, it is essential for nurses to have comprehensive knowledge and maintain a positive attitude toward enteral nutrition to ensure its effective implementation[11].

Malnutrition is associated with numerous adverse clinical outcomes, including longer hospital stays, increased morbidity and mortality, and higher hospital costs[12]. Malnutrition primarily leads to complications such as delayed healing, impaired protein absorption and binding, dysfunction in hepatic metabolism, and compromised renal elimination of drugs and their metabolites. Malnutrition can worsen the immune response, resulting in higher rates of infections and postoperative complications; increase the likelihood of pressure injuries; prolong hospital stays; elevate mortality risk; and substantially increase hospital costs[8]. Furthermore, the absence of nutritional screening fails to meet the essential care requirements of hospitalized patients and impedes the timely treatment of those at risk for malnutrition[13].

Hospital staff are essential in the nutrition care process, which includes practices by health professionals aimed at enhancing patients' food-related behaviors and improving health outcomes. Measures for evaluating the quality of nutrition care in hospitals are frequently insufficient[14]. It is mandatory to conduct daily assessments of the nutritional status of all patients receiving nutritional supplementation, focusing on parameters such as weight gain, levels of consciousness, and electrolyte levels. A nutritional chart similar to those used for children should be implemented, with the patient's initial status and daily data meticulously recorded. This approach will not only provide guidance but also serve as a valuable learning tool for ongoing improvements[15].

Proper nutrition is crucial for injury recovery, particularly in reducing inflammation and promoting muscle healing. A combination of carbohydrates and proteins, along with antioxidants and anti-inflammatory nutrients, can significantly aid the recovery process[16]. The essential role of nutrition in cutaneous healing has been recognized since the inception of medicine as a discipline. Some of the earliest writings identifying this synergy date back approximately 2,300 years, when Hippocrates emphasized the importance of nutrition in health and human disease[17]. Deficiencies in specific nutrients can inhibit healing, while, conversely, certain additives that are not typically present in large quantities in the diet may exert beneficial effects[18]. According to the information mentioned before our study aims to assess the KAP of medical staff in ICUs regarding therapeutic nutrition and its role in patient recovery.

METHODS

The research adopted a cross-sectional study was conducted between May to July 2024, from Physician and Nurse at targeted hospitals at Taiz - Yemen. The Raosoft sample size calculator was used to determine the sample size. Using a 50% response distribution, 95% confidence interval, and 5% margin of error, and The sample size calculated was 87. The study included Physician, and Nurse aged between 20 and older, including both males and females. Participants younger than 20 years, and Nutrition service staff were excluded. A validated self-administered questionnaire Adapted from previous study available in English[15].

The study received ethical approval from the Health Research Ethical Clearance Commission at Al Rowad University on February 26th, 2024, under the approval number "00375-RU-2024." All participants were thoroughly informed about the study's purpose and potential benefits and were assured of their right to voluntarily decide on participation, ensuring informed consent was obtained.

The operational definitions and categorization of variables were critical for analyzing the KAP scores among ICU medical staff. Age groups (20–25, 26–30, 31–35, and >35) were categorized to investigate potential generational differences in KAP. Gender (male and female) was included to examine possible variations in KAP. The place of work, covering nine hospitals, enabled

institutional comparisons in KAP levels. Educational qualifications (higher diploma, bachelor's, and master's degrees) were analyzed to assess the impact of academic background on nutritional care. Similarly, job titles (Physician Assistants, Resident Physicians, Specialists, Practical Nurses, Staff Nurses, Nurse Midwives, and Anesthesiologists) were included to explore variations in KAP across professional roles. Work time (part-time or full-time) provided insights into its influence on practices, while clinical experience (0–2 years, 3–10 years, and >10 years) was examined to evaluate the role of professional expertise in shaping KAP scores.

The questionnaire employed in this study was carefully designed to gather detailed information on the KAP of ICU medical staff regarding nutritional care. It included sections addressing demographic variables such as age, gender, place of work, education, job title, work time, and clinical experience, allowing for a detailed analysis of factors influencing KAP scores. Furthermore, the questionnaire featured specific items to evaluate staff knowledge of nutritional principles, their attitudes toward the role of nutrition in patient recovery, and the extent to which these attitudes were reflected in their practical actions within the ICU setting.

SPSS version 27 was used to enter, clean, and analyze the gathered data. The demographic features were determined using descriptive statistics. Data that did not follow a normal distribution were subjected to the Kruskal-Wallis H test. To investigate the potential association between continuous variables at p-value<0.05, the Spearman rank correlation was used.

RESULTS AND DISCUSSIONS

This study involved 87 medical staff members working in ICUs in some districts of Taiz, Yemen, during the period from May to July 2024. The socio-demographic characteristics are presented in Table 1. The majority of the study participants were female, representing 51.7%, while 48.3% were male. Regarding age, approximately 36.8% were aged under 25 or 30 years, 20.7% were between the ages of 31-35 years, and 5.7% were older than 35 years. In terms of education, about 56.3% had a higher diploma in nursing, 35.6% held a bachelor's degree, and 8% had a master's degree in nursing. Additionally, 14.9% of participants were physicians, while 85.1% were nurses. Among the nursing staff, 75.9% were practical nurses, 2.3% were nurse midwives, 2.3% worked in anesthesia, and 2.3% were physician assistants. Regarding work hours, 60.8% of the medical staff worked part-time, while 39.1% worked full-time. About half of the sample (50.6%) had clinical experience of less than two years, 36.8% had between 3-10 years of experience, and a small proportion (12.6%) had more than 10 years of experience.

Table 1. Frequency distribution of demographics data for ICU Medical Staff

Variable	Frequency (n)	Percentage (%)
Age		
20-25	32	36.8
26-30	32	36.8
31-35	18	20.7
>35	5	5.7
Gender		
Male	42	48.3
Female	45	51.7
Place of Work		
Al-Hikma Hospital	9	10.3
CVD Center	10	11.5
Yemen Hospital	10	11.5
The Republican Hospital	11	12.6
Al-Thawra Hospital	14	16.1
Al-Qahera Hospital	7	8.00
Al-Abbas Hospital	12	13.8
Al-Tawon Hospital	12	13.8
Al-Madina Hospital	2	2.3
Education		
Higher Diploma	49	56.3
Bachelors	31	35.6
Master	7	8
Job Title		
Resident Physician	10	11.5
Specialist Physician	3	3.4
Practical Nurse	2	2.3
Staff Nurse	66	75.9
Nurse Midwife	2	2.3
Anesthesia	2	2.3
Physician Assistant	2	2.3
Work Time		
Partial	53	60.9
Full	34	39.1

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Variable	Frequency (n)	Percentage (%)
Clinical Experience		
0-2 Years	44	50.6
3-10 Years	32	36.8
>10 Years	11	12.6

Table 2, demonstrated that a significant association was found between knowledge and both gender and place of work (p-value<0.05). Specifically, male respondents reported higher knowledge levels (median=49.20) compared to female respondents (median=39.08). Furthermore, respondents working in Al-Qahera (median=58.79), Al-Abbas (median=53.50), Al-Hikma (median=51.00), and the CVD center (median = 44.80) reported higher levels of knowledge compared to those working in Yemen (median=37.05), Al-Thawra (median=36.36), Republic (median=26.46), and Al-Madina (no median score available). However, no significant relationship was found between attitude and socio-demographic variables such as age, gender, place of work, education, job title, work time, or years of work. However, as shown in Table 2, education was significantly associated with practice toward nutrition care (p-value<0.05). Additionally, job title was also significantly associated with practice (p-value<0.05). Specifically, higher levels of practice were observed among respondents with a master's degree (median=66.29) compared to those with a bachelor's degree (median=45.82) or a higher diploma (median=39.66). In terms of job titles, resident physicians, specialist physicians, and nurse midwives reported higher levels of practice compared to anesthesia staff, practical nurses, staff nurses, and physician assistants (median=53.00, 47.00, 39.81, and 14.00, respectively). Conversely, no other demographic factors showed any significant association with practice, this result in agreement with study by Shakhshir and Alkaiyat, 2023 said that Inadequate nutrition knowledge affects patient care quality. Another study by Yuanyuan et al., 2023[19], this suggests that there were barriers preventing ICU medical staff from effectively translating their knowledge of enteral nutrition interruption into practice.

Table 2. Association of socio-demographic characteristics Knowledge, Attitude, and Practice of ICU Medical Staff

Variable	(N=87)		Knowledge Score Median	p-value	Attitude Score Median	p-value	Practice Score Median	p-value
	Frequency (n)	Percentage (%)						
Age								
20-25	32	36.8	40.25		40.25		41.9	
26-30	32	36.8	43.86	0.075	43.86	0.075	41.39	0.496
31-35	18	20.7	55.69		55.69		49.00	
>35	5	5.7	26.80		26.80		55.90	
Gender								
Male	42	48.3	49.27	0.049	49.27	0.049	47.70	0.071
Female	45	51.7	39.08		39.08		40.54	
Place of Work								
Al-Hikma Hospital	9	10.3	51.00		51.00		47.00	
CVD Center	10	11.5	44.80		44.80		39.75	
Yemen Hospital	10	11.5	37.05		37.05		52.60	
The Republican Hospital	11	12.6	26.64	0.007	26.64	0.007	46.77	0.709
Al-Thawra Hospital	14	16.1	36.36		36.36		37.36	
Al-Qahera Hospital	7	8.00	58.79		58.79		43.79	
Al-Abbas Hospital	12	13.8	53.50		53.50		30.58	
Al-Tawon Hospital	12	13.8	43.50		43.50		49.79	
Al-Madina Hospital	2	2.3	-		-		-	
Education								
Higher Diploma	49	56.3	45.48	0.770	45.48	0.770	39.66	0.029
Bachelors	31	35.6	41.37		41.37		45.82	
Master	7	8	45.29		45.29		66.29	
Job Title								
Resident Physician	10	11.5	57.05		57.05		64.70	
Specialist Physician	3	3.4	24.17		24.17		65.67	
Practical Nurse	2	2.3	80.00		80.00		47.00	
Staff Nurse	66	75.9	43.11	0.078	43.11	0.078	39.81	0.018
Nurse Midwife	2	2.3	43.00		43.00		64.25	
Anesthesia	2	2.3	21.25		21.25		53.00	
Physician Assistant	2	2.3	25.75		25.75		14.00	
Work Time								
Partial	53	60.9	44.75	0.727	44.75	0.727	41.34	0.218
Full	34	39.1	42.82		42.82		48.15	

Variable	(N=87)		Knowledge Score Median	p-value	Attitude Score Median	p-value	Practice Score Median	p-value
	Frequency (n)	Percentage (%)						
Clinical Experience								
0-2 Years	44	50.6	45.38		45.38		44.63	
3-10 Years	32	36.8	43.14	0.851	43.14	0.851	41.47	0.632
>10 Years	11	12.6	41.00		41.00		42.77	

Table 3, provided a comprehensive analysis of the statistically significant relationships between overall KAP scores and socio-demographic factors. Importantly, no statistically significant differences were found concerning age, place of work, education level, job title, work time, or years of work. Nevertheless, gender was significantly correlated with KAP regarding nutrition care (p-value<0.05). Specifically, male respondents reported higher scores (median=48.4) in comparison to female participants (median=39.89). Furthermore, with respect to place of work, respondents from Al-Qahera (median=53.29), Al-Abbas (median=44.00), Al-Hikma (median=49.11), the CVD center (median=45.40), Al-Tawon (median=45.00), Yemen (median=45.70), Al-Thawra (median=33.36), and Republic (median=35.82) demonstrated varying scores, while no median score was reported for respondents from Al-Madina. In terms of age, respondents aged 20-25 years had a median score of 39.42, whereas those aged 26-30 years had a slightly higher median of 43.61. Interestingly, respondents aged 31-35 years exhibited the highest median score (54.69), while those over 35 years of age recorded a lower median of 37.30. Regarding educational attainment, respondents

with a diploma had a median score of 43.02, while those with a bachelor's degree reported a similar median score of 42.79. However, respondents with a master's degree achieved the highest median score of 56.21, indicating a stronger association between higher educational qualifications and KAP scores. Additionally, concerning work time, respondents with part-time work reported a median score of 43.00, whereas full-time workers had a slightly higher median score of 45.56. When analyzing years of work experience, those with (0-2 years) of experience reported a median score of 44.36, while respondents with (3-10 years) of experience had a median score of 43.92, and those with (>10 years) of experience reported a slightly lower median score of 42.77. Finally, the analysis of job titles revealed notable differences. Resident physicians had the highest median score (60.15), followed by practical nurses with a median score of 74.50. Conversely, specialist physicians had a median score of 40.17, nurse midwives scored 42.00, anesthesia staff had a median score of 35.75, staff nurses scored 41.80, and physician assistants had the lowest median score of 21.25.

Table 3. Association between knowledge, attitude, and practice for ICU Medical Staff and socio-demographic factors

Variable	(N=87)		KAP Score Median	p-value
	Frequency (n)	Percentage (%)		
Age				
20-25	32	36.8	39.42	
26-30	32	36.8	43.61	0.200
31-35	18	20.7	54.69	
>35	5	5.7	37.30	
Gender				
Male	42	48.3	48.4	0.042
Female	45	51.7	39.89	
Place of Work				
Al-Hikma Hospital	9	10.3	49.11	
CVD Center	10	11.5	45.40	
Yemen Hospital	10	11.5	45.70	
The Republican Hospital	11	12.6	35.82	
Al-Thawra Hospital	14	16.1	33.36	0.392
Al-Qahera Hospital	7	8.00	53.29	
Al-Abbas Hospital	12	13.8	44.00	
Al-Tawon Hospital	12	13.8	45.00	
Al-Madina Hospital	2	2.3	-	
Education				
Higher Diploma	49	56.3	43.02	
Bachelors	31	35.6	42.79	0.410
Master	7	8	56.21	
Job title				
Resident Physician	10	11.5	60.15	
Specialist Physician	3	3.4	40.17	0.150
Practical Nurse	2	2.3	74.50	
Staff Nurse/Registered Nurse	66	75.9	41.80	

Variable	(N=87)		KAP Score Median	p-value
	Frequency (n)	Percentage (%)		
Nurse Midwife	2	2.3	42.00	
Anesthesia	2	2.3	35.75	
Physician Assistant	2	2.3	21.25	
Work Time				
Partial	53	60.9	43.00	0.644
Full	34	39.1	45.56	
Clinical Experience				
0-2 Years	44	50.6	44.36	
3-10 Years	32	36.8	43.92	0.982
>10 Years	11	12.6	42.77	

Table 4 demonstrated a significant positive correlation between the knowledge and attitude scores of respondents (rho=0.275, p-value<0.010). The findings suggest that respondents with greater knowledge exhibited a more favorable attitude toward nutrition care. This finding is consistent with a previous study by Shakhshir and Alkaiyat, 2023. Furthermore, a significant positive correlation was identified between the knowledge and practice scores of the respondents (rho=0.214, p-value<0.047). This result is consistent with a study by Barbosa et al, 2020[1], which found that increased knowledge was attributed to the condensed courses received by medical staff in ICUs, and it aligns with the findings of Shakhshir and Alkaiyat, 2023[14]. A significant positive correlation was also found between knowledge/attitude and practice (rho=0.926, p-value <0.001), suggesting that respondents with better knowledge and attitudes were more likely to engage in good practices regarding nutrition care. This result is consistent with a Croatian study published in 2018 by Dumic and Miskulin[20], which found that extra education on nutrition played a major role in improving knowledge and patient health outcomes, as well as with the findings of Shakhshir and Alkaiyat, 2023. Furthermore, a significant positive correlation was observed between the respondents' attitude and practice scores related to nutrition care (rho=0.791, p-value<0.001), indicating that respondents with a positive attitude were more likely to engage in better practices. This result aligns with previous studies by Shakhshir and Alkaiyat, 2023; and Xu et al, 2015[7,14], which found that an equal distribution of nursing staff and patients played a role in this relationship. However, this result contrasts with the findings of Roshdy Mohamed Sayd et al, 2013, who noted that the absence of a link was due to the systematic learning being implemented in only a few ICUs.

Table 4. Correlation between knowledge, attitude and practice for ICU Medical Staff

Correlation	Spearman's Rho Correlation	p-value
Knowledge/Attitude	0.275	0.010
Knowledge/Practice	0.214	0.047
Knowledge, Attitude/Practice	0.926	<0.001
Attitude/Practice	0.791	<0.001

This study offers significant strengths, notably its ability to identify critical gaps in nutritional KAP among ICU medical staff. It demonstrated that inadequate nutritional knowledge and low KAP scores represent substantial barriers to the delivery of effective nutrition care. These findings provide a robust evidence base for developing targeted interventions aimed at improving nutrition management in ICU settings. However, the study also revealed key limitations, including a disconnect between positive attitudes toward nutrition care and their translation into consistent practices, particularly in addressing malnutrition throughout a patient's ICU stay. These findings highlight the urgent need for systemic reforms and the integration of nutrition care into standard ICU protocols to ensure comprehensive patient management.

CONCLUSIONS

Our findings demonstrate that the respondents generally had low nutritional KAP scores, so inadequate knowledge was viewed as a hindrance to effective nutrition care for the patient in ICU. While, Numerous convictions and attitudes do not always translate into practice. Especially since recognizing malnutrition in hospitalized patients is not often a priority in ICU practice from the time a patient is admitted until their discharge, in Taiz, Yemen. So having high-quality documentation of the nutrition treatment process is crucial. Additionally, to improve nutritional care in ICUs, targeted training programs should be implemented to enhance staff knowledge, focusing on malnutrition recognition and timely intervention. Standardized nutritional screening tools and clear protocols must be introduced, ensuring nutrition assessment is prioritized from admission to discharge. Strengthening interdisciplinary collaboration and incorporating nutrition into continuous medical education will help bridge the gap between attitudes and practice. Regular KAP assessments should be conducted, with feedback provided to address gaps, while adequate resources and awareness of malnutrition's impact on recovery should be prioritized to ensure effective nutrition care in ICUs.

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