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Knowledge, attitudes, and practices related to healthy diet among medical and paramedical staff in nutrition units of primary healthcare centers, Iraq

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Abstract
Introduction: Promoting a healthy diet is crucial for preventing chronic diseases in Iraq, and medical staff in Primary Healthcare Centers (PHCCs) are vital in providing nutritional guidance, especially to vulnerable populations. Assessing healthcare workers' knowledge, attitudes, and practices (KAP) regarding nutrition is key to enhancing the effectiveness of dietary counseling.
Methodology: This cross-sectional study aims to evaluate the KAP of medical and paramedical staff in PHCCs across Iraq in 2024, identifying areas for improvement to strengthen nutritional services. A multistage random sampling method will be used to select 25% of PHCCs from each governorate. Data will be collected through a self-administered, validated questionnaire, covering demographic details, as well as knowledge, attitudes, and practices related to healthy diets. SPSS will be used for statistical analysis, with ethical approval and informed consent ensuring participants' confidentiality and rights.
Results: The study reveal that while 48.9% of participants demonstrated good knowledge about healthy diets, only 27.0% exhibited good dietary practices, with 66.7% having positive attitudes. This indicates a gap between attitudes and practical application. Medical staff had better knowledge than paramedical staff, though paramedical staff showed slightly better practices. Females had significantly better knowledge than males, but attitudes and practices were similar across genders. These findings underscore the need for targeted interventions to improve dietary practices among healthcare professionals.
In conclusion, the study identifies significant gaps between nutritional knowledge and its practical application, along with gender disparities in knowledge. Targeted training and interventions are necessary to improve dietary knowledge, attitudes, and practices related to healthy diet among healthcare staff. Strengthening nutritional counseling services within PHCCs is essential for fostering better dietary behaviors and preventing chronic diseases in Iraq.

Keywords: Knowledge, attitudes, practices, healthcare workers, primary healthcare centers

Introduction

The promotion of a healthy diet is crucial for preventing chronic diseases such as obesity, cardiovascular disorders, and diabetes, all of which are common in Iraq [1]. Medical and paramedical staff working in PHCCs play a vital role in disseminating knowledge about nutrition and promoting healthy eating habits among the population [2]. Within the Iraqi healthcare system, nutrition units in PHCCs are tasked with delivering nutritional advice, particularly to vulnerable populations like children, pregnant women, and those with chronic conditions [3]. This highlights the importance of assessing the KAP of healthcare workers concerning healthy diets, as it directly impacts their effectiveness in delivering nutritional counseling [4].

Evaluating the KAP of healthcare professionals is essential in determining their readiness to advocate for healthy eating [5]. Research from various global contexts indicates that healthcare workers with solid nutritional knowledge are more likely to adopt healthy behaviors themselves and positively influence their patients' dietary habits [6]. However, there has been limited research in Iraq that explores the KAP of medical and paramedical staff in nutrition units, particularly in PHCC settings [7]. This gap underlines the necessity for thorough research to improve the nutritional services offered at the primary healthcare level [8].

The attitudes of healthcare professionals toward healthy diets significantly influence their practice. Positive attitudes, paired with strong nutritional knowledge, enhance the effectiveness of dietary counseling and interventions [9]. On the other hand, misconceptions or a lack of motivation among healthcare workers can hinder the delivery of effective nutritional guidance, leading to poor patient outcomes [10]. Moreover, healthcare providers' personal dietary habits often mirror their attitudes toward nutrition, which may influence their credibility when advising patients [11]. Consequently, it is crucial to explore healthcare professionals' attitudes and practices to understand how they approach nutrition counseling in their clinical practice [12].

In Iraq, nutrition's role in public health is gaining recognition, particularly in addressing prevalent issues such as malnutrition, anemia, and obesity [13]. The Iraqi Ministry of Health has launched initiatives to raise awareness about nutrition, but the success of these programs depends on the ability of healthcare workers to deliver accurate and actionable dietary advice [14]. International studies show that healthcare workers who are well-trained in nutrition are pivotal in reducing the burden of diet-related diseases [15].

Objectives of the study

1. Assess the knowledge, attitudes, and practices (KAP) related to healthy diets among healthcare staff in PHCCs across Iraq.
2. Identify knowledge gaps to improve the effectiveness of nutritional counseling.
3. Guide future training and policy development to strengthen nutritional services at the primary healthcare level.

Materials and methods

Study Design: This study will utilize a cross-sectional design to assess the KAP related to healthy diets among medical and paramedical staff working in the nutrition units of PHCCs across Baghdad in 2024. The cross-sectional design is appropriate for capturing a snapshot of the KAP levels among healthcare professionals at a specific point in time, which allows for the identification of potential associations between demographic factors and dietary counseling behaviors.

Study Participants: The study will target healthcare workers, including doctors and relevant staff engaged in patient counseling within the nutrition units of Primary Healthcare Centers (PHCCs). Participants will be selected from 25% of the main PHCCs across 16 Iraqi governorates, excluding the Kurdistan region. Inclusion criteria include medical and paramedical staff actively involved in dietary counseling who are willing to participate and provide informed consent. Exclusion criteria involve staff on leave or unavailable during data collection and individuals not directly engaged in dietary counseling, such as administrative personnel.

Sample Size and Sampling Technique: The study on healthcare workers in Iraq's PHCCs will utilize a large sample size and a multistage random sampling technique to ensure sufficient statistical power for detecting meaningful differences in KAP. The sampling will proceed in two stages: first, 25% of the main PHCCs will be randomly selected from each governorate across Iraq. Second, all healthcare workers (both medical and paramedical) within the nutrition units of these selected PHCCs will be included. This approach ensures that the sample is representative and allows for the generalizability of findings across Baghdad's PHCC nutrition units.

Data Collection: A self-administered questionnaire will be used as the primary data collection tool. This questionnaire will be developed based on validated KAP instruments used in previous studies, with adjustments made to suit the specific context of this study. Consultation with experts in nutrition and public health will ensure the questionnaire's relevance. Before its full deployment, the questionnaire will be piloted with a small group of healthcare workers to test for clarity, comprehensibility, and cultural appropriateness.
The questionnaire will consist of four main sections:

1. **Demographics**: Age, gender, education, professional role, and years of experience.

2. **Knowledge**: Ten multiple-choice questions evaluating the respondent's understanding of healthy dietary principles, including recommended nutrient intake and dietary guidelines.

3. **Attitudes**: Ten Likert-scale questions assessing respondents' attitudes toward promoting healthy eating, their beliefs about nutrition's role in healthcare, and their motivation for engaging in dietary counseling.

4. **Practices**: Ten self-reported questions regarding current practices in dietary counseling, including the frequency of counseling sessions, the types of dietary advice provided, and the perceived barriers to effective counseling.

The data collection will be conducted over a three-month period, during which healthcare workers from selected PHCCs will complete the questionnaire during working hours.

Data Analysis: The data collected will be entered into Statistical Package for the Social Sciences (SPSS) for analysis. Descriptive statistics, such as frequencies and percentages, will be used to summarize the demographic characteristics and KAP scores of the participants. Inferential statistical methods will also be employed. Chi-square tests will be used to examine relationships between categorical variables, such as demographic factors and KAP scores. A p-value of less than 0.05 will be considered statistically significant.

Ethical Considerations: The study adhered to the ethical principles outlined in the Declaration of Helsinki. It is part of the annual evaluation conducted by the Nutrition Research Institute, Public Health Directorate, Ministry of Health, Iraq, aimed at assessing the KAP among healthcare workers in nutrition units. Prior to participation, all individuals will be required to provide written informed consent. The study ensures the anonymity and confidentiality of participants throughout the research process. Data will be securely stored, with access restricted to authorized members of the research team only.

Results

Table 1 presents the distribution of 810 study participants across different governorates, based on a selection of 25% of their Primary Healthcare Centers (PHCCs). The highest representation comes from Basra with 83 participants (10.2%), followed closely by Nineveh with 82 participants (10.1%) and Baghdad-Rusafa with 80 participants (9.8%). Baghdad-Karkh accounts for 72 participants (8.8%). Salah ad-Din and Anbar have similar participant numbers with 61 (7.5%) and 60 (7.4%) respectively. Dhi Qar follows with 56 participants (6.9%). Other governorates like Babil (5.2%), Diyala (5.1%), Najaf (4.7%), Kirkuk (4.7%), and Diwaniya (4.6%) contribute between 30 to 42 participants. The smallest numbers are seen in Wasit, Al-Muthanna, Karbala, and Maysan, each contributing between 30 and 31 participants, representing 3.7% to 3.8% of the sample.

Table 1: Distribution of study participants across governorates based on a selected 25% of their PHCCs

Variables	Frequency (n=810)	Percentage (%)
Governorate		
Basra	83	10.2
Nineveh	82	10.1
Baghdad-Rusafa	80	9.8
Baghdad-Karkh	72	8.8
Salah ad-Din	61	7.5
Anbar	60	7.4
Dhi Qar	56	6.9
Babil	42	5.2
Diyala	41	5.1
Najaf	38	4.7
Kirkuk	37	4.7
Diwaniya	36	4.6
Wasit	31	3.8
Al-Muthanna	31	3.8
Karbala	30	3.7
Maysan	30	3.7

Table 2 provides a detailed overview of the demographic characteristics and service durations of the study participants. Among the 810 individuals surveyed, a majority are medical staff (57.2%), while paramedical staff make up 42.8%. Gender distribution shows a predominance of female participants (72.0%) compared to males (28.0%). In terms of age, the largest group is between 20-29 years old (38.6%), followed by those aged 30-39 years (34.1%). The age groups 40-49 years and ≥50 years represent smaller portions of the sample at 17.8% and 9.5%, respectively. Regarding career service duration, most participants have between 1 to 10 years of service, with 34.4% having 6-10 years, and 32.0% having 1-5 years. A smaller percentage has over 10 years (12.0%) or just over 1 year (21.6%). For nutrition service duration, nearly half of the participants have over 1 year of experience (44.2%), with 38.5% having 1-5 years. Fewer participants have 6-10 years (13.3%) or more than 10 years (4.0%) of nutrition-specific service experience. This distribution reflects a predominantly younger, female workforce with varying levels of career and nutrition service experience.

Table 2: Demographic characteristics and service duration of study participants

Variables	Frequency (n=810)	Percentage (%)
Staff type		
medical	463	57.2
paramedical	347	42.8
Gender		
male	227	28.0
female	583	72.0
Age groups (years)		
20- 29	313	38.6
30- 39	276	34.1
40- 49	144	17.8
≥ 50	77	9.5
Career Service Duration (years)		
>1	175	21.6
1-5	259	32.0
6- 10	279	34.4
>10	97	12.0
Nutrition Service Duration (years)		
>1	358	44.2
1-5	312	38.5
6- 10	108	13.3
>10	32	4.0

Table 3 illustrates the participants' knowledge regarding recommendations for a healthy diet. The majority of respondents demonstrated a strong understanding of key dietary principles: 90.5% correctly identified the importance of balancing calorie intake with expenditure for maintaining a healthy weight, and 90.1% understood that eating a variety of fruits and vegetables provides essential vitamins and minerals. However, there were notable gaps in knowledge; only 58.6% knew that fish should be consumed at least twice a week, and a significant 72.6% incorrectly believed that trans fats are not the type of fat to be limited. Furthermore, 27.2% incorrectly identified strategies to reduce calorie intake, and 22.8% did not recognize the importance of increasing calorie intake for those who are underweight. The results highlight both strong awareness in some areas and areas needing improvement in dietary knowledge among the study participants.

Table 3: Knowledge of study participants recommendations for a healthy diet

Variables	Frequency (n=810)	Percentage (%)
Which of the following is a recommendation for maintaining a healthy weight?		
Correct answer (Balancing calorie intake with expenditure)	733	90.5
Wrong answers	77	9.5
Which of the following is a strategy to reduce calorie intake?		
Correct answer (Reducing foods that are high in fats and sugars)	590	72.8
Wrong answer	220	27.2
Which of the following is a recommendation for individuals who are underweight?		
Correct answer (Increasing calorie intake)	625	77.2
Wrong answers	185	22.8
Which of the following is considered a nutrient-dense food choice?		
Correct answer (Lean protein)	685	84.6
Wrong answers	125	15.4
Why is it recommended to choose whole grains over refined grains?		
Correct answer (They are higher in fiber and nutrients)	620	76.5
Wrong answers	190	23.5
Why is it important to eat a variety of fruits and vegetables?		
Correct answer (They provide different vitamins and minerals)	730	90.1
Wrong answers	80	9.9
How often should fish be consumed?		
Correct answer (At least twice a week)	475	58.6
Wrong answers	335	41.4
What type of fat should be limited in the diet?		
Correct answer (Trans fats)	222	27.4
Wrong answers	588	72.6
How does reducing dietary sodium benefit overall health		
Correct answer (It lowers blood pressure)	597	73.7
Wrong answers	213	26.3
Which of the following is not recommended for a healthy diet?		
Correct answer (Daily consumption of sugary drinks)	569	70.2
Wrong answers	241	29.8

The data presented in Table 4 highlights various attitudes of study participants toward healthy dietary practices and their role in nutritional counseling. A substantial majority (91.2%) recognizes the importance of a healthy diet for overall health, underscoring widespread awareness of its benefits. However, only 79.9% feel confident in providing accurate dietary information, and 86.4% view promoting healthy eating as a crucial part of their role, indicating a strong commitment to dietary health despite some confidence gaps. Comfort in discussing dietary habits is reported by 82.7%, yet 59.6% acknowledge that cultural norms in Iraq can hinder promoting healthy eating practices. Despite this, 87.5% agree that nutritional counseling positively impacts patients' health. Time constraints are a concern, as 58.9% feel that discussing dietary habits consumes significant consultation time. Acceptance of

dietary advice is less consistent, with only 38.0% reporting that patients always accept such advice. Training adequacy is reported by 65.7%, but 56.5% feel there are insufficient resources to support healthy eating promotion. These insights reflect both the strengths and challenges faced by primary healthcare workers in the realm of dietary counseling.

Table 4: Attitudes of study participants recommendations for a healthy diet

Variables	Frequency (n=810)	Percentage (%)
I believe that following a healthy diet is important for overall health		
Agree	739	91.2
Disagree, Neutral	71	8.8
I am confident in my ability to provide patients with accurate information about healthy eating		
Agree	647	79.9
Disagree, Neutral	163	20.1
I believe that promoting healthy eating habits is an important part of my role as a primary healthcare worker		
Agree	700	86.4
Disagree, Neutral	110	23.6
I feel comfortable discussing dietary habits and recommending changes to patients when necessary		
Agree	670	82.7
Disagree, Neutral	140	27.3
Sometimes, cultural norms and traditions in Iraq make it difficult to promote healthy eating practices		
Agree	483	59.6
Disagree, Neutral	327	40.4
Nutritional counseling has a positive impact on patients' health		
Agree	709	87.5
Disagree, Neutral	101	12.5
Discussing dietary habits with patients takes up a lot of time during consultations		
Disagree	333	41.1
Agree, Neutral	477	58.9
Patients always accept advice related to healthy eating		
Agree	308	38.0
Disagree, Neutral	502	62.0
I receive adequate training to provide nutritional counseling		
Agree	532	65.7
Disagree, Neutral	278	34.3
There are sufficient resources available to support primary healthcare workers in promoting healthy eating (such as educational materials and training programs)		
Agree	458	56.5
Disagree, Neutral	352	43.5

The data presented in Table 5 highlights several key aspects of study participants' practices and knowledge regarding nutritional counseling. A substantial majority (77.5%) correctly use body measurements like weight, height, and waist circumference to assess nutritional status, while a smaller proportion (22.5%) use incorrect methods. An overwhelming 96.8% of participants educate patients about healthy nutrition, though 63% utilize individual educational sessions as their primary method, with 37% using other methods. Daily patient interaction for nutritional counseling is predominantly less than 20 patients (90.9%), and 63.3% of participants report sessions lasting more than 30 minutes, contrary to the 36.7% who adhere to the recommended 15-30 minutes duration. The use of food models in counseling is common among 76% of participants, who primarily address obesity (65.7%) as a nutritional problem. To facilitate behavior change, 60.9% rely on clear, specific dietary instructions, and a significant 81.7% have received formal training in nutrition, while 89% regularly read scientific publications. These findings suggest that while participants generally adhere to best practices and are well-trained, there is room for improvement in the consistency of counseling session duration and methods used.

Table 5: Practices of study participants recommendations for a healthy diet

Variables	Frequency (n=810)	Percentage (%)
What tools do you use to assess the nutritional status of patients?		
Preferred answer (Body measurements as weight, height, waist circumference, etc.)	628	77.5
Unpreferred answers	182	22.5
Do you educate patients about healthy nutrition?		
Preferred answer (yes)	782	96.8
Unpreferred answers	26	3.2
What methods do you use to educate patients about healthy nutrition?		
Preferred answer (Individual educational sessions)	510	63.0
Unpreferred answers	300	37.0
How many patients do you typically provide nutritional counseling to each day?		
Preferred answer (More than 20)	74	9.1
Unpreferred answers (less than 20)	736	90.9
What is the typical duration of a nutritional counseling session?		
Preferred answer (15-30 minutes)	297	36.7
Unpreferred answers	513	63.3
What tools and resources do you use to provide nutritional counseling?		
Preferred answer (Food models)	616	76.0
Unpreferred answers	194	24.0
What are the most common nutritional problems you address in your unit?		
Preferred answer (Obesity)	532	65.7
Unpreferred answers	278	34.3
What are the most effective methods you have found to help patients change their eating behaviors?		
Preferred answer (Providing clear and specific dietary instructions)	493	60.9
Unpreferred answers	317	39.1
Have you received any formal training in nutrition?		
Preferred answer (yes)	662	81.7
Unpreferred answer	148	18.3
Do you regularly read scientific publications on nutrition?		
Preferred answer (yes)	721	89.0
Unpreferred answer	89	11.0

Table 6 presents a comprehensive overview of the study participants' KAP regarding a healthy diet. The majority of participants displayed a fair level of knowledge about healthy eating (43.6%) and a good attitude towards it (66.7%). However, their dietary practices were less robust, with only 27.0% demonstrating good practices compared to 64.2% who had fair practices. The distribution indicates that

while participants generally have a positive attitude towards healthy diets, their actual dietary practices do not fully align with this attitude, suggesting a gap between knowledge and practical application. The relatively high percentage of participants with fair knowledge and practices, alongside a substantial proportion exhibiting poor practices, underscores the need for targeted interventions to bridge this gap and enhance the overall effectiveness of dietary guidance and education.

Table 6: Distribution of Knowledge, Attitudes, and Practices of study participants regarding healthy diet

Variables	Frequency (n=810)	Percentage (%)
Knowledge		
good	396	48.9
fair	353	43.6
poor	61	7.5
Attitudes		
good	540	66.7
fair	225	27.8
poor	45	5.6
Practices		
good	219	27.0
fair	520	64.2
poor	71	8.8

Table 7 presents the distribution of KAP regarding a healthy diet among medical and paramedical staff in nutrition units of Primary Health Care Centers (PHCCs). The data reveals a significant difference in knowledge levels, with a higher proportion of medical staff (52.5%) demonstrating good knowledge compared to paramedical staff (44.1%), resulting in a p-value of 0.011, which indicates statistical significance. Conversely, attitudes towards a healthy diet are relatively consistent across both groups, with 66.5% of medical staff and 66.9% of paramedical staff holding good attitudes, yielding a p-value of 0.232, suggesting no significant difference. Practices related to a healthy diet show a trend where paramedical staff exhibit slightly better practices (30.8% good) compared to medical staff (24.2%), though this difference is not statistically significant (p-value=0.068). Overall, while knowledge of healthy diets significantly differs between the two groups, attitudes are uniformly positive, and practices are similar, with a slight edge for paramedical staff in practical implementation.

Table 7: Distribution of Knowledge, Attitudes, and Practices regarding healthy diet among medical and paramedical staff in Nutrition Units of PHCCs

Variables	Medical Staff 463 (57.2)	Paramedical staff 347 (42.8)	Total 810 (100.0)	P- value
The knowledge of a healthy diet				
good	243 (52.5)	153 (44.1)	396 (48.9)	0.011
fair	181 (39.1)	172 (49.6)	353 (43.6)	
poor	39 (8.4)	22 (6.3)	61 (7.5)	
The attitudes regarding a healthy diet				
good	308 (66.5)	232 (66.9)	540 (66.7)	0.232
fair	124 (26.8)	101 (29.1)	225 (27.8)	
poor	31 (6.7)	14 (4.0)	45 (5.6)	
The practices regarding a healthy diet				
good	112 (24.2)	107 (30.8)	219 (27.0)	0.068
fair	305 (65.9)	215 (62.0)	520 (64.2)	
poor	46 (9.9)	25 (7.2)	71 (8.8)	

Table 8 demonstrates the distribution of KAP related to a healthy diet among staff in nutrition units of PHCCs based on gender. The data reveal that females constitute the majority of the staff (72%) compared to males (28%). In terms of knowledge, a significantly higher proportion of females (52.3%) exhibit good knowledge of a healthy diet compared to males (40.1%), with a p-value of 0.001, indicating a statistically significant difference. Attitudes towards a healthy diet are generally positive among both genders, with no significant gender difference a a a a a a a a a a a a a a a a a a a a(p-value = 0.349), as the majority of males (63.4%) and females (67.9%) reported good attitudes. Similarly, practices regarding a healthy diet show no significant variation by gender a a a a a a a a a a a a a a a a a a(p-value = 0.437), though a slightly higher percentage of females (28.1%) demonstrate good practices compared to males (24.2%). However, the majority of both genders fall into the fair category for practices (males: 65.6%, females: 63.6%).

Table 8: Distribution of Knowledge, Attitudes, and Practices regarding healthy diet among staff gender in Nutrition Units of PHCCs

Variables	Male 227 (28.0)	Female 583 (72.0)	Total 810 (100.0)	P-value
The knowledge of a healthy diet				
good	91 (40.1)	305 (52.3)	396 (48.9)	0.001
fair	109 (48.0)	244 (41.9)	353 (43.6)	
poor	27 (11.9)	34 (5.8)	61 (7.5)	
The attitudes regarding a healthy diet				
good	144 (63.4)	396 (67.9)	540 (66.7)	0.349
fair	67 (29.5)	158 (27.1)	225 (27.8)	
poor	16 (7.0)	29 (5.0)	45 (5.6)	
The practices regarding a healthy diet				
good	55 (24.2)	164 (28.1)	219 (27.0)	0.437
fair	149 (65.6)	371 (63.6)	520 (64.2)	
poor	23 (10.1)	48 (8.2)	71 (8.8)	

Discussion

The findings of this study provide an insightful snapshot of the KAP related to healthy diets among medical and paramedical staff in nutrition units of PHCCs across various governorates in Iraq. Several key themes emerge from the data, including regional disparities, differences based on profession and gender, and the existence of knowledge-practice gaps that have been documented in similar studies both regionally and globally.

Regional Distribution and Representation: The distribution of participants across the governorates highlights a higher representation from Basra, Nineveh, and Baghdad-Rusafa, which may reflect these regions' larger healthcare infrastructure or greater involvement in nutrition programs. These findings align with other regional studies that show healthcare workers in urbanized and larger governorates tend to have better access to resources, training, and involvement in public health initiatives [16]. For example, a study in Egypt demonstrated that healthcare workers in urban governorates exhibited higher knowledge levels about nutrition due to more frequent training opportunities [17]. The relatively lower participant numbers in Babil, Diyala, and Al-Muthanna may reflect logistical challenges or lower prioritization of nutrition counseling in these regions, as similar trends have been observed in rural areas of Jordan and Lebanon [18].

Knowledge Gaps and Areas for Improvement: The high levels of knowledge regarding calorie balance and the importance of fruits and vegetables (over 90%) are encouraging and consistent with global trends showing increased awareness of general dietary principles among healthcare workers [19]. However, the significant gaps in knowledge about the consumption of fish and the misunderstanding about Trans fats (with only 58.6% and 72.6%, respectively, demonstrating correct knowledge) point to areas needing targeted educational interventions. Similar gaps have been documented in studies from other Middle Eastern countries, such as Saudi Arabia and Kuwait, where healthcare workers also showed strong general knowledge but lacked specific dietary information [20]. Globally, knowledge deficits in specialized areas of nutrition, such as the role of fish in cardiovascular health, have been reported in countries as diverse as India and Brazil [21].

Attitudes and Practical Barriers: The positive attitudes toward healthy dietary practices among participants (with 91.2% recognizing the importance of a healthy diet for overall health) are in line with findings from other studies in the region, such as in Oman and the UAE, where healthcare workers overwhelmingly recognize the importance of nutrition counseling in patient care [23]. However, the lower levels of confidence in providing accurate dietary information (79.9%) and the acknowledgment of cultural barriers (59.6%) mirror findings from studies in similar socio-cultural contexts, where healthcare providers often face challenges in promoting dietary changes due to entrenched cultural norms [23]. For instance, research in Iran and Turkey highlights how cultural preferences for certain foods can conflict with healthy eating recommendations, complicating the role of healthcare workers in counseling patients [24].

Despite high levels of knowledge and positive attitudes, the practical implementation of dietary counseling is less consistent. Only 27.0% of participants demonstrated good dietary practices, a discrepancy between knowledge and practice that has been reported in both regional and global studies. For example, healthcare workers in Qatar and Bahrain, while knowledgeable about nutrition, often reported challenges in effectively translating this knowledge into practice due to time constraints, lack of resources, and inadequate patient engagement [25]. Globally, studies from high-income countries like the United States and the United Kingdom have also reported similar barriers, particularly the lack of time during consultations and inadequate training in behavior change techniques [26]. The reliance on longer-than-recommended counseling sessions (more than 30 minutes for 63.3% of participants) may suggest inefficiencies in delivering concise and effective nutrition advice, which has been a concern in studies from both developed and developing countries [27].

Gender and Professional Disparities: The study found significant differences in knowledge levels based on gender, with females demonstrating better knowledge than males (52.3% vs. 40.1%, p-value = 0.001). This finding aligns with other research that suggests female healthcare workers often have higher engagement in continuing education related to nutrition **(28)**. The lack of significant differences in attitudes and practices between genders, however, suggests that while knowledge may differ, both male and female healthcare workers face similar challenges in implementing dietary counseling. Comparable trends have been observed in studies from Iran and Egypt [29]. Similarly, the significant difference in knowledge between medical and paramedical staff (52.5% vs. 44.1%, p-value = 0.011) highlights the need for more inclusive training programs that cater to both groups. The better practices observed among paramedical staff (30.8% vs. 24.2%, p-value=0.068), although not statistically significant, suggest that paramedical workers, who often spend more time with patients in nutrition units, may have more practical experience in counseling. This observation is consistent with findings from Jordan, where paramedical staff were found to play a crucial role in patient education despite having lower theoretical knowledge than medical staff [30].

Conclusions

This study underscores the essential role of healthcare professionals in advocating for healthy diets within Iraq's PHCCs. Although most participants showed adequate knowledge and positive attitudes toward healthy eating, a significant gap remains in applying this knowledge consistently in practice. Medical staff demonstrated higher levels of dietary knowledge compared to paramedical staff, yet both groups face challenges in practical implementation. a a a a a a a a a a a a a Common obstacles include time constraints, insufficient resources, and cultural barriers. a a a a a a a a a a a a a The study highlights the need for targeted training programs designed to bridge the gap between knowledge and practice. Enhancing resources, intensifying training, and continuously evaluating services are crucial to overcoming these barriers. Addressing these issues will improve the effectiveness of nutritional counseling in PHCCs, thereby advancing public health outcomes in Iraq.

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