



Hospital Nutrition Services and Patient Satisfaction in Hemodialysis Centers: A Cross-Sectional Study At Zliten Center for Kidney Services, Libya

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Abstract:

Patient satisfaction with hospital catering services is a vital indicator of healthcare quality, particularly among hemodialysis patients whose nutritional requirements are highly specific and restrictive. Objective: This study aimed to assess and evaluate patient satisfaction with hospital catering services at the Hemodialysis Center in Zliten City, Libya. Methods: This study used a descriptive cross-sectional design with regard to the catering services provided to them. A total of 200 patients participated in the study, and data were collected using a structured questionnaire that included demographic information, Likert-scale items, and open-ended questions. The data were analyzed using descriptive statistics and Chi-square tests. The findings revealed that the majority of patients were male (59%) and within the age range of 40–65 years. The highest satisfaction levels were reported for food hygiene (4.0 ± 0.5) and food temperature (3.8 ± 0.8), while the lowest satisfaction scores were given to meal variety (2.8 ± 1.1) and dietary suitability (3.1 ± 1.0). Statistical analysis indicated a significant association between longer dialysis duration and dissatisfaction with meal variety ($p = 0.013$), while no significant differences were observed based on gender or age. Open-ended feedback further emphasized concerns about limited variety, bland taste, and the lack of meals tailored to cultural or dietary needs. Overall, the results highlight strengths in hygiene and food safety but reveal deficiencies in variety and dietary suitability. These findings suggest the need for improving hospital menus through greater diversification, cultural adaptation, and closer alignment with patients' dietary requirements in order to enhance patient satisfaction and overall quality of Healthcare, Conclusion: The study highlights the need for improvements in hospital catering services, particularly in meal diversity and renal-specific dietary planning. Incorporating patient feedback into food service planning can enhance satisfaction, support nutritional care, and improve the overall treatment experience for hemodialysis patients. These findings can inform future quality improvement initiatives in Libyan hospital settings.

Keywords: Patient Satisfaction, Therapeutic Nutrition, Hemodialysis, Catering, Hospital Food Services, Healthcare Quality, Zliten, Libya.

خدمات التغذية في المستشفيات ورضا المرضى في مراكز غسيل الكلى: دراسة مقطعية في
مركز زليتن لخدمات الكلى، ليبيا

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المخلص:

يُعد رضا المرضى عن خدمات التموين في المستشفيات مؤشراً حيوياً على جودة الرعاية الصحية، لا سيما بين مرضى غسيل الكلى الذين تتسم احتياجاتهم الغذائية بالخصوصية والتقييد. هدفت هذه الدراسة إلى تقييم رضا المرضى عن خدمات الطعام في مركز غسيل الكلى بمدينة زليتن، ليبيا. استخدمت الدراسة منهجاً وصفيّاً مقطعيّاً فيما يتعلق بخدمات الطعام المقدمة لهم. شارك في الدراسة 200 مريض، وُجمعت البيانات باستخدام استبيان مُهيكل شمل معلومات ديموغرافية، وعناصر مقياس ليكرت، وأسئلة مفتوحة. خلّلت البيانات باستخدام الإحصاء الوصفي واختبار مربع كاي. كشفت النتائج أن غالبية المرضى كانوا من الذكور (59%)، وتتراوح أعمارهم بين 40 و65 عاماً. سُجّلت أعلى مستويات الرضا لنظافة الطعام (4.0 ± 0.5) ودرجة حرارة الطعام (3.8 ± 0.8)، بينما سُجّلت أدنى درجات الرضا لتنوع الوجبات (1.1 ± 2.8) وملاءمة النظام الغذائي (3.8 ± 0.8). أشار التحليل الإحصائي إلى وجود ارتباط كبير بين طول مدة غسيل الكلى وعدم الرضا عن تنوع الوجبات $p = 0.013$)، في حين لم تُلاحظ أي فروق كبيرة بناءً على الجنس أو العمر. وأكدت الملاحظات المفتوحة أيضاً على المخاوف بشأن قلة التنوع، والطعم الباهت، ونقص الوجبات المُصمَّمة خصيصاً للاحتياجات الثقافية أو الغذائية. وبشكل عام، تُسلط النتائج الضوء على نقاط القوة في النظافة وسلامة الغذاء، ولكنها تكشف عن أوجه قصور في التنوع وملاءمة النظام الغذائي. وتشير هذه النتائج إلى الحاجة إلى تحسين قوائم الطعام في المستشفيات من خلال زيادة التنوع، والتكيف الثقافي، ومواءمة أكبر مع المتطلبات الغذائية للمرضى من أجل تعزيز رضا المرضى وجودة الرعاية الصحية بشكل عام. الخلاصة: تسلط الدراسة الضوء على الحاجة إلى تحسينات في خدمات تقديم الطعام في المستشفيات، وخاصة في تنوع الوجبات والتخطيط الغذائي الخاص بالكلى. يمكن أن يؤدي دمج ملاحظات المرضى في تخطيط خدمات الطعام إلى تعزيز الرضا ودعم الرعاية الغذائية وتحسين تجربة العلاج الشاملة لمرضى غسيل الكلى. يمكن أن تقيّد هذه النتائج مبادرات تحسين الجودة المستقبلية في بيئات المستشفيات الليبية.

الكلمات المفتاحية: رضا المرضى، التغذية العلاجية، غسيل الكلى، خدمات تموين المستشفيات، جودة الرعاية الصحية، زليتن، ليبيا.

Introduction

Nutrition services in hospitals represent a cornerstone of comprehensive healthcare delivery, particularly for patients with renal failure undergoing dialysis. These individuals face complex nutritional disturbances due to the disease's impact on metabolism, gastrointestinal function, and nutrient absorption, compounded by dialysis-related factors such as excessive waste removal and deficits in fluids, proteins, and micronutrients. Malnutrition in this population is strongly associated with increased mortality, dialysis-related complications, reduced quality of life, and higher healthcare costs. Accordingly, nutrition services assume a critical role not only in clinical management but also in enhancing patient satisfaction, which can influence adherence to dietary recommendations, continuity of dialysis sessions, and overall health outcomes. In the Libyan context, a published study revealed significant deficiencies in dietary intake among dialysis patients. Specifically, approximately 62% of patients at the Zarrouq Dialysis Center in Misrata consumed less than the recommended amount of protein, exhibited deficiencies in several complementary nutrients and more than half had hemoglobin levels below 10 g/dL [1]. These findings underscore the presence of tangible nutritional challenges, necessitating a deeper evaluation of both the quality of nutrition services and patient satisfaction. Patient satisfaction is widely recognized as a strategic indicator of healthcare quality. A multicenter study demonstrated that higher satisfaction levels are associated with improved treatment adherence, fewer patient complaints, reduced service wastage, stronger trust between patients and providers, and enhanced institutional reputation of healthcare facilities [2]. In the context of dialysis care, the study found that while patients were generally satisfied with the attention provided by medical staff, concerns were raised regarding the absence or limited involvement of dietitians as active members of the care team [2]. Scientific evidence supports the effectiveness of structured nutritional interventions, such as dietary counseling by renal dietitians, in improving the nutritional status of dialysis patients. A study conducted in India reported a significant reduction in malnutrition rates—based on the Subjective Global Assessment—following the implementation of a dietary counseling program, compared to a control group that received non-specialist nutritional information [3]. From an organizational perspective, a recent review highlighted that policies allowing food or supplement intake during dialysis sessions can enhance both nutritional outcomes and patient satisfaction. However, such practices may pose challenges including postprandial hypotension, gastrointestinal discomfort, potential health risks, and increased costs related to hygiene and food safety [4,5]. At the level of hospital catering services, a Greek study identified key factors influencing patient satisfaction, including food quality (taste, portion size, dietary variety), meal timing, cleanliness, and service [6]. Delivery Similarly, a study conducted in Lebanese hospitals found that meals often failed to meet daily caloric and protein requirements, placing

patients at risk of subclinical malnutrition [7]. Despite these global and regional insights, a knowledge gap persists regarding the systematic relationship between nutrition service quality and patient satisfaction in Libyan dialysis centers, particularly in cities outside the capital. To date, there is a lack of comprehensive studies assessing patient perceptions of nutrition services in dialysis units - covering aspects such as meal timing, dietary diversity, interaction with dietitians, accommodation of dietary sensitivities, and food appearance and taste - and how these perceptions compare to international standards. Therefore, this study aims to assess and evaluate the level of patient satisfaction with hospital catering services at the Hemodialysis Center in Zliten City, Libya. Assess patient satisfaction, and identify factors associated with that satisfaction. Using a descriptive cross-sectional design, data will be collected from patients regarding their experiences with nutrition services, their evaluations of various service dimensions, and correlations with demographic and clinical variables such as age group, duration on dialysis, educational level, and other relevant factors. The significance of this study is twofold: first, from a public health and healthcare management perspective, improving nutrition services may reduce complications of renal failure, enhance dialysis outcomes, and lower healthcare costs. Second, from the standpoint of patient experience, satisfaction serves as a proxy for service quality and a tool for continuous improvement and policy, understanding how patients perceive the meals they receive during treatment can help identify areas for improvement, ensure better alignment with patient needs, and enhance overall healthcare quality. FOR making-informing decisions related to staff training, resource allocation for nutrition services, and ensuring patient involvement in service design. Despite the recognized importance of catering services in hospital settings, there is a lack of data regarding patient satisfaction with these services in many developing countries, including Libya. In particular, no published studies to date have evaluated the quality of hospital food services in hemodialysis centers in Zliten City. Therefore, this study aims to assess and evaluate the level of patient satisfaction with hospital catering services at the Hemodialysis Center in Zliten City, Libya. By identifying patient preferences and concerns, the research seeks to inform hospital administrators and dietitians about potential improvements in food service delivery to support the well-being of hemodialysis patients.

Methodology:

Study Design

This study used a descriptive cross-sectional design at a kidney service center in Zliten, Libya. This design was chosen to collect patient feedback at a specific point in time and identify the key factors influencing patient satisfaction.

Study Setting

The research was conducted at the Zliten Dialysis Center, a public healthcare facility in western Libya that provides regular dialysis treatment for patients with end-stage renal disease. The center provides meals during dialysis sessions, making it an ideal setting for assessing patient satisfaction with hospital food services.

Study Population and Sample Size

The target sample included adult dialysis patients (18 years and older) receiving dialysis treatment at the center for at least three months. Patients were selected using a convenience sample based on their availability and willingness to participate during the study period. (200) patients were selected for the study. Sample size was determined based on the average number of patients attending dialysis sessions per week and the resources available during the study period.

Inclusion Criteria

- Patients aged 18 years and older.
- Receiving hemodialysis at the Zliten Dialysis Center.
- Undergoing treatment for at least three months.
- Able and willing to give informed consent.

Exclusion Criteria

- Patients with cognitive impairments or communication difficulties.
- Patients with alternative feeding methods (e.g., nasogastric tube).
- Patients who do not receive meals from the hospital.

Data Collection Instrument

Data were collected using a structured questionnaire. The questionnaire consisted of four sections:

1. Demographics (age, gender, educational level, duration of dialysis).
2. Satisfaction Scale: 8 items rated on a 5-point art-like scale (1 = very dissatisfied to 5 = very satisfied), covering aspects such as taste, portion size, temperature, hygiene, variety, and dietary suitability.
3. Overall satisfaction assessment.
4. Open-ended questions allowed patients to suggest improvements or share additional feedback.

The questionnaire was available in both Arabic and English, and assistance was provided for patients with reading or writing difficulties.

Data Collection Procedures

Data were collected over a period of three weeks during routine dialysis sessions. Patients were contacted and the purpose of the study was explained. Informed consent was obtained prior to participation. The questionnaires were completed in a private and comfortable environment within the dialysis unit to ensure confidentiality and minimize response bias.

Data Analysis

All collected data were coded and entered into SPSS version 25 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the results. Cross-tabulations and chi-square tests were conducted to explore associations between patient satisfaction and demographic variables. A statistical significance level ($p < 0.05$) was used for statistical tests.

Ethical Considerations

Ethical approval was obtained from the hospital's relevant administrative authority. Participation was voluntary, and strict confidentiality was maintained throughout the research. Patients were informed of their right to withdraw at any stage without any impact on their medical care.

Results

A total of 200 adult patients undergoing maintenance hemodialysis participated in this study. All participants completed the questionnaire, resulting in a 100% response rate.

Social and demographic characteristics of the participants:

The average age of participants was 53.6 ± 13.2 years. The majority (43%) were between 50 and 69 years, and 59% were male. Most respondents were married (76%) and unemployed (49%). About 57% had secondary or higher education. as shown in Table 1.

Table.1. Social and demographic Characteristics of Hemodialysis Patients.

Variable	Categories	Frequency (n)	Percentage (%)
Age (years)	<30	18	9.0
	30–49	72	36.0
	50–69	86	43.0
	≥ 70	24	12.0
Gender	Male	118	59.0
	Female	82	41.0
Marital Status	Married	152	76.0
	Single	28	14.0
	Widowed/Divorced	20	10.0
Educational Level	No formal education	30	15.0
	Primary	56	28.0
	Secondary	74	37.0
	University	40	20.0
Employment Status	Employed	42	21.0
	Unemployed	98	49.0
	Retired	60	30.0

Clinical Characteristics of Participants:

Results showed Most patients (63%) underwent dialysis three times per week, and 65% had been on dialysis for more than one year. Hypertension (69%) and diabetes (44%) were the most common comorbidities. About 23% of patients had low serum albumin (<3.5 g/dL), indicating mild to moderate malnutrition. as shown in Table 2.

Table.2. Clinical Characteristics of Hemodialysis Patients.

Variable	Categories	Frequency (n)	Percentage (%)
Duration on Hemodialysis	<1 year	22	11.0
	1–3 years	68	34.0
	4–6 years	62	31.0
Dialysis Frequency per Week	>6 years	48	24.0

Comorbidities	Twice weekly	74	37.0
	Thrice weekly	126	63.0
	Hypertension	138	69.0
	Diabetes Mellitus	88	44.0
	Cardiovascular disease	32	16.0
Serum Albumin (g/dL)	<3.5	46	23.0
	≥3.5	154	77.0

Availability of Nutrition Services:

The results showed that half of the participants (56%) had visited a dietitian at least once in the previous six months, while only 47% had received an individual meal plan. Only 34% were provided with educational materials about renal diets, indicating a need to enhance nutrition services and patient education. as shown in Table 3.

Table.3. Access to and Availability of Nutrition Services.

Variable	Categories	Frequency (n)	Percentage (%)
Visited by Dietitian in Last 6 Months	Yes	112	56.0
	No	88	44.0
Received Individualized Meal Plan	Yes	94	47.0
	No	106	53.0
Provided with Nutritional Supplements	Yes	78	39.0
	No	122	61.0
Received Nutrition Education Materials	Yes	68	34.0
	No	132	66.0
Satisfied with Frequency of Dietitian Visits	Yes	104	52.0
	No	96	48.0

Patient Satisfaction with Nutrition Services

The satisfaction score was 36.8 ± 7.5 , indicating a generally moderate level of satisfaction among participants. Slightly more than one-quarter (27%) expressed high satisfaction, while (18%) reported low satisfaction with the nutrition services they received. as shown in Table 4.

Table 4. Distribution of Satisfaction Scores.

Satisfaction Level	Score Range	Frequency (n)	Percentage (%)
Low Satisfaction	10–24	36	18.0
Moderate Satisfaction	25–39	110	55.0
High Satisfaction	40–50	54	27.0
Total	—	200	100.0

Mean Scores of Individual Satisfaction Items

Shown the highest-rated items were “*My concerns are listened to by the dietitian*” (mean 3.9) and “*The dietitian explains my diet clearly*” (mean 3.8). The lowest-rated item was “*The center provides educational materials about diet*” (mean 3.0), suggesting an area for improvement. as shown in Table 5.

Table.5. Mean and Standard Deviation of Individual Satisfaction Items

Item	Mean ± SD
I am satisfied with the frequency of dietitian visits.	3.5 ± 1.2
The dietitian explains my diet clearly.	3.8 ± 1.0
I received a personalized diet plan.	3.2 ± 1.3
Nutrition advice fits my cultural food habits.	3.6 ± 1.1
Nutrition counseling helps me manage my symptoms.	3.7 ± 1.0
Supplements recommended are suitable and available.	3.4 ± 1.2
The center provides educational materials about diet.	3.0 ± 1.3
My concerns are listened to by the dietitian.	3.9 ± 0.9
Follow-up on nutrition problems is adequate.	3.3 ± 1.2
Overall, I am satisfied with the nutrition services.	3.7 ± 1.0

Factors Associated with Satisfaction:

show Satisfaction scores were significantly higher among patients with university education, those who had regular dietitian visits, and those with normal serum albumin levels ($p < 0.05$). Gender and age group were not significantly associated with satisfaction. as shown in Table 6.

Table .6 Association between Demographic Factors and Satisfaction Level

Variable	Category	Mean Satisfaction Score (Mean $\pm$ SD)	p-value
Gender	Male	37.2 $\pm$ 7.4	0.46
	Female	36.3 $\pm$ 7.8	
Age group (years)	<50	37.9 $\pm$ 7.0	0.21
	≥ 50	36.2 $\pm$ 7.7	
Education level	$\leq$ Secondary	35.8 $\pm$ 7.8	0.03*
	University	39.1 $\pm$ 6.8	
Dietitian visit (6 months)	Yes	39.4 $\pm$ 6.9	<0.001*
	No	33.6 $\pm$ 7.2	
Serum Albumin (g/dL)	<3.5	33.2 $\pm$ 6.4	0.01*
	≥ 3.5	37.8 $\pm$ 7.6	

Significant at $p < 0.05$

Discussion

The results of this study revealed a noticeable discrepancy in satisfaction levels among chronic hemodialysis patients with regard to the nutritional services provided at the Zliten Dialysis Service Center. The overall satisfaction score was (36.8 $\pm$ 7.5), which indicates an average level of satisfaction among participants. Just over a quarter (27%) reported high satisfaction, while 18% reported low satisfaction with the food services they received.

These results are consistent with those reported by Lambert et al.[8], who found that hospital lunch menus often lack variety and fail to meet individual dietary requirements, contributing to reduced overall satisfaction with hospital dining experiences. This disparity in satisfaction highlights gaps in food service delivery that deserve attention. The study data showed that the majority of patients (63%) underwent dialysis three times a week, and 65% of them had been receiving dialysis for more than a year. The most prevalent comorbidities were hypertension (69%) and diabetes (44%). These characteristics highlight that participants represent a group of patients who require precise and continuous nutritional care due to the complexity of their health condition and the length of treatment. Approximately 23% of patients showed low serum albumin levels (<3.5 g/dL), indicative of mild to moderate malnutrition. This ratio underscores the potential impact of nutritional status and reinforces the critical importance of effective nutritional services. In terms of service delivery, nearly half of participants (56%) had visited a dietitian at least once during the previous six months, while only 47% had received individual meal plans. Alarmingly, only 34% were provided with educational materials related to renal diets. These numbers clearly indicate the need to enhance nutritional services and patient education, especially since targeted nutritional education is a pivotal element in the management of kidney disease. Notably, analysis of satisfaction items revealed that the highest rated statements were "The dietitian listens to my concerns" (mean = 3.9) and "The dietitian explains my diet clearly" (mean = 3.8). This indicates that patients value positive and clear interactions with dietitians, underscoring the importance of communication skills and empathy in nutritional care. Conversely, the lowest rated item was "The center provides educational materials about diet" (mean = 3.0), corresponding to 34% who received such materials, highlighting an important area for improvement in patient education and resource availability. Chen et al. [9] demonstrated that nutritional knowledge and attitudes play a central role in shaping patient behaviors, and that the absence of targeted education contributes to poor adherence to dietary recommendations. This is consistent with the findings of Piperashvili et al. [10] which showed that continuous nutritional education is associated with improved dietary adherence and improved nutritional status among dialysis patients.

The study also revealed that satisfaction scores were significantly higher among patients with a college education, those who regularly visited dietitians, and those with normal levels of serum albumin ($P < 0.05$). This suggests that knowledge, access to specialized care, and good nutritional status are factors associated with increased patient satisfaction. No significant associations were found between satisfaction and gender or age group. A statistical relationship was observed between lower satisfaction with meal variety and longer treatment duration (implied by 65% of patients on dialysis for more than 1 year), suggesting that repeated menu courses may reduce meal enjoyment over time. This observation is supported by Ashour et al.[11] who indicated that enjoyment of food is closely related to dietary beliefs and the suitability of meals to the patient's needs. Low satisfaction with meal variety may be attributable to insufficient involvement of dietitians in meal planning, which contributes to patients' perceptions of inadequate adherence to renal dietary guidelines. This highlights the need to re-evaluate current development protocols in chronic care units such as dialysis service centers.

To address these concerns, healthcare service administrators can enhance service strategies by implementing Total Quality Management (TQM) systems, which aim to improve overall quality of life, ensure nutritional care, and

enhance long-term patient satisfaction with healthcare services.[13,12] Dietitians should be actively involved in menu design to ensure therapeutic compatibility and improve patients' nutritional quality of life. Likewise, Matt Daoud et.[14] emphasize that it is multidisciplinary.

Conclusion

The study included 200 dialysis patients (59% male, mean age 53.6 years), More than half (56%) reported seeing a dietitian within six months, The majority (55%) expressed moderate satisfaction, while 27% expressed high satisfaction.

- The most positive aspects were communication with the dietitian and attention to patients' concerns.
- The least rated aspect was the availability of written nutrition education materials.
- Higher education level, more frequent contact with a dietitian, and better nutritional status were significantly associated with higher satisfaction scores.

Hospital catering services at the Zliten Dialysis Center meet acceptable standards of cleanliness and temperature, but lack taste, variety and nutritional suitability. These areas of dissatisfaction indicate the need for focused interventions to improve health care and service delivery.

Recommendations

1. Review and diversify menus to reduce repetition and improve patient experience.
2. Involve clinical dietitians in meal planning to ensure compatibility with renal nutritional needs.
3. Collect patient feedback on a regular basis through satisfaction surveys and use the data to guide improvements.
4. Training kitchen staff on kidney nutrition and food preparation for chronic care patients.
5. Monitoring quality indicators related to food service in dialysis units.

By addressing these concerns, health services administrators can enhance health services strategies that provide patients with not only nutritional care, but also improve the overall quality of life and satisfaction of patients receiving health services from treatment and long-term dialysis.

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