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Knowledge, attitude, and practice regarding malnutrition amongst patients with chronic kidney disease in China: A qualitative study

Shengrui Zhu, Dariah Mohd Yusoff, Hafzan Yusoff¹, Kueh Yee Cheng²,
Xiujuan Feng¹, Hongfang Chen³

Abstract:

BACKGROUND: Chronic kidney disease (CKD) can be complicated by malnutrition, which has adverse implications on patients' health outcomes and quality of life. CKD patients from different sociocultural contexts may have varying perceptions of knowledge, attitudes, and practices of malnutrition. However, information on the perception of malnutrition in patients with CKD is limited. This study aimed to explore and describe the knowledge, attitude, and practice of patients with CKD disease regarding malnutrition.

MATERIALS AND METHODS: A qualitative-descriptive design was used. Thirteen participants were selected through a purposive sampling technique among malnourished CKD patients from a hospital in Xi'an Provincial Hospital of Traditional Chinese Medicine between November 2022 and January 2023. Data were collected through face-to-face semistructured interviews until data saturation. All participants were informed about the study. Data obtained were analyzed by content analysis.

RESULTS: Three main categories and seven subcategories were extracted from the data analysis: 1) knowledge (basic knowledge acquisition and understanding, knowledge misconceptions, and confusion, nutrition knowledge, and culture collision); 2) attitude (negative attitudes and adverse situations, positive attitude and self-awareness); 3) practice (disadvantageous and passive practice, favorable practice).

CONCLUSION: This study provided insight into the knowledge, attitude, and practice of malnutrition in patients with CKD. Our findings can serve as important baseline data for the development of future interventions that can help reduce the risk of malnutrition, slow disease progression, and improve the quality of life in patients with CKD.

Keywords:

Attitude, chronic kidney disease, knowledge, malnutrition, practice, qualitative study

Introduction

Chronic kidney disease (CKD) is a general term for heterogeneous disorders affecting renal structure and function (renal impairment for more than 3 months) associated with or without a reduction in glomerular filtration rate (GFR). The symptoms are renal impairment, pathological abnormalities,

or an unexplained decrease in GFR (<60 mL/min·1.73 m²) over 3 months.^[1] CKD is not simply a disease of the renal system, but a chronic metabolic disease characterized by a progressive loss of renal excretory and endocrine function.^[2] It is a major risk factor for end-stage renal failure, cardiovascular disease, and premature mortality.^[3] Therefore, it is recognized as a public-health challenge threatening the

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Nursing Programme,
School of Health Sciences,
Universiti Sains Malaysia,
Kelantan, Malaysia,
¹Nutrition and Dietetics
Programme, School of
Health Sciences, Universiti
Sains Malaysia, Kelantan,
Malaysia, ²Biostatistics
and Research
Methodology Unit, School
of Medical Sciences,
Universiti Sains Malaysia,
Kelantan, Malaysia,
³Human Resources Office,
Xi'an Provincial Hospital
of Traditional Chinese
Medicine, Xi'an, China

Address for correspondence:

Dr. Dariah Mohd Yusoff,
Nursing Programme,
School of Health Sciences,
Universiti Sains Malaysia,
Kelantan, Malaysia.
E-mail: dariah@usm.my

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health of the global population, especially those of low- and middle-income countries.^[3]

Patients with CKD are at high risk of malnutrition because it creates a complex pathological environment resulting in metabolic changes in the body, thereby affecting nutritional intake, metabolism, and energy expenditure, as well as predisposing patients to malnutrition.^[4] According to the American Society for Parenteral and Enteral Nutrition, malnutrition is defined as an imbalance between nutrient requirement and intake resulting in cumulative deficits of energy, protein, or micronutrients that may negatively affect growth, development, and other relevant outcomes.^[5] Malnourished patients always suffer from weight loss and wasting, reduced fat content, sometimes even growth retardation, and feeling of being weak.^[6]

The CKD patients are also known to be at high risk for malnutrition, which is common in developed and developing countries. A meta-analysis has reviewed the global prevalence of malnutrition in patients with kidney disease. Their results show that the prevalence of malnutrition in patients with CKD stages 3–5 ranges from 11 to 54%.^[7] Meanwhile, in dialysis patients, the prevalence of malnutrition is 28–54%.^[7] Based on a survey in China, 20–50% of CKD patients often suffer from malnutrition.^[8] The prevalence of malnutrition in CKD patients is accompanied by a decline in renal function and is a strong indicator of poor outcomes in patients with CKD.^[6]

Simple malnutrition in the general population may be caused by inadequate nutritional intake. However, malnutrition in patients with CKD cannot be explained simply by adjusting nutritional intake.^[6] The pathogenic mechanisms of malnutrition in CKD are complex and involve an interaction among multiple pathophysiological changes, including reduced appetite and nutrient intake, hormonal disturbances, metabolic imbalances, inflammation, increased catabolism, and dialysis-related abnormalities.^[4]

Malnutrition is a life-threatening problem for CKD patients. It increases the risk of morbidity, mortality, and overall disease burden in patients with CKD. It is also an important risk factor for the malignant progression of CKD.^[4] Moreover, the consequences of malnutrition are multifaceted, negatively affecting the prognosis, complications, management, and quality of life of patients, as well as health economics.^[9]

Despite this evidence, malnutrition often goes undetected and untreated and is not considered a clinical priority.^[10] The lack of adequate knowledge, positive beliefs, and practical experiences may be some

of the major barriers. Knowledge can be understood as an individual's beliefs about the causes, symptoms, prevention, and treatment of disease.^[11] Attitude is also important in disease treatment. A positive attitude promotes the positive practice and the opposite produces negative practice.^[12] Practice is the way a person acts to achieve health goals, building on knowledge and attitudes.^[11] A hierarchical relationship exists among the three, in which accurate knowledge is the foundation, a good attitude is the motivation, and healthy practice is the goal.^[13]

The prevention or early detection of malnutrition is necessary, and in this context, knowledge of the disease, attitudes toward it, and related practices can play an important role.^[14] The rapid increase in the incidence of malnutrition calls for effective preventive and management measures to reduce malnutrition in CKD patients.^[15] However, the majority of malnourished CKD patients in China lack adequate knowledge and education on malnutrition.^[16] Considering this knowledge gap, the present study aimed to determine the knowledge, attitudes, and practices (KAP) of Chinese CKD patients toward malnutrition.

Material and Methods

Study design and setting

A qualitative-descriptive design was adopted in this study. It is suitable for understanding the experiences and perspectives of a certain type of group, and the views of such groups on a particular issue or thing.^[17] The data were analyzed using content analysis, which is a systematic coding and categorizing approach.^[18]

The interview was performed among inpatients of the nephrology department at the Xi'an Provincial Hospital of Traditional Chinese Medicine from November 2022 to January 2023. The hospital is a referral and teaching hospital located in Xi'an, Shaanxi Province, China.

Study participants and sampling

A total of 16 participants were initially involved in this study. They were selected using the purposive-sampling technique. The inclusion criteria were as follows: (a) male and female patients who were diagnosed with CKD,^[1] (b) age >18 years, (c) patients with CKD malnutrition: serum albumin <35 g/L, and (d) agreed to participate in this study. Those who had multiple mental illnesses and could not cooperate with the study, such as having speech impairment and inability to communicate were excluded.

Data collection

Data were collected through face-to-face, semi-structured interviews. The location of the interview was a single hospital room or a quiet demonstration room. The

interview process was recorded with a voice recorder after obtaining the participants' consent. Interviews were held using an interview guide developed based on the theory of KAP, combined with literature research, and discussed by a panel of experts. At the end of each interview, the researcher asked the participants, if they wanted to add anything else about malnutrition.

The length of interviews varied according to participants' conditions and ranged between 21 and 42 minutes each. Data saturation was reached by the time the interview reached the 14th participant. Nevertheless, the researcher conducted two interviews to ensure data saturation. No new data were generated from these two interviews. The third participant was interviewed twice, and the other participants were interviewed once. Therefore, the total number of interviews were 17. Among these 16 participants, the first two were mock interviews, after which the guide content and order of the interviews changed, so data from these two participants were not ultimately included. A third participant answered multiple questions in both interviews that were not the questions asked by the researcher, so the final decision was made to exclude his data. Thus, a total of 13 participants were finally included in the analysis.

Ethical approval

As part of doctoral work, this study was approved by the Human Ethical Committee of the Universiti Sains Malaysia (code: USM/JEPeM/22070470). Approval from the Ethics Committee of the Shaanxi Provincial Hospital of Traditional Chinese Medicine, where the study was conducted had also been obtained (code: 2022067). Before each interview, the researcher briefed the participants on the research content and purpose. They were assured of the confidentiality of the information and the freedom to unilaterally withdraw from the study at any time. Then, written informed consent was obtained from the participants.

Data analysis

Content analysis involves the following three phases: preparation, organizing, and reporting.^[19] In the preparation phase, the researcher initially transcribed verbatim the interview script. Afterward, the researcher immersed herself in the data and read several times to gain a sense of the entire meaning.^[20] The units of analysis were then selected. Meanwhile, in the organization phase, codes under possible subcategories or categories were collected, and clusters of codes that emerged were put together. In the final phase, the researcher reported the results for all stages by category.

Rigor

Lincoln and Cuban standards were used to ensure the validity and reliability of the results. These standards

were credibility, confirmability, dependability, and transferability.^[21] Credibility was enhanced by recruiting participants familiar with the survey topic, the long-term involvement of the researcher in the data, and member verification. Verifiability was ensured by documenting all steps of the study. Dependability was also ensured by reflecting on the stability of the data and providing full details about the interviews. Finally, the researcher provided detailed participant descriptions to ensure transferability.

Results

Among 13 participants, 4 were female and 9 were male with ages ranging from 19 to 55 years. The majority of the participants (69.2%) were married, but three (23.1%) were unmarried and one (7.7%) was divorced. Four (30.8%) participants were unemployed, four (30.8%) were professional and technical staff, and each occupation had one participant (n = 1, 7.7%): farmer, student, retiree, business services staff, and administrative staff. Furthermore, over half of the participants were diagnosed with nephrotic syndrome (n = 7, 53.8%), five (38.5%) were at the stage of chronic renal failure (uremic phase), and one (7.7%) was diagnosed with CKD. Table 1 presents the demographic details of the participants.

Three categories were identified using a deductive approach based on KAP theory, namely, knowledge, attitude, and practice. Eight subcategories were subsequently generated in relation to the research questions. Table 2 shows the detailed main categories, subcategories, and codes obtained from the content analysis.

Category 1: Knowledge

Findings for this category were presented through the following subcategories: 1) basic knowledge acquisition and understanding, 2) knowledge misconceptions and confusion, and 3) nutrition knowledge and culture collision.

Basic knowledge acquisition and understanding

This subcategory included the relationship between CKD and malnutrition, identification of malnutrition, symptoms of malnutrition, and dangers of malnutrition. Patients with CKD were largely aware that malnutrition may occur during the disease. Patients noted that the occurrence of malnutrition was primarily associated with disease progression, dietary restrictions, and the development of complications. For example, participant 9 stated:

Because I can't eat greasier things, so I can't keep up with the nutrition. I can't drink more milk than all these, I'm sure I'll be malnourished. (P9: para 2, line 6).

Table 1: Demographic characteristics of participants (n=13)

No.	Gender	Age	Marital Status	Occupation	Diagnosis	Serum albumin (g/L)
P1	Male	46	Married	Unemployed	Chronic renal failure (Uremic phase)	32
P2	Female	51	Married	Unemployed	Nephrotic syndrome	29
P3	Female	27	Unmarried	Business services staff	Nephrotic syndrome	13.7
P4	Male	38	Married	Administrative Staff	Chronic renal failure (Uremic phase)	27
P5	Male	20	Unmarried	Student	Nephrotic syndrome	18.8
P6	Female	25	Married	Professional and technical staff	Chronic renal failure	33
P7	Male	51	Married	Professional and technical staff	Chronic renal failure	28
P8	Male	19	Unmarried	Professional and technical staff	Nephrotic syndrome	26
P9	Male	38	Married	Farmer	Chronic kidney disease	26.6
P10	Male	53	Married	Professional and technical staff	Nephrotic syndrome	33.2
P11	Male	55	Married	Retiree	Nephrotic syndrome	22.5
P12	Male	49	Divorce	Unemployed	Chronic renal failure	26.7
P13	Female	34	Married	Unemployed	Nephrotic syndrome	13.7

Table 2: “Knowledge, attitude, and practice in CKD patients” with categories, subcategories, and codes

Category	Subcategory	Codes
Knowledge	1. Basic knowledge acquisition and understanding	1. The relationship between chronic kidney disease and malnutrition 2. Identification of malnutrition 3. Symptoms of malnutrition 4. The dangers of malnutrition
	2. Knowledge misconceptions and confusion	1. Misconception 2. Confusion
	3. Nutrition knowledge and culture collision	1. Regional food culture 2. Religious food culture
Attitude	1. Negative attitudes and adverse situation	1. Lack of attention to nutrition 2. Over-dependence on the external environment
	2. Positive attitude and self-awareness	1. Positive beliefs about dietary nutritional intake 2. The desire to learn about nutrition 3. Positive beliefs about the prevention of malnutrition 4. Self-control 5. Awakening of self-awareness
Practice	1. Disadvantageous and passive practice	1. Lack of attention to nutritional management 2. Misconduct 3. Passive recipients of nutritional knowledge
	2. Favorable practice	1. High-protein diet 2. Nutritional balance 3. Change bad eating habits 4. Manage nutrition flexible

Patients with CKD described such symptoms of malnutrition as weakness, lack of energy, fatigue, loss of appetite, and weight loss as in the following quote:

I feel like I don't have any energy, and I feel a little dizzy... (P2: para 2, line 23) Weakness and sleepiness. (P2: para 3, line 3)... Mental state is not very good either. (P2: para 3, line 7)... Weight loss is obvious. (P2: para 3, line 11) ...Poor appetite (P2: para 3, line 13).

Most CKD patients think malnutrition is dangerous and can significantly affect a person. Its effects are specific to health, activity, mood, mind, life, and work. The excerpt below typifies one (P3) CKD patient's view:

Malnourished patients have no energy, lose their hair, are thin, and have no energy. If you have no energy, how can

you have any strength? In addition, the patient's appetite is not good and he eats less. As the saying goes, 'Man is iron, rice is steel, one meal is not enough for hunger'. If you don't eat, you don't have any energy and you don't want to move anything. (N3: para 3, line 83).

Knowledge misconceptions and confusion

The amount and complexity of nutrition-related knowledge available to CKD patients may lead to misconception or loss of autonomy in the judgment of nutrition knowledge, which may affect patient practice. This situation is evident from the viewpoint of one (P12) CKD patient:

To use an analogy, I've been told before that I can't eat meat, so I'm all about the vegetarian diet. For several years, I didn't eat much meat, which caused malnutrition. (P12: para 3, line 36).

Additionally, patients at different stages of their disease or who have two or more simultaneous diseases may be indirectly confused about nutrition knowledge. It can be illustrated in the following quotes from one (P3) CKD patients:

I am anemic and in this area of diet, doctors tell anemic patients to eat more lean meat, but lean meat is not something you should eat in comparison to patients with chronic kidney disease. I'm not sure what I can do about it, but I'm at a loss for the moment. (N3: para 4, line 33).

Nutrition knowledge and culture collision

China's deep historical and cultural heritage has created a unique food culture. In China, eating habits differ between people in the south and in the north. The dietary habits of urban people also differ from those of rural ones. Therefore, patients have their dietary preferences influenced by the regional dietary culture. For example, one (P11) CKD patient made the following description:

I like to eat noodles, not rice. Rice is a good mix of vegetables and meat, I do not like, because growing up in the countryside has always ate noodles, do not like to eat rice. (P11: para 4, line 28).

Moreover, a proportion of patients do not eat meat and are vegetarians for religious culture or eating habit reasons. Participant 9 said:

I don't like to eat meat. I like vegetarian food because of my religious beliefs. (P9: para 4, line 20).

Category 2: Attitude

Findings for this category are presented through the following subcategories: 1) negative attitudes and adverse situations, and 2) positive attitude and self-awareness.

Negative attitudes and adverse situation

During the interviews, some patients with CKD revealed more negative attitudes and insufficient awareness of the importance of nutritional management or paid no attention to knowledge at all. One (P1) CKD patient remarked:

Because malnutrition does not affect anything, just my whole body tired, eating is not good. (P1: line 34 para 3)... what does it [malnutrition] matter? Malnutrition doesn't bother me. (P1: para 3, line 38).

When in contact with the external environment, patients depend totally on their family members, hospital canteen, or takeaways for the provision of a nutritious diet owing to inconvenient conditions. This environment affects the nutritional management plan, affecting the

patients themselves. The following are the views of a (P10) CKD patient.

In everyone's daily life, a day includes three meals. My family can't cook for me, I think it is unlikely. When we arrange the diet, we should not only follow the patient's eating habits but also take into account the eating habits of other family members to make reasonable arrangements.(P10: para 4, line 15).

Positive attitude and self-awareness

Some patients with CKD developed positive beliefs and attitudes throughout their illness, including positive beliefs about dietary nutrient intake, a desire to actively learn about nutrition and positive beliefs about preventing malnutrition. These aspects are explained in the following patient (P5) narratives.

After all, they are doctors, so I must listen to what they say with care and try to follow medical advice. (P5: para 2, line 22)... It is still important to control the diet. A proper diet will improve nutrition. I'll try to arrange my nutritional intake in a well-rounded way so that malnutrition can be prevented. (P5: para 4, line 17).

Some CKD patients mentioned an awakening of self-awareness in nutritional management. This finding meant that CKD patients can be positively aware of some of their attitudinal and belief problems, thereby providing an opportunity to build positive attitudes and beliefs:

...if you don't know much about malnutrition or don't pay attention to it, you may also aggravate the condition. (P8: para 2, line 14).

Category 3: Practice

Findings for this category are presented through the following subcategories: 1) disadvantageous and passive practice, and 2) favorable practice.

Disadvantageous and passive practice

Disadvantageous practice often occurs during the nutritional management of patients with CKD, which is manifested in a lack of attention to nutritional management or misconduct. Such disadvantageous practices have a direct impact on the health of a patient and are detrimental to the treatment and recovery of the disease. For example, one (P11) CKD patient made the following remark in response to the question related to nutrition-management practice:

We're from the countryside and I just feel that polenta in the morning is the best. I don't even care about meat, I don't like meat too much... (P11: para 4, line 8) ...I'm a careless person, I'm not that particular about food, just get enough to eat. (P11: para 4, line 14).

In terms of nutrition-knowledge acquisition, according to the descriptions of CKD patients, most patients are passive recipients of nutrition-related health education knowledge. For example, CKD patients are passive recipients of knowledge imparted by professionals, such as doctors and nurses, and they lack the initiative to acquire knowledge. The following are excerpts of the views of one (P5) CKD patient:

I have received health information from the hospital. (N5: para 2, line 14). I just listened carefully when they told me about it, and I didn't usually try to learn it too deliberately. (N5: para 2, line 16).

Favorable practice

Some patients with CKD demonstrated favorable and positive practices in their nutrition-management practice. After the onset of malnutrition, the CKD patient's diet structure changed considerably to achieve a balanced diet. The patients also changed their previous poor eating habits. They also had their own flexible approaches and behaviors to manage their nutrition based on their disease status.

I probably eat a little more protein than the average person when I take it in, as my body is losing a lot of it. (P8: para 3, line 20).

The diet should definitely take into account a balanced intake of eggs and meat and all these carbohydrates. Then I can maintain a balanced diet. (P3: para 4, line 20).

Discussion

This study provided KAP perspectives on malnutrition based on the experiences of patients with CKD. Results showed three main categories and seven subcategories, including knowledge (basic knowledge acquisition and understanding, knowledge misconceptions and confusion, nutrition knowledge, and culture collision), attitude (negative attitudes and adverse situations, positive attitudes, and self-awareness), practice (disadvantageous and passive practice, favorable practice).

Basic knowledge acquisition and understanding were the first subcategories of the main category of knowledge. Our results revealed that CKD patients had a basic knowledge of malnutrition, but it was not sufficiently comprehensive and in-depth. This finding indicated that CKD patients' knowledge of malnutrition required improvement. A cross-sectional study has shown that the ability of CKD patients' knowledge is directly proportional to their education and literacy level. A long duration of illness and knowledge by family members can also enrich patients' knowledge.^[22] We recommend that healthcare providers should strengthen the

education of nutrition knowledge for patients with low literacy in the early stage of CKD and their families.^[23] Lastly, this study found that patients' acquisition of knowledge lacked initiative and was too single channel. Therefore, scientific knowledge can be disseminated to patients through content-rich, diverse formats, such as by organizing kidney clubs, scientific lectures, and community presentations and by utilizing peer education and online media.^[24]

According to the results of this study, knowledge, misconceptions, and confusion were another subcategory of the main category of knowledge. Several reasons may explain these findings. First, owing to the lack of nutrition knowledge of CKD patients, recognizing the correctness of nutrition information was difficult.^[25] Second, cognitive dysfunction was prevalent in CKD patients at different stages of the disease, especially in uremic patients, which also affected the patient's understanding and judgment of knowledge.^[26] Third, the knowledge that CKD patients acquire may not be accurate or even incorrect, which can be confusing. Patients often obtain health information from readily accessible online sources, such as social media, blogs, and websites.^[27] Lambert *et al.*^[28] found that only 73% of the information on 254 websites was accurate, and only 18% of 161 YouTube videos were accurate. Therefore, to address the above problems, healthcare providers should carry out nutrition-related health education as early as possible to strengthen knowledge.^[29] Regular follow-up visits should be conducted to answer patients' questions and disseminate correct nutrition knowledge. For CKD patients with cognitive dysfunction, healthcare providers should pay attention and provide professional support.

Nutrition knowledge and culture collision was the last subcategory of the main category of knowledge. For many participants, food had a geo-cultural, family tradition, and religious significance that transcended even its nutritional value, and culture undoubtedly always dominates.^[30] For example, some CKD patients talked about how they have loved to eat noodles since childhood and how noodles were a happy memory for them; thus, changing this eating habit was difficult. These findings were consistent with the qualitative evaluation of Notaras *et al.*^[31] In fact, China is a multi-ethnic country comprising 56 ethnic groups. The food culture is also very diverse, and each ethnic group has its own traditional diet, so finding a balance between culture and nutrition is the key. We recommend that simplified, personalized, and culturally appropriate nutrition education may help meet patients' needs and improve compliance, by taking into account on their cultural eating habits.

According to the results of the attitude category, negative attitudes, and adverse situations were one of the

subcategories. In this study, we found that the negative attitudes of CKD patients were primarily characterized by a lack of attention to their nutritional problems. When analyzing the causes, lack of knowledge was one of the very important factors. KAP is a mutually reinforcing relationship.^[32] Only with sufficient knowledge can patients change their attitudes and consequently their practice.^[33] Another important reason was the long duration and recurrent episodes of the disease, which tended to lead to anxiety and depression in CKD patients and reduced their confidence in nutritional management.^[34] Adverse situations such as uncooperative cooking by family members can also directly affect the formation of positive attitudes in CKD patients. Thus, social support networks from family, friends, and healthcare professionals were crucial to the formation of CKD patients' nutritional attitude.^[23]

Positive attitude and self-awareness were the other subcategories of the main category of attitude. CKD patients fully understand the relationship between nutrition and disease progression and prognosis and establish a positive attitude toward nutritional management so that they can consciously adopt healthy behaviors.^[35] Hence, in the face of changes in dietary patterns after disease, healthcare providers should guide CKD patients to adapt to such changes with a positive attitude. The awakening of self-awareness was also a key element in the development of positive attitudes in CKD patients. Gradually changing patients' health attitudes by raising their health awareness corrected their negative practice habits.^[36] Therefore, healthcare providers and dietitians should fully communicate with CKD patients to understand their intrinsic motivation. CKD patients should be motivated to develop self-awareness and positive attitudes toward nutrition and promote nutrition management.

Practice is another dimension, and as our results showed, disadvantageous and passive practice was one of the subcategories. A study has revealed that energy, protein, and fat adherence rates in CKD patients are only 24.8%, 9.0%, and 14.4%, respectively.^[37] Similarly, the results of the present study found many disadvantageous diet habits in CKD patients. This finding may be related to patients' lack of adequate nutrition knowledge and positive attitudes.^[33] Research has also found that CKD patients are not motivated to actively acquire knowledge, which may be related to the failure of patients to recognize the importance of nutrition in the disease.^[28] In this regard, healthcare providers can develop a personal follow-up plan and conduct regular follow-up visits to improve adherence. Positive nutritional practices are promoted through motivational interviewing, interventions based on behavior change theory,^[38] patient-centered empowerment education,^[39] and intensive health education.

This research also demonstrated that favorable practice was the other subcategory of the main category of practice. The chronic, long-term nature of CKD disease determined the lifelong nature of its nutritional management behaviors, which was a huge challenge for patients but a key issue for the effectiveness of disease management.^[40] When faced with challenges in the practice of nutrition management, patients' ways of coping were not fixed and often varied between "facing" and "avoiding or giving in".^[41] Hence, in addition to the disadvantageous practice mentioned earlier, others were able to actively modify their dietary behaviors in accordance with the disease-required nutrition management.^[28,42] Correct nutritional practices help patients establish healthy eating behaviors and provide the body with energy and nutrients to slow the progression of the disease.^[36] Notably, a nutrition-management program may differ based on the stage of CKD or the presence of comorbidities.^[31] These findings suggested that nutritional guidance from healthcare providers should be specific, quantifiable, and enforceable.^[35]

Strengths and Limitations

This study is among the first to thoroughly examine the perspectives of malnourished KAP in CKD patients in a traditional Chinese medicine hospital in Xi'an, China. Thus, it may be considered novel due to its focus on a unique and specific patient population within a distinctive healthcare setting. At present, there is not enough focus on understanding the knowledge, attitudes, and practices (KAP) related to malnutrition in patients with chronic kidney disease (CKD). Nonetheless, patients have a significant role in managing their own nutritional well-being. Gaining insight into patients' perspectives can offer valuable guidance and direction for tailored clinical nutrition advice and intervention strategies.

The current research also encountered certain constraints. For instance, data gathering was carried out using a single approach, and only CKD patients who chose to take part were considered. It is possible that patients who declined to participate hold distinct viewpoints regarding malnutrition-related knowledge, attitudes, and practices. It's important to recognize that this qualitative study has limitations when it comes to applying the findings broadly due to the sample size was not large enough and the study involving only a single hospital; therefore, additional investigations should be undertaken across various geographical areas.

Implications

This research contributes to the existing body of knowledge in this field and provides certain perspectives relevant to clinical application. The results underscore

the significance of understanding nutritional KAP in the context of nutritional management. These initial findings highlight essential components that warrant the creation of interventions geared toward altering practices, with knowledge as the basis and attitude as the driving force. Simultaneously, we suggest the development of relevant tools aimed at early detection of malnutrition. This approach can aid in enabling CKD patients to maintain their remaining kidney function and decelerate the advancement of the disease.^[43] Finally, multidisciplinary collaboration is essential to reinforce consistent nutritional messages for positive and sustained patient outcomes.^[31] This collaboration involves cooperation among clinicians, dietitians, nurses, and other healthcare providers responsible for CKD patient care, working collectively to advance early nutritional interventions for individuals with CKD.

Conclusion

This study helped elucidate the concept of malnutrition KAP in patients with CKD. We also emphasized that the acquisition of adequate knowledge and the development of positive beliefs were critical to practice outcomes. Future services should focus on using these results to plan and implement the necessary interventions and to promote nutrition practice for patients with CKD. We further recommend that nutrition services be provided to CKD patients as early as possible to improve their KAP. Training courses should be provided as well for dietitians and related healthcare providers to enhance their nutrition knowledge and improve communication and nutritional counseling skills.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Ethical approval

As part of doctoral work, this study was approved by the Ethics Committee of the Universiti Sains Malaysia (code: USM/JEPeM/22070470). Approval from the Ethics Committee of the Shaanxi Provincial Hospital of Traditional Chinese Medicine where the study was conducted also obtained (code: 2022067).

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Conflicts of interest

There are no conflicts of interest.

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