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Dietary Behavior Challenges Among Hospitalized Older Adults with Oral Frailty: A Qualitative Study

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Abstract

Background

Oral frailty profoundly compromises the nutritional status and overall well-being of older adults. Although dietary modifications are essential for managing this condition, many older patients struggle to maintain healthy eating behaviors. Therefore, this study aimed to explore the multifaceted barriers to dietary behavior change from the lived perspectives of older adults with oral frailty, guided by the Theory of Planned Behavior.

Methods

A descriptive qualitative study design was adopted. Sixteen older adults with oral frailty were recruited using maximum variation purposive sampling to ensure diversity of experiences. Data were collected over a three-month period through fully audio-recorded, semi-structured, in-depth interviews. All interviews were transcribed verbatim and analyzed using directed content analysis guided by the Theory of Planned Behavior.

Results

Three themes and nine subthemes were identified: Behavioral attitudes were characterized by limited awareness and understanding of oral frailty, along with a passive, age-related mindset of compromise. Subjective norms were marked by limited family involvement, a lack of dietary guidance for oral health, and insufficient institutional dietary support. Perceived behavioral control was constrained by diminished chewing function that restricted food choices, reduced taste perception that weakened motivation for change, the influence of traditional dietary patterns, and conflicts between dietary requirements of comorbidities and oral function.

Conclusion

Dietary behavior changes in older inpatients with frailty are influenced by three factors: behavioral attitudes, subjective norms, and perceived behavioral control. Healthcare providers should enhance dynamic assessments of dietary behaviors in frail patients, assist them in maintaining healthy eating habits by addressing specific underlying causes, and thereby improve their health outcomes.

Introduction

Global population aging represents a significant and growing public health challenge. According to United Nations projections [1], by 2050, the global population aged 65 and older will reach 1.6 billion, accounting for 16% of the world's total population. As the country with the largest population base

globally, China faces particularly severe aging pressures [2]. Aging is characterized by a progressive decline in physiological reserve. Among these, oral health issues have emerged as a significant public health concern, profoundly affecting the quality of life and overall well-being of older adults [3].

Oral frailty, which is gaining recognition as an emerging geriatric syndrome, affects an estimated 20–29% of community-dwelling older adults, with the prevalence being significantly higher among hospitalized patients [4]. The concept describes the cumulative decline in oral health stemming from age-related structural and functional deterioration [5]. This condition presents with clinical signs, such as reduced tooth count and poor oral hygiene, and subjective symptoms, including chewing and swallowing difficulties [6]. Research [7] indicates that 37.9% of older adults experience chewing difficulties due to oral frailty, leading to restricted food choices and reduced dietary diversity. This cascade, in turn, contributes to malnutrition, sarcopenia, and physical frailty. Additionally, impaired oral function can contribute to systemic inflammation, elevating the risk of chronic disease progression and all-cause mortality [8].

Dietary behavior is a dynamic process, shaped by physiological, psychological, and sociocultural factors, that encompasses how individuals acquire, select, and consume food [9]. Despite evidence that high protein and energy intake, along with dietary diversity, can improve nutritional status and delay frailty in older adults with oral frailty [10, 11], many older patients struggle to adhere to healthy dietary patterns. Difficulties with chewing, reduced taste perception, and poor appetite can lead to inadequate dietary intake [12, 13]. However, existing research has largely focused on quantitative associations between oral frailty and nutritional status. Limited attention has been given to exploring, from the perspectives of older adults themselves, the psychosocial and functional factors that may hinder hospitalized older patients with oral frailty from maintaining healthy dietary behaviors.

The Theory of Planned Behavior (TPB) [14] proposes that individual behavior is primarily driven by behavioral intention, which in turn is influenced by three key constructs: attitudes toward the behavior, subjective norms, and perceived behavioral control. This theoretical framework has demonstrated robust explanatory power in understanding health-protective behaviors, with extensive application in domains such as dietary adherence and physical activity [15, 16]. Therefore, guided by the TPB, this study adopts a qualitative descriptive approach to explore the subjective experiences and multidimensional challenges encountered by older patients with oral frailty when attempting to adopt healthy dietary behaviors. The findings aim to provide evidence to inform the development of personalized, patient-centered dietary interventions.

Methods

Study design and setting

This study employed a qualitative descriptive research approach, adhering to the “Standards for Qualitative Research Reports” [17] for standardized documentation to enhance methodological rigor. The qualitative investigation was conducted through in-depth interviews and directed content analysis [18] at

a tertiary-level general hospital in Zhengzhou from August to October 2025. Located in Zhengzhou, the hospital specializes in geriatric medicine, equipped with advanced diagnostic and therapeutic facilities and featuring specialized clinical departments.

Participant recruitment

Purposeful sampling was employed to select older inpatients from a tertiary-level Class A hospital in Zhengzhou between August and October 2025, adhering to the principle of maximum diversity. Inclusion criteria: Age ≥60 years; Confirmed oral frailty (score ≥4) assessed using the Oral Frailty Index-8[19]; Low dietary behavior (≤36 points) as assessed by the Healthy Eating Behavior Scale[20]; Stable medical condition with sufficient comprehension of interview content and clear expression of personal views. Exclusion criteria: Severe mental, cognitive, or hearing impairment; Concurrent major illnesses such as malignant tumors or acute myocardial infarction; Participants who withdrew from the study. Sample size was determined by data saturation, defined as the point where no new themes emerged from repeated data analysis.

Data collection

Using the Theory of Planned Behavior as a framework and drawing on relevant literature, a preliminary interview guide was developed through team discussions. This guide was revised based on expert consultation and preliminary patient interviews (results not included in the final analysis) (Tables 1). Qualitative descriptive research interviews were conducted in the conference room of the geriatric ward, with each participant's interview lasting approximately 30 minutes. We employed a combined approach of semi-structured interviews and observation. First, interviewers explained the study's purpose and significance to participants, who then signed informed consent forms. Subsequently, interviewers clarified the purpose of audio recording and obtained consent. Interviewers then established rapport with participants through self-introductions. During interviews, interviewers adjusted question sequencing based on participant feedback, guiding discussions around themes while allowing participants to freely express thoughts and feelings. Interviewers employed specific techniques such as active listening, restatement of questions, and guiding questions while avoiding leading prompts.

Table 1 Open-ended questions asked in the semi-structured interview

Items	Questions
Q1	How much do you know about oral frailty?
Q2	Based on your oral health condition, how do you feel your eating habits have changed?
Q3	What factors do you think have influenced your eating habits?
Q4	How do you feel the attitudes and advice from family, friends, fellow patients, or healthcare providers have affected your eating habits or behaviors?
Q5	Given your current oral health status, what are your feelings about adhering to healthy eating behaviors during daily home life? What challenges have you encountered?
Q6	In facing these challenges, what kind of support would you like to receive?

Data analysis

Within 24 hours of each interview, researchers transcribed the data verbatim into text and annotated nonverbal cues such as facial expressions and body movements. A second researcher reviewed the transcripts to ensure accuracy and completeness. The processed data were independently analyzed and coded by two researchers using directed content analysis [19]. Coding was completed independently using NVivo 12 by the two coders. The thematic extraction process followed these steps: □ Select key concepts from the Theory of Planned Behavior as initial coding categories; □ Through sentence-by-sentence reading, focus on content related to dietary behavior issues among older adults, marking and annotating relevant segments to extract semantic units; □ Classify related semantic units using predefined coding categories to create codes; □ Researchers determine whether to construct subcategories based on similarities and differences among codes. Data that did not fit neatly within the pre-existing TPB constructs were analyzed inductively, leading to the refinement of existing themes. In case of disagreement, researchers engage in group discussions and consult expert opinions until final consensus is reached.

Rigor and Trustworthiness

To ensure the rigor and trustworthiness of this qualitative study, we adhered to the criteria proposed by Sundler AJ[21], addressing credibility, transferability, dependability, and confirmability. Credibility was established through prolonged engagement. The interviewers□2 female□, who were nursing graduate students with formal academic training, completed a three-month clinical rotation in a geriatric ward. This experience enabled them to build rapport with participants and develop a contextual understanding prior to data collection. Additionally, triangulation was achieved through the involvement of two independent researchers in data analysis and the use of member checking, whereby transcribed interviews were returned to participants for verification of accuracy and authenticity. Transferability was enhanced by providing detailed demographic characteristics of participants (Table 2) and rich, verbatim quotations to allow readers to assess the applicability of findings to similar contexts. Dependability was

ensured through the development of a comprehensive audit trail, including detailed documentation of the research process, coding decisions, and analytical memos, enabling transparency in how themes were derived. Confirmability was addressed through reflexivity, with researchers maintaining regular debriefing sessions to discuss potential biases and assumptions throughout the research process, ensuring that findings were grounded in participants' experiences rather than researcher preconceptions.

Ethical approval

This study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Medical Ethics Committee of the University (Approval No. KY2025139). Before participating in interviews, all subjects received detailed explanations regarding the study objectives, specific methodologies, and measures to ensure their health and safety. They were also informed of the confidentiality policy for personal information and the voluntary nature of participation. Written informed consent was obtained after confirming participants' full understanding of the research process and their rights. Participants were also informed they could withdraw from the study at any time without penalty or loss of benefits. During the study, participants' names were replaced with coded identifiers, and data were securely stored to ensure strict confidentiality of personal information.

Results

Among the 17 elderly participants who provided informed consent, one participant did not complete the interview due to an unexpected commitment. Finally, a total of 16 older adults with oral frailty were interviewed for this study. To preserve the identity of participants, aggregated, rather than individualised demographic characteristics are presented in Table 2 (Table 2).

Table 2 Demographics of interviewees (n=16)

Demographics	Count (%)
Gender	
Female	7(43.8%)
male	9(56.3%)
Age(years)	
60~70	2（12.5%）
70~79	4（25.0%）
80~89	9（56.3%）
≥90	1（6.3%）
Occupation (Before retirement)	
Farmer	5（31.3%）
Worker / Staff	5（31.3%）
Military	2（12.5%）
Professional / Cadre	4（25.0%）
Living status	
Living alone	3(18.8%)
With spouse	10(62.5%)
With children	2(12.5%)
With caregiver	1(6.3%)
Education level	
Illiterate	2(12.5%)
Primary school	6(37.5%)
Middle school	2(12.5%)
High school	3(18.8%)
University/College	3(18.8%)
Number of comorbidities	
0	1（6.3%）
1-2	10（62.5%）
≥3	5（31.3%）

Oral frailty score	
4-5	9（56.3%）
6-7	5（31.3%）
≥8	2（12.5%）

Based on our conceptual framework, analysis revealed 3 main themes and 9 sub-themes: 1. Behavioral attitudes (2 sub-themes), 2. Subjective norms (3 sub-themes), and 3. Perceived behavioral control (4 sub-themes) (fig.1).

Theme 1 Behavioral attitudes

In this study, behavioral attitudes refer to the perceptions, cognition, and positive or negative attitudes held by older inpatients with oral frailty toward dietary behavior modifications.

1.1 Limited awareness and understanding of oral frailty

Limited awareness and understanding of oral frailty among some older adults, rooted in historical educational disparities and low health literacy, results in a failure to prioritize oral health as a component of overall health, thereby undermining the perceived importance of dietary modification. Even among those who sensed a possible connection between oral health and broader wellbeing, this awareness remained vague and had not translated into any conscious motivation for dietary change.

I suspect my poor eating habits aren't just causing oral issues, but may also indicate underlying health problems... I don't usually pay much attention to oral health information. (P9)

Oh, it's so hard to eat healthier these days... But that probably doesn't have much to do with dental health, right? (P10)

I never went to school either, so I don't know about oral health issues. I don't really follow this dietary stuff either—as long as I'm full and not hungry, that's good enough. (P14)

1.2 A mindset of compromise dominated by aging

Several participants expressed a passive orientation toward dietary change, describing their current eating patterns as an accepted part of growing older rather than something requiring active modification. This mindset fosters a tendency to compromise with existing eating habits rather than actively pursue change, thereby weakening motivation to adopt healthier dietary behaviors.

(Food) It's not a big deal. Anyway, I'm getting older—I don't really care what I eat anymore. (P2)

Oh dear, it's hard to eat healthily these days! (wry smile) At this age, I just don't eat much anymore. I've gotten a bit picky too—can't handle things that are too cold or too hot. (P10)

At our age, it's different from how people in their forties or fifties feel. We've lived through all the ups and downs in life. Now, we just take things as they come. If I can chew it, I'll eat it. If not, I'll skip it (shakes head). (P12)

Theme 2 Subjective norms

In this study, subjective norms refer to the pressure perceived by older adults with oral frailty from external factors such as family, friends, and society when engaging in dietary behaviors. Individuals exist within an environment influenced by others, thereby forming their subjective norms regarding dietary behaviors.

2.1 Limited family involvement

Several participants described experiencing limited involvement from family members in the management of their daily dietary routines, a situation they perceived as leaving them without adequate support for maintaining healthy eating practices. Consequently, the absence of active family engagement may weaken adherence to recommended dietary practices and hinder the maintenance of healthy eating behaviors.

My kids are busy working away from home. My son occasionally calls and tells me to eat more eggs and sweet potatoes, but usually I just eat alone and don't eat much. (P1)

For daily dietary guidance, it's mainly our caregiver Xiao Tang. My daughter's son isn't here to look after me. (P7)

My daughter is busy working at the school. At home, it's just me and my wife. Neither of us pays much attention to healthy eating. Whatever my wife cooks, I eat. I've never been picky since I was young, and I don't have any special nutritional requirements either. (P10)

2.2 Absence of dietary guidance for oral health

Several participants indicated a lack of professional dietary guidance related to oral health. Although healthcare professionals were considered important sources of dietary advice, older adults expressed that the available education was limited and did not adequately address their needs. In addition, some participants expressed a need for more accessible and practical educational materials, suggesting that even when guidance is available, it may not be delivered in formats that are easily understood or tailored to older adults, thereby limiting its effectiveness in supporting dietary behavior change.

No, no one gave me any advice. My teeth aren't great, but no doctor or nurse ever mentioned needing to take special care of them. (P3)

I'd still prefer to read some educational guides. Tell me how to supplement nutrition for this oral weakness and what healthy foods to eat—pictures or videos would work too. But there's nothing like that available now. (P8)

No one gave me advice, so I just did what I thought. I try to eat soft foods most of the time, but I don't know how to make soft foods healthier. (P10)

2.3 Insufficient institutional dietary support

Some participants relied on hospital-provided meals during hospitalization. However, they reported that the available food options were limited and did not always meet their preferences or perceived nutritional needs. The standardized and restrictive nature of hospital meals appeared to reduce satisfaction and made it difficult for participants to adjust their dietary practices.

These days I'm eating mostly vegetables... But eating bland food every day just doesn't work for me. With my dentures, I can't taste anything normally, and the hospital food is way too bland.(P7)

I've been hospitalized in the city these past few days, and I'm really not used to this food. After a few meals in the cafeteria, I just can't stand it anymore—it's always the same few options. The restaurants nearby are way too greasy. (P14)

Older folks tend to choke easily when eating. I just wish the hospital's nutritional meals would offer something nutritious and suitable for seniors. That way, if we eat well here, we'll know what to eat when we get home. (P16)

Theme 3 Perceived behavioral control

In this study, perceived behavioral control refers to the perception of older adults with oral frailty regarding the ease or difficulty of adopting dietary behaviors. Specifically, it involves patients fully assessing, based on past experiences and anticipated barriers, whether their personal capabilities and objective factors enable them to adhere to healthy dietary behaviors.

3.1 Diminished chewing function restricting food choices

Participants with oral frailty perceived that diminished chewing function had directly constrained their dietary choices, leading to a narrowed food variety and adaptations in cooking methods in their daily lives. These changes in dietary variety, quantity, and food texture may influence their overall nutritional intake and dietary balance, potentially affecting their health status.

The dental implant I had before broke off. Now my dentures don't feel as comfortable as my original teeth. Chewing slightly harder foods is a bit of a struggle. (P2)

When I can't chew hard foods, I ask my kids to cook them longer and softer. I used to love fried foods, but I definitely eat less of them now. (P8)

I mostly have porridge or noodle soup—all soft foods. My teeth aren't what they used to be, so eating is definitely affected. I can't eat hard things anymore, so I stick to soft foods. Sometimes when I see something hard, I'll take a couple bites. If I can't eat it, I just don't eat it—no forcing myself! (laughs helplessly) Some things I can't manage; I take a couple bites and spit them out. (P12)

I just eat less now, since I have dentures on top and bottom. Eating hard foods is uncomfortable. (P15)

3.2 Reduced taste perception weakening motivation for change

Older adults with oral frailty may experience impaired taste as a result of oral health problems or denture use. In daily life, they often maintain long-established dietary preferences (such as a preference for high-salt, meat-heavy foods), which may hinder attempts to modify their dietary behaviors.

My teeth are dentures now. When eating, others might find the food salty or sweet, but I often can't taste it. So I don't crave specific foods—as long as I'm not hungry, that's fine.(P1)

My eating habits haven't changed. I still prefer meat dishes over light fare, don't like vegetables, and avoid tofu products. I want to eat healthier, but it's not always easy to do.(P3)

My eating habits aren't great—I don't enjoy rice or vegetables much. Since my teeth got worse, I eat even less. I mostly stick to steamed buns and soup. I love salty food and have a heavy palate. (P5)

3.3 Traditional dietary patterns influencing eating behaviors

Participants described how long-standing dietary habits shaped by traditional cultural practices influenced their eating behaviors. Many maintained established patterns characterized by limited dietary diversity and a preference for familiar foods, which sometimes differed from recommended healthy eating practices. Early life experiences of economic hardship appeared to contribute to values such as frugality and endurance, which may have reinforced these habitual patterns. These deeply ingrained habits were often described as difficult to change and seemed to limit participants'perceived ability to modify their dietary behaviors.

Ever since I was a kid, my family was pretty poor. Later when I joined the army, life was tough too—we'd eat dry biscuits to stave off hunger. Back then, we ate whatever was available, never being picky about food. That's how I've lived my whole life. (P2)

There are some things I don't eat—like meat, for instance. I rarely eat it. I haven't eaten pork since joining the revolution, and I still don't eat it to this day. (P10)

We Henan folks love noodle dishes. Our diet is pretty simple. Back then, we ate steamed buns every day, but they're tough to chew. Once my teeth started failing, I switched to noodles (soup noodles). Five out of seven days, our family eats noodles. (P14)

3.4 Conflicts between comorbidities' dietary needs and oral function

Some older adults reported living with two or more chronic conditions. Participants described that the coexistence of multiple diseases was often accompanied by poorer overall health status and a more rapid decline in oral function. At the same time, oral health problems made it difficult for them to follow dietary recommendations required for managing their chronic conditions. This conflict between dietary requirements and oral function further increased the risk of inadequate nutritional intake.

I have high blood pressure and diabetes now. I want to eat, but I'm afraid to, because with this condition I have to control my diet. The doctor advised limiting carbohydrate intake and choosing low-sugar, high-fiber foods whenever possible. But my teeth aren't good, and some foods are just too hard for me to eat —like apples and nuts, which are usually difficult to bite through, so I just don't eat them. That leaves me with very few food choices. (P6)

I have multiple health issues. After developing coronary heart disease and suffering a cerebral infarction, I eat less. Swallowing is difficult, and eating causes discomfort in my mouth. I know I should eat more vegetables and fruits, but sometimes these foods are hard to chew and swallow, especially carrots. I have to cut them into very small pieces. (P9)

The doctor says I need less salt and sugar for my high blood pressure, but I'm always thirsty and my food tastes bland. Without soy sauce or salt to season it, the food just doesn't taste good. (P12)

Discussion

The primary objective of this study was to explore the multifaceted challenges of modifying eating behaviors in older adults with oral frailty using the Theory of Planned Behavior. Our findings fill a crucial gap in understanding why this vulnerable population struggles to adopt healthy diets despite clinical recommendations. Overall, the qualitative evidence indicates that behavior change is non-linear and deeply restricted by the intersection of patients' fatalistic attitudes toward aging, inadequate external dietary guidance, and the physical decline of oral functions.

Behavioral attitudes and the necessity of oral health education

This study found that dietary behavior changes in older adults with oral frailty are influenced by their attitudes, primarily manifested as cognitive blind spots regarding oral frailty and negative dietary attitudes resulting from aging, leading to nutritional misconceptions. The negative dietary attitudes of frail older patients hinder adherence to healthy eating behaviors, a finding consistent with the study by Xia et al[22]. This may stem from the subtle early symptoms of oral frailty, which often lead to overlooked oral health issues, as well as individual variations in information comprehension.

These findings highlight the importance of targeting attitudinal barriers—a core determinant of behavioral intention within the TPB—by prioritizing patients' oral health education and awareness. Initial efforts could focus on establishing an accurate understanding of oral frailty, using accessible language to educate older patients about oral health and nutrition. Utilizing health education, educational videos,

or hospital digital platforms can enhance patients' knowledge of oral health and dietary practices, elevate their health literacy, and foster positive dietary attitudes[23]. Simultaneously, healthcare providers are encouraged to implement integrated oral-dietary awareness modification strategies. For instance, Hidaka et al. [24]developed the Comprehensive Awareness Modification of Mouth, Chewing and Meal (CAMCAM) program, a novel intervention that concurrently trains patients' chewing function while delivering oral health and nutrition-related education during meals. This combined approach has shown promise in improving both attitudes toward oral health and dietary habits, thereby promoting the maintenance of healthy eating behaviors. Such integrated interventions may be particularly effective for older adults with oral frailty, as they address the simultaneous decline in oral function and nutritional status within a single, practical framework.

Furthermore, consistent with previous research[25], some patients experience increased difficulty in managing healthy diets due to age-related resignation. This underscores the need to prioritize psychological support for older adults with oral frailty. Healthcare providers can engage in regular communication, leveraging patients' interests and skills to enhance their sense of self-worth. This fosters positive perceptions of aging and promotes active aging. Ultimately, educating patients about oral frailty improves their understanding and motivates sustainable dietary changes[26].

Subjective norms and the construction of multidimensional support systems

According to the Theory of Planned Behavior[27], subjective norms describe how individuals' behavioral changes are shaped by perceived expectations and influences from significant others, including healthcare professionals, family members, and peers. Consistent with previous studies[28], our findings indicate that dietary behaviors among older adults with oral frailty are significantly influenced by social support. Family support plays a crucial role not only in disease management but also in helping delay the decline of oral function through close communication and daily assistance [29]. However, some participants reported receiving limited family support due to their relatives’ demanding work schedules and time constraints. Strengthening social support for older adults may enhance their motivation to maintain healthier dietary habits and can also contribute to improved family relationships [30]. Previous research indicates that [31] implementing family-centered care interventions—treating the family as a cohesive care unit and guiding patients' active participation—can enhance treatment adherence and overall quality of life. Therefore, enhancing family involvement and encouraging more frequent communication in daily life may help maximize the supportive role of families.

Furthermore, professional guidance from healthcare providers is equally essential. This study found that the insufficient involvement of healthcare professionals is a major barrier to maintaining healthy eating habits. Previous research [32]has shown that weekly professional oral care interventions over one month can effectively improve plaque indices and maintain oral function, which is a fundamental prerequisite for successful dietary modifications. Consequently, healthcare providers should place greater emphasis on assessing patients’ oral functional status and implementing targeted oral care interventions for this vulnerable population.

In addition, the traditional centralized hospital meal service model may not adequately address older patients' sensory preferences or the dietary requirements associated with multiple chronic conditions. Participants in this study expressed dissatisfaction with the limited variety and palatability of hospital meals, highlighting a system-level barrier that may hinder adherence to recommended dietary practices. Addressing this challenge will require innovations in how hospital food services are organized and delivered. Looking forward, the development of digital health solutions, such as cloud-based integrated management platforms offers a promising avenue for future research and practice [33]. Such platforms could facilitate the design of personalized nutritional plans that balance patients'dietary preferences with clinical recommendations while enabling effective communication channels between patients and healthcare providers for the seamless exchange of dietary information. By improving patient engagement and meal satisfaction, these technology-enabled approaches may help translate inpatient dietary guidance into sustainable eating behaviors that patients can maintain after discharge. Collectively, these multidimensional strategies address the subjective norm construct of the TPB by reshaping the normative influences that shape patients' dietary intentions across familial, professional, and institutional levels.

Perceived behavioral control and strategies to overcome dietary barriers

The findings of this study suggest that perceived behavioral control among older adults with oral frailty is shaped by multiple factors, including oral functional limitations, long-standing dietary habits, and comorbid chronic conditions. The Theory of Planned Behavior posits that perceived behavioral control is a key variable in predicting behavioral intentions and actual behaviors. Therefore, it is essential to explore both subjective and objective barriers faced by older patients and to employ multidimensional support strategies to restore their sense of control over healthy eating.

This study found that some participants experienced reduced oral function and consequently developed a preference for soft foods, resulting in an excessive reliance on soft diets. Although this strategy may temporarily alleviate eating difficulties, long-term dependence on soft foods may further weaken chewing ability and contribute to nutritional imbalances [34], thereby gradually reducing patients' actual control over their dietary choices. Therefore, for such patients, guidance on food texture modification could be provided based on international dysphagia dietary standards[35]. Soft or semi-liquid diets can help ensure adequate nutrient intake and maintain dietary diversity without exceeding chewing capacity. Concurrently, oral chewing function training should be integrated into daily care; for instance, consuming coarse-fiber foods can enhance tongue and facial muscle strength[36].

Furthermore, this study identified conflicts between dietary requirements for chronic disease management and the limitations imposed by declining oral function, which may lead to reduced adherence to recommended diets. This finding underscores a critical insight single-discipline interventions may be insufficient to meet the complex needs of this population. Older adults with oral frailty often navigate multiple chronic conditions alongside progressive oral functional decline, yet current care delivery models frequently address these issues in isolation. To address this gap, a

multidisciplinary management model for geriatric oral frailty may therefore be beneficial.Within this framework, dental professionals could instruct patients on denture maintenance and specialized care to uphold oral hygiene, thereby enhancing appetite [37]. Meanwhile, nutritionists could develop individualized dietary plans that balance chronic disease management with oral health status. Nursing staff may also play an important role in enhancing patients' dietary self-efficacy and confidence in managing their eating behaviors. By integrating expertise across disciplines, such a collaborative model would directly address the intersecting barriers patients face, offering a more holistic and practical approach to care.

Finally, the findings indicate that[38] long-established traditional dietary patterns represent ingrained automatic behaviors, making conventional health education challenging to alter. While the present research demonstrates the value of enhancing patients' perceived behavioral control over dietary choices, translating this insight into effective behavioral interventions remains a significant challenge. Future research could explore the use of emerging digital health technologies, such as Just-in-Time Adaptive Interventions (JITAIs) [39], which have shown promise in addressing recurrent unhealthy behaviors, to deliver personalized dietary support and potentially enhance patients' perceived behavioral control. By leveraging wearable devices for real-time monitoring of patients' eating contexts, such technologies could enable the delivery of timely, context-sensitive interventions at critical decision points, translating evidence-based dietary principles into intuitive visual cues or voice alerts[40]. Although empirical evidence in this specific population remains limited, this innovative approach warrants further investigation for its potential to help disrupt ingrained poor dietary habits, and strengthen patients' perceived behavioral control over their dietary behaviors.

Several limitations should be acknowledged. First, data derived from semi-structured interviews are subject to self-report bias, particularly as age-related variations or oral-induced verbal barriers in older adults with oral frailty may limit their full articulation of dietary challenges. Second, while the TPB-guided directed content analysis provided a solid foundation, this deductive approach inherently carries a risk of researcher bias, potentially overshadowing themes outside the predefined framework. Finally, participants were recruited from a single tertiary hospital in northern China. Given that dietary habits are deeply influenced by regional culture, the transferability of these findings may be limited. Future multi-center and longitudinal studies across diverse socio-cultural contexts are warranted to validate these results.

Conclusion

Guided by the Theory of Planned Behavior, this qualitative study highlights the multifaceted challenges older adults with oral frailty encounter when attempting to adopt healthy dietary behaviors. The findings reveal that these patients face significant barriers deeply rooted in negative behavioral attitudes, insufficient social support, and diminished behavioral control. Therefore, clinical healthcare providers are encouraged to incorporate routine, dynamic assessments of patients' dietary behaviors. By addressing these specific multidimensional barriers through tailored interventions, practitioners can effectively

assist older patients in improving their dietary habits and overall quality of life. Future large-scale, multicenter, and mixed-methods research is warranted to further inform the development of evidence-based, patient-centered dietary intervention strategies.

Declarations

Author Contributions:

Chenxi Du and Xia Zhang contributed equally to this work and share first authorship. Chenxi Du and Xia Zhang planned and designed the study, conducted data collection and qualitative analysis, and wrote the original manuscript. Yinuo Chen, Dandan Wang, Lihua Xing, and Jingjing Wang were involved in data collection and edited the manuscript. Xiaoyan Shi provided guidance on qualitative methodology and edited the manuscript. Hui-Chen (Rita) Chang conceptualized and designed the study, supervised the conduct of the research, reviewed the themes, and edited the manuscript. All authors reviewed and approved the final version of the manuscript.

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Data availability:

The data used and generated during this study are not publicly available to minimize the risk of identifying the participants. Datasets are available from the corresponding author upon reasonable request.Dietary Behavior Challenges Among Hospitalized Older Adults with Oral Frailty: A Qualitative Study

References

1. Nations U. World population prospects 2019: highlights. United Nations. https://www.un.org/en/desa/world-population-prospects-2019-highlights. Accessed 22 Feb 2026.
2. Li HD, Zhao SB, Wang X, Li HY. Regional differences and trend prediction of population aging in China. Stat Decis. 2021;37:71–5. https://doi.org/10.13546/j.cnki.tjyjc.2021.03.015. [In Chinese]
3. Liu C, Du MQ. Oral frailty in older adults: a comprehensive review from concept to intervention. Int J Stomatol. 2025. [In Chinese]
4. Yang C, Gao Y, An R, Lan Y, Yang Y, Wan Q. Oral frailty: a concept analysis. J Adv Nurs. 2024;80:3134–45. https://doi.org/10.1111/jan.16042.
5. Li T, Shen Y, Leng Y, Zeng Y, Li L, Yang Z, et al. The prevalence of oral frailty among older adults: a systematic review and meta-analysis. Eur Geriatr Med. 2024;15:645–55.

https://doi.org/10.1007/s41999-023-00930-7.

6. Guo ZX, Xu HP, Zhang Y, Liu YJ, Huang Q, Sun YF, et al. Current status and influencing factors of co-occurrence of oral frailty and sarcopenia in elderly inpatients. Chin J Nurs. 2025;60:281–7. [In Chinese]
7. Dibello V, Lobbezoo F, Lozupone M, Sardone R, Ballini A, Berardino G, et al. Oral frailty indicators to target major adverse health-related outcomes in older age: a systematic review. Geroscience. 2023;45:663–706. https://doi.org/10.1007/s11357-022-00663-8.
8. Cha J-M, Jung DH, Kim H, Lim H-S. Factors affecting oral frailty and nutritional status in older adults living alone. Front Nutr. 2025;12. https://doi.org/10.3389/fnut.2025.1586860.
9. Tanaka T, Takahashi K, Hirano H, Kikutani T, Watanabe Y, Ohara Y, et al. Oral frailty as a risk factor for physical frailty and mortality in community-dwelling elderly. J Gerontol A Biol Sci Med Sci. 2018;73:1661–7. https://doi.org/10.1093/gerona/glx225.
10. Hihara T, Goto T, Ichikawa T. Investigating eating behaviors and symptoms of oral frailty using questionnaires. Dent J. 2019;7. https://doi.org/10.3390/dj7030066.
11. Sugiharto S, Hey CC, Supinganto A, Uly N. Healthy eating: a concept analysis. Malahayati Int J Nurs Health Sci. 2021;4:18–27.
12. Yang QJ, Wang YN, Xu SH, Song JY, Zhang C, Zhang Y, et al. Mediating effect of oral frailty between health-promoting behaviors and healthy aging in rural older adults. Mod Prev Med. 2025;52:92–6. https://doi.org/10.20043/j.cnki.MPM.202407096. [In Chinese]
13. Hoshino D, Hirano H, Edahiro A, Motokawa K, Shirobe M, Watanabe Y, et al. Association between oral frailty and dietary variety among community-dwelling older persons: a cross-sectional study. J Nutr Health Aging. 2021;25:361–8. https://doi.org/10.1007/s12603-020-1538-6.
14. Schifter DE, Ajzen I. Intention, perceived control, and weight loss: an application of the theory of planned behavior. J Pers Soc Psychol. 1985;49:843–51. https://doi.org/10.1037/0022-3514.49.3.843.
15. Chen JL, Huang XL, Sun R, Niu YZ, Li Y, Li J, et al. Research progress on the application of the theory of planned behavior in breast cancer screening. Nurs Res. 2025;39:690–4. [In Chinese]
16. McDermott MS, Oliver M, Simnadis T, et al. The theory of planned behaviour and dietary patterns: a systematic review and meta-analysis. Prev Med. 2015;81:150–6. https://doi.org/10.1016/j.ypmed.2015.08.020.
17. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. Acad Med. 2014;89:1245–51. https://doi.org/10.1097/ACM.0000000000000388.
18. Barroga E, Matanguihan GJ. A practical guide to writing quantitative and qualitative research questions and hypotheses in scholarly articles. J Korean Med Sci. 2022;37:e121. https://doi.org/10.3346/jkms.2022.37.e121.
19. Tanaka T, Hirano H, Ohara Y, Nishimoto M, Iijima K. Oral frailty index-8 in the risk assessment of new-onset oral frailty and functional disability among community-dwelling older adults. Arch Gerontol

Geriatr. 2021;94:104340. https://doi.org/10.1016/j.archger.2021.104340.

20. Chen LJ. Development of popular science works on dietary nutrition for sarcopenia in community-dwelling older adults [Master's thesis]. Chongqing Medical University; 2025. https://doi.org/10.27674/d.cnki.gcyku.2024.001487. [In Chinese]
21. Sundler AJ, Lindberg E, Nilsson C, Palmér L. Qualitative thematic analysis based on descriptive phenomenology. Nurs Open. 2019;6:733–9. https://doi.org/10.1002/nop2.275.
22. Xia S, Wu Y, Wang Q, Wang L, Chen X. Oral frailty and nutritional appetite in older adults: a cross-sectional, moderated mediation model of oral self-efficacy and personal mastery. BMC Oral Health. 2025;25:1503. https://doi.org/10.1186/s12903-025-06934-y.
23. Lv K, Yu P, Xue Y, Su J, Ren Y, Tang J. A pathway analysis of the role of factors influencing oral frailty in community-dwelling older adults: structural equation modeling. Geriatr Nurs. 2025;63:428–33. https://doi.org/10.1016/j.gerinurse.2025.03.036.
24. Hidaka R, Masuda Y, Ogawa K, Tanaka T, Kanazawa M, Suzuki K, et al. Impact of the comprehensive awareness modification of mouth, chewing and meal (CAMCAM) program on the attitude and behavior towards oral health and eating habits as well as the condition of oral frailty: a pilot study. J Nutr Health Aging. 2023;27:340–7. https://doi.org/10.1007/s12603-023-1913-1.
25. Zhang K, Sun YJ, Yu HB, Su H, Ma WD. Current status of dietary patterns and its influence on blood pressure control in patients with hypertension. South China J Prev Med. 2025;51:857–63. [In Chinese]
26. Hu HJ, Guo XQ, Tang QQ, Cheng J, Li HY, Li TT. Mediating effect of aging cognition between perceived social support and inner strength in nursing home elderly. J Nurs (China). 2022;29:57–61. https://doi.org/10.16460/j.issn1008-9969.2022.03.057. [In Chinese]
27. Zhang C, Shi JH. Research progress on the application of the theory of planned behavior in chronic disease management. Nurs Res. 2023;37:1208–12. [In Chinese]
28. Laniado N, Cloidt M, Shah P. Social support and oral health among working-age and older adults in the United States. J Public Health Dent. 2023;83:247–53. https://doi.org/10.1111/jphd.12573.
29. Nagayoshi M, Higashi M, Takamura N, Tamai M, Koyamatsu J, Yamanashi H, et al. Social networks, leisure activities and maximum tongue pressure: cross-sectional associations in the Nagasaki islands study. BMJ Open. 2017;7:e014878. https://doi.org/10.1136/bmjopen-2016-014878.
30. Liang C, Wang Y, Jiang Q, Luo J, Shi J, Quan Z, et al. The current status and influencing factors of oral frailty in elderly populations: a scoping review. Geriatr Nurs. 2025;63:61–8. https://doi.org/10.1016/j.gerinurse.2025.03.003.
31. Meng SY, Wang XM, Liu SY. Practice research on improving care quality of elderly patients with chronic diseases centered on families. Chin Hosp. 2021;25:58–60. https://doi.org/10.19660/j.issn.1671-0592.2021.10.16. [In Chinese]
32. Morino T, Ookawa K, Haruta N, Hagiwara Y, Seki M. Effects of professional oral health care on elderly: randomized trial. Int J Dent Hyg. 2014;12:291–7. https://doi.org/10.1111/idh.12068.

33. Wu HL, Wang LY, Su X. Application of binary linkage cloud platform nutrition management model in gastric cancer patients undergoing chemotherapy. J Nurs Sci. 2025;40:95–9. [In Chinese]
34. Hatanaka Y, Tabata T, Teraoka M, Suzuki H, Taue R, Yamane K, et al. Oral factors associated with declines in masticatory and swallowing function in older and middle-aged dental outpatients. J Oral Rehabil. 2025. https://doi.org/10.1111/joor.70097.
35. García-Gutiérrez D, Ayala Márquez B, Gironés García X, Molero Muñoz A, García-Salido C, Ramírez-Baraldes E, et al. Integration of the IDDSI scale into 3D food printing: a strategy to improve food safety and quality of life for people with dysphagia. Nutrients. 2025;17:3925. https://doi.org/10.3390/nu17243925.
36. Kashiwazaki K, Komagamine Y, Uehara Y, et al. Effect of gum-chewing exercise on maintaining and improving oral function in older adults: a pilot randomized controlled trial. J Dent Sci. 2024;19:1021–7. https://doi.org/10.1016/j.jds.2023.06.029.
37. Chen YJ, Xin XL, Sun F. Current status and influencing factors of oral frailty in elderly patients with intestinal ostomy. Chin J Bases Clin Gen Surg. 2025;32:1612–7. [In Chinese]
38. Rebar AL, Vincent G, Kovac Le Cornu K, Gardner B. How habitual is everyday life? An ecological momentary assessment study. Psychol Health. 2025:1–26. https://doi.org/10.1080/08870446.2025.2561149.
39. Nahum-Shani I, Smith SN, Spring BJ, Collins LM, Witkiewitz K, Tewari A, et al. Just-in-time adaptive interventions (JITAIs) in mobile health: key components and design principles for ongoing health behavior support. Ann Behav Med. 2018;52:446–62. https://doi.org/10.1007/s12160-016-9830-8.
40. Dorsch MP, Cornellier ML, Poggi AD, Bilgen F, Chen P, Wu C, et al. Effects of a novel contextual just-in-time mobile app intervention (LowSalt4Life) on sodium intake in adults with hypertension: pilot randomized controlled trial. JMIR Mhealth Uhealth. 2020;8:e16696. https://doi.org/10.2196/16696.

Figures

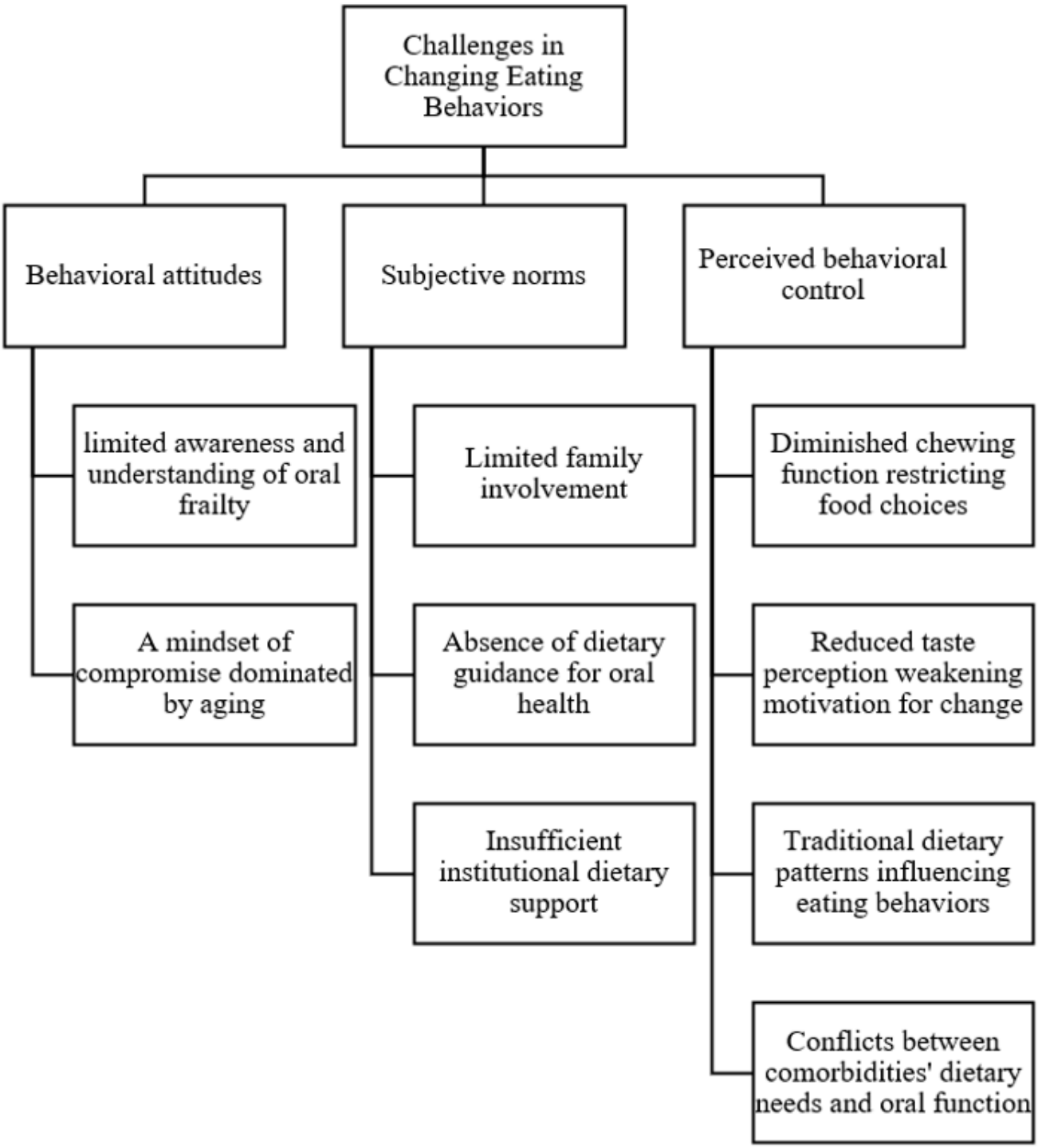


Figure 1

Challenges in changing eating behaviors among older adults with oral frailty (adapted from the Theory of Planned Behavior).