

The Quality in Nutrition Care (QUINCE) model: development of a model based on Australian healthcare consumer perspectives

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Title: The Quality in Nutrition Care (QUINCE) model: Development of a model based on Australian healthcare consumer perspectives

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Authorship Declaration

All authors contributed to the conceptualisation and design of the study. AK conducted data collection. All authors contributed to the analysis and interpretation of results and to writing the manuscript. All authors critically reviewed the manuscript and approved the final version submitted for publication.

Key messages

- The model comprises five components extending from system to practice level.
- Quality nutrition care should be integrated, accessible, and evidence based.
- Consumers expect personalised care underpinned by positive relationships.
- The model can be used to inform system reform and policy.
- Practitioners can use the model to guide quality improvement activities.

Abstract

Background: Primary health care is the ideal setting to address diet-related disease through delivery of nutrition services. However, quality nutrition care has not previously been defined from the healthcare consumer perspective.

Objectives: To explore, and develop a theoretical model of, healthcare consumer expectations of quality nutrition care in the primary health care setting.

Methods: A qualitative study design collected data describing healthcare consumer expectations of nutrition care. Consumers were recruited through social media and research networks, screened, and invited to participate in a semi-structured telephone interview. Interviews explored experiences and views of nutrition care. Interviews were thematically analysed, and informed development of a model using an iterative process.

Results: Twenty-three healthcare consumers participated in an interview. Five themes were identified. The Quality in Nutrition Care consumer model developed from these themes comprised five interconnected components, these being: 1. Quality nutrition care occurs within an integrated societal system; 2. Quality nutrition care is available, accessible, and affordable; 3. Quality nutrition care is up-to-date and evidence-based; 4. Quality nutrition care is underpinned by positive relationships; and 5. Quality nutrition care is personalised to consumer needs.

Conclusions: The consumer-derived model of quality nutrition care can be used by providers to inform activities that enhance primary health care practice, outcomes, and impact. The model has important implications for primary health care system reform and policy. Future research should explore the provision of dietetic services in primary care, with specific focus on factors that influence quality care, and investigate how quality is monitored and improved.

Key words (MeSH compliant): Nutrition Therapy, Quality of Care, Primary Health Care, Patients

Introduction

Poor nutrition is a modifiable risk factor that contributes significantly to the global burden of chronic disease (1, 2). Nutrition advice plays a role in both the prevention and treatment of disease (3). Multiple reports tabled by the World Health Organization (WHO) have identified primary health care as the ideal setting for improving nutrition and addressing chronic disease (2, 4, 5). Nutrition care is defined as any practice that supports healthy dietary behaviours undertaken during a healthcare consultation (6). In the primary health care setting, nutrition care is provided by a variety of healthcare professionals, including dietitians, physicians, and practice nurses (7, 8). Systematic reviews have demonstrated the effectiveness of dietitians in the primary health care setting (9), including for weight management (10), and cardiovascular disease risk (11). Given the potential positive effect on health outcomes, it is imperative that nutrition care provided in this setting is effective, integrated, and person-centred; that is, nutrition care is high-quality.

Quality care is defined as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes” (12). The WHO further describes quality care in terms of seven measurable elements, these being effective, safe, timely, equitable, integrated, efficient and people-centred (5). The scientific literature informs and guides healthcare providers in how to prevent, diagnose, and treat disease, and describes the outcomes that can be expected from any given treatment. These outcomes can be clinical outcomes, such as anthropometric and biochemical measures, as well as patient-reported outcomes, such as quality of life and satisfaction with service delivery (12). A recent systematic review and meta-analysis of quality improvement strategies employed in primary care dietetics identified the relative absence of research exploring quality in this setting (13). The review found only twelve eligible studies (13), illustrating the need for further research exploring quality in the context of primary care nutrition.

Generalised models, such as the Chronic Care Model (CCM) (14) and the Expanded CCM (15), have been developed to inform quality improvement initiatives in primary health care, and have informed the development of new condition-specific models of care (16). Primary care interventions that employ the CCM have been associated with improved outcomes (17, 18), demonstrating the value of guiding models in quality improvement. People-centred care (PCC) is foundational to achieving high-quality care (5) and requires care that is built around the needs and expectations of healthcare consumers (19). While several studies have explored healthcare consumer experiences and preferences in specific disease and healthcare contexts (20-27), no studies have comprehensively described healthcare consumer expectations for nutrition care through a quality lens. This study aimed to explore healthcare consumer expectations of nutrition

care provided in the primary health care setting to inform the development of a model of high-quality nutrition care.

Methods

Study design

This qualitative study employed semi-structured interviews to obtain data on consumer expectations of nutrition care and, using an inductive approach, developed a model describing the healthcare consumer perspective of quality nutrition care for primary health care. Qualitative methods were considered appropriate given there was no prior exploration of this topic in the literature. This study was approved by the [blinded for peer review] ethics committee (Ref No: 2018/167) and was reported in accordance with Standards for Reporting Qualitative Research (SRQR) (28).

Study setting and recruitment

This study was set in the Australian primary health care setting. Participants were recruited through social media (i.e. LinkedIn, Facebook) and established research participant databases. Facebook groups addressing topics relevant to the study population (e.g. coeliac disease, weight management, or nutrition) were identified. The group moderator was contacted to request approval to circulate recruitment materials with the Facebook group. Recruitment materials were also circulated through an electronic newsletter ([blinded for peer review]), and by email. Individuals were encouraged to share the information with their contacts. Individuals registered their interest by completing an online survey (administered through LimeSurvey). The survey included screening items (i.e. living in Australia, English speaking) and demographic items (i.e. age, gender, indigenous status, location, whether advice had previously been sought from a dietitian), as well as contact information needed for the interview (i.e. name, email address, telephone number). The recruitment strategy relied on digital platforms to share study information and for participants to request an interview. Given this was written in English, participants needed to be digitally literate and able to read English. The lead researcher purposively selected a sample of participants based on survey results for age, gender, location, and previous experience accessing nutrition care to obtain as heterogeneous a sample as possible. Participants were contacted by email and offered a choice of two interview times. The researcher confirmed the interview time by email. Consent was obtained and audio-recorded at the beginning of the interview. Participants received an AU\$20 voucher as compensation for their time.

Data collection

The research team developed a semi-structured interview protocol to explore healthcare consumers' experiences and expectations for quality nutrition care. Interview questions (Table 1) were

developed to address two objectives: to explore a) previous experiences receiving nutrition care; and b) expectations of quality nutrition care. The protocol employed a semi-structured format, with the lead researcher, a female dietitian, utilising previous primary care experience to prompt participants to describe experiences and expectations more deeply. The protocol was pilot tested with three healthcare consumers and subsequently amended to ensure that questions elicited data to satisfy the research objectives. The lead researcher conducted interviews during September and October of 2020. Interviews were audio-recorded and saved directly to a password-protected research storage facility. Audio recordings were transcribed verbatim using a transcription service. The lead researcher reviewed each transcript alongside the associated audio recording to ensure accuracy of the transcript. A Microsoft Word document containing the entire interview transcript was emailed to each participant for review and verification. Participants were asked to provide a response within two weeks. No response was accepted as confirmation of the transcript accuracy. The lead researcher coded interviews concurrent to data collection and ceased conducting interviews when no new themes were identified in two consecutive interviews.

Table 1. Interview protocol for semi-structured interviews of Australian healthcare consumers exploring experiences and views of quality nutrition care

Objective	Inquiry Logic	Interview Question/s	Prompting Question/s
(1) Explore healthcare consumers' experiences receiving nutrition care in the Australian primary care setting.	To explore participants' lived experiences of receiving nutrition care from a range of healthcare professionals.	1.Can you please tell me briefly what nutrition care you have received?	a. Have you received nutrition care from any other health care professionals?
	To explore aspects of nutrition care that participants would or would not change, and why.	2.Thinking of the nutrition care you have received, would you change anything about how it was provided to you?	b. What would you change? Can you say a little bit more about why you would like to change that? c. Can you say a little bit more about why you wouldn't change anything?
	To explore participants' expectations of nutrition care provided in the primary care setting, and why.	3. Did the nutrition care you received meet your expectations?	d. Can you say a little bit more about why you said it did / didn't meet your expectations?
(2) Explore quality nutrition care from the healthcare consumer perspective.	To give participants the opportunity to freely describe their idea/s of what constitutes high quality nutrition care.	4. In an ideal world, what would high-quality nutrition care look like to you?	
	To explore participants' perspectives of the role of dietitians in nutrition care provided in the primary care setting.	5. Can you please share with me what role, if any, you think a dietitian should play in nutrition care?	

Data analysis

Demographic data were extracted from the online survey. The lead researcher completed content analysis of interview transcripts to identify chronic health conditions reported by participants. Frequencies and percentages were calculated for all data to describe the sample. Two researchers (AK, TS) analysed interview transcripts in duplicate employing an inductive thematic analysis approach using NVivo (Version 12) (29). The method described by Braun and Clarke (30) was used for the analysis, and comprised the following steps: 1. Each researcher read and re-read each transcript and noted initial ideas; 2. Initial codes were developed and data from each transcript were allocated to the relevant code/s; 3. Codes were collated into themes and sub-themes and a map of the analysis was developed; 4. Related themes and sub-themes were reviewed to confirm consistency in content; 5. A definition and name was given to each theme and sub-theme;

6. Exemplary examples were extracted from the transcripts for each sub-theme (30). Steps 1-6 were independently completed by each researcher. The two researchers convened once all transcripts were independently coded to discuss the analysis and to agree upon the preliminary themes, sub-themes, and descriptions. The preliminary analysis was presented to the entire research team, who discussed and agreed upon the final themes, sub-themes and descriptions.

The research team (AK, LW, LM, LB) developed the model from the themes and sub-themes through an iterative process. This process involved all team members and included: 1. Drafting a preliminary model; 2. Reviewing the model alongside the themes and sub-themes for accuracy; 3. Refining the model based on feedback from step 2; 4. Finalising the model. Steps 2 and 3 were undertaken iteratively until the model accurately reflected the themes and sub-themes generated from the interview transcripts.

Quality and rigour

Techniques were employed to improve the quality and rigour of this study. Procedural management of the analysis process (31) was facilitated by conducting the analysis using NVivo (Version 12) (29). Additional techniques were employed during the analysis to improve rigour, including use of a reflexive journal and bracketing. Both coding researchers maintained a reflexive journal in which pre-conceived ideas and reflections were detailed alongside a personal account of the research process (31). Bracketing was used to minimise the degree to which pre-conceived ideas interfered with the analysis of participant experiences (31). This was further enhanced through two rounds of discussion, involving first, the coding researchers, and then the entire research team. These steps were conducted to enhance the trustworthiness of the findings of the healthcare consumer perspective.

Results

Sixty-seven individuals agreed to participate in an interview and twenty-three interviews were conducted. The average duration of interviews was 32 minutes (range 23-47 minutes). Table 2 outlines participant demographic information. Participants ranged in age from 19 to 69 years. Most had previously received nutrition care from a dietitian (15/23) or GP (12/23). Three participants had received nutrition care from a dietitian in their role as a carer for another person. Only two participants had not received nutrition advice from a healthcare professional. Seventeen participants reported living with a chronic health condition.

Table 2. Demographic and health characteristics of participants (n=23) in this study of healthcare consumers exploring expectations and views of quality nutrition care

Variables	Yes	
	n	%
Gender		
Female	17	73.9%
Male	5	21.7%
Unspecified	1	4.3%
Age range (years)		
18-29	8	34.8%
30-39	7	30.4%
40-49	3	13.0%
50-69	5	21.7%
Location		
Queensland	13	56.5%
New South Wales	3	13.0%
Victoria	3	13.0%
Western Australia	3	13.0%
South Australia	1	4.3%
Chronic condition/s ^{ab}		
Overweight / obesity	8	34.8%
Coeliac disease	3	13.0%
Diabetes (type-1/type-2)	2	8.7%
Cardiovascular disease	2	8.7%
Eating disorder	2	8.7%
Endometriosis	1	4.3%
Thyroid disease	1	4.3%
No chronic disease	6	26.1%

^a n≠23 as participants could identify multiple chronic conditions; percentages calculated as a proportion of 23.

^b Self-reported

Detailed descriptions of themes and sub-themes, along with illustrative quotes, are provided in Table 3.

Table 3. Themes arising from 23 interviews exploring healthcare consumer experiences and views of quality nutrition care in the primary care setting.

Theme	Sub-theme	Illustrative Quote
1. Quality nutrition care should occur within an integrated societal system	1.1 Nutrition should traverse societal structures (health care, education, food supply) and have a preventative approach	<i>"I feel like it should be expressed to you earlier in your life. I think a lot of us spend too late in our life going to a nutritionist...and that's when you've already done most of the damage to your body. I think it should be more promoted towards when you're younger or to when you're growing up to be able to understand exactly how to look after your body because you can set out a lot more damage to yourself."</i> (P5)
	1.2 Nutrition care should be integrated into primary care services	<i>"I think that the most important question is for the doctor to ask a question about nutrition and diet as part of the consultation, where its relevant."</i> (P15)
	1.3 Nutrition care should be provided by a multidisciplinary team that values, supports, and communicates amongst one another	<i>"...everyone on all levels being in communication with each other. So, you know, no one being left out of the loop ... everyone knowing what's going on, everyone being, having the same information."</i> (P16)
2. Quality nutrition care should be available, accessible, and affordable to whomever needs it	2.1 Nutrition care should be available when it is needed	<i>"I didn't bring up my weight at that time, the doctor did ... but that was, it was unrelated to what I was going in for, and that wasn't a good experience."</i> (P19) <i>"... having that opportunity of an avenue to get in touch with her ... outside of our sessions would have been helpful."</i> (P14)
	2.2 Consumers should be able to easily identify and choose the right provider for them	<i>...one of the biggest factors was talking to our GP and really looking around on reviews that people have given ... it's knowing that a lot of people that had a lot of good experiences with the specific nutritionist."</i> (P5)
	2.3 Nutrition care should be accessible through various modalities	<i>"... it could be a video chat, it could be in person, it could be on the phone, it could be over the Internet. It could be whatever is comfortable for that person, regardless of their anxiety, their personal situation, their availability, whether they could drive, whether they could get there."</i> (P16)
	2.4 Nutrition care should be affordable to whoever needs it	<i>"Ideally it would be subsidised to the government, to some extent, the way other specialist visits are. And perhaps subsidised depending on what your income is or on what your personal circumstances are."</i> (P19)
	2.5 Frequency and duration of nutrition care should be based on consumer needs	<i>"... with something like coeliac disease, it's an education process about how to manage this, because this is forever, this is not just for a short period of time. So some people will require a lot of help to do that, others less so. So I think it needs to be kind of self-paced as well."</i> (P3)
3. Quality nutrition care should be up-	3.1 Providers should be qualified and maintain competence	<i>"I think it is quite important that if you come to an issue that is as serious as something like having diabetes ... at least if you have papers, you know that the person has been given proper studies. They truly understand."</i> (P5)

Theme	Sub-theme	Illustrative Quote
to-date and evidence-based	3.2 Advice and information should be current and evidence-based	<i>"I'd like to see materials provided to people that are evidence based ... I'd like to see the actual evidence on which they're generating handouts and things ... I think just bringing the consumer more into the conversation about where the evidence is coming from would be helpful..."</i> (P3)
4. Quality nutrition care should be underpinned by positive relationships	4.1 Providers should establish a relationship in which the consumer feels understood, accepted, and cared for	<i>"I felt like they were there to help me rather than trying to push me to do anything ... even though I was a bigger person at the time, they didn't make me feel bad for being a bigger person."</i> (P16)
	4.2 Providers should be trustworthy	<i>...the diet that she was talking about ... she said, 'I did this myself. I just thought that I was telling it to all my patients and I want to try it myself.' ... And it made me feel like, okay she knows what she's talking about, she's done it herself."</i> (P10)
	4.3 Providers should motivate and hold the consumer accountable	<i>"She made me feel quite confident and that I was in control; that I could get results."</i> (P10)
5. Quality nutrition care should be personalised to consumer needs	5.1 Nutrition care should be goal-driven and focus on outcomes that matter to the consumer	<i>"I think it's really important that I control the direction it's taking, and as a consumer, I'm the one who's saying what I want out of the relationship or the partnership or the team that I'm approaching for help."</i> (P4)
	5.2 Nutrition care should treat the root cause of nutrition concerns while maintaining a whole-of-person perspective	<i>"...it's [food] kind of my go-to when I feel emotionally unsettled and ... I think it might have helped to explore that part of it as well, but we really just focused on "no you cannot eat that much" and "you should eat less"."</i> (P9)
	5.3 Advice should be tailored to the consumer's unique circumstances	<i>"...so making a, not a generalised plan, but a plan specific to that person by building a relationship and getting to know that person and then advising around nutrition..."</i> (P9)
	5.4 Education should aim to inform the consumer so that they can play an active role in their care	<i>"I actually want to make sure that I understand why they're making those suggestions and the benefits of doing it or not doing it."</i> (P2)

The QUINCE Consumer Model

These five themes were built into a model of quality nutrition care (Figure 1). The model is comprised of concentric circles representing the relationship between factors. The outer-most circle sets the context for nutrition care within the broader societal and healthcare systems (Theme 1). Moving towards the centre of the circle, the next two circles relate to accessibility and reliability of nutrition care, wherever it is provided (Themes 2 and 3). This includes the traditional, personalised nutrition care received in the healthcare setting, as well as nutrition information accessible in the public domain. The two inner-most circles relate to the provision of nutrition care through positive care-provider relationships (Theme 4) and personalisation (Theme 5).

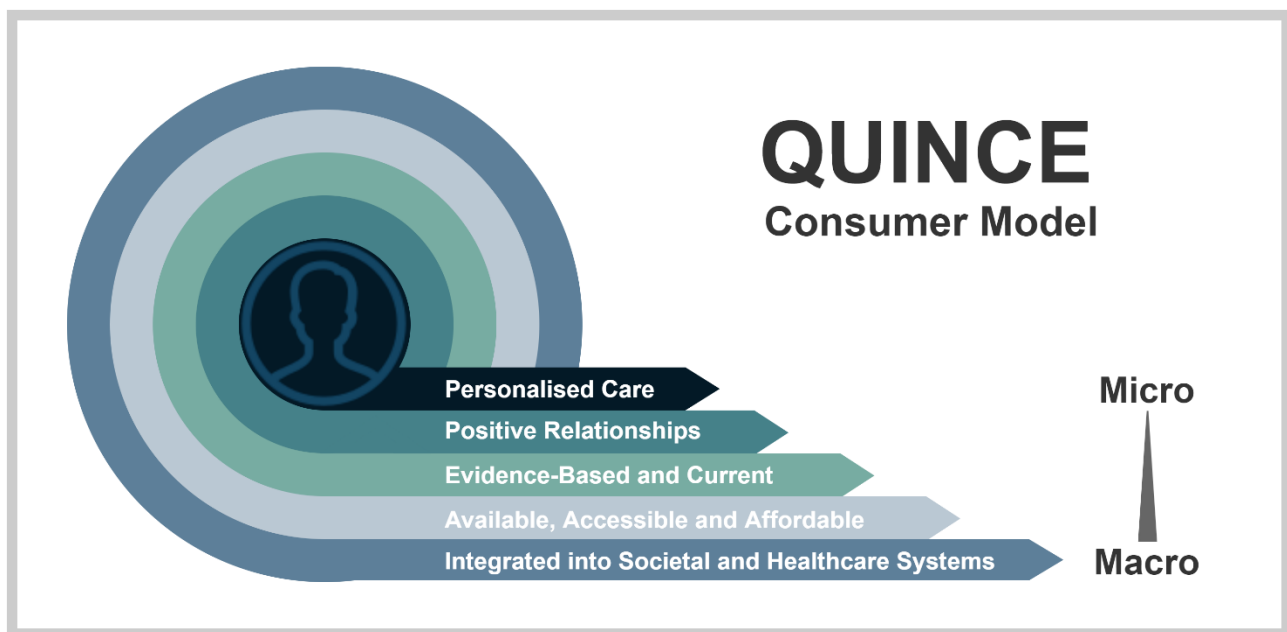


Figure 1. The Quality in Nutrition Care (QUINCE) consumer model illustrating expectations for quality nutrition care in the primary care setting and developed from 23 interviews of healthcare consumers.

1. Quality nutrition care occurs within an integrated societal system

Multiple areas of society, including health care, education, and the food industry, should work together in a harmonised manner to promote health and prevent disease. Within health care, nutrition should be a standard component of care provided by a coordinated, multidisciplinary team of professionals, each with their own specialisation.

“I don't think people see nutrition as a bigger factor in people's wellbeing as what it is. I think it's hidden away as a small thing. I think it needs to be brought to people's attention a lot earlier in their medical issues, when people are complaining of whatever health problems they have. I think it needs to be included right at the start.” (P11)

2. *Quality nutrition care is available, accessible, and affordable*

Within the broader societal context, nutrition care should be available, accessible, and affordable. Consumers should be at the centre of all decisions relating to nutrition care, including when it is initiated, who provides it, how frequently, and for what duration. Affordability should never be a factor in decisions relating to nutrition care.

“I feel like people in my age group and who've got chronic illnesses, I feel like we get stuck in a bit of a rut...we don't have much income and the preventative healthcare like nutrition is not accessible financially.” (P10)

3. *Quality nutrition care is up-to-date and evidence-based*

Nutrition care, in whatever modality it is provided, should be evidence-based and up to date. Consumers should be assured of a minimum standard of care. All healthcare providers should have a basic level of nutrition knowledge, while specialist providers should have comprehensive nutrition knowledge in their area of speciality.

“...I think if you want to provide care for specific diseases, you should really be trained in those specific diseases. So it's not necessarily something that should be generic for all nutrition-type issues.” (P03)

4. *Quality nutrition care is underpinned by positive relationships*

Consumers should feel connected to, and understood by, their nutrition care provider: “they actually tried to understand how I felt about food and my body” (P21). Providers should listen and establish commonalities, such as culture and personal experiences. This was considered fundamental to whether consumers could trust their provider. Trust was a necessary condition that allowed the provider to motivate and hold the consumer accountable: “I just didn't want to let myself down, to also let her down too, in away. And I think that's important too, that you have that accountability because it motivates you a little” (P14).

5. *Quality nutrition care is personalised to consumer needs*

Consumers should be at the centre of nutrition care, with the provider taking a whole-of-person approach and focusing on outcomes that matter to the consumer: “in my perfect world, it would have looked something like more of a comprehensive goal setting process...”(P23). Nutrition care providers should aim to educate consumers so that they have the knowledge to actively participate in their own care.

Discussion

This study explored healthcare consumers' experiences and views of nutrition care to develop a model of quality nutrition care for primary health care. Given the role nutrition care plays in the prevention and treatment of lifestyle diseases, understanding healthcare consumer expectations is an important step towards aligning nutrition practices with these expectations. This is the first study to use evidence to develop a consumer-based model of quality nutrition care that recognises both system and practice-level components. The QUINCE consumer model illustrates that nutrition care is not a discrete and isolated transaction, rather, it requires system-wide, coordinated engagement from multiple stakeholders. The healthcare consumer is at the centre of quality nutrition care and the model includes components that highlight the engaged and active role consumers play in their own care.

Healthcare consumers in this study described quality nutrition care as being integrated within societal and healthcare systems. In this context, individuals should have broad access to care for disease prevention and treatment. Integrated health care that addresses both prevention and treatment is central to the Expanded CCM, which describes the health system as existing within and exchanging ideas, resources, and people with the broader community (17). Equitable public policy that ensures healthier services and environments is critical. However, in a meta-synthesis by Moreno-Peral and colleagues, primary care consumers reported misalignment between system-level and consumer goals as a barrier to preventative care (32). This highlights the importance for policy to reflect consumer goals to support system-level integration of nutrition care across societal structures. The Expanded CCM proposes a top-down and bottom-up approach to disease prevention and treatment, with the top-down aspect represented by community, and the bottom-up aspect represented by the healthcare organisation (17). This bidirectional approach aligns with the QUINCE Model. However, concerns have been raised by healthcare professionals operating in the healthcare environment, which warrant further discussion.

Healthcare professionals have expressed challenges integrating nutrition care in healthcare settings. A study of GPs (n=34) in England highlighted that raising sensitive issues with patients took time, which was limited (33). Additional concerns about damaging relationships with patients, needing to prioritise other areas of patient care, and following the patient's agenda, were raised (33). These concerns are echoed in studies exploring nutrition care for paediatric obesity (34) and prediabetes (35) in primary care. This perspective highlights the practice-level factors that must be addressed to effectively integrate nutrition into primary care. The integration of nutrition specialists, including dietitians, into the healthcare system was viewed as an enabler of preventative care in the meta-

synthesis by Moreno-Peral and colleagues (32). Nutrition specialists have described integration in the literature in terms of clear expectations of what can be provided and achieved by the dietitian (36) and appropriate sharing of patient information (37). Integration, which is a foundational component of the QUINCE consumer model, should be supported by healthcare professionals, practices and systems. However, further research is needed to understand how to change structures to support integration at all levels.

Healthcare consumers in this study wanted care to be patient-centred, personalised, and driven by their own goals. While consumer goal-driven care is ideal, in reality, individual patient beliefs can act as a significant barrier to appropriate nutrition care (32). The belief that nutrition care is only necessary when a disease is present, or at high risk of developing, may influence the goals a consumer chooses, or even whether the consumer accesses care (32). This is particularly evident in disease prevention. Patient education, including knowledge (e.g. knowing the consequences of unhealthy habits) and skills (e.g. how to find information, ability to understand professional advice), are important ways to challenge consumer beliefs (32) and need to be incorporated into the broader nutrition care context. A study by Levey and colleagues of twelve primary care dietitians saw that a patient-centred approach played an important role in helping them to understand and empower their patients, with patient goal-setting key to PCC (36). Several factors, including time, education, and resources, were identified as constraints to PCC (36). Tailoring nutrition care to the patient is important as patients report lack of time and financial resources as barriers to implementing treatment plans (32). The desire for translation of advice into a plan the patient can implement is echoed by studies of patients with obesity (27), prediabetes (38), and type-2 diabetes (20, 21). PCC is an accepted and valued approach to nutrition care but initiatives that support healthcare professionals to be more patient-centred are needed. Healthcare consumers need skills and knowledge to enable them to make informed goals and decisions that direct nutrition care.

The QUINCE consumer model supports healthcare consumers to choose their provider based on expertise and personal connection, and to select how to receive care using multiple modalities. The desire for a positive and personal connection between patient and provider has been identified in other studies of patients with type-2 diabetes (21) and preventative care (32). Where a provider did not have appropriate expertise, patients reported that they could not trust their provider and saw this as a barrier to care (32). Dietitians in a study of PCC reported several factors that affected their ability to provide PCC, including rushing the provision of advice to meet patient expectations and the high number of requirements contained in best practice guidelines (36). This indicates that structural change to funding models is needed to address patient centred care for the QUINCE

consumer model to be achieved. The desire for nutrition information and delivery of care in modalities that suit healthcare consumers also aligns with primary care dietitian perspectives, who report using various technologies to deliver information and education, track patient goals and progress, and connect with patients outside of the consultation (39). However, further research to understand prevalence of technology use and strategies for its integration while assuring consumer privacy are needed.

Limitations

The recruitment strategy and qualitative design means that the views of participants in this study may not be representative of all healthcare consumers. Distribution of study information published in English through digital platforms, paired with the eligibility criteria that participants be able to converse in English, excluded certain groups of the Australian population. In addition, while every effort was made to achieve a diverse sample, there was a stronger representation of people from the state of Queensland who have received dietetic care. This was likely due to recruitment through [removed for blinding purposes], which is a Queensland-based university. No individuals who identified as Aboriginal or Torres Strait Islander completed the online survey. Therefore, the model may not reflect views of consumers from non-English speaking or First Nations groups and future research should aim to test the QUINCE model within these populations.

Conclusion

This study described the evidence-based development of a theoretical model of quality nutrition care from the healthcare consumer perspective. The model is broad in terms of societal systems and deep in terms of the healthcare system. This model can be used to inform quality improvement activities that aim to bring nutrition care into alignment with healthcare consumer expectations. However, the healthcare system is complex, and the sheer breadth and depth of change required means that structural change is needed using both top-down and bottom-up approaches. Future research should aim to understand how the complex primary health care system functions to deliver nutrition care. A specific focus should be on understanding the role of dietitians, given that they were identified as nutrition specialists in this study. Such knowledge and awareness are critical to inform research that aims to improve quality within this system, in order to treat and prevent chronic disease.

Ethics approval

This study was approved by the Griffith University ethics committee (Ref No: 2018/167).

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Conflicts of interest statement

There are no conflicts of interest to declare.

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Data availability

The data underlying this article cannot be shared publicly due to the privacy of individuals that participated in the study. The data will be shared on reasonable request to the corresponding author.

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