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Exploring Dietitians' Views on Healthy Dietary-Pattern Counselling for Adults with Type 2 Diabetes Mellitus in Tobruk, Libya: A Qualitative Study

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Abstract

Type 2 diabetes mellitus (T2DM) represents a growing public health challenge globally and in Libya, where increasing prevalence is associated with dietary behaviours, obesity, and lifestyle changes. Dietary-pattern counselling is a key component of diabetes management; however, limited evidence exists regarding how dietitians interpret and deliver such counselling within routine clinical practice in Libya. This study aimed to explore dietitians' views and experiences of providing healthy dietary-pattern counselling for adults with T2DM in Tobruk, Libya. A qualitative descriptive design was adopted using semi-structured face-to-face interviews with 20 purposively selected dietitians and clinical nutritionists working in hospitals, primary healthcare centres, and private clinics. Interviews lasted approximately 30–45 minutes, were audio-recorded with participant consent, transcribed verbatim, and analysed using reflexive thematic analysis. Three major themes emerged from the analysis. The first, *Translating Dietary Knowledge into Practical Counselling*, highlighted the importance of individualising dietary advice and simplifying complex nutritional guidance to improve patient understanding and feasibility. The second, *Contextual Barriers and Influences on Counselling*, identified cultural food practices, family expectations, limited consultation time, and restricted resources as important influences on counselling delivery. The third, *Patient Engagement and Response to Dietary Advice*, revealed persistent misconceptions, health-literacy challenges, and difficulties maintaining long-term dietary adherence. Collectively, the findings suggest that effective dietary counselling depends on balancing evidence-based recommendations with cultural, socioeconomic, and behavioural realities. The study provides context-specific evidence that may inform the development of culturally appropriate educational resources, professional training initiatives, and structured dietary-counselling pathways to strengthen diabetes care within Libyan healthcare settings.

Keywords: Type 2 diabetes mellitus, Dietary counselling, Dietitians, Clinical nutritionists, Qualitative research, Libya

Introduction

Type 2 diabetes mellitus remains a major global public-health burden and is associated with substantial morbidity, premature mortality, and long-term healthcare demand. Global estimates indicate that approximately 830 million people were living with diabetes in 2022, with the fastest increase occurring in low- and middle-income countries where prevention, follow-up, and specialist care are often limited (World Health Organization, 2023). Poorly controlled type 2 diabetes contributes to cardiovascular disease, renal impairment, visual loss, neuropathy, reduced quality of life, and increased treatment burden (Awuchi et al., 2020; World Health Organization, 2023). Modifiable factors, including unhealthy diet, excess body weight, physical inactivity, smoking, hypertension, and

poor treatment adherence, continue to influence disease progression and complications. Dietary behaviour has become an important focus in diabetes management because food quality influences glycaemic control, body weight, lipid profiles, blood pressure, and wider cardiometabolic risk (Evert et al., 2019; Awuchi et al., 2020). Clinical nutrition guidance recommends individualised nutrition therapy, practical meal-planning support, reduced intake of refined carbohydrates and added sugars, adequate fibre intake, healthier fat choices, and culturally appropriate dietary counselling for adults with type 2 diabetes (Evert et al., 2019; Minari et al., 2023). Reviews of diabetes nutrition also suggest that Mediterranean-style dietary patterns, lower refined carbohydrate intake, higher vegetable and whole-grain consumption, and sustainable weight-management strategies may support glycaemic and cardiovascular outcomes (Petroni et al., 2021; Forouhi, 2023). However, translating these recommendations into routine care remains challenging, particularly where access to dietitians, consultation time, referral systems, and culturally adapted patient-education materials is limited (Boocock et al., 2021; Siopis et al., 2020). In Libya, diabetes represents a growing public-health concern. Country-level estimates suggest that the number of adults living with diabetes has increased over recent decades, with further growth expected according to international projections (International Diabetes Federation, 2024). Overweight and obesity have also been reported as common among Libyan adults, adding to cardiometabolic risk and increasing the complexity of type 2 diabetes management (Lemamsha et al., 2019). In Tobruk, dietary counselling is especially relevant because food choices may be shaped by traditional meals, family eating patterns, affordability, food availability, and changing nutrition habits. These conditions indicate that healthy dietary-pattern counselling requires practical and culturally appropriate communication rather than general advice alone. The rationale for this study arises from the gap between international diabetes dietary recommendations and the limited local evidence on how dietitians provide dietary-pattern counselling in Tobruk. Although global evidence supports individualised nutrition therapy for type 2 diabetes, most qualitative studies on dietitians' counselling experiences have been conducted outside Libya and within better-resourced healthcare systems (Moutou et al., 2022; Siopis et al., 2020). Existing Libyan evidence has mainly described diabetes, obesity, and biomedical risk factors, while limited attention has been given to dietitians' views, counselling practices, and perceived barriers within routine diabetes care (Lemamsha et al., 2019). Therefore, little is known about how dietitians in Tobruk define healthy dietary patterns, interpret guidance, and adapt advice to local clinical and cultural realities. The central problem addressed in this study is the absence of sufficient qualitative evidence on dietitians' perspectives regarding healthy dietary-pattern counselling for adults with type 2 diabetes mellitus in Tobruk. Patients may receive general dietary messages, such as reducing sugar, avoiding fatty foods, or limiting portions, but such advice may not always be supported by structured counselling, individualised assessment, or consistent follow-up. Limited local evidence also restricts understanding of how dietitians manage patient misconceptions, family food practices, low nutrition literacy, affordability, and organisational constraints during counselling. As a result, service planners and healthcare professionals have limited context-specific evidence to guide improvements in dietetic practice and patient education. The novelty of this study lies in its contribution as one of the first qualitative studies examining dietitians' views on healthy dietary-pattern counselling for adults with type 2 diabetes mellitus in Tobruk, Libya. Unlike previous local work that focused mainly on disease burden or metabolic risk factors, this study examined professional experiences, counselling approaches, perceived barriers, and enabling factors within routine clinical practice. The study focused on how dietitians conceptualised healthy dietary patterns, how dietary guidance was communicated, and how advice was adapted to patient needs, cultural food practices, and organisational conditions in Tobruk. The main aim of the study was to explore dietitians' views and experiences regarding healthy dietary-pattern counselling for adults with type 2 diabetes mellitus in Tobruk, Libya. The specific objectives were to examine how dietitians described their current counselling approaches, including how guidance was interpreted and communicated in practice; to identify perceived barriers and enabling factors affecting counselling delivery, including cultural, organisational, and patient-related influences; and to understand how dietitians conceptualised healthy dietary patterns and how these understandings shaped individualisation, consistency, and acceptability of dietary advice. The study is significant because it provides local qualitative evidence on dietitians' dietary-pattern counselling practices for adults with type 2 diabetes mellitus in Tobruk. Its contribution lies in clarifying how international dietary guidance is interpreted within a Libyan clinical setting and how practical constraints affect the delivery of nutrition advice. The findings also support the development of culturally appropriate patient-education materials, dietetic training, and structured nutrition-counselling pathways for diabetes care in Tobruk and similar Libyan healthcare settings.

Material and Methods

Study Design and Setting

A qualitative descriptive study was conducted to examine dietitians' experiences and perspectives regarding healthy dietary-pattern counselling for adults living with type 2 diabetes mellitus in Tobruk, Libya. Qualitative methods were considered appropriate because the study sought to understand how dietary counselling was interpreted, delivered, and adapted within routine clinical practice rather than to measure predefined outcomes. The design enabled detailed exploration of professional experiences, perceived barriers, contextual influences, and clinical decision-making processes within a specific healthcare environment (Maxwell & Reybold, 2015; Shannon-Baker, 2016). The study was undertaken in healthcare facilities that routinely provide nutritional support and diabetes management services, including Tobruk Medical Centre, Al-Mukhtar Polyclinic, and Al-Manara Polyclinic. Inclusion of both hospital-based and primary-care settings provided variation in organisational structure, patient populations, and service-delivery arrangements, allowing examination of dietary counselling practices across different clinical contexts.

Participants and Sampling

Purposive sampling was employed to recruit information-rich participants with direct experience in providing dietary counselling for adults with type 2 diabetes mellitus. This sampling approach is widely used in qualitative health research because it facilitates the selection of participants capable of providing detailed insight into the phenomenon under investigation (Campbell et al., 2020; Staller, 2021) Eligible participants included registered dietitians and clinical nutritionists currently practising in hospitals, primary healthcare centres, or private clinics within Tobruk. Participants were required to have direct involvement in dietary counselling for adults with type 2 diabetes mellitus and to be willing to participate voluntarily. Professionals without experience in diabetes-related nutrition counselling, those not actively practising at the time of data collection, and individuals declining consent were excluded. A total of 20 participants were recruited. Sample size determination was guided by the principle of information power and thematic sufficiency rather than statistical representation. Recruitment continued until interviews generated recurring patterns and no substantial new insights emerged from subsequent discussions (Braun & Clarke, 2019; Hennink & Kaiser, 2022).

Data Collection Procedures

Data were collected through individual face-to-face semi-structured interviews conducted between [Month Year] and [Month Year]. Semi-structured interviewing was selected because it provides sufficient consistency across participants while allowing flexibility to pursue issues arising during discussion (Creswell & Poth, 2016; Kallio et al., 2016). The approach was particularly suitable for examining professional experiences, perceptions, and contextual influences affecting dietary counselling practice. Participants were approached through their workplaces and provided with an information sheet describing the study purpose, procedures, confidentiality arrangements, and voluntary nature of participation. Written informed consent was obtained prior to each interview. Interviews were conducted in private consultation rooms or quiet office spaces within participants' workplaces to ensure confidentiality and minimise disruption to clinical activities. Interview duration ranged from approximately 30 to 45 minutes. With participant permission, all interviews were audio-recorded and supplemented by field notes documenting contextual observations, non-verbal communication, and preliminary analytical reflections.

Interview Guide and Language Procedures

An interview guide was developed from the study objectives and the wider literature on diabetes nutrition management, dietary-pattern counselling, patient adherence, and professional practice (Evert et al., 2019; Moutou et al., 2022; Siopis et al., 2020). The guide included open-ended questions addressing participants' professional backgrounds, interpretations of healthy dietary patterns, counselling approaches, perceived barriers and facilitators, patient engagement, cultural influences, and organisational factors affecting service delivery. Interview questions were initially prepared in English and translated into Arabic to facilitate participant

understanding and ensure linguistic appropriateness within the local context. Translation focused on conceptual equivalence rather than literal word-for-word conversion. The interview pack consisted of a participant information sheet, informed consent form, demographic questionnaire, interview schedule, and debriefing information. Minor wording adjustments were made following pilot review to improve clarity and flow while maintaining consistency with the study objectives.

Data Analysis

Interview recordings were transcribed verbatim and analysed using reflexive thematic analysis following the framework described by Braun and Clarke (2019). Reflexive thematic analysis was selected because it provides a systematic yet flexible approach for identifying patterns of meaning across qualitative datasets while recognising the active interpretive role of the researcher. Analysis commenced with repeated reading of transcripts to achieve familiarity with the data. Initial codes were then generated inductively from meaningful segments of text relating to participants' experiences, perceptions, and counselling practices. Codes were subsequently organised into broader candidate themes reflecting recurring patterns across interviews. Themes underwent iterative review and refinement to ensure internal coherence, conceptual clarity, and alignment with the study aim. The final analytical stage involved defining and naming themes and constructing an interpretive narrative supported by representative participant quotations. Analytical rigour was enhanced through maintenance of an audit trail, systematic documentation of coding decisions, continuous reflexive engagement with the data, and regular review of emerging interpretations throughout the analytical process (Braun et al., 2023).

Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of the Faculty of Health Sciences, University of Tobruk, before data collection. All procedures complied with recognised ethical principles for research involving human participants. Participation remained voluntary throughout the study. Participants received written and verbal explanations regarding the study purpose, interview procedures, confidentiality measures, and their right to withdraw without consequence before data analysis commenced. Written informed consent was obtained from all participants before data collection. Confidentiality and anonymity were maintained through removal of identifying information from transcripts and use of participant codes during analysis and reporting. Audio recordings, transcripts, and associated research materials were stored on password-protected devices accessible only to the research team. Data were used exclusively for academic purposes and managed in accordance with institutional research-governance requirements.

Results

The findings are derived from semi-structured interviews conducted with 20 dietitians and clinical nutritionists in Tobruk, Libya. The analysis identified three main themes: translating dietary knowledge into practical counselling, contextual barriers and influences on counselling, and patient engagement and response to dietary advice. These themes show that healthy dietary-pattern counselling for adults with type 2 diabetes was shaped by clinical knowledge, cultural food practices, service limitations, and patients' ability to understand and sustain dietary change.

Participants' Characteristics

Table 1 presents the demographic and professional characteristics of the 20 participants. Female participants formed the majority of the sample, accounting for 75.0% of respondents, while males represented 25.0%. Professional representation was evenly distributed between clinical nutritionists and dietitians, with each group accounting for 50.0% of the sample. The largest age group was 30–39 years, representing 35.0%, followed by 40–49 years at 30.0%, indicating that most participants were within active mid-career stages. Educationally, bachelor's degree holders represented the largest group at 60.0%, while 30.0% held master's degrees and 10.0% held doctoral qualifications. Hospital-based participants accounted for the highest proportion at 45.0%, followed by primary healthcare centres at 30.0% and private clinics at 25.0%. In terms of professional experience, 40.0% had 2–5 years of experience, while 30.0% had 6–10 years. All participants reported direct experience in counselling adults with type 2 diabetes mellitus, confirming the relevance of the sample to the study aim.

Table 1: Demographic and Professional Characteristics of Participants (n = 20**)**

Variable	Category	n (%)
Gender	Male	5 (25.0%)
	Female	15 (75.0%)
Professional role	Clinical nutritionist	10 (50.0%)
	Dietitian	10 (50.0%)
Age group	20–29 years	5 (25.0%)
	30–39 years	7 (35.0%)
	40–49 years	6 (30.0%)
	50–59 years	2 (10.0%)
	60+ years	0 (0.0%)
Education	Bachelor's degree	12 (60.0%)
	Master's degree	6 (30.0%)
	Doctoral degree	2 (10.0%)
Place of work	Hospital	9 (45.0%)
	Primary healthcare centre	6 (30.0%)
	Private clinic	5 (25.0%)
Years of experience	Less than 2 years	4 (20.0%)
	2–5 years	8 (40.0%)
	6–10 years	6 (30.0%)
	More than 10 years	2 (10.0%)
Experience with T2DM counselling	Yes	20 (100.0%)
	No	0 (0.0%)

4.3 Distribution of Response Patterns

Table 2 summarises the distribution of participants' responses across the main counselling domains identified during analysis. Individualisation of dietary advice was reported by all participants, indicating complete agreement regarding the need to adapt counselling to patient circumstances. Cultural adaptation was also strongly represented, with 90.0% of participants referring to the importance of aligning advice with local food habits, family meals, and social expectations. Patient engagement and adherence support were each reported by 85.0%, showing that dietitians viewed counselling as an interactive process rather than simple information delivery. By contrast, lower response proportions were observed for resource availability and formal training support, reported by 45.0% and 40.0% respectively. These findings suggest that while dietitians commonly recognised the value of individualised and culturally adapted counselling, fewer participants reported sufficient institutional resources or structured professional support to deliver such counselling consistently.

Table 2: Distribution of Reported Counselling Domains Across Interviews (n = 20)

Counselling domain	Participants reporting the domain	Percentage (%)	Interpretation
Individualisation of dietary advice	20	100.0%	Universal concern across interviews
Cultural adaptation of advice	18	90.0%	Highly prominent counselling issue
Patient engagement	17	85.0%	Strongly represented across accounts
Adherence support	17	85.0%	Major concern in long-term management
Simplification of dietary guidance	16	80.0%	Common strategy for improving understanding
Time limitations	14	70.0%	Frequent system-level barrier
Guideline application challenges	13	65.0%	Moderate to high practical difficulty
Interdisciplinary collaboration	12	60.0%	Present but inconsistently described
Resource availability	9	45.0%	Less consistently available
Formal training support	8	40.0%	Reported as limited by many participants

4.4 Response Intensity by Participant Characteristics

Table 3 presents response intensity across selected participant characteristics. Female participants showed high response concentration in individualisation, cultural adaptation, patient engagement, and adherence support. Participants aged 30–49 years also demonstrated strong response intensity across most counselling domains, suggesting that mid-career professionals were particularly engaged with practical counselling adaptation. Postgraduate participants showed high concentration in professional confidence, simplification of advice, and guideline interpretation. Participants with less than two years of experience showed lower response intensity in guideline application, resource use, and professional confidence. Nevertheless, early-career participants still reported moderate engagement with patient interaction and cultural awareness. Overall, the response pattern indicates that experience and postgraduate education were associated with more detailed reflections on counselling complexity, while resource and training limitations remained evident across several groups.

Table 3: Response Intensity Across Participant Characteristics

Participant category	Individualisation	Guideline application	Cultural adaptation	Patient engagement	Adherence support	Resource availability	Professional confidence
Male	50–99%	50–99%	50–99%	50–99%	50–99%	1–49%	50–99%
Female	100%	50–99%	100%	100%	100%	50–99%	100%
20–29 years	50–99%	50–99%	50–99%	50–99%	50–99%	1–49%	50–99%
30–39 years	100%	50–99%	100%	100%	100%	50–99%	100%
40–49 years	100%	100%	100%	100%	100%	50–99%	100%
50+ years	50–99%	50–99%	50–99%	50–99%	50–99%	1–49%	50–99%
Bachelor's degree	50–99%	50–99%	50–99%	50–99%	50–99%	50–99%	50–99%
Postgraduate	100%	50–99%	100%	100%	100%	50–99%	100%
< 2 years' Exp.	50–99%	1–49%	50–99%	50–99%	50–99%	1–49%	50–99%
2–5 years'	100%	50–99%	100%	100%	100%	50–99%	100%
6–10 years'	100%	50–99%	100%	100%	100%	50–99%	100%
> 10	100%	100%	100%	100%	100%	50–99%	100%

Exp.-Experience - Response intensity categories: low = 1–49%, moderate to high = 50–99%, complete = 100%.

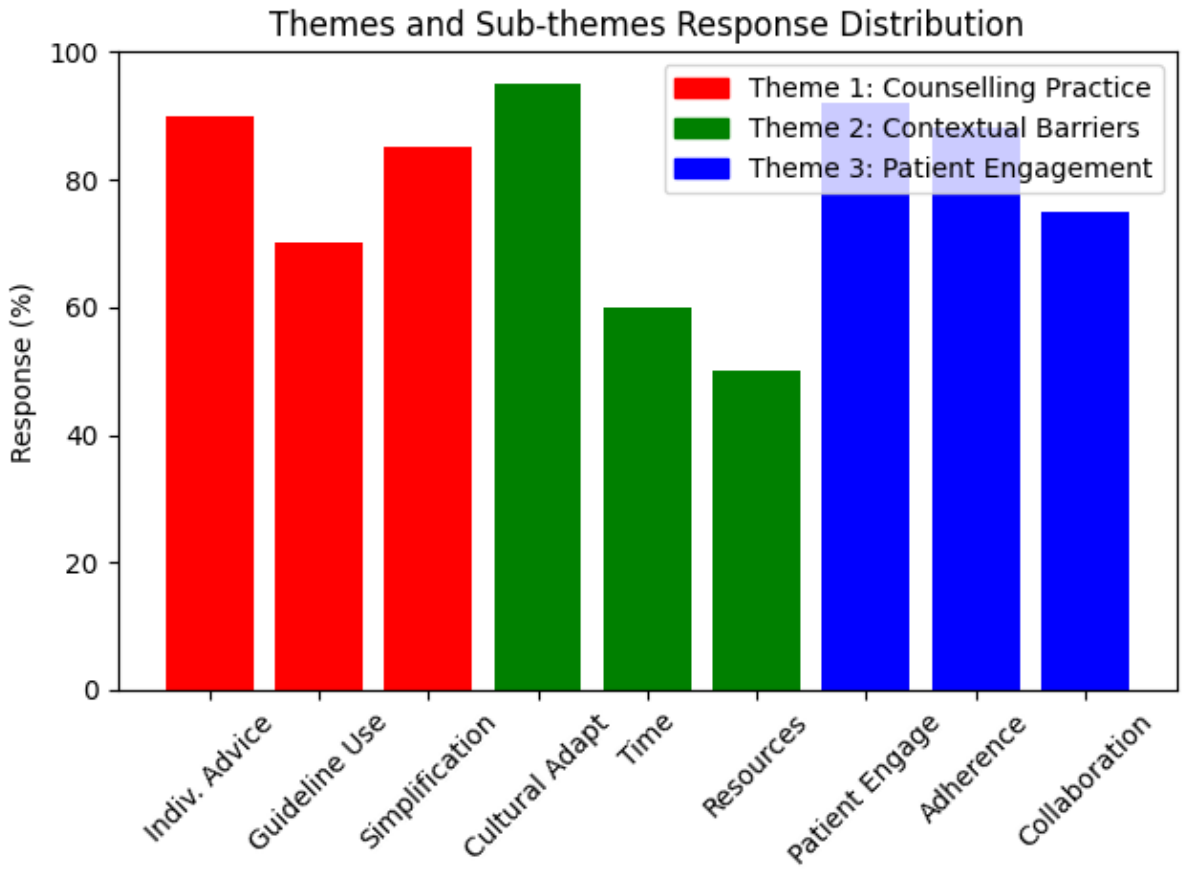

Figure 1: Distribution of Dietitians' Responses Across Themes and Sub-Themes of Healthy Dietary-Pattern Counselling for Adults with Type 2 Diabetes Mellitus in Tobruk, Libya

Themes, Sub-Themes and Codes

Table 4 presents the thematic framework generated from the reflexive thematic analysis of interviews with dietitians and clinical nutritionists in Tobruk. The analysis identified three main themes, six sub-themes, and twelve sub-sub-themes (codes), representing recurring patterns in participants' accounts of healthy dietary-pattern counselling for adults with type 2 diabetes mellitus. The first theme, *Translating Dietary Knowledge into Practical Counselling*, captures how dietitians adapted dietary guidance to individual patient circumstances and managed challenges associated with applying clinical guidelines in routine practice. The second theme, *Contextual Barriers and Influences on Counselling*, reflects the influence of cultural, social, organisational, and resource-related factors on counselling delivery. The third theme, *Patient Engagement and Response to Dietary Advice*, describes participants' perceptions of patient understanding, misconceptions, adherence, and long-term behavioural change. Together, these themes provide a structured representation of how dietary counselling is understood, implemented, and experienced within the Tobruk healthcare context. Illustrative quotations are presented to demonstrate the credibility of the findings and to reflect participants' own accounts of counselling practice.

Table 4 : Themes, Sub-Themes, Codes, and Illustrative Quotations

Main theme	Sub-theme	Code	Illustrative quotation
Translating dietary knowledge into practical counselling	Individualisation of dietary advice	Socioeconomic adaptation	"I cannot give the same diet plan to every patient. I always think about what they can afford here in Tobruk and what is available in the market." [P3, Female, Clinical Nutritionist]
Translating dietary knowledge into practical counselling	Individualisation of dietary advice	Lifestyle tailoring	"Some patients eat with family all the time, so I adjust advice to fit their daily routine, not just theory." [P7, Male, Dietitian]
Translating dietary knowledge into practical counselling	Challenges in applying guidelines	Complexity of guidelines	"Guidelines are useful, but when I explain them to patients, they become too complicated to follow." [P2, Female, Dietitian]
Translating dietary knowledge into practical counselling	Challenges in applying guidelines	Simplification strategies	"I try to simplify everything into small steps, like reduce sugar in tea first, then move step by step." [P11, Male, Clinical Nutritionist]
Contextual barriers and influences on counselling	Cultural and social influences	Traditional food practices	"In Tobruk, people eat bread and rice daily, so asking them to reduce it is not easy." [P5, Female, Clinical Nutritionist]
Contextual barriers and influences on counselling	Cultural and social influences	Family and social expectations	"Patients tell me they cannot change their diet because the whole family eats together, especially in gatherings." [P9, Male, Dietitian]
Contextual barriers and influences on counselling	System and resource constraints	Time limitations	"Sometimes we only have 10 minutes, so counselling becomes quick and not detailed." [P1, Female, Dietitian]
Contextual barriers and influences on counselling	System and resource constraints	Limited materials and training	"We do not always have updated materials or enough training to support patients properly." [P14, Male, Clinical Nutritionist]
Patient engagement and response to dietary advice	Patient understanding and misconceptions	Misinterpretation of diet	"Some patients think fruits are forbidden completely, which is not correct, so we spend time correcting that." [P6, Female, Dietitian]
Patient engagement and response to dietary advice	Patient understanding and misconceptions	Health literacy gaps	"Many patients do not understand portion size, even when we explain it clearly." [P12, Male, Clinical Nutritionist]
Patient engagement and response to dietary advice	Adherence and behavioural response	Short-term compliance	"Patients follow the diet for a few weeks, then slowly return to old habits." [P8, Female, Dietitian]
Patient engagement and response to dietary advice	Adherence and behavioural response	Long-term sustainability	"The challenge is not starting the diet, it is continuing it in daily life here." [P17, Male, Dietitian]

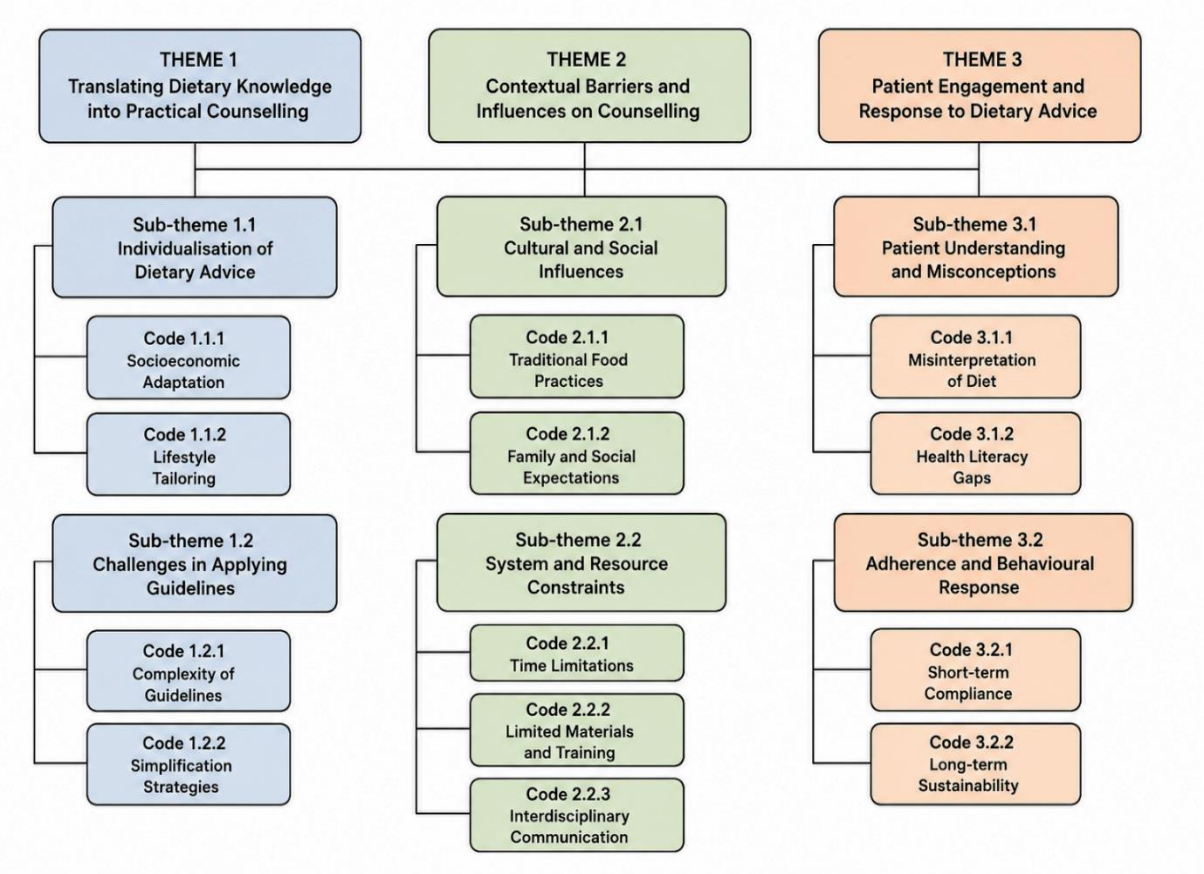

Figure 2. the three main themes, six sub-themes, and twelve sub-sub-themes identified - Through Reflexive Thematic Analysis of Dietitians' Experiences of Dietary-Pattern Counselling for Adults with Type 2 Diabetes Mellitus

Theme 1: Translating Dietary Knowledge into Practical Counselling

This theme reflects how dietitians changed general dietary knowledge into practical advice that patients could understand and apply. Participants described counselling as an adaptive process rather than a fixed instruction. Dietary advice was shaped by patients' income, food access, family routines, and ability to make gradual changes.

Sub-theme 1.1: Individualisation of Dietary Advice

Individualisation was the strongest finding, as all participants described the need to adapt counselling to patients' real-life circumstances. Dietitians explained that advice had to match what patients could afford, what foods were available locally, and how families usually ate.

Sub-sub-theme 1.1.1: Socioeconomic Adaptation

Socioeconomic adaptation refers to the way dietitians modified dietary advice according to patients' financial capacity and the availability of foods in Tobruk. Participants explained that ideal dietary recommendations were often difficult to apply when patients could not afford specific foods or when healthier options were not consistently available. One participant stated, "I cannot give the same diet plan to every patient. I always think about what they can afford here in Tobruk and what is available in the market" [P3, Female, Clinical Nutritionist]. Another participant added, "The best plan is the one the patient can follow, not the one written perfectly on paper" [P18, Female, Clinical Nutritionist].

Sub-sub-theme 1.1.2: Lifestyle Tailoring

Lifestyle tailoring reflects the adaptation of dietary counselling to patients' family routines, meal patterns, and daily habits. Dietitians reported that dietary advice had to fit the patient's existing lifestyle rather than requiring unrealistic changes. One participant noted, "Some patients eat with family all the time, so I adjust advice to fit their daily routine, not just theory" [P7, Male, Dietitian]. Another participant explained, "If I ask the patient to change everything at once, they will stop. I prefer to start with one or two changes first" [P15, Female, Dietitian].

Sub-theme 1.2: Challenges in Applying Guidelines

Dietitians recognised the value of clinical guidelines but reported difficulty applying them directly in routine consultations. Several participants described guidelines as useful for professional reference but too complex for many patients.

Sub-sub-theme 1.2.1: Complexity of Guidelines

The complexity of guidelines refers to dietitians' difficulty in translating technical dietary recommendations into patient-friendly advice. Participants reported that guideline language was often unsuitable for patients with limited nutrition knowledge. One participant stated, "Guidelines are useful, but when I explain them to patients, they become too complicated to follow" [P2, Female, Dietitian]. Another participant noted, "I do not speak to patients using medical terms. I use examples from their meals, like bread, rice, soup, and tea" [P4, Female, Clinical Nutritionist].

Sub-sub-theme 1.2.2: Simplification Strategies

Simplification strategies describe the methods used by dietitians to make dietary guidance easier for patients to understand and apply. Participants commonly used gradual steps, familiar foods, visual explanations, and practical examples. One participant explained, "I try to simplify everything into small steps, like reduce sugar in tea first, then move step by step" [P11, Male, Clinical Nutritionist]. Another participant stated, "Patients understand better when I show them the plate, not when I only explain calories or carbohydrates" [P20, Female, Dietitian].

Theme 2: Contextual Barriers and Influences on Counselling

This theme describes the cultural, social, and organisational factors that shaped counselling practice. Participants reported that dietary counselling in Tobruk was affected by traditional food habits, family meals, social gatherings, limited consultation time, and lack of educational resources.

Sub-theme 2.1: Cultural and Social Influences

Traditional food practices were repeatedly described as important barriers to dietary change. Participants explained that bread, rice, shared dishes, and sweetened tea were common in daily meals, making dietary restriction difficult.

Sub-sub-theme 2.1.1: Traditional Food Practices

Traditional food practices refer to the influence of common local foods and meal structures on patients' ability to follow dietary advice. Participants explained that staple foods, particularly bread and rice, were deeply embedded in daily eating habits. One participant stated, "In Tobruk, people eat bread and rice daily, so asking them to reduce it is not easy" [P5, Female, Clinical Nutritionist]. Another participant noted, "Food here is connected with respect and hospitality, so patients cannot always control what they eat" [P13, Male, Clinical Nutritionist].

Sub-sub-theme 2.1.2: Family and Social Expectations

Family and social expectations describe the influence of shared meals, family gatherings, and social pressure on dietary adherence. Dietitians reported that patients often struggled to follow individual advice when meals were prepared and eaten collectively. One participant added, "Patients tell me they cannot change their diet because the whole family eats together, especially in gatherings" [P9, Male, Dietitian]. Another participant explained, "In family occasions, patients feel embarrassed to refuse food, even when they know it affects their sugar" [P16, Female, Dietitian].

Sub-theme 2.2: System and Resource Constraints
System-related barriers limited the depth and consistency of counselling. Participants reported short consultation times, high patient numbers, and limited written materials.

Sub-sub-theme 2.2.1: Time Limitations
Time limitations refer to short consultation periods that restricted detailed counselling, patient education, and follow-up. Participants explained that limited time often forced them to provide only basic advice.
One participant stated, “Sometimes we only have 10 minutes, so counselling becomes quick and not detailed” [P1, Female, Dietitian]. Another participant added, “Without follow-up, many patients forget the advice or lose motivation” [P1, Female, Dietitian].

Sub-sub-theme 2.2.2: Limited Materials and Training
Limited materials and training describe the shortage of updated educational resources, Arabic counselling materials, and professional development opportunities. Participants indicated that these limitations affected the consistency and quality of dietary counselling. One participant explained, “We do not always have updated materials or enough training to support patients properly” [P14, Male, Clinical Nutritionist]. Another participant said, “We need simple leaflets in Arabic with local foods, because patients understand better when the examples are from their own meals” [P10, Male, Dietitian].

Sub-sub-theme 2.2.3: Interdisciplinary Communication
Interdisciplinary communication refers to the need for consistent messages between dietitians, doctors, nurses, and other healthcare professionals. Participants suggested that counselling became more effective when the healthcare team provided unified advice. One participant stated, “Counselling becomes stronger when doctors, nurses, and dietitians give the same message” [P19, Male, Clinical Nutritionist].

Theme 3: Patient Engagement and Response to Dietary Advice
This theme reflects how patients understood, accepted, and followed dietary advice. Dietitians reported that patient response was influenced by knowledge, motivation, family support, and the practicality of recommendations.

Sub-theme 3.1: Patient Understanding and Misconceptions
Participants reported that many patients misunderstood diabetes dietary advice. Some patients avoided foods unnecessarily, while others believed that a single food or drink could control diabetes.

Sub-sub-theme 3.1.1: Misinterpretation of Diet
Misinterpretation of diet refers to patients’ inaccurate understanding of diabetes-related food advice. Participants reported that some patients avoided foods unnecessarily or focused only on sugar while ignoring other dietary factors. One participant stated, “Some patients think fruits are forbidden completely, which is not correct, so we spend time correcting that” [P6, Female, Dietitian]. Another participant noted, “Some patients think only sugar is the problem, but they do not think about bread, rice, or large portions” [P8, Female, Dietitian].

Sub-sub-theme 3.1.2: Health Literacy Gaps
Health literacy gaps describe difficulties in understanding dietary concepts such as portion size, balanced meals, and carbohydrate control. Dietitians reported that repeated explanation was often needed to support patient understanding. One participant explained, “Many patients do not understand portion size, even when we explain it clearly” [P12, Male, Clinical Nutritionist]. Another participant added, “The patient may listen in the clinic, but at home they follow what the family says or what they heard from other people” [P15, Female, Dietitian].

Sub-theme 3.2: Adherence and Behavioural Response
Participants reported that many patients showed initial motivation but struggled to maintain dietary change over time. Short-term compliance was common, especially after diagnosis or high blood-glucose readings, but long-term adherence was more difficult.

Sub-sub-theme 3.2.1: Short-Term Compliance

Short-term compliance refers to patients' initial willingness to follow dietary advice after diagnosis, clinical review, or high blood-glucose readings. Participants reported that this motivation often decreased over time. One participant stated, "Patients follow the diet for a few weeks, then slowly return to old habits" [P8, Female, Dietitian]. Another participant noted, "When the advice is simple and close to their normal food, patients continue better" [P3, Female, Clinical Nutritionist].

Sub-sub-theme 3.2.2: Long-Term Sustainability

Long-term sustainability describes the difficulty patients experienced in maintaining dietary changes within daily life. Participants connected this difficulty to family routines, social events, food preferences, and limited follow-up. One participant explained, "The challenge is not starting the diet, it is continuing it in daily life here" [P17, Male, Dietitian]. Another participant added, "Without follow-up, many patients forget the advice or lose motivation" [P1, Female, Dietitian].

Discussion

Overview

This study explored dietitians' experiences of healthy dietary-pattern counselling for adults with type 2 diabetes mellitus in Tobruk, Libya. Three interrelated themes emerged from the analysis: translating dietary knowledge into practical counselling, contextual barriers and influences on counselling, and patient engagement and response to dietary advice. Collectively, these findings indicate that dietary counselling extends beyond the communication of nutritional recommendations and involves continuous negotiation between evidence-based guidance, sociocultural realities, organisational constraints, and patient capabilities. The findings contribute context-specific insight into how diabetes nutrition counselling is operationalised within a resource-constrained healthcare environment and extend existing qualitative evidence that has largely originated from high-income settings.

Translating Dietary Knowledge into Practical Counselling

A prominent finding was the central role of individualisation in dietary counselling. Participants consistently described adapting recommendations according to patients' socioeconomic circumstances, food availability, family structures, and daily routines. Such adaptation reflects contemporary nutrition guidance, which emphasises that effective diabetes management requires flexible dietary strategies rather than a single prescribed eating pattern (Evert et al., 2019; Forouhi, 2023). Similar observations have been reported among dietitians in the United Kingdom, where counselling was characterised by pragmatic modification of dietary recommendations according to individual patient needs rather than strict adherence to a particular dietary model (Moutou et al., 2022).

The findings suggest that individualisation serves both clinical and practical purposes. Within the Tobruk context, affordability and local food availability appear to influence counselling decisions substantially. Dietary recommendations that fail to account for these realities may be perceived as unrealistic and therefore less likely to be implemented. Similar relationships between socioeconomic conditions and dietary adherence have been reported across low- and middle-income settings, where financial constraints frequently influence food choices and limit implementation of nutritional recommendations (Minari et al., 2023). Individualisation may therefore represent not only a patient-centred approach but also a practical mechanism through which dietitians increase the feasibility of dietary change.

Participants also highlighted challenges in translating clinical guidelines into patient-friendly advice. Guidelines were generally viewed as valuable professional resources, yet difficulties emerged when attempting to communicate complex nutritional concepts to individuals with varying levels of health literacy. Comparable findings have been reported in studies examining diabetes self-management, where technical nutritional information often required simplification before meaningful patient engagement could occur (Ranasinghe et al., 2015). The frequent use of practical examples, gradual behaviour modification, and simplified language suggests that counselling effectiveness may depend as much on communication skills as on nutritional expertise.

An important implication is that structured counselling resources specifically adapted to the Libyan context may help dietitians maintain consistency while preserving flexibility. Locally relevant educational tools incorporating familiar foods, common meal patterns, and culturally appropriate examples may reduce variability in counselling practice while supporting patient understanding.

Contextual Barriers and Influences on Counselling

The second theme highlights the substantial influence of sociocultural and organisational conditions on dietary counselling. Participants consistently described dietary behaviour as embedded within broader social practices, particularly those related to traditional foods, family eating arrangements, and social obligations. Such findings align with behavioural and sociological perspectives that conceptualise eating practices as socially organised activities rather than purely individual choices (Forouhi, 2023).

Bread, rice, and shared family meals emerged as particularly important considerations within counselling encounters. Similar observations have been reported in studies from South Asia, Africa, and the Middle East, where dietary recommendations frequently intersect with cultural traditions and collective eating practices (Hushie, 2019; Wang et al., 2023). Cultural food practices may therefore function simultaneously as barriers and opportunities. While established dietary habits may limit acceptance of some recommendations, incorporating culturally familiar foods into dietary plans may enhance relevance and long-term adherence.

Family influence appeared especially significant. Participants described situations in which dietary decisions were shaped by household routines rather than individual preferences. Existing literature suggests that family members frequently influence food preparation, purchasing decisions, and meal structure, making diabetes management a shared rather than individual responsibility (Hushie, 2019). Consequently, interventions directed exclusively at patients may have limited effectiveness when broader family dynamics remain unchanged. Greater involvement of family members within diabetes education programmes may therefore strengthen implementation of dietary advice.

Organisational constraints further complicated counselling delivery. Limited consultation time, insufficient educational materials, and restricted professional development opportunities were recurrent concerns. These findings correspond closely with previous qualitative studies in which workload pressures and inadequate resources constrained the delivery of comprehensive nutritional care (Boocock et al., 2021; Siopis et al., 2020). Despite these limitations, participants demonstrated considerable adaptability, often modifying counselling approaches to accommodate available resources. Such adaptability reflects professional resilience but may also indicate dependence on individual initiative rather than systematic service support.

Taken together, the findings suggest that dietary counselling outcomes are influenced by interactions between social, cultural, and organisational factors. Improvements in counselling effectiveness may therefore require system-level responses in addition to individual practitioner efforts. Enhanced educational resources, protected consultation time, and stronger multidisciplinary collaboration may help create conditions that support effective dietary management.

Patient Engagement and Response to Dietary Advice

The third theme emphasises the central role of patient engagement in determining counselling outcomes. Dietitians consistently described misconceptions regarding diabetes nutrition, difficulties understanding dietary concepts, and challenges sustaining behavioural change over time. Similar findings have been reported internationally, where misunderstanding of dietary recommendations remains a persistent obstacle to effective diabetes self-management (Ranasinghe et al., 2015; Wang et al., 2023).

Misconceptions concerning food restrictions were particularly evident. Participants described patients categorising foods as entirely permissible or prohibited, often resulting in unnecessary restrictions or inappropriate dietary choices. Such binary interpretations have been documented previously and may arise when complex nutritional concepts are simplified without adequate explanation (Ranasinghe et al., 2015). These findings suggest that effective counselling requires not only information provision but also active correction of misconceptions and reinforcement of accurate dietary understanding.

Health literacy emerged as another important consideration. Difficulties understanding portion size, carbohydrate intake, and meal balance indicate that nutritional information alone may be insufficient when patients lack foundational knowledge. Existing evidence suggests that health literacy strongly influences diabetes self-management behaviours, treatment adherence, and long-term outcomes (Wang et al., 2023). Educational approaches tailored to literacy levels and cultural context may therefore improve the translation of dietary advice into daily practice.

The challenge of maintaining behavioural change represented one of the most consistent findings across interviews. Participants frequently described a pattern of initial motivation followed by gradual decline in adherence. Similar trajectories have been reported throughout the behavioural-change literature, where motivation generated by diagnosis or clinical advice often diminishes without ongoing reinforcement (Forouhi, 2023). Within Tobruk, social expectations, family influences, and established dietary habits appear to further complicate long-term adherence.

These findings suggest that dietary counselling should be conceptualised as an ongoing process rather than a single educational encounter. Regular follow-up, behavioural support strategies, goal setting, and reinforcement mechanisms may help sustain motivation and improve long-term adherence. In addition, culturally adapted educational interventions addressing common misconceptions may strengthen patient engagement and self-management capacity.

Integration of Findings and Implications

The three themes collectively indicate that dietary-pattern counselling for adults with type 2 diabetes in Tobruk is shaped by dynamic interactions between professional practice, contextual conditions, and patient-related factors. Effective counselling appears to depend on the ability of dietitians to balance evidence-based recommendations with local realities while simultaneously addressing social influences and behavioural challenges.

A notable contribution of this study lies in demonstrating how dietary counselling is operationalised within a Libyan healthcare context. Much of the existing qualitative evidence originates from high-income countries where service structures, workforce capacity, and educational resources differ considerably from those available in Tobruk (Moutou et al., 2022; Siopis et al., 2020). The findings therefore extend current understanding by illustrating how dietitians adapt counselling practices within a setting characterised by resource limitations, strong family influences, and culturally embedded food practices.

Several practical implications emerge. Development of culturally adapted educational materials, enhanced behavioural-counselling training, improved multidisciplinary collaboration, and structured follow-up systems may strengthen diabetes nutrition services. Family-inclusive approaches may also improve adherence by addressing the social context within which dietary decisions occur. Collectively, these strategies may contribute to more effective and sustainable dietary management for adults living with type 2 diabetes in Libya.

Theoretical and Practical Implications

The findings contribute to the growing body of qualitative literature examining dietary counselling in type 2 diabetes management by demonstrating how nutritional guidance is interpreted and operationalised within a resource-constrained and culturally specific setting (Moutou et al., 2022; Siopis et al., 2020). Existing theoretical models of diabetes self-management frequently emphasise individual behaviour change, health literacy, and adherence; however, the present findings suggest that dietary counselling is influenced by a broader interaction between professional judgement, sociocultural expectations, organisational conditions, and patient capabilities. The identified themes support contemporary perspectives that view dietary behaviour as socially and contextually embedded rather than solely determined by individual knowledge or motivation. Consequently, the study extends current understanding of dietary counselling by illustrating how dietitians actively adapt evidence-based recommendations to local realities. The findings also contribute to behavioural and patient-centred care frameworks by highlighting the importance of flexibility and contextual adaptation in diabetes nutrition management (Evert et al., 2019; Forouhi, 2023). Dietitians' reliance on individualisation, simplification, and culturally relevant communication suggests that effective dietary counselling may depend on the integration of clinical evidence with social and environmental considerations. The study therefore provides conceptual support for counselling approaches that move beyond prescriptive dietary advice towards more adaptive and context-sensitive models of care, particularly within low- and middle-income healthcare environments.

The findings indicate that dietary-pattern counselling for adults with type 2 diabetes in Tobruk is shaped by a combination of professional judgement, cultural influences, and organisational constraints (Boocock et al., 2021; Siopis et al., 2020).

The strong emphasis on individualisation suggests that counselling services may benefit from structured frameworks that maintain evidence-based consistency while allowing adaptation to patients' socioeconomic circumstances, food availability, and cultural practices. Development of locally relevant educational resources incorporating familiar foods, common meal patterns, and practical examples may improve communication and increase the acceptability of dietary recommendations. The findings further suggest that healthcare services may benefit from strengthening behavioural support mechanisms within routine diabetes care (Ranasinghe et al., 2015; Wang et al., 2023). Participants frequently highlighted misconceptions, low health literacy, and difficulties sustaining dietary change, indicating that dietary counselling extends beyond information provision. Regular follow-up, goal-setting strategies, and reinforcement of key dietary messages may improve long-term adherence. Greater interdisciplinary collaboration between dietitians, physicians, nurses, and diabetes educators may also support delivery of consistent dietary advice and enhance patient understanding. At a service level, improved access to professional development opportunities, updated educational materials, and protected consultation time may strengthen the quality of dietary counselling. Organisational support for culturally sensitive counselling approaches could further improve patient engagement and facilitate implementation of dietary recommendations. Collectively, these practical implications suggest that strengthening both individual counselling practices and healthcare system support structures may contribute to more effective diabetes nutrition services within Tobruk and similar healthcare settings.

Strengths and Limitations

Several methodological strengths enhance the value of this study, particularly its qualitative design and use of reflexive thematic analysis (Braun & Clarke, 2019; Braun et al., 2023). First, the qualitative design enabled in-depth exploration of dietitians' experiences and perspectives, providing insights that would have been difficult to obtain through quantitative methods alone. Semi-structured interviews facilitated detailed discussion of counselling practices, contextual influences, and patient-related challenges, generating rich data closely aligned with the study objectives. Second, inclusion of participants from hospitals, primary healthcare centres, and private clinics allowed representation of diverse practice environments, strengthening the breadth of perspectives captured. Third, the use of reflexive thematic analysis provided a systematic and transparent approach to identifying patterns across interviews, supporting analytical rigour and credibility.

The study also offers an important contextual contribution by focusing on Tobruk, an area where evidence regarding diabetes nutrition counselling remains limited (Lemamsha et al., 2019; Ashawesh et al., 2025). Most existing qualitative literature originates from high-income countries with different healthcare structures and resource availability. The findings therefore provide locally relevant evidence that enhances understanding of how dietary counselling is delivered within a Libyan healthcare context. Furthermore, the inclusion of both dietitians and clinical nutritionists allowed exploration of experiences across related professional groups involved in diabetes care.

Several limitations should nevertheless be acknowledged, including the use of purposive sampling and the single geographical setting (Campbell et al., 2020; Staller, 2021). The use of purposive sampling and the focus on a single geographical area may limit transferability of the findings to other regions of Libya or different healthcare settings. Although the sample size was appropriate for qualitative inquiry, additional perspectives may have emerged from a larger and more geographically diverse sample. The findings were also based on self-reported experiences, which may be influenced by recall bias or the tendency to present professional practices positively. In addition, patient perspectives were not included, limiting understanding of how counselling approaches are experienced, interpreted, and implemented by those receiving dietary advice.

Recommendations for Future Studies

Future research should extend the current findings by examining dietary counselling practices across multiple regions of Libya, particularly because current evidence remains limited and context-specific (Lemamsha et al., 2019; Ashawesh et al., 2025). Comparative studies involving urban and rural healthcare settings may provide greater understanding of how geographical, organisational, and cultural differences influence counselling approaches. Inclusion of larger samples and a broader range of healthcare institutions may also strengthen the transferability of findings and support development of national recommendations for diabetes nutrition care.

Further research should incorporate patient perspectives to provide a more comprehensive understanding of dietary counselling processes, especially in relation to health literacy, adherence, and long-term behaviour change (Ranasinghe et al., 2015; Wang et al., 2023). Exploration of patients' experiences, perceptions of dietary advice, and barriers to adherence may complement the present findings and identify areas where counselling strategies can be improved. Longitudinal and mixed-methods studies may additionally examine the relationship between counselling approaches, dietary behaviour, and clinical outcomes over time. Evaluation of culturally adapted educational interventions, digital support tools, and family-based dietary programmes may also contribute to identifying effective strategies for improving diabetes self-management within Libyan healthcare settings.

Conclusion

The study demonstrates that dietary-pattern counselling for adults with type 2 diabetes mellitus in Tobruk is shaped by the interaction of professional judgement, contextual influences, and patient-related factors. Dietitians described counselling as an adaptive process requiring individualisation, simplification of complex nutritional information, and consideration of cultural and organisational realities. Challenges associated with traditional food practices, resource limitations, misconceptions, and long-term adherence highlight the complexity of diabetes nutrition management within routine clinical practice. Despite these challenges, the findings indicate that culturally sensitive, patient-centred, and contextually relevant counselling approaches may strengthen dietary management and support improved diabetes care. The study contributes original qualitative evidence from Libya and provides a foundation for future research, service development, and professional practice in diabetes nutrition counselling.

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References

Ashawesh, M., Alkawash, M., Meigal, A., Almsiri, B., & Almasalati, A. (2025). Tracking the burden of type 2 diabetes mellitus among Libyan patients in three populated districts of Tripoli, Libya. *Razi Medical Journal*, 336–346.

Awuchi, C. G., Echeta, C. K., & Igwe, V. S. (2020). Diabetes and the nutrition and diets for its prevention and treatment: A systematic review and dietetic perspective. *Health Sciences Research, 6*(1), 5–19.

Boocock, R. C., Lake, A. A., Haste, A., & Moore, H. J. (2021). Clinicians' perceived barriers and enablers to the dietary management of adults with type 2 diabetes in primary care: A systematic review. *Journal of Human Nutrition and Dietetics, 34*(6), 1042–1052. https://doi.org/10.1111/jhn.12875

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health, 11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Braun, V., Clarke, V., Hayfield, N., & Terry, G. (2023). *Thematic analysis: A practical guide*. SAGE Publications.

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing, 25*(8), 652–661. https://doi.org/10.1177/1744987120927206

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.

Evert, A. B., Dennison, M., Gardner, C. D., Garvey, W. T., Lau, K. H. K., MacLeod, J., Mitri, J., Pereira, R. F., Rawlings, K., Robinson, S., Saslow, L., Uelmen, S., Urbanski, P. B., & Yancy, W. S., Jr. (2019). Nutrition therapy for adults with diabetes or prediabetes: A consensus report. *Diabetes Care, 42*(5), 731–754. https://doi.org/10.2337/dci19-0014

Forouhi, N. G. (2023). Embracing complexity: Making sense of diet, nutrition, obesity and type 2 diabetes. *Diabetologia, 66*(5), 786–799. https://doi.org/10.1007/s00125-023-05873-z

Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine, 292*, 114523. https://doi.org/10.1016/j.socscimed.2021.114523

Hushie, M. (2019). Exploring the barriers and facilitators of dietary self-care for type 2 diabetes: A qualitative study in Ghana. *Health Promotion Perspectives, 9*(3), 223–232. https://doi.org/10.15171/hpp.2019.31

International Diabetes Federation. (2024). *IDF diabetes atlas: Libya country profile*. https://diabetesatlas.org

Kallio, H., Pietilä, A.-M., Johnson, M., & Kangasniemi, M. (2016). Systematic methodological review: Developing a framework for a qualitative semi-structured interview guide. *Journal of Advanced Nursing, 72*(12), 2954–2965. https://doi.org/10.1111/jan.13031

Lemamsha, H., Randhawa, G., & Papadopoulos, C. (2019). Prevalence of overweight and obesity among Libyan men and women. *BioMed Research International, 2019*, 8531360. https://doi.org/10.1155/2019/8531360

Maxwell, J. A., & Reybold, L. E. (2015). Qualitative research. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (2nd ed., Vol. 19, pp. 685–689). Elsevier.

Minari, T. P., Tácito, L. H. B., Yugar, L. B. T., Ferreira-Melo, S. E., Manzano, C. F., Pires, A. C., Vilela-Martin, J. F., & Yugar-Toledo, J. C. (2023). Nutritional strategies for the management of type 2 diabetes mellitus: A narrative review. *Nutrients, 15*(24), 5096. https://doi.org/10.3390/nu15245096

Moutou, K. E., England, C. Y., Gutteridge, C., Toumpakari, Z., McArdle, P. D., & Papadaki, A. (2022). Exploring dietitians' practice and views of giving advice on dietary patterns to patients with type 2 diabetes mellitus: A qualitative study. *Journal of Human Nutrition and Dietetics, 35*(1), 179–190. https://doi.org/10.1111/jhn.12939

Petroni, M. L., Brodosi, L., Marchignoli, F., Sasdelli, A. S., Caraceni, P., Marchesini, G., & Ravaioli, F. (2021). Nutrition in patients with type 2 diabetes: Present knowledge and remaining challenges. *Nutrients, 13*(8), 2748. https://doi.org/10.3390/nu13082748

Ranasinghe, P., Pigera, A. S. A. D., Ishara, M. H., Jayasekara, L. M. D. T., Jayawardena, R., & Katulanda, P. (2015). Knowledge and perceptions about diet and physical activity among Sri Lankan adults with diabetes mellitus: A qualitative study. *BMC Public Health, 15*, 1160. https://doi.org/10.1186/s12889-015-2518-3

Shannon-Baker, P. (2016). Making paradigms meaningful in mixed methods research. *Journal of Mixed Methods Research, 10*(4), 319–334. https://doi.org/10.1177/1558689815575861

Siopis, G., Colagiuri, S., & Allman-Farinelli, M. (2020). Dietitians' experiences and perspectives regarding access to and delivery of dietetic services for people with type 2 diabetes mellitus. *Heliyon, 6*(2), e03344. https://doi.org/10.1016/j.heliyon.2020.e03344

Staller, K. M. (2021). Big enough? Sampling in qualitative inquiry. *Qualitative Social Work, 20*(4), 897–904. https://doi.org/10.1177/14733250211024516

Wang, Y., Yuan, X., Gu, X., Meng, C., & Zheng, Y. (2023). Developing a conceptual model for understanding nutritional problems and their negative impacts on quality of life among Chinese patients with type 2 diabetes: A qualitative study. *Nursing Open, 10*(8), 5271–5281. https://doi.org/10.1002/nop2.1765

World Health Organization. (2023). *Diabetes fact sheet*. https://www.who.int/news-room/fact-sheets/detail/diabetes