Original Article

JHSMR Journal of Health Science and Medical Research

Addressing Perceived Barriers to Dietary Adherence in Type 2 Diabetes Management: Development and Evaluation of a Targeted Intervention Strategy

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Received 18 June 2025 ● Revised 1 September 2025 ● Accepted 6 October 2025 ● Published online 14 May 2026

Abstract:

Objectives: This pilot study sought to assess the effectiveness of an intervention aimed at addressing perceived barriers to dietary adherence among patients with type 2 diabetes in Iraq in response to the critical issue of insufficient dietary compliance in diabetes management.

Material and Methods: A quasi-experimental pilot study design (single blinding for participants) was used, with 60 participants (30 in the intervention group and 30 in the control group) from the Sekanyan Health Centre in Kirkuk, Iraq. The control group continued to receive their usual care. The intervention group participated in an eight-week educational program focused on the perceived barriers to dietary adherence, followed by a one-month follow-up. Outcomes were assessed using the validated 15-item perceived barriers for the dietary adherence questionnaire (PBDAQ). Higher PBDAQ scores indicate fewer perceived barriers. The Statistical Package for the Social Sciences (SPSS), version 26, was used in the data analysis.

Results: The intervention group exhibited a notable decrease in perceived barriers from baseline to post-intervention (mean difference=-0.639, 95% CI: 0.427 to 0.850, p-value=0.004) and a significant enhancement in dietary adherence (mean difference=0.448, 95% CI: -0.668 to -0.227, p-value=0.006). The control group showed no significant changes.

Conclusion: This pilot study suggests that targeted interventions addressing the perceived barriers may enhance dietary adherence among Iraqi patients with type 2 diabetes. The findings support further investigation into integrating barrier assessment and culturally tailored strategies into standard diabetes care.

Keywords: attitude to health, diabetes mellitus, diet therapy, health behavior, health education, patient compliance, type 2

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J Health Sci Med Res
doi: 10.31584/jhsmr.20261357
www.jhsmr.org

Introduction

Type 2 diabetes (T2DM) constitutes a global health crisis and affects many people worldwide and has serious public health implications[1-3]. The prevalence is expected to rise from 425 million in 2017 to 629 million by 2045, resulting in future economic, social, and health impacts[4-6]. Lifestyle changes, such as dietary changes, urbanisation, and lack of physical activity, are the main causes of this disease[7,8]. T2DM can lead to many complications, such as heart disease, kidney failure, neuropathy, and blindness[7].

Effective management of type 2 diabetes must follow a plan that goes beyond medical treatment alone, including dietary changes, exercise, weight control, and smoking cessation. Educating patients and helping them improve their adherence to treatment and self-care management can also help improve their overall quality of life[9]. Adherence to dietary recommendations is an important part of type 2 diabetes management and the primary method of treatment[10,11]. However, many patients struggle to adhere to their diet, and research indicates that adherence rates range from 30% to 70% worldwide[12].

The health belief model (HBM) has been widely used to analyse health behaviors and inform the development of interventions aimed at enhancing them. The health belief model consists of six concepts, which include the perceived susceptibility, severity, benefits, and obstacles, in addition to self-efficacy and cues to action[13]. Perceived barriers refer to the interpretation of obstacles to behavioral change that may impede the execution of efforts aimed at transformation. According to the HBM, overcoming barriers is one of the best predictors of health behavior change[14-16]. Dietary recommendations are challenging to follow due to their complexity and the many personal, social, and environmental factors that affect the patient[16]. Studies have found that the most significant barriers that make it difficult for people with diabetes to adhere to a diet include poor economic capacity and lack of time, in addition to poor knowledge, pressure from family and friends, cultural food preferences, and lack of access to nutritious foods[17,18].

In Iraq, as a developing country, the prevalence of T2DM had reached 10.4%, or about three million Iraqis with type 2 diabetes[19]. While patient education is a cornerstone of T2DM management, its translation into improved dietary adherence remains suboptimal, both globally and in the Iraqi context[9,11,12]. This persistent gap between knowledge and behavior suggests that standard educational approaches fail to adequately address the profound perceptual and environmental barriers that impede behavior change. Studies have identified such barriers to include economic constraints, social pressures, and deeply ingrained cultural food practices[12,17,18,20]. Therefore, this pilot study aimed to develop and evaluate a focused intervention strategy, grounded in the health belief model, specifically designed to address these perceived barriers to dietary adherence among individuals with type 2 diabetes in Iraq.

Material and Methods

Study design

This pilot study used two groups with a quasi-experimental design: a control group and an intervention group. Pre- and post-tests were conducted over a period of 3months to evaluate the effect of a perceived barriers-based intervention on supporting dietary adherence among type 2 diabetes patients. This study used the Transparent Reporting for Evaluations with Nonrandomized Designs (TREND) guidelines for quasi-experimental research[21].

Study setting

The study was conducted at the Sekanyan Health Centre in Kirkuk Governorate, Iraq. Among all the primary healthcare facilities in Kirkuk Governorate, the centre was selected using a direct random selection process. Serving the residents of Kirkuk Governorate and surrounding areas as a comprehensive primary healthcare facility, the

Sekanyan Health Centre opened in 2013. The centre's three main departments are chronic disease treatment, maternal and child health, and immunisation. It also includes nursing units, a pharmacy, and medical consultation rooms.

Sample and sampling

Sample size determination was based on methodological approaches to diabetes interventions, using G*Power software with Cohen's d=0.50, study power at 80%, and significance level at a=0.05, resulting in a required minimum sample of 66 participants[22]. To account for potential attrition, a target sample size of 76 was set[22].

The sampling frame included all 380 registered type 2 diabetes patients who visited the Sekanyan Health Centre during the 15-day recruitment period. A systematic sampling method was employed to ensure efficiency and a representative temporal distribution of participants[23]. The procedure involved a random start from the first five patients, then recruiting every fifth patient thereafter (sampling interval, K=N/n= 380/76=5). After eligibility screening, 16 individuals were excluded. The final sample thus consisted of 60 participants. These participants were alternately assigned to the intervention (n=30) and control (n=30) groups based on odd and even sequence numbers, respectively. Complete retention was achieved with no attrition throughout the study period (Figure 1). The recruitment and assignment process was completed between January 1 and 15, 2025. Both groups were studied concurrently during the same seasonal period (January-April 2025) to minimize any potential confounding influence of seasonal variations in food availability, religious observances, or social circumstances.

Inclusion criteria

The study required individuals aged 20-65 with active type 2 diabetes records, a doctor's confirmation of their diagnosis, mental capacity, and no physical activity limitations or consequences.

Exclusion criteria

Include missing one training session, serious mental and physical health difficulties, severe sight and hearing issues, or pregnancy. Participants could stop or restart the study at any moment during the trial.

Instrument of the study

In this pilot study, a developed tool was used due to the lack of any culturally appropriate tool to measure the perceived dietary barriers among Iraqi patients with T2DM. The tool consists of two sections. The first section covers demographic characteristics and includes questions about participants' age, gender, family history, marital status, and body mass index. The second section addresses the impact of perceived barriers on dietary adherence. This tool was developed by systematically integrating validated items from two trusted tools: the Perceived Dietary Adherence Questionnaire (PDAQ) and the Health Beliefs Model for Dietary and Physical Activity (HBM-DAPA) Questionnaire[24,25]. The Perceived Barriers to Dietary Adherence Questionnaire (PBDAQ) consists of 15 items divided into four theoretically based domains: Knowledge and awareness barriers (3 items): Difficulty understanding appropriate foods and identifying carbohydrates and their effect on blood sugar. Practical and environmental barriers (3 items): Challenges related to food availability, affordability, and preparation time. Psychosocial barriers (3 items): Difficulties coping with food cravings, social eating situations, and family interactions. Barriers to specific dietary recommendations (6 items): Challenges in implementing specific dietary guidelines and the importance of adhering to healthy diet recommendations. Each item uses a 7-point Likert scale (0-6), with higher PBDAQ scores indicating fewer perceived barriers and thus fewer problems limiting dietary adherence. Total scores range from 0 to 90, with domain-specific ratings ranging from 0 to 18 for the first three domains and 0 to 36 for the dietary recommendations domain.

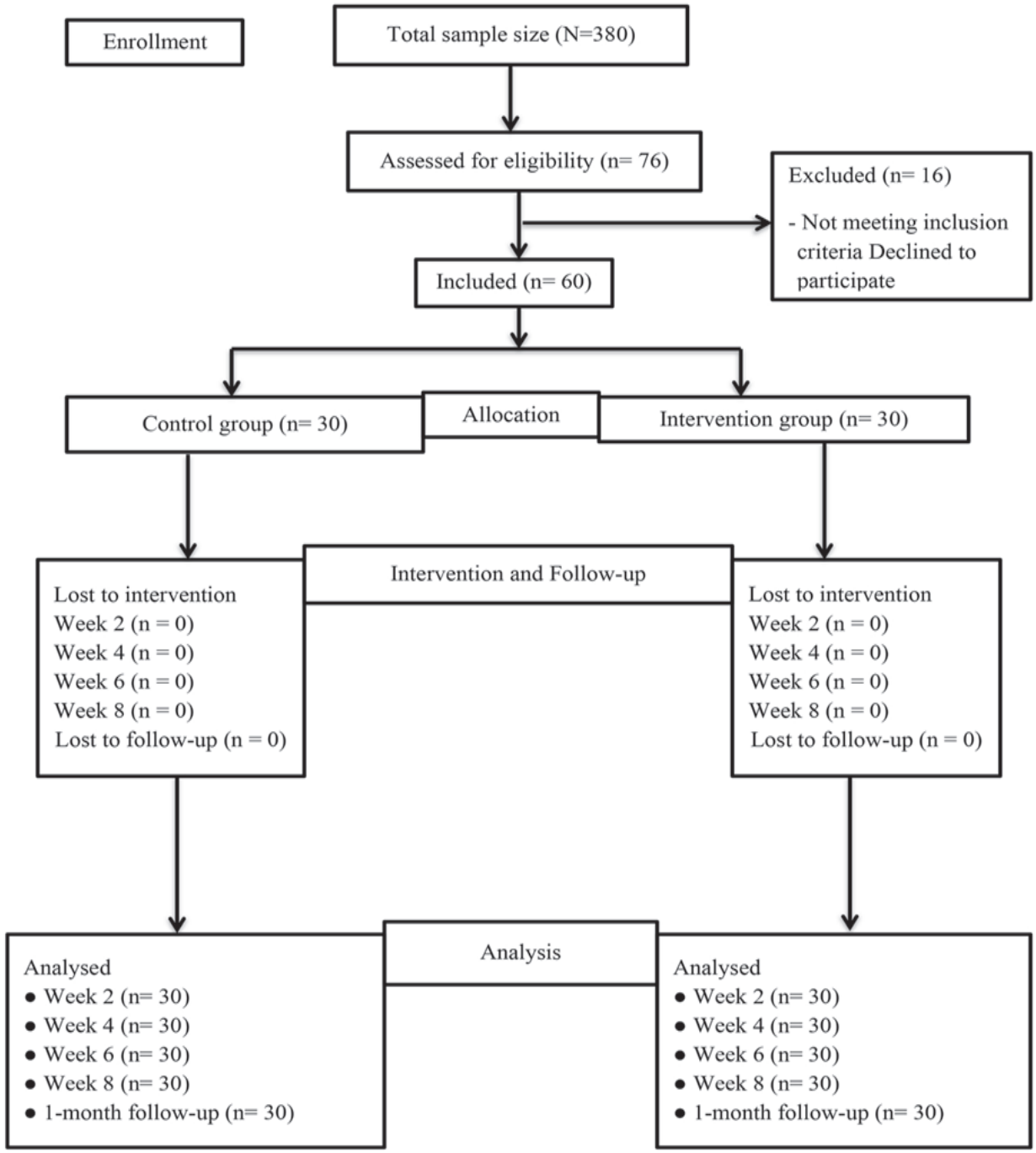

Figure 1 CONSORT flowchart: in addition to the 1–month follow–up periods, 60 participants completed the 8–week educational period and were eligible for analysis

The questionnaire was evaluated by a group of specialists: six academic experts from the college of nursing and two endocrinologists. They reviewed the questionnaire and made the necessary adjustments.

Psychometric properties

Content validity (CVI) was 0.88 or higher for all questionnaire items. Face validity scores ranged from 2.1 to 4.6, indicating that the items are clearly defined and relevant to the general context of the target population. To evaluate internal consistency reliability, the Cronbach's alpha coefficient was 0.821. A two-week test-retest evaluation with pilot study participants revealed a strong correlation coefficient (r=0.88, p-value=0.003), indicating the instrument's temporal stability.

Intervention

The intervention group underwent an eight-week structured programme and a one-month follow-up, focusing on identifying and addressing perceived barriers to diet adherence. The programme included (1) group educational sessions addressing common barriers, (2) group discussions to identify barriers, (3) problem-solving training, (4) goal-setting approaches, and (5) peer-support components. The educational programme was culturally tailored to be more suitable and pertinent for patients. Brochures on diabetes were distributed after the end of the educational intervention. The control group received standard medical care concurrently with the intervention group's educational programme (60 minutes weekly for 8 weeks with follow-up), which encompassed medical consultations and medication management. This arrangement aimed to provide equal contact time between both groups for a fair comparison. To adhere to ethical principles, after completing the data collection for the second post-test, a month after the follow-up, the same educational programme was provided to the control group, in addition to distributing brochures to them.

Outcome measurement and bias minimization

To minimize measurement bias, all outcome assessments were conducted by trained research assistants who were blinded to group allocation. The same trained personnel administered questionnaires at all time points using standardized protocols. Participants completed questionnaires independently in a private setting to reduce social desirability bias. Data collection occurred at consistent times of day and in similar environmental conditions for both groups.

Ethical considerations

The Ethics Committee of the College of Nursing, University of Baghdad, approved the study (approval number 67, November 19, 2024). The Kirkuk Health Directorate granted approval (no. 64, January 20, 2025) to conduct the study at Sekanyan Health Centre. After receiving information about the study's objectives, procedures, benefits, and potential risks, all participants provided informed consent. Participants entered the study voluntarily, retaining the right to withdraw at any time without jeopardising their healthcare.

Statistical analysis

We used version 26 of the Statistical Package for the Social Sciences (SPSS) software for statistical analyses. Descriptive tests included percentage and frequency, in addition to mean and standard deviation, while inferential tests included chi-square to analyse categorical variables between groups, Mauchly's test to test the validity or violation of the assumption of sphericity, repeated-measures analysis of variance to find differences within and between groups, and partial eta squared (η^2) and cohen's d to assess the effect size resulting from the intervention. Effect sizes (Cohen's d) with 95% confidence intervals (CI) were calculated using standardised mean differences, corrected for small sample bias (Hodges' correction factor j=0.987). Confidence intervals were calculated using the non-central

t-distribution method with appropriate degrees of freedom (df=58 for between-subjects comparisons, df=116 for within-subjects comparisons), which provides more accurate interval estimates than approximation. Post hoc tests using Scheffe corrections for pairwise comparisons were used to find differences in means. Statistical significance was at p-value<0.05.

Results

Between January 20 and April 17, 2025, of the 380 patients, 76 were systematically enrolled at the Sekanyan Health Center. Sixteen participants who did not meet the eligibility criteria were excluded, and the remaining 60 were assigned (30 participants) to the intervention group and (30 participants) to the control group. Sixty participants (76.8%) in both groups completed all pre-, post-program, and follow-up questionnaires (Figure 1). The intervention and control groups shared common characteristics, including being married, being aged between 51 and 60 years, being female, having a family history of T2DM, having a body mass index (BMI) between 25.0 and 29.9 kg/m^2, being a house owner, and having a monthly income between 301,000 and 600,000 Iraqi dinars. While educational levels were mostly elementary (33.3% in the control group) or lower (26.7% in the intervention group), most participants were housewives (43.3% in the control group) or freelancers (46.7% in the study group). No significant differences were observed between the groups with respect to any of the baseline characteristics (all p-values>0.05) (Table 1).

Table 1 Demographic characteristics between the control and intervention groups

Socio-demographic variables	Categories	Control		Intervention		P[a]
		F	%	F	%	
Age (years)	(20-30) year	2	6.7	1	3.3	0.638
	(31-40) year	3	10.0	6	20.0	
	(41-50) year	9	30.0	10	33.3	
	(51-65) year	16	53.3	13	43.3	
Sex	Male	14	46.7	13	43.3	0.795
	Female	16	53.3	17	56.7	
Marital status	Married	25	83.3	26	86.7	0.922
	Divorced	4	13.3	3	10.0	
	Widowed	1	3.3	1	3.3	
Body mass index (BMI)	>25 kg/m^2	5	16.7	6	20.0	0.938
	25-29.9 kg/m^2	14	46.7	13	43.3	
	≥30 kg/m^2	11	36.7	11	36.7	
Housing situation	Owner	19	63.3	25	83.3	0.80
	Rent	11	36.7	5	16.7	
Education level	Not read and write	1	3.3	3	10.0	0.385
	Read and write	6	20.0	8	26.7	
	Elementary school	10	33.3	7	23.3	
	Intermediate school	1	3.3	3	10.0	
	High school	4	13.3	7	23.3	
	Institute	3	10.0	1	3.3	
	College	4	13.3	1	3.3	
	Post graduate	1	3.3	0	0.0	

Table 1 (continued)

Socio-demographic variables	Categories	Control		Intervention		P[a]
		F	%	F	%	
Occupation	Not working	3	10.0	2	6.7	0.868
	Housewife	13	43.3	11	36.7	
	Freelance	12	40.0	14	46.7	
	Employed	2	6.7	3	10.0	
Family monthly income (Iraqi dinars)	Less than 300,000	5	16.7	4	13.3	0.958
	301,000-600,000	14	46.7	16	53.3	
	601,000-900,000	8	26.7	7	23.3	
	901,000-1,200,000	3	10.0	3	10.0	
T2DM duration	≤5 year	15	50.0	14	46.7	0.294
	6-10 year	11	36.7	15	50.0	
	>10 year	4	13.3	1	3.3	
Family history	Yes	23	76.7	26	86.7	0.317
	No	7	23.3	4	13.3	

[a]χ^2=Chi-square, p=significance level (>0.05 considered statistically significant), BMI=body mass index, F=frequency, %=percentage, (n=30 for each group)

Primary outcomes

Table 2 presents the descriptive statistics for perceived barrier and dietary adherence scores by group and time.

Mauchly's test indicated that the assumption of sphericity was achieved for both perceived barriers (χ^2=4.93, p-value=0.085) and dietary adherence (χ^2=1.53, p-value=0.464) (Table 3). Therefore, the correction for the assumption of sphericity was used for repeated univariate analysis of variance.

Table 4 presents the results of a repeated measures analysis of variance, which revealed significant main effects in both perceived barriers (η^2=0.48, Cohen's d=1.94) and dietary adherence (η^2=0.24, Cohen's d=1.14) compared to the control group (as illustrated in Figures 2 and 3).

Post-hoc analysis results

The intervention group showed a significant reduction in perceived barriers from baseline to post-intervention (mean difference=-0.639, 95% CI: 0.427 to 0.850, p-value= 0.004) and from baseline to 1-month follow-up (mean difference=-0.633, 95% CI: 0.421 to 0.844, p-value=0.002). Similarly, dietary adherence improved significantly from baseline to post-intervention (mean difference=-0.448, 95% CI: -0.668 to -0.227, p-value=0.006) and remained high at follow-up (mean difference=-0.354, 95% CI: 0.574 to 0.134, p-value=0.030). The control group showed no significant changes at any time point (Table 5).

Discussion

This pilot research assessed the impact of educational interventions on diminishing the perceived barriers to dietary adherence in patients with T2DM. The results indicated substantial improvements with large effect sizes in reducing barriers (Cohen's d=1.94) and enhancing dietary adherence (Cohen's d=1.14) within the intervention group (Table 4). While these effect sizes are encouraging, they should be interpreted cautiously, as such large effects may be inflated due to the small sample size, single-centre design, and short follow-up period characteristic of pilot studies. In contrast, no significant improvements were noted among participants in the control group (Table 5).

These findings align with the existing literature regarding interventions informed by the health belief model. A prior investigation in the Middle East conducted by Halali et al. indicated comparable enhancements in dietary behavior due to diminished perceived barriers[17]. An Iranian randomised controlled trial conducted by Nouri et al. reported comparable effect sizes for perceived barriers (Cohen's d =2.82), indicating that diminished barriers significantly enhance treatment adherence[13]. This convergence of results across diverse populations underscores the universal importance of designing interventions that target the specific perceived barriers faced by patients with T2DM. Further supporting this, studies by Wilson et al. have demonstrated that directly addressing the challenges to adherence leads to significant improvements in dietary behaviours[26,27].

Nonetheless, the literature remains inconsistent. A study from Yemen revealed no enhancement in dietary adherence, with certain participants exhibiting reduced adherence levels[20]. The differences in the study environment, along with other socio-demographic characteristics and dietary patterns among the participants, may explain these discrepancies. Furthermore, other studies indicated that socioeconomic factors, including low levels of education and income, significantly impacted dietary adherence in T2DM[12,28], variables that may not be equally addressed in all interventions.

Table 2 Descriptive statistics for perceived barriers and dietary adherence scores by group and time

Variable	Group	Baseline (pretest) M±S.D.	Post-intervention (posttest 1) M±S.D.	1-month of follow-up (posttest 2) M±S.D.
Perceived Barriers	Control	2.31±0.30	2.25±0.37	2.26±0.30
	Intervention	2.31±0.38	1.67±0.32	1.68±0.26
Dietary Adherence	Control	1.74±0.33	1.81±0.35	1.81±0.36
	Intervention	1.77±0.28	2.22±0.36	2.13±0.36

Higher perceived barriers scores indicate fewer barriers (reverse scored); higher dietary adherence scores indicate better dietary adherence, M=mean, S.D.=standard deviation

Table 3 Mauchly's test of sphericity for repeated measures assumptions

Variable	Within subjects effect	Mauchly's W	Approx. Chi-square	df	Sig.	Epsilon[b]		
						Greenhouse-geisser	Huynh-feldt	Lower-bound
Perceived Barriers	Time	0.917	4.930	2	0.085	0.923	0.969	0.500
Dietary Adherence	Time	0.973	1.536	2	0.464	0.974	1.000	0.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.
Mauchly's test of sphericity: intercept+group
Within subjects design: time
[b]May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.
df=degree of freedom, Sig=significance level (<0.05 considered statistically significant)

Table 4 Perceived barriers and dietary adherence tests of within-subjects effects for time and time × group interaction, and between-subjects effects for overall group differences

Variables	Source	SS	df	MS	F	Sig.	η^2	Cohen's d	95% CI lower for d	95% CI upper for d	Effect size
Perceived Barriers	Time	4.72	2	2.36	23.39	0.002	0.287	1.27	0.89	1.62	Large
	Time*Group	3.42	2	1.71	16.94	0.0004	0.226	1.08	0.72	1.44	Large
	Error (Time)	11.72	116	0.10							
	Group	6.67	1	6.67	54.60	0.003	0.485	1.94	1.48	2.40	Large
	Error	7.093	58	0.12							
Dietary Adherence	Time	2.32	2	1.16	11.22	0.0006	0.162	0.88	0.55	1.21	Large
	Time*Group	1.14	2	0.57	5.51	0.003	0.087	0.62	0.32	0.92	Medium
	Error (Time)	11.99	116	0.10							
	Group	2.87	1	2.87	18.77	0.001	0.245	1.14	0.80	1.48	Large
	Error	8.88	58	0.15							

F=Fisher, SS=Sum of Squares, MS=Mean Square, Sig=significance level (>0.05 statistically significant), η^2=Partial Eta Squared (≤0.01 small, 0.06 moderate, ≥0.14 large), Cohen's d=≤0.2 small, 0.5 medium, ≥0.8 large

Table 5 Scheffé-corrected pairwise comparisons within each group for perceived barriers and dietary adherence

Variable	Group	Comparison	MD	SE	Sig.	95% CI	
						Lower bound	Upper bound
Perceived Barriers	Control	pretest vs posttest 1	0.05710	0.084	0.798	−0.154	0.268
		pretest vs posttest 2	0.04510	0.084	0.869	−0.166	0.256
		posttest 1 vs posttest2	−0.01200	0.084	0.990	−0.223	0.199
	Study	pretest vs posttest 1	0.63943*	0.084	0.004	0.427	0.850
		pretest vs posttest 2	0.63314*	0.084	0.002	0.421	0.844
		posttest 1 vs posttest 2	−0.00629	0.084	0.997	−0.217	0.205
Dietary Adherence	Control	pretest vs posttest 1	−0.07167	0.090	0.731	−0.296	0.153
		pretest vs posttest 2	−0.07750	0.090	0.694	−0.302	0.147
		posttest 1 vs posttest 2	−0.00583	0.090	0.998	−0.231	0.219
	Study	pretest vs posttest 1	−0.44800*	0.088	0.006	−0.668	−0.227
		pretest vs posttest 2	−0.35450*	0.088	0.030	−0.574	−0.134
		posttest 1 vs posttest 2	0.09350	0.088	0.574	−0.126	0.313

*The mean difference is Sig=significant level (<0.05 considered statistically significant), SE=standard error, CI=confidence interval, an asterisk (*) indicates statistically significant differences (p-value<0.05), M.D.=mean difference

Despite the positive results, several methodological limitations should be acknowledged. Time constraints and recruitment challenges resulted in a smaller sample size (n=60) than calculated (n=76), potentially limiting statistical power. Additionally, systematic sampling was necessitated by budget constraints and unpredictable patient visits, which may have introduced selection bias despite the diverse reasons for clinic attendance and the temporal distribution of

recruitment. Beyond these sample considerations, first, the quasi-experimental design lacks the rigour of a randomised controlled trial. Second, the single-centre design conducted within the specific cultural and socioeconomic context of Kirkuk, Iraq, limits the generalisability of the findings. While the intervention was tailored to local dietary practices and constraints, its applicability to other cultural settings or healthcare systems requires careful validation and

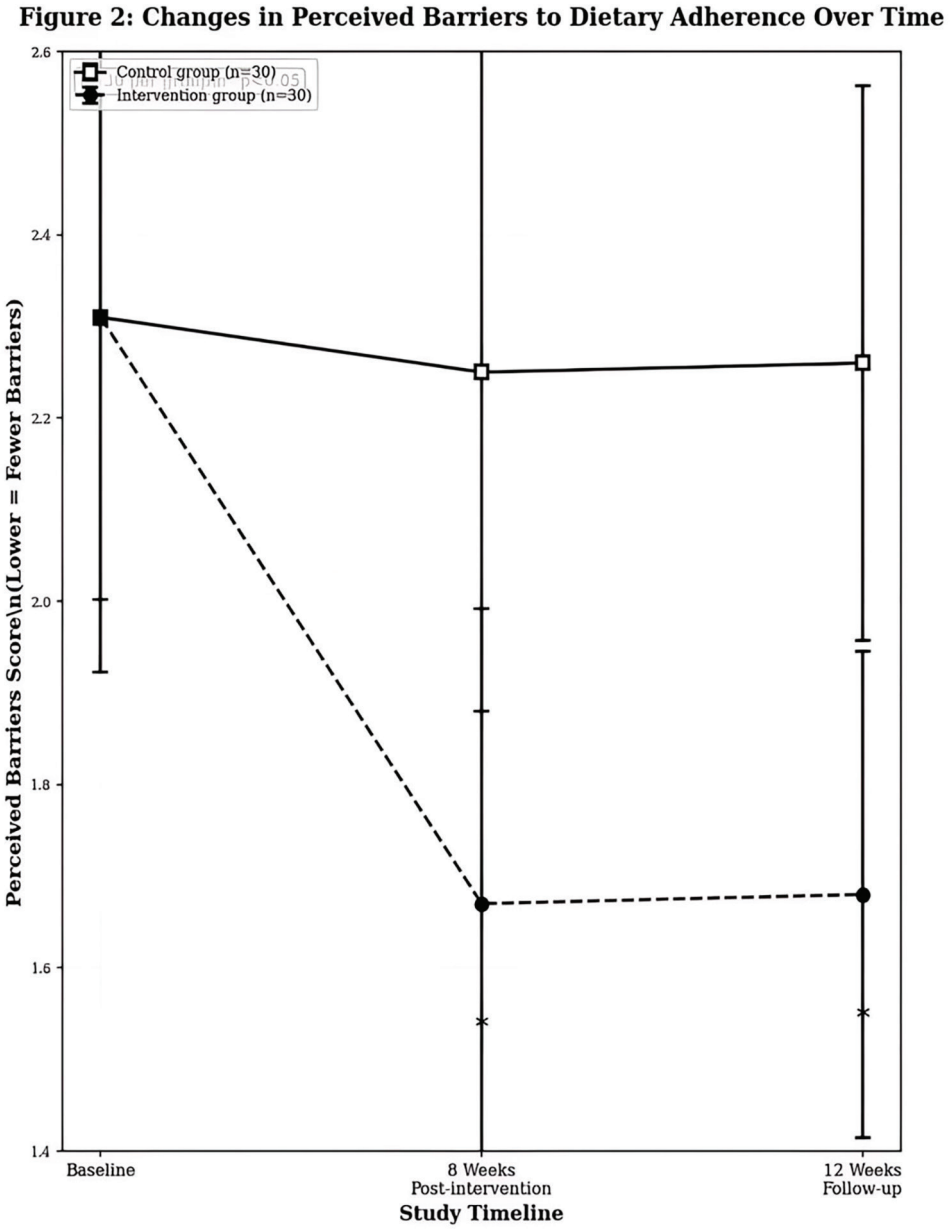

Figure 2 Mean scores of perceived barriers by group and time (0–6 Likert scale)

adaptation. Third, the reliance on self-reported measures of dietary adherence is a significant limitation, as this method is susceptible to social desirability and recall biases[26,29]. Future studies should incorporate objective measures, such as HbA1c levels, Fasting Plasma Glucose (FPG), dietary recalls, or food frequency questionnaires, to validate self-reported adherence.

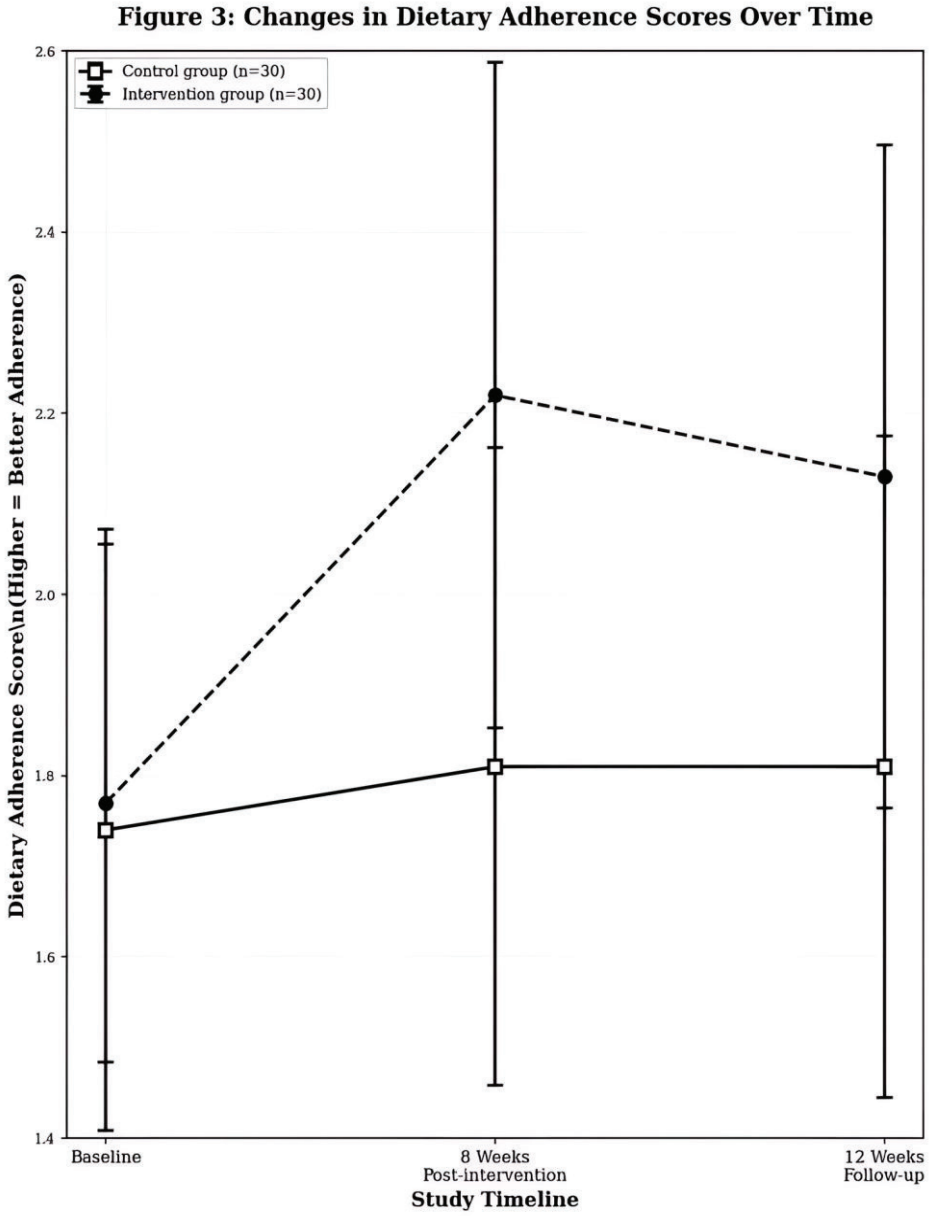

Figure 3 Mean scores of dietary adherence by group and time (0–6 Likert scale)

Although the PBDAQ demonstrated acceptable preliminary reliability (Cronbach's α=0.821) and temporal stability (test-retest r=0.88), these psychometric properties are based on a small validation sample (n=10). A full validation with a larger, more diverse sample is necessary to establish its robustness through confirmatory factor analysis and criterion validity testing.

The short one-month follow-up period, while characteristic of a pilot study, is insufficient to assess the long-term sustainability of the observed improvements. As suggested by Mirmiran et al., follow-up periods of 12 to 24 months are needed to evaluate the efficacy of dietary interventions on glycaemic control[30]. Furthermore, while both groups were studied simultaneously to control for seasonal variation, this study did not account for resource density and seasonal fluctuations in food availability, which are known to influence dietary patterns and adherence[31-34].

Despite these limitations, the findings offer valuable preliminary evidence. The intervention's low-resource nature enhances its potential for scalability in similar resource-limited settings. The results emphasise that effective diabetes care must include a tailored assessment of perceived barriers. Nutritional guidance should be culturally congruent, accommodating local food preferences, cooking methods, and family-centric eating patterns. Practical strategies to address economic constraints, such as selecting low-cost, nutrient-dense foods, are essential[35,36]. Healthcare providers should be trained to deliver culturally appropriate dietary advice. Simultaneously, policymakers and relevant stakeholders should develop initiatives that improve support to patients facing financial hardships, thereby addressing one of the most fundamental barriers to dietary adherence in T2DM.

Conclusion

This pilot study's results indicate that perceived barriers have a significant impact on dietary adherence in patients with type 2 diabetes. The preliminary findings suggest that an educational intervention addressing these perceived barriers may lead to statistically significant enhancements in diet management among participants. These exploratory findings highlight the necessity of addressing barriers identified by patients in order to enhance diabetes self-management behaviors.

Healthcare providers should consider adopting comprehensive, culturally aware strategies that incorporate continuous nutrition education to mitigate the perceived obstacles and enhance adherence to diet in the management of T2DM. Dietary recommendations must be tailored to align with the patient's preferences, cultural practices, and current dietary habits. The integration of barrier-focused counselling into standard diabetes management may potentially improve quality of life and reduce diabetes-related complications for the affected individuals. The Iraqi context of this pilot study underscores the necessity for policymakers to consider socioeconomic factors that impede dietary compliance, such as food accessibility and affordability. Enhanced community support programmes can supplement clinical interventions to tackle structural barriers to optimal nutrition.

To build a more robust evidence base for such programmes, future research must incorporate multicentre randomised controlled trials across diverse healthcare environments, with prolonged follow-up durations (≥6 months) to evaluate the intervention's sustainability and confirm these preliminary findings. Replication in larger, more diverse samples is essential to establish the generalisability of these pilot study results. Furthermore, the inclusion of objective measures like HbA1c, lipid levels, and various metabolic biomarkers would improve the evaluation of intervention effectiveness on clinical outcomes. Longitudinal studies investigating the association between perceived barriers and chronic diabetes complications would yield important insights for evidence-based practice.

Acknowledgement

The researchers thank the study participants for their generous engagement and patience, as well as all we express our gratitude to the reviewers for their time and effort in evaluating the work. We genuinely value all constructive feedback and recommendations, which contributed to enhancing the manuscript's quality.

Funding sources

There is nothing to be declared.

Conflict of interest

There are no potential conflicts of interest to declare.

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