

Evaluation of changes in diabetes distress, resilience, and self-care behavior following Occupational Therapy Diabetes Self-Management (OTDSM) among adults with type 2 diabetes: A preliminary Quasi-experimental study

Kamala Arumugam, Loganathan Shanmugam*, Raghuram Pattusamy, Darsana Ganesan, Jaivignesh Shanmugam

Sri Ramachandra Faculty of Occupational Therapy, Sri Ramachandra Institute of Higher Education and Research (DU), Porur, Chennai, India.

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ABSTRACT

Background: Type 2 diabetes mellitus (T2DM) is a growing health concern that necessitates consistent self-management practices to avoid complications and maintain health. Psychological factors like diabetes distress and poor resilience levels frequently interfere with self-care practices of individuals, resulting in less than adequate diabetes related self-care. By integrating self-management into daily routines, occupational therapy plays a major role in preventing secondary complications of diseases.

Objectives: To find the changes in diabetes distress, resilience, and self-care behavior following the Occupational Therapy Diabetes Self-Management (OTDSM) intervention among adults with type 2 diabetes.

Materials and methods: A quasi-experimental single-group pre-test post-test study was conducted in a community setting, with 12 adults diagnosed with type 2 diabetes. The Occupational Therapy Diabetes Self-Management (OTDSM) intervention was provided for 4 weeks in 10 sessions. Outcomes were assessed using the Diabetes Distress Scale (DDS -17), the Connor-Davidson Resilience Scale (CD-RISC-25), and the Summary of Diabetes Self-Care Activities Questionnaire (SDSCA). Pre- and post-intervention data were analyzed using Paired t-tests and Repeated Measures ANOVA.

Results: Diabetes distress showed marked reduction from 3.72 ± 0.25 to 2.53 ± 0.28 ($p < 0.001$). Resilience scores improved from 42.91 ± 3.53 to 49.45 ± 3.24 ($p < 0.001$). Self-care behavior also showed improvements across multiple domains ($p < 0.001$).

Conclusion: The OTDSM intervention was associated with positive changes in diabetes distress, resilience, and self-care outcomes among adults with T2DM. These preliminary findings may suggest the potential integration of OTDSM into diabetes care to address both psychosocial and behavioral aspects of disease management.

* Corresponding contributor.

Author's Address: Sri Ramachandra Faculty of Occupational Therapy, Sri Ramachandra Institute of Higher Education and Research (DU), Porur, Chennai, India.

E-mail address: loganathanot@sriramachandra.edu.in

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Introduction

Diabetes mellitus (DM) leads to hyperglycemia, caused by abnormalities in insulin production or action. This results in malfunctions in the metabolism of proteins, fats, and carbohydrates.¹ Type 2 diabetes mellitus (T2DM) is the most common form, influenced by non-modifiable factors such as age, familial medical history, genetic makeup, and cultural background,

along with modifiable risks such as sedentary lifestyle, poor diet, obesity, stress, and inadequate sleep.² Poorly managed diabetes contributes to cardiovascular diseases, renal dysfunction, retinopathy, amputations, neuropathy, stroke, and reduced life expectancy.³

Diabetes distress (DD), which often goes unnoticed, is the emotional struggle individuals deal with when managing this demanding condition. Higher distress is associated with poor blood-glucose control, inadequate self-care, and diminished quality of life.⁴ Unlike psychiatric disorders, DD is regarded as a disease-related psychological response, with prevalence estimates between 21% and 49% worldwide.^{5,6} Psychoeducational approaches addressing psychological aspects and diabetes are more efficient in reducing DD.⁷

Resilience is a psychosocial ability that minimizes distress, improves adaptability in times of crisis, and ultimately enhances quality of life.⁸ Resilience is strongly correlated with self-management behavior, and interventions to build resilience can improve self-management.⁹ Even with increasing diabetes distress, resilient individuals will continue to engage in effective self-management.¹⁰

Self-management is an individual's capability to handle symptoms, medications, therapy, lifestyle modifications, and the psychological repercussions of chronic illness.¹¹ Competent self-management strategies help individuals with T2DM to mitigate complications. Four key components of diabetes self-management (DSM) are understanding the disease, developing the skills for managing it, modifying lifestyle, and receiving psychological support.¹² DSM is hindered by the chronic, unstable course of the disease, food cravings, incorrect assumptions regarding self-management techniques, lack of motivation, diabetes distress, and lack of education and skills.¹³

Occupational therapy shapes routines and behaviors that promote health and integrate self-care practices into meaningful daily occupations.¹⁴ Occupational Therapy Diabetes Self Management (OTDSM) intervention is an evidence-based, occupation-centered program that combines education, counseling, activities, occupations, and groups.¹⁵ OTDSM has demonstrated benefits for glycemic control,¹⁶ but its effect on diabetes distress and resilience has not been explored. Therefore, this study examined reductions in diabetes distress and improvements in resilience and self-care behavior following the OTDSM intervention among adults with type 2 diabetes. The study's two main research objectives were as follows:

1. To assess the reductions in diabetes distress and improvements in resilience, following the occupational

therapy diabetes self-management (OTDSM) intervention among adults with type 2 diabetes.

2. To analyze changes in self-care behavior among adults with type 2 diabetes.

Materials and methods

Study design and setting

This study employed a preliminary quasi-experimental single-group pre-test-post-test design. In a real-world setting, it was not feasible to deny the control group valuable health-related education; thus, the practical limitations and ethical concerns led to the selection of this study design. The study was conducted at the community level in the Koyambedu Market in Chennai, India, over four weeks.

Study participants

The sample size was calculated using a paired pre-post comparison of self-management scores reported by Gregg *et al.*¹⁷ Mean±SD of 7.49±5.87, and 13.58±5.56 were used for calculation. Assuming an effect size of 1.07, a two-sided significance level of 5% ($\alpha=0.05$) and 90% power ($1-\beta=0.90$), the minimum required sample size was 11 participants. To account for 10% loss to follow-up, 12 participants were recruited.

A total of 25 participants with T2DM were screened for eligibility. 12 participants who satisfied the inclusion criteria were recruited using convenience sampling. Out of these, 11 completed the study. Recruitment and follow-up took place between May 2025 and June 2025. Criteria for inclusion were: 1) diagnosis of type 2 diabetes, 2) score of 2 or more in the diabetes distress scale (DSS -17), 3) score less than 82 in the Connor Davidson Resilience Scale (CD-RISC-25), 4) male or female participants above 18 years of age, and 5) ability to speak and comprehend Tamil or English. Participants with any psychiatric conditions, diabetic complications requiring additional treatment that interfered with participation, and lactating and pregnant women were excluded.

The study received ethical approval from the Institutional Ethics Committee (CSP/25/MAR/159/171), Sri Ramachandra Institute of Higher Education and Research (Category-1 deemed to be university). The study was conducted in accordance with the ethical principles of the declaration of Helsinki (World Medical Association, 2013 revision). The procedures, potential risks, and benefits were clearly explained before recruitment, and informed consent was obtained from all eligible and willing participants before recruitment. The participant flow is shown in Figure 1.

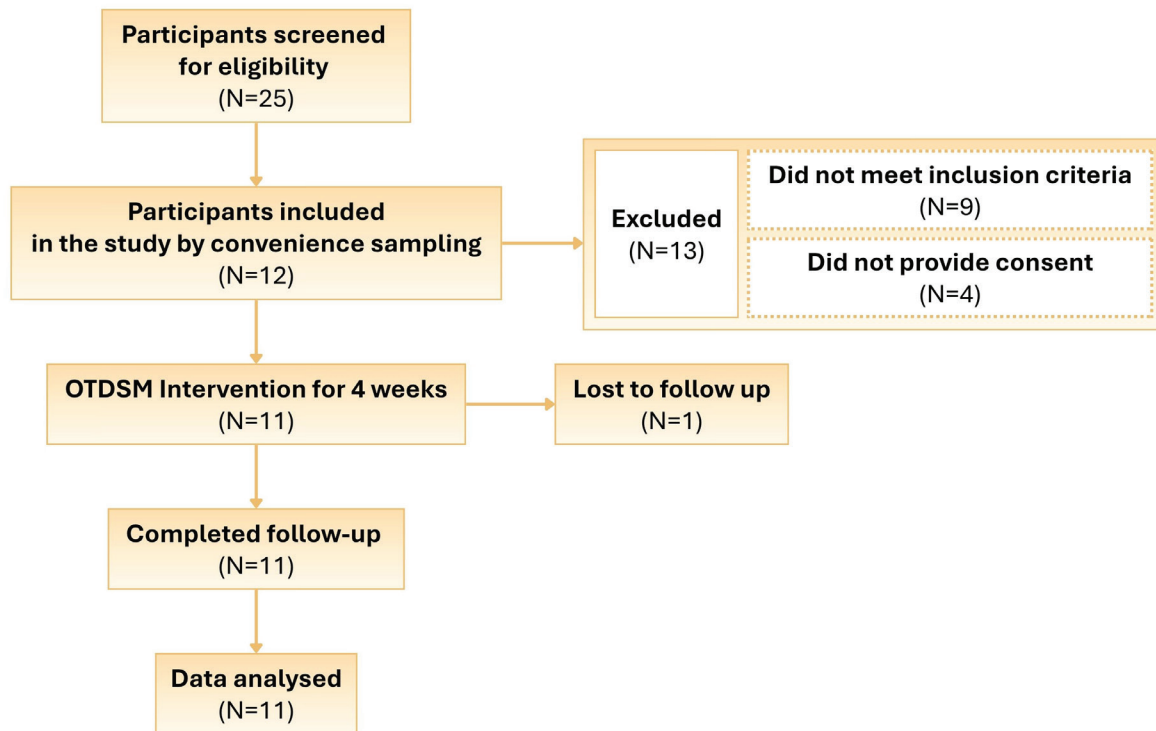


Figure 1. The flow of participants.

Intervention

Occupational Therapy Diabetes Self Management (OTDSM) intervention used in this study was adapted from the OTDSM framework developed by Binesh *et al.*,¹⁵ with cultural and contextual modifications made to suit the current study population. OTDSM is a well-structured, occupation-centered DSM intervention that focuses on integrating self-management behaviors, including following a diet, being physically active, psychological coping, periodic glucose testing, etc., delivered through education, counseling, and activities to make them part of the individual's meaningful daily routines.

The intervention in this study was group-based and held over four consecutive weeks, comprising 10 sessions lasting 60 minutes each. The components of the intervention were educating and giving informations

about diabetes, risk factors, and complications; skill-building; problem-solving; stress management and coping strategies; and occupation-based practice, integrating self-care behavior into everyday roles and routines. The sessions followed a structured format consisting of warm-up and orientation activities, an educational discussion, a demonstration, guided hands-on practice, group interaction, feedback, and wind-down activities, all delivered in a supportive group setting. The sessions were facilitated by the principal investigator under the supervision of a licensed occupational therapist and emphasized active participation and application through DSM kits and educational brochures. A depiction of the intervention is provided in Table 1.

Table 1. Intervention protocol.

Session	Session topic	Objectives	Activities
Session 1	Introduction to OTDSM and diabetes	Improve understanding of diabetes, symptoms, risk factors, and complications	Ice breaker activities and rapport building, educational discussion, visual examples, and group sharing of experiences. Distribution of a diabetes self-care practices brochure in the local language
Session 2	Self-monitoring of blood glucose	Improve knowledge and practice of blood glucose monitoring and hypoglycaemia management	Need for, types, guidelines and frequency of blood glucose testing through brochures, glucometer demonstration, guided hands-on glucose testing, glucose logs, hypoglycaemia plan

Table 1. Intervention protocol (continued).

Session	Session topic	Objectives	Activities
Session 3	Dietary habits and recommendations	Promote healthy dietary choices and meal planning	Eating tips, diabetes plate method, culturally adapted food models, sample meal plans, Plate It Right game to understand the diabetes plate model.
Session 4	Diabetic foot disease	Improve awareness of diabetic foot complications and self-inspection	Education on common diabetic foot complications, risk factors, and preventive measures; self examination and inspection; demonstration and practice. examination kits (mirrors and monofilaments)
Session 5	Diabetic foot care	Develop foot care and safe footwear habits	Foot hygiene and nail care practice demonstration, footwear selection and maintenance education with visual examples, foot care kits, and foot exercises.
Session 6	Aerobic exercises	Encourage participation in physical activity	Seated and standing aerobic exercises, breathing exercises
Session 7	Strengthening exercises	Improve strength and physical fitness	Sit-to-stand, wall/ chair push-ups, calf raises, leg/ biceps curls
Session 8	Flexibility exercises, 8-shaped pathway walking	Improve flexibility and fitness	Stretching exercises, walking an 8-shaped path
Session 9	JPMR, guided imagery	Promote stress management and coping strategies	Jacobson's progressive muscle relaxation, guided imagery using diabetes self-care scripts.
Session 10	Mandala art	Promote emotional expression and relaxation	Pre-drawn/free-drawn mandala art activity, music-assisted calming, storytelling activities.

Data collection tools

Three standardized tools were used to assess the outcomes. To ascertain the reliability and robustness of data collection, the instruments were evaluated for contextual and language sensitivity, and the examiner completed comprehensive training in administering and scoring the measures. All tools were administered at baseline and immediately after completion of the four-week intervention.

Diabetes Distress Scale (DDS-17)

The DDS-17 is a self-administered measure of 17 items. It assesses the emotional burden (EB), physician distress (PD), regimen distress (RD), and interpersonal distress (ID) domains. Items are graded on a 6-point Likert scale, where 1 represents "not a problem" and 6 represents a "very serious problem," with higher scores indicating elevated levels of distress. It is reliable, with a high internal consistency (Cronbach's alpha 0.93), and can therefore be used effectively in clinical and research purposes.¹⁸

Connor-Davidson Resilience Scale (CD-RISC-25)

CD-RISC-25 is a 25-item instrument. The items use a 5-point Likert scale (0 = not true at all to 4 = true nearly all the time). The total scores range from 0 to 100. The higher the scores, the more resilient the person is. The scale has adequate reliability with a Cronbach's alpha of 0.89.¹⁹

Summary of Diabetes Self-Care Activities Questionnaire (SDSCA)

The SDSCA is a self-report instrument that assesses the frequency of diabetes self-care behaviors over the last seven days, including diet, exercise, blood glucose testing, foot care, and medication adherence. Responses range from 0 to 7 days. Higher scores reflect better self-management. The SDSCA demonstrates acceptable internal consistency (Cronbach's $\alpha=0.61-0.85$ across subscales) and construct validity. This questionnaire was used to measure self-care behaviors at 5 time points throughout the study (pre-test and weeks 1-4).²⁰

Data analysis

The unit of assignment and analysis was the individual participant. Data were analyzed with SPSS software (version 20). Descriptive statistics were used to summarise the demographic baseline characteristics. Normality was assessed prior to inferential analysis using the Shapiro-Wilk test, and the assumption of normality was considered satisfied for parametric analyses. Paired t-tests were employed to analyze the within-group differences between pre- and post-test scores for diabetes distress and resilience. Repeated measures ANOVA with Bonferroni-adjusted pairwise comparison was employed to analyze within-group changes in self-care behavior scores across multiple related time points (baseline and weekly follow-ups). The assumption of sphericity was evaluated using Mauchly's test before RM ANOVA, and Greenhouse-Geisser corrections were applied when the assumption was not met. Effect sizes were calculated using Cohen's

d for paired t-tests and partial eta squared (η^2p) for RM ANOVA. The $p < 0.05$ was considered statistically significant.

Results

Participant characteristics

Of the 12 participants enrolled, 11 completed the

4-week OTDSM intervention; one was lost to follow-up. Participants were mostly female (90.9%), with a mean age of 48.45 ± 6.15 years. The mean duration of diabetes was 4.55 ± 2.70 years, reflecting early- to intermediate-stage disease, a critical period for adopting self-management practices (Table 2).

Table 2. Participants' demographic characteristics.

Characteristics	Intervention group (N=11)
Age, years (mean $\pm$ SD)	48.45 $\pm$ 6.15
Gender, N (%)	
- Female	10 (90.9)
- Male	1 (9.1)
Duration of diagnosis, years (%)	
1	2 (18.2)
2	1 (9.1)
3	0
4	3 (27.2)
5	1 (9.1)
6	2 (18.2)
7	1 (9.1)
8	0
9	0
10	1 (9.1)

Note: Gender and duration of diagnosis are reported as frequency and %.

Diabetes distress

The total DDS-17 score showed a statistically significant reduction from 3.72 ± 0.25 at baseline to 2.53 ± 0.28 post-intervention ($p < 0.001$). Decreases were observed in the emotional burden ($p = 0.001$), physician

distress ($p < 0.001$), regimen distress ($p < 0.001$), and interpersonal distress ($p = 0.005$) subscales. The highest significant reduction was observed in regimen distress (Table 3).

Table 3. Comparison of diabetes distress and resilience pre- and post-intervention.

Outcome measure	Mean±SD		Mean difference±SD	95% CI	t-value	p value	Cohen's d
	Pre-test	Post-test					
Diabetes distress (DDS-17)							
Emotional burden	3.53±0.48	3.02±0.37	0.51±0.35	0.20 to 0.74	4.82	0.001	1.45
Physician distress	4.02±0.79	2.14±0.42	1.89±0.44	1.59 to 2.18	14.28	<0.001	4.30
Regimen distress	4.29±0.27	2.55±0.53	1.75±0.39	1.48 to 2.01	14.81	<0.001	4.47
Interpersonal distress	2.66±0.94	2.27±0.67	0.39±0.36	0.15 to 0.63	3.61	0.005	1.09
Diabetes Distress Scale (DDS-17) total	3.72±0.25	2.53±0.28	1.19±0.18	1.06 to 1.31	21.43	<0.001	6.46
Resilience (CD-RISC-25)							
Resilience	42.91±3.53	49.45±3.24	-6.55±0.93	-7.17 to -5.92	-23.24	<0.001	7.01

Note: Values are reported as mean $\pm$ SD at pre- and post-test, $p < 0.05$ indicates a statistically significant difference (two-tailed), CI: confidence interval, t-value: T-statistic, Cohen's d: Cohen's d effect size.

Resilience

Resilience scores showed statistically significant improvement following the intervention, from 42.91 ± 3.53 at baseline to 49.45 ± 3.24 post-intervention ($p < 0.001$) (Table 3).

Self-care behavior

Self-care behavior was assessed at five time points (pre-test through week 4). Repeated-measures ANOVA showed significant time changes across the diet, physical activity, blood glucose testing, and foot care domains ($p < 0.001$). Post hoc pairwise comparisons were conducted to identify the specific time points at which changes occurred in each self-care domain following the overall RM ANOVA findings. Bonferroni correction ($\alpha = 0.0125$) was applied to control for multiple comparisons; thus, $p < 0.0125$ was considered

statistically significant for pairwise comparison of the SDSCA self-care domains.

Diet scores increased progressively from 2.73 ± 0.31 at baseline to 4.98 ± 0.48 at week 4 ($F = 63.35$, $p < 0.001$). Physical activity scores showed delayed improvements, with no significant changes observed during weeks 1 and 2, and becoming significant from week 3 onward ($F = 221.03$, $p < 0.001$), consistent with the intervention protocol. Blood glucose testing scores rose from 0.00 at baseline to 5.27 ± 0.65 at week 4, with significant weekly improvements ($F = 175.02$, $p < 0.001$). Foot care scores improved steadily, from 1.80 ± 0.51 at baseline to 6.02 ± 0.47 at week 4, with significant changes from week 2 ($F = 211.32$, $p < 0.001$). Medication adherence remained high, reaching the ceiling effect score of 7 across all weeks ($p = 0.003$) (Table 4).

Table 4. Comparison of self-care behavior pre- and post-intervention.

SDSCA self-care domain	Time Point (Week)	Mean $\pm$ SD	Repeated measures ANOVA		$\eta^2 p$
			F-value	p value	
Diet	Pre-test	2.73 ± 0.31	63.35	<0.001	0.864
	1	3.34 ± 0.34			
	2	3.92 ± 0.51			
	3	4.23 ± 0.38			
	4	4.98 ± 0.48			
Physical activity	Pre-test	0.18 ± 0.34	221.03	<0.001	0.957
	1	0.14 ± 0.32			
	2	0.14 ± 0.32			
	3	2.27 ± 0.47			
	4	3.09 ± 0.63			
Blood sugar testing	Pre-test	0.00 ± 0.00	175.02	<0.001	0.946
	1	2.82 ± 0.60			
	2	4.36 ± 0.92			
	3	4.55 ± 0.69			
	4	5.27 ± 0.65			
Foot Care	Pre-test	1.80 ± 0.51	211.32	<0.001	0.955
	1	2.07 ± 0.83			
	2	4.11 ± 0.67			
	3	5.35 ± 0.65			
	4	6.02 ± 0.47			

Table 4. Comparison of self-care behavior pre- and post-intervention (continued).

SDSCA self-care domain	Time Point (Week)	Mean±SD	Repeated measures ANOVA		η^2p
			F-value	p value	
Medication	Pre-test	6.55±0.69	4.81	0.003	0.325
	1	7.00±0.00			
	2	7.00±0.00			
	3	7.00±0.00			
	4	7.00±0.00			

Note: Values are reported as mean±SD at each time point, F-value: F-statistic (analysis of variance-ANOVA), η^2p : partial eta squared effect size, $p<0.05$ indicates a statistically significant difference (two-tailed).

Post hoc pairwise comparisons confirmed that the greatest improvements across all domains occurred by week 4 ($p<0.0125$), reflecting the cumulative

progression of self-care behavioral changes throughout the intervention period. (Table 5).

Table 5. Time-wise comparison of self-care behavior pre- and post-intervention.

Domain	Comparison	Mean Difference	Standard Error	95% CI	Bonferroni-adjusted α	Overall ANOVA p value
Diet	Pre- vs week 1	-0.614	0.097	-0.96 to -0.26	0.001	<0.001
	Pre- vs week 2	-1.191	0.173	-1.81 to -0.57	<0.001	
	Pre- vs week 3	-1.500	0.139	-1.99 to -1.00	<0.001	
	Pre- vs week 4	-2.250	0.147	-2.78 to -1.72	<0.001	
Physical activity	Pre- vs week 1	0.045	0.045	-0.12 to 0.21	1.000	<0.001
	Pre- vs week 2	0.045	0.045	-0.12 to 0.21	1.000	
	Pre- vs week 3	-2.091	0.148	-2.62 to -1.56	<0.001	
	Pre- vs week 4	-2.909	0.200	-3.63 to -2.19	<0.001	
Blood sugar testing	Pre- vs week 1	-2.818	0.182	-3.47 to -2.17	<0.001	<0.001
	Pre- vs week 2	-4.364	0.279	-5.36 to -3.37	<0.001	
	Pre- vs week 3	-4.545	0.207	-5.29 to -3.80	<0.001	
	Pre- vs week 4	-5.273	0.195	-5.97 to -4.57	<0.001	
Foot care	Pre- vs week 1	-0.273	0.156	-0.83 to 0.29	1.000	<0.001
	Pre- vs week 2	-2.309	0.163	-2.89 to -1.73	<0.001	
	Pre- vs week 3	-3.545	0.171	-4.16 to -2.93	<0.001	
	Pre- vs week 4	-4.218	0.167	-4.82 to -3.62	<0.001	
Medication	Pre- vs week 1	-0.455	0.207	-1.19 to 0.288	0.531	0.003
	Pre- vs week 2	-0.455	0.207	-1.19 to 0.288	0.531	
	Pre- vs week 3	-0.455	0.207	-1.19 to 0.288	0.531	
	Pre- vs week 4	-0.455	0.207	-1.19 to 0.288	0.531	

Note: Values are reported as mean difference between baseline and weekly follow-up scores, CI: confidence interval; Bonferroni-adjusted $p<0.0125$ indicates a statistically significant difference (two-tailed).

The effect size estimates indicate substantial magnitudes of change across all the assessed outcomes during the intervention period. Overall, reductions in

diabetes distress, improvements in resilience, and positive changes in self-care behavior were observed following the OTDSM intervention.

Discussion

This preliminary study explored changes in diabetes distress, resilience, and self-care behavior following the Occupational Therapy Diabetes Self-Management (OTDSM) intervention among adults with T2DM. Findings suggest statistically significant decreases in diabetes distress, improvements in resilience, and significant changes across all domains of diabetes self-management within the study sample.

The participants had a mean age of 48.45 ± 6.15 years, indicating that the intervention targeted middle-aged adults. Middle age is a vulnerable period for diseases, because it often involves managing personal health alongside family and occupational responsibilities. OTDSM may be compatible with participants' daily routines, cultural backgrounds, and behavioral needs, suggesting its potential as a model for DSME delivery at this phase of life.

The participants' occupation was cleaning and maintenance work, which involved long hours and physically demanding work. Due to their work schedules, low literacy, and limited access to healthcare, these individuals face difficulties adhering to self-management practices.²¹ Traditional DSME formats lack the flexibility to cover the occupational realities. Occupational Therapy Diabetes Self-Management (OTDSM), which may be offered conveniently and flexibly while respecting culture-specific factors, may be a possible approach to addressing this gap by integrating self-management into patients' day-to-day routines and habits, thereby increasing accessibility and compliance.¹⁵

Most of the participants were women, consistent with the cleaning sector workforce.²² Women are more prone to poor diabetes self-management,²³ lower psychological well-being, and higher diabetes distress.²⁴ In this study, females accounted for 90.9% of participants, underlining the need for self-management interventions targeting this group. OTDSM may appear relevant in supporting these needs by providing peer support, skill-building, and knowledge necessary for autonomous diabetes management.

Following OTDSM intervention, reductions in diabetes distress were observed across all DDS-17 subscales. The reductions may be explained by the intervention's health education components, which included understanding the disease, identifying risk factors and symptoms, awareness of complications, and planning for sick days. Education was provided in plain language and reinforced with interactive activities. These elements may have supported the participants' understanding and control over their condition. Better understanding and perceived control, brought on by addressing both informational and emotional demands, may have contributed to decreases in regimen and emotional distress, consistent with findings from Guo *et al.* and Perrin *et al.*, suggesting a possible role for culturally relevant DSM education

and psychoeducational interventions in reducing diabetes distress.^{25,26} Hands-on activities such as using glucometers, foot examinations, foot hygiene practices, and culturally appropriate plate models may support autonomy and self-esteem, which in turn may further reduce distress. Similar findings were reported by Misra *et al.*, suggesting that experiential learning may be associated with decreased diabetes distress.²⁷

There was no direct physician-client interaction in this study; however, it is possible that the group-specific focus of the OTDSM, which provided peer support, shared experiences, reassurance, and feedback through the OT facilitator, may have indirectly supported medical communication concerns, which in turn may have contributed to the observed decrease in physician distress. Peer interactions may have supported decreases in interpersonal distress. Mathiesen *et al.* and Hessler *et al.* emphasized that when psychosocial interventions centered on peer support were provided to vulnerable populations, diabetes distress, particularly in the interpersonal domain, decreased significantly, while improvements were observed in coping skills, trust-building, and collaborative problem-solving.^{28,29}

Improvements in resilience were observed following the OTDSM intervention, which may be explained by elements such as active learning, routine-building, autonomy, control, coping mechanisms, feedback, and group interaction. This is consistent with Wilson *et al.* and Dubois *et al.*, who emphasized that DSME promotes resilience alongside diabetes self-management.^{30,31} OTDSM also includes techniques prevalent in resilience training interventions, such as deep breathing, imagery, peer guidance, competence, and control, which may be associated with positive changes in resilience. The simultaneous observation of reduced distress and increased resilience scores may indicate that resilience is a protective factor against DD, consistent with previous findings.³⁰

Progressive weekly improvements were observed in all SDSCA domains, especially in diet, blood glucose testing, physical activity, and foot care. This may reflect improved capacity for day-to-day self-care practices, following the OTDSM intervention. The positive changes revealed in this study are congruent with Binesh *et al.* and Pyatak *et al.*, who described the possible role of occupation-based, person-centered Occupational Therapy interventions in DSM.^{16,32} The medication adherence domain reached a ceiling effect, which may suggest a pre-existing habit that formed from previous healthcare encounters. OTDSM may have reaffirmed this formed habit. This trend aligns with a prior study, which suggests medication adherence is the most consistent self-care area, as it does not demand as much behavioral restructuring as other domains.³²

OTDSM may help address barriers to diabetes self-management, as identified by Oluchina *et al.*¹³ The educational, demonstrational, and hands-on elements,

peer-group setting, and interactive activities may have contributed to the observed changes in both diabetes self-management and psychological outcomes. These tendencies may suggest that structured community-based DSME, such as the OTDSM, may help address self-care adherence among groups living in low socio-economic situations.

This study further aligns with the United Nations Sustainable Development Goals. In particular, it is relevant to SDG 3: good health and well-being by showing preliminary changes in distress and resilience levels, and supporting strategies that may enhance self-management for the prevention and management of chronic non-communicable diseases (Target 3.4).

Clinical implications

This study highlights the possible role of Occupational Therapy Diabetes Self Management (OTDSM). The OTDSM intervention suggests that occupation-based, client-centered practices may be associated with reductions in diabetes distress and improvements in psychological resilience, both of which are necessary to sustain regular self-care behavior. The flexible, feasible, low-cost, and adaptable nature of OTDSM may support its use across a broad adult population, including those with demanding jobs and varying levels of literacy. Occupational therapists may play a key role in diabetes care teams by embedding self-management behaviors into meaningful daily routines to improve functional outcomes in primary and community care settings.

Limitations

The following limitations, however, should be addressed. The small sample size limits generalizability. The use of a quasi-experimental single-group design without a control group limits causal inference about the intervention's effectiveness. The study's focus on a specific occupational group limits generalisability to other adult T2DM populations. Future research should conduct randomized controlled trials with larger, more diverse samples and extend the intervention duration to examine the long-term effectiveness of OTDSM. Additionally, adapting OTDSM to digital platforms may improve accessibility and sustained engagement.

Conclusion

This preliminary study observed changes in diabetes distress, resilience, and self-care behavior following the occupational therapy diabetes self-management (OTDSM) intervention among adults with type 2 diabetes. By incorporating culturally adapted education, routine practices, and psychological support into a structured, occupation-focused program, OTDSM may offer a possible approach to addressing both behavioral and psychological components of diabetes self-management. The present findings provide preliminary observations on the possible role

of Occupational Therapy in diabetes care.

Ethical approval

The study received approval from the Institutional Ethics Committee (CSP/25/MAR/159/171), Sri Ramachandra Institute of Higher Education and Research (Category-1 Deemed to be University). The study was conducted in accordance with the ethical principles of the Declaration of Helsinki (World Medical Association, 2013 revision). The procedures, potential risks, and benefits of the study were clearly explained before recruitment, and written informed consent was obtained from all eligible and willing participants.

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Conflict of interest

The authors declare no conflict of interest.

CRediT authorship contribution statement

Kamala Arumugam: conceptualization, data curation, investigation, methodology, project administration, writing: original draft; **Loganathan Shanmugam, Raghuram Pattusamy, Darsana Ganesan, Jaivignesh Shanmugam:** supervision, validation, writing: draft and review.

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