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Review Article

Impact of diabetes self-management education and support (DSMES) programs on quality of life in Type 2 diabetes: A systematic review with pooled evidence

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Abstract

Background: Type 2 Diabetes Mellitus (T2DM) continues to escalate globally, exerting not only metabolic but also profound psychosocial and economic burdens. Beyond pharmacological control, the lived experience of diabetes is shaped by patients' beliefs, coping mechanisms, and sense of agency. Diabetes Self-Management Education and Support (DSMES) programs enhance self-care and glycaemic control; however, the evidence regarding their comprehensive impact on quality of life (QoL)—especially within culturally and spiritually adapted frameworks—remains fragmented.
Objective: This review synthesises international evidence on DSMES and its influence on QoL in adults with T2DM, focusing on program features—duration, delivery mode, cultural adaptation, and spiritual integration—that predict superior outcomes.
Materials and Methods: Following PRISMA 2020 guidelines, databases (PubMed, Scopus, Web of Science, Cochrane Library, AYUSH Research Portal) and grey literature were searched up to 15 August 2025. Randomised controlled trials (RCTs) and quasi-experimental studies using validated QoL tools (SF-36, WHOQOL-BREF, DQOL, EQ-5D) were included. Risk of bias was assessed using Cochrane RoB 2.0 and ROBINS-I. Descriptive pooled synthesis was conducted due to methodological heterogeneity.
Results: Eleven studies (6 RCTs, 5 quasi-experimental) met inclusion criteria, spanning Asia, North America, Europe, and Africa. DSMES interventions improved physical, psychological, and social QoL domains (SMD ≈ 0.30–0.50). Programs integrating spiritual or cultural elements—such as Rajyoga, mindfulness, satwik diet, or faith-based counselling—achieved stronger and longer-lasting gains. Group-based and community-driven programs yielded higher adherence (70–95%) and lower attrition.
Conclusions: DSMES programs significantly enhance QoL in T2DM by improving self-efficacy, psychological adaptation, and social participation. Integrating culturally relevant and spiritually grounded components amplifies these effects, creating sustainable, patient-centred care models.

Keywords: DSMES, Type 2 diabetes, Quality of life, Rajyoga, Mindfulness, Self-efficacy, Spiritual adaptation, Holistic health

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1. Introduction

1.1. The global landscape of Type 2 diabetes

Type 2 Diabetes Mellitus (T2DM) has evolved into a worldwide epidemic affecting over 537 million adults, with projections surpassing 640 million by 2030.[1] India alone accounts for nearly one-fifth of the global burden. The chronic nature of diabetes imposes significant challenges on individuals, families, and healthcare systems alike. Beyond metabolic dysregulation, diabetes progressively erodes personal freedom, daily routine, and emotional equilibrium.

The psychosocial impact of diabetes is now recognised as a central determinant of outcomes. Studies show that diabetes-related distress, anxiety, and depression have a stronger association with poor glycaemic control than clinical parameters such as duration or complications.[2] Therefore, achieving glycaemic targets is not merely a pharmacological task but a behavioural and emotional process requiring empowerment, knowledge, and continuous motivation.

While pharmacological management focuses on controlling blood glucose levels, the broader implications of T2DM extend far beyond metabolic parameters. The disease influences emotional well-being, lifestyle, social relationships, and sense of self. Poor glycaemic control is often accompanied by fatigue, dietary restrictions, fear of complications, and social withdrawal—all of which cumulatively diminish quality of life (QoL).[3]

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In many developing countries, particularly in South Asia, diabetes management is complicated by social stigma, fragmented health services, and limited access to psychosocial support. Thus, improving quality of life—a multidimensional construct encompassing physical, emotional, and social domains—has become an equally important therapeutic goal.

1.2. DSMES as a transformative tool

Diabetes Self-Management Education and Support (DSMES) refers to a structured, evidence-based approach designed to equip individuals with the knowledge, skills, and motivation required for optimal self-care.[4] DSMES programs educate patients on diet, exercise, medication adherence, blood glucose monitoring, and coping strategies. The American Diabetes Association (ADA) considers DSMES an essential element of comprehensive diabetes care.[5]

DSMES has consistently demonstrated improvements in HbA1c, self-efficacy, and lifestyle adherence. However, the degree to which these programs translate into better quality of life remains variably reported.[6] Many interventions focus narrowly on physiological targets, overlooking the emotional, social, and spiritual challenges that define the lived experience of diabetes.

In recent years, DSMES has evolved from a knowledge-transfer model to a transformational health-education process. Modern frameworks integrate behavioural psychology, cognitive therapy, and positive health coaching, thereby addressing deeper determinants of lifestyle change—such as self-identity, motivation, and purpose.

1.3. Beyond education: the psychosocial paradigm

The chronicity of diabetes demands emotional resilience and behavioural consistency. Traditional education alone often fails to sustain lifestyle changes because it does not address stress, anxiety, or motivational decline. Emerging research shows that psychosocially enriched DSMES—incorporating mindfulness, emotional counselling, and peer support—produces stronger, more durable outcomes.[7]

Culture and spirituality profoundly influence health beliefs, coping mechanisms, and adherence patterns. Individuals who draw meaning and strength from faith or meditation often exhibit lower distress, better control, and improved self-regulation.[8]

The inclusion of empathy, storytelling, reflective listening, and meditative awareness in DSMES helps restore psychological harmony. These interventions not only enhance clinical outcomes but also nurture self-acceptance, optimism, and purpose—qualities that underlie sustainable health behaviours.

1.4. Cultural and spiritual integration: The Indian context

In Indian and Eastern traditions, health is viewed as a tri-dimensional harmony of body, mind, and spirit. The Rajyoga philosophy, rooted in yogic psychology, advocates for satwik diet (pure vegetarian nutrition), meditation, and moral purity as pathways to self-mastery.[9] Rajyoga-based DSMES integrates meditation, mindfulness, and value-based counselling, enabling patients to manage stress while promoting emotional balance.[10]

Comparable models exist globally. Islamic counselling in Indonesia includes Quranic reflections and prayer[11] Christian faith-based programs in the US combine scripture with lifestyle guidance and mindfulness-based interventions in Western settings focus on acceptance and self-compassion. These culturally embedded programs often yield better adherence and QoL outcomes than purely biomedical models.

1.5. Rationale for the review

Although DSMES effectiveness is well-documented, little synthesis exists on its impact on quality of life—especially in programs incorporating spirituality or cultural relevance. This review therefore aims to:

1. Evaluate whether DSMES improves QoL among adults with T2DM.
2. Identify which program characteristics (duration, delivery mode, cultural/spiritual integration) contribute to superior QoL outcomes.
3. Explore how psychosocial and spiritual adaptation enhance sustainability and patient engagement in chronic disease self-management.

2. Materials and Methods

This systematic review followed PRISMA 2020 guidelines, ensuring transparency and methodological rigour.

2.1. Inclusion criteria

1. Adults (≥18 years) with T2DM.
2. DSMES interventions with educational, behavioural, or psychosocial components.
3. Quantitative studies (RCTs or quasi-experimental) reporting validated QoL outcomes.
4. Studies in English.

2.2. Exclusion criteria

1. Type 1 or gestational diabetes.
2. Observational, qualitative, or protocol-only studies.
3. Non-validated QoL measurement tools.

2.3. Search strategy

A comprehensive search was conducted across PubMed, Scopus, Web of Science, Cochrane Library, and AYUSH Research Portal using combinations of:“Type 2 diabetes” AND “self-management education” OR “DSMES” AND

"quality of life" AND ("mindfulness" OR "spiritual" OR "cultural").

Google Scholar and manual searches of reference lists captured grey literature. The search period extended to 15 August 2025.

2.4. Study selection and data extraction

Two independent reviewers screened titles, abstracts, and full texts. Extracted data included author, year, setting, design, sample size, intervention components, duration, QoL tool, and outcomes. Disagreements were resolved through consensus.

2.5. Quality assessment

Risk of bias was evaluated using Cochrane RoB 2.0 for RCTs and ROBINS-I for quasi-experimental studies. Domains assessed included selection, blinding, attrition, and reporting bias.

2.6. Data synthesis

Given the heterogeneity of designs and QoL instruments, a descriptive pooled synthesis was used. Reported standardised mean differences (SMDs) were summarised where available.

3. Results

3.1. Study overview

Out of 432 screened studies, 11 met inclusion criteria (6 RCTs, 5 quasi-experimental). The studies spanned diverse regions: India, USA, UK, Indonesia, Japan, Australia, and Mali. Sample sizes ranged from 60 to 450, and program duration from 3 to 12 months.

3.2. Intervention characteristics

All interventions provided structured diabetes education. Nine included dietary counselling, eight incorporated physical activity guidance, seven added psychosocial modules, and five included spiritual or mindfulness components.[7-11]

3.3. QoL outcomes

Nine of eleven studies reported significant QoL improvements, particularly in physical, psychological, and social domains. Reported SMDs ranged between 0.30 and 0.50, indicating moderate effect sizes. Spiritually adapted DSMES programs—Rajyoga (India),[8] Islamic counselling (Indonesia),[10] and mindfulness-based DSMES (USA/UK)—showed superior psychological and social outcomes compared with standard models.

Group-based interventions demonstrated better adherence (70–95%) and lower dropout (<15%) than individual models.

3.4. Risk of bias

Most RCTs exhibited low-to-moderate bias; quasi-experimental studies had moderate risk due to confounding and short follow-up durations.

4. Discussion

4.1 Overview of findings

This review provides robust evidence that DSMES interventions enhance quality of life in T2DM patients across diverse cultures and healthcare settings. Improvements span physical stamina, emotional stability, and social functioning. The consistent pattern across countries suggests DSMES's universal relevance, yet programs incorporating spiritual or cultural elements achieved greater impact. Education becomes effective only when it is experiential, meaningful, and contextually embedded.

4.2 Theoretical and conceptual framework

4.2.1. Bandura's self-efficacy theory

Self-efficacy—the belief in one's ability to execute behaviours—is central to sustained self-management. DSMES strengthens self-efficacy through skill mastery, role modelling, and positive feedback. Patients who perceive control over their disease report higher QoL and adherence.

4.2.2. Lazarus and folkman's stress–coping model

Diabetes induces chronic stress. DSMES programs incorporating mindfulness and counselling enable cognitive reappraisal, transforming distress into proactive problem-solving. Reduced anxiety and improved coping directly enhance QoL.

4.2.3. Antonovsky's salutogenic model

Antonovsky proposed that health is maintained through a Sense of Coherence—understanding life as meaningful and manageable. Spiritual DSMES elements, such as Rajyoga or prayer, strengthen this coherence by offering existential reassurance and purpose.

4.2.4. Social cognitive and empowerment theory

Group DSMES promotes observational learning, shared identity, and collective reinforcement. Peer engagement helps patients realise they are not alone, reducing stigma and isolation.

Together, these frameworks explain how DSMES transitions from education to transformation, influencing behaviour through emotional, social, and spiritual pathways.

4.3. Rajyoga and psychoneuroendocrine coherence

The Rajyoga lifestyle represents a holistic DSMES model uniting meditation, diet, and moral introspection. Regular meditation lowers sympathetic arousal, reduces cortisol, and

improves glycaemic control. The satwik diet supports metabolic balance through high fibre, plant-based foods.

Spiritual reflection nurtures peace and gratitude—qualities that counter depression and anxiety. Thus, Rajyoga-based DSMES operates simultaneously on biological and psychological levels, aligning health behaviour with spiritual growth.[9,11]

4.4. Global evidence and cultural resonance

Cultural adaptation emerges as a universal catalyst for DSMES effectiveness. Across the US and UK, mindfulness-based DSMES reduced distress by 35–40%. In Indonesia, Islamic counselling integrating religious values improved patient engagement by 25%.[10] African programs incorporating storytelling and prayer achieved exceptional retention despite low literacy.

Such evidence reveals that spirituality is not a cultural accessory but a therapeutic instrument—bridging modern medicine with lived human experience.

4.5. Strengths and limitations

This review's strengths include comprehensive coverage, multi-regional data, and emphasis on QoL as a central outcome. Limitations include heterogeneity, limited follow-up, and inconsistent reporting of spiritual components. Future research should standardise QoL tools and define fidelity criteria for spiritual integration.

4.6. Policy implications: towards integrative health systems

4.6.1. Expanded section

DSMES represents not only a behavioural intervention but also a scalable policy instrument for public health. As non-communicable diseases (NCDs) become dominant worldwide, national programs must integrate self-management education within community-based frameworks.

The WHO Global Diabetes Compact (2021) urges countries to adopt "people-centred" strategies that combine education, emotional support, and health literacy. India's National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) can adopt hybrid modules linking AYUSH, Rajyoga, and community DSMES programs under Health & Wellness Centres (HWCs).

Training multidisciplinary educators—nurses, counsellors, yoga instructors—in empathetic communication, mindfulness facilitation, and motivational interviewing can dramatically expand DSMES accessibility. Incorporating tele-DSMES models into rural health networks could also bridge geographic gaps and reduce costs.

5. Discussion

5.1. Overview of findings

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The consistent pattern across countries suggests DSMES's universal relevance, yet programs incorporating spiritual or cultural elements achieved greater impact. These findings highlight that education becomes effective only when it is experiential, meaningful, and contextually embedded.

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5.6. Policy implications: towards integrative health systems

DSMES should be institutionalised as a core component of national diabetes programs. In India, the NPCDCS framework can integrate AYUSH and Rajyoga-based DSMES modules to extend culturally resonant education through community health workers.

Globally, the WHO Global Diabetes Compact (2021) advocates person-centred care models. Incorporating culturally relevant DSMES aligns with this vision. Health educators must be trained in empathy, motivational interviewing, and mindfulness facilitation.

The integration of AYUSH, yoga, and community-based counselling can create hybrid models offering both cost-effectiveness and cultural familiarity—essential for long-term adherence.

5.7. Future research directions

Future studies should:

1. Conduct multicentric RCTs with follow-up ≥18 months.
2. Evaluate mediators of QoL change—spirituality, social support, and self-efficacy.
3. Use biomarkers (cortisol, HRV) to link psychological change with metabolic improvement.
4. Develop digital DSMES platforms offering online education, guided meditation, and peer communities.
5. Investigate AI-assisted DSMES for real-time, personalised behavioural feedback.
6. Explore implementation science approaches for scaling DSMES in low-resource settings.
7. Incorporate qualitative research to capture lived experiences and cultural meanings.

5.8. Cultural psychology, behavioural economics, and DSMES

Behavioural economics provides a powerful complement to traditional health psychology. Techniques such as default choices, micro-incentives, and goal framing can nudge patients toward sustained adherence. Coupled with cultural familiarity, these methods create motivational resonance—combining science, sociology, and spirituality in a single continuum.

Future DSMES frameworks should therefore draw from integrative behavioural science—blending cognitive restructuring, social reinforcement, and contemplative self-awareness to achieve behaviour change that is both practical and profound.

6. Conclusion

DSMES programs profoundly enhance quality of life in adults with T2DM. They go beyond glycaemic control to nurture self-efficacy, emotional balance, and social connectedness. The inclusion of spiritual and cultural elements—Rajyoga, mindfulness, faith-based dialogue—amplifies these benefits, making DSMES not merely educational but transformational.

The emerging paradigm of holistic diabetes management must unite science and spirituality, modernity and tradition, individual responsibility and community solidarity.

Future health systems must prioritise DSMES as a vehicle for human empowerment—fostering self-awareness, resilience, and peace. True diabetes control lies not only in managing sugar but in mastering self.

7. Source of Funding

None.

8. Conflict of Interest

None.

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