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Review Article

Diabetic distress – Role of sudarshan kriya yoga in managing the emotional burden

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ABSTRACT

Background: Although an alarming number of diabetes mellitus patients suffer from diabetes-related distress, little has been done to offer a solution to eliminate this unique, often hidden emotional burden. Sudarshan Kriya Yoga (SKY), a unique breathing technique developed by the Art of Living Organization, has been studied in persons living with diabetes (PWD).

Objective: The objective of this study was to undertake a narrative review of clinical studies of SKY's role in emotional diabetic distress and quality of life (QOL) parameters in PWD.

Methods: Keyword searches of Medline and PubMed database.

Results: Four clinical studies have studied the effect of SKY practice on quality-of-life parameters in PWD. Analysis of the results reveals that SKY practice can improve QOL, relieve anxiety and depression, and improve dietary practices and medication adherence in PWD.

Conclusion: Diabetes distress (DD) takes a toll on motivation for self-care and increases the chances of diabetes complications and related mortality. There is an urgent need to screen, prevent, and treat DD. SKY practice is an effective and easy way to manage DD and must, therefore, be taught to PWD with the goal of optimizing health outcomes and health-related QOL.

Keywords: Type 2 diabetes mellitus, Persons living with diabetes, Diabetic distress, Diabetes-related distress, Sudarshan Kriya yoga, Quality of life

INTRODUCTION

Diabetes-related distress (DRD) refers to an emotional reaction found in persons living with diabetes (PWD) in response to their perceived inability to cope with the challenges and demands of managing diabetes mellitus (DM).[1,2] Successful management of DM requires being regular with prescribed medication, following a diet, exercising daily, and periodically monitoring blood glucose levels.[3] Persons living with diabetes frequently feel overwhelmed by self-management responsibilities, the existing comorbidity, the threat of complications, or perceived insufficiency of social support. They feel burned out and experience significant negative emotional reactions such as anger, irritability, fear, guilt, frustration, sadness, and a sense of doom.[3-5]

The results of a recent meta-analysis of 55 studies (n = 36998) indicated the prevalence of 36% diabetes distress (DD) in the worldwide population of type 2 DM (T2DM).[6] The prevalence of DD in the Indian population has been investigated in several tertiary care centers across the country.[7-14] Most of these studies utilized the diabetic distress scale (DDS17), a rating scale consisting of 17 questions to measure DD across four domains: Physician-related distress, emotional burden, interpersonal distress, and regimen distress.[15] The lowest prevalence of DD (18%) was reported in a study on 410 T2DM patients in a tertiary care center in Haryana, while the highest prevalence of DD (58.57%) was recorded in a study on 140 T2DM in a tertiary care center in Tumkur, Karnataka.[8,10] An observation common across all Indian studies was the higher emotional distress scores compared to regimen, interpersonal, and physician-related DD scores.[7-9,11-12]

Diabetes-related emotional distress lowers the motivation to follow the multitude of self-care activities demanded by diabetes management, leading to higher blood glucose levels, thus increasing the risk of complications and adversely affecting the quality of life (QOL).[16]

The American Diabetes Association (ADA) issued a Position Statement on Psychosocial Care for People with Diabetes in

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December 2016, calling for routine screenings for emotional distress in adults with diabetes. ADA recommended diabetes self-management education (DSME) as a first-level intervention for those screening positive.[17] Two systematic studies provide evidence of improved emotional distress post-intervention in DSME programs.[18,19] However, one systematic review of 15 studies found no strong evidence to support the benefits of DSME programs in improving DD and even questioned the ADA's recommendation of DSME as a first-level intervention for emotional distress.[20]

When clinicians give up on modern medicine, they seek India's ancient disciplines of yoga and meditation to find solutions, especially in chronic conditions.[7]

In this context, sudarshan kriya yoga (SKY), a unique sequence of specific breathing techniques (Ujjayi, Bhastrika and Sudarshan kriya) developed by the Art of Living organization, is a research-proven method to eliminate negative emotions and heal multiple problems associated with mind, body, and emotions.[21] Some clinical studies have explored the benefits of SKY practice on PWD. This paper provides a narrative review that summarizes the role of SKY practice in DD and QOL in PWD.

MATERIAL AND METHODS

The study was based on a literature search performed in PubMed and Google Scholar. The search terms used were SKY, Sudarshan kriya and MeSH terms such as "Quality of life" and "Type 2 diabetes." To focus the investigation, the search strategy included the combination of keywords "Quality of life", "Type 2 diabetes", and "Sudarshan Kriya" in titles of publications. The most recent search was conducted in June 2023.

RESULTS

These searches revealed six clinical studies on the effect of SKY practice in T2DM, out of which two were excluded as they did not study QOL parameters.[22-27] An extraordinarily small number of studies have been included in this paper, and each of these studies has limitations that should be acknowledged. However, this is a narrative review with a specific focus on SKY's role in relieving emotional DD and improving QOL parameters. The details of the study characteristics and findings are summarized in Table 1.[24-27]

Three studies assessed the effects of SKY practice on QOL in PWD.[24,25,27] These studies used generic instruments to quantify QOL, such as the Short Form Health Survey (SF-36), the brief version of the World Health Organization QOL questionnaire (WHOQOL-BREF), and WHO total QOL. Significant improvements in QOL was noted in all three studies. Positive results were noted as early as 5 days post-SKY in one study.[25] In the other two studies, significant improvement in QOL scores was noted at 4 weeks, 3 months, and 6 months post-SKY intervention.[24,27] Interestingly, in the study by Jyotsna *et al.,* wherein the WHOQOL-BREF questionnaire was used to assess QOL, improvement was prominently noted in the psychological and environmental domains of the QOL questionnaire.[24]

Effects of SKY on stress levels were explored in two studies with the help of tools such as the Hamilton Anxiety Rating Scale (HAM-A), Patient Health Questionnaire and hospital anxiety depression scale. Statistically significant reduction in stress levels was confirmed in both studies. Results were observed at 5 days and 4 weeks post-SKY intervention.[25,27]

Besides reducing stress and improving QOL, SKY practice was also found effective in improving dietary practice in PWD. In the study by Dasappa *et al.*, SKY practice motivated persons living with diabetes to increase their consumption of healthy food, such as vegetables and fruits and decrease their consumption of unhealthy food items, such as salty food, bakery food, and fried food. In the same study, SKY practice also increased adherence to metformin ($\chi^2 = 41.780$, $P < 0.005$) and other medications ($\chi^2 = 21.871$, $P < 0.005$).[26]

DISCUSSION

Diabetes is a severe chronic disease demanding high levels of self-efficacy, resilience, perceived control, and empowerment.[16] Managing such a demanding disease causes significant emotional burdens and worries, feelings of stress, guilt, or denial that are unique and often hidden.[28] Patients with diabetes and comorbid DD are reported to have poorer self-management behaviors, glycemic control, and a higher risk of morbidity and mortality than those with diabetes alone.[6,29,30] DD is a factor that prevents PWD from achieving optimal glycemic control.[31]

ADA calls for routine monitoring of PWD for DD and recommends DSME as a first-level intervention for those who screen positive. However, there is an absence of strong evidence to support the DSME program's role in maintaining psychological well-being in PWD.[20] The role of education in preventing distress among PWD has been assessed in two Indian studies. While one study found a favorable outcome of pharmacist-administered patient education on all four aspects of the DD score, no improvement in the emotional burden score was noted in the other.[32,33]

In clinical studies, DD is measured using the DDS that measures DD across four domains: Regimen-related distress, physician-related distress, interpersonal distress, and emotional distress.[6,15,34] Regimen distress refers to the distress patients experience on not being able to strictly follow the treatment regimen, getting overwhelmed by the number of medications, injections and frequent blood glucose monitoring, and finally losing confidence in their ability to take care of the condition.[35,36] Physician-related distress can arise due to a lack of communication between the patient and the treating physician, either due to a lack of quality time given by the physician or the

Table 1: Summary of study characteristics and role of SKY in emotional distress and QOL and health behavior.

Study author, year	Study design	Population	Intervention	Comparator	Outcomes	Intervention vs. comparator	Limitations
Jyotsna *et al.*,[24] 2014	• RCT • 6 months • India (New Delhi)	• *n*=120 • T2DM	• Standard therapy • Comprehensive yogic breathing program with SKY	Control	• Glycemic control • QOL • CAFT	• Positive study result • Significant improvement in QOL at 3 and 6 months • Intervention (269.87±31.48) versus control (254.90±37.83), (*P*=0.02)	Follow up only for 6 months
Shiju *et al.*,[25] 2019	• Open • 15 weeks • Kuwait	• *n*=26 • T2DM	• Standard therapy • Comprehensive yogic breathing program with SKY	None	• Anxiety • Depression • Total QOL	• Positive study result • Significant improvement in the QOL, depression, anxiety and insomnia at Day 5 post-SKY intervention	Small pilot study
Dasappa *et al.*[26] 2016	• Non RCT • 40 days • India (Bangalore)	• *n*=109 • T2DM	• Standard therapy • Comprehensive yogic breathing program with SKY	Control	• Hb1Ac • Adherence to medication • Changes in lifestyle • BP	• Positive study result • Statistically significant change (*P*<0.005) in consumption of vegetables, fruits, salty food, bakery food and fried food • Adherence to metformin (χ^2=41.780, *P*<0.005)	• Randomization could not be done. • Participants who were interested in practicing Yoga were included in the intervention group.
Giakwad *T et al.*[27] 2019	• RCT • 4 weeks • India (Mumbai)	• *n*=60 • T2DM	• Standard therapy • Comprehensive yogic breathing program with SKY	• Control group that performed Breathing Exercises	• Six-minute walk test • QOL-SF-36 Questionnaire • Hamilton depression rating scale • % Rise in heart rate	• Positive study result • Statistically significant improvement in 6 MWT, SF 36 scores and Hamilton depression rating scores • Statistically significant reduction in % heart rate rise	• Study duration 4 weeks only

RCT: Randomized controlled trial, T2DM: Type 2 diabetes mellitus, SKY: Sudarshan kriya yoga, QOL: Quality of life, BP: Blood pressure, CAFT: Cardiac autonomic function test, Hb1Ac: Hemoglobin A1c

inability of the patient to grasp the treatment and self-care advice.[36] Interpersonal distress refers to distress arising from the feeling of not being supported by family as the patient perceives the support attempts from family or friends as excessive, untimely, or inappropriate.[37] Emotional distress refers to the frustration, anger, or anxiety among the patients that would have originated at the point of first diagnosis, on contemplating the chronic nature of the condition and the challenges ahead of endless lifestyle modifications and self-care activities, along with the fear of complications.[37]

Studies on the Indian population suggest the emotional distress component contributes disproportionately higher to the total DD score. In a study on 124 PWD at Kasturba Medical College, Mangalore, among the 41.9% of participants that had DD, a majority had low regimen distress (n = 80, 64.5%), low physician distress (n = 110, 88.7%), and low

interpersonal distress (n = 93, 75%) but high emotional distress (n = 86, 69.3%).[7] In another cross-sectional study on 410 PWD in a tertiary care center in Haryana, the prevalence of DD was 18.0%, among which 16.1% had emotion-related distress, 5.6% regimen-related distress, 1.5% interpersonal-related distress, and 1.2% physician-related DD.[8] A study at MGM Institute of Health Sciences, Navi Mumbai, on 131 PWD, noted higher scores in the regimen-related subscale and emotional burden as compared to the physician-related distress and interpersonal distress.[9] Higher emotional diabetic distress compared to regimen-, interpersonal-, and physician-related DRD were also found in two independent studies in Karnataka on 250 PWD each.[11,12]

The two important emotions contributing to high emotional DD were the feeling that diabetes is taking up too much mental and physical energy every day and, secondly, the feeling that they will end up with serious long-term complications.[12]

On reviewing the results of SKY practice in PWD, it was found that 4 weeks of SKY practice could eliminate anxiety and depression in this population and maintain psychological well-being. It is important to note that in these studies, subjects diagnosed or under treatment for depression were excluded from the study.[25,27] It may thus be concluded that SKY is effective in treating anxiety and depression related to living with and managing diabetes, as patients with other causes of overall emotional distress or mental health problems were not included in the study.

Improved psychological well-being, life satisfaction, optimism, coping ability, and self-esteem, post-SKY intervention have been noted in studies other than DM.[38,39] All studies of SKY in persons living with depression, insomnia, anxiety, and posttraumatic stress disorders reveals SKY to be highly effective in alleviating stress, anxiety, and depression.[40-44]

Studies to understand the mechanism by which SKY contributes to the state of calm alertness have suggested increased parasympathetic drive, calming of the stress response systems, inducing increased production of hormones such as prolactin, oxytocin, and vasopressin, decreasing production of cortisol and adrenocorticotropin hormone and normalization of serum brain-derived neurotrophic factor level among many.[21,44-48]

It may be concluded that similar mechanisms may be responsible for alleviating diabetes-related stress, anxiety, and depression in PWD. The effectiveness of SKY practice in eliminating stress and anxiety arising from diabetes is further strengthened by the findings of Dasappa *et al.* Although QOL was not investigated in this study, it was found that 40 days of SKY practice was sufficient to build positive health behaviors in PWD. In this study, SKY participants consumed more vegetables and fruits and decreased their consumption of unhealthy food items. Besides improving dietary habits, SKY practice also increased their adherence to antidiabetic and other medications.[26] As DD is linked to reduced medication adherence, it may be surmised that improved adherence to medication observed after 40 days of SKY practice is due to its effectiveness in calming the stress response.

Adherence to diabetes medication is one of the most important determinants for the effectiveness of therapy as it not only achieves a desirable glycemic level but, in the long run, reduces morbidity and mortality. Poor adherence does not simply hinder optimum clinical benefit; it increases mortality, use of health services, treatment costs, and the country's economic burden. The issue of non-adherence is high and universal in both developed and developing countries and is a major hurdle in the management of diabetes by healthcare providers.[49]

SKY can address this gap in diabetes management. By ensuring good adherence to treatment, SKY helps achieve diabetes treatment goals. This finding was observed in the study by Dasappa *et al.,* wherein the proportion of patients with diastolic blood pressure and glucose random blood sugar under control was statistically higher ($P < 0.005$) in the group following SKY intervention.[26] It may be concluded that the complete benefit of treatment was achieved as the medication was taken and the diet followed as prescribed. By eliminating DRD, SKY practice ensures good adherence to dietary practice and medication that, in turn, would ensure good glycemic control and prevent diabetes-related complications.

Limitation

All papers reviewed used generic instruments for measuring QOL, such as the SF-36, WHOQOL-BREF, and WHO total QOL. However, DRD is a unique emotional problem that is directly related to the burden and anxiety experienced by PWD when they feel challenged by diabetes therapy. Therefore, the use of specific instruments like the DDS17 questionnaire would accurately assess the role of SKY intervention in relieving DRD.

Future direction

In light of the above findings, clinical studies should be planned to assess the role of SKY intervention in relieving DRD with the help of specific instruments such as the DDS17 questionnaire. The duration of SKY practice needed to motivate patients toward self-treatment compliance will also need to be investigated. Such data would enable SKY to be integrated as a part of psychosocial care in diabetes management.

CONCLUSION

SKY must be taught to PWD, especially those screened for DD, as it is effective in eliminating emotional distress and maintaining psychological well-being. In addition, SKY practice builds positive health behaviors, such as improved

dietary habits and adherence to medication. SKY practice can lay the foundation for achieving diabetes treatment goals and maximizing QOL. SKY practice is easy to practice, well tolerated, and cost-effective. Positive results are seen in 40 days of SKY practice once a day.

Ethical approval

Institutional Review Board approval is not required.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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