



Contents lists available at ScienceDirect

Journal of Ayurveda and Integrative Medicine

journal homepage: <http://elsevier.com/locate/jaim>

Short Communication

A pilot cross-sectional survey on awareness and practice regarding Type 2 Diabetes mellitus and its management with Yoga

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ARTICLE INFO

Article history:

Received 20 August 2018

Received in revised form

1 October 2018

Accepted 26 June 2019

Available online 4 April 2020

Keywords:

Awareness

Yoga

Diabetes mellitus

ABSTRACT

Diabetes mellitus is a metabolic disorder of multiple etiology, characterized by chronic hyperglycaemia with disturbance of carbohydrate, fat, and protein metabolism resulting from defect in insulin secretion, insulin action or both. Improper lifestyle contributes to the increasing number of people affected with Type 2 diabetes mellitus (T2DM). Systematic reviews on the management of T2DM in adults through Yoga reported significant improvements in multiple modifiable indices of diabetes mellitus management including glycemic control, lipid levels, and body composition. Awareness levels of a condition among the population play a critical role in behaviour change. However, studies related to assessing the awareness and practice of Yoga for managing diseases are limited. Hence, this study was formulated with the objective of assessing the awareness level and extent of knowledge about diabetes mellitus and its management through yoga. A cross-sectional survey with a sample size of 317 was conducted using a structured questionnaire at 5 districts in Tamil Nadu and Kerala. 95% of the study population were aware of diabetes mellitus while 61.2% responded that diabetes can be prevented by regular exercise and healthy diet. 62.4% people perceived that yoga practices can prevent diabetes mellitus and 59% mentioned that regular yoga practice can help in controlling diabetes and prevent further complications. Only 13% reported to practice Yoga regularly at least three days a week. Identifying a qualified Yoga trainer was reported to be a limiting factor for regular yoga practice. The study suggested that there is a need to increase the access to qualified Yoga professionals at community level. Further large scale studies with random sampling method to assess the awareness level and practice of Yoga in different settings is indicated.

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1. Introduction

Diabetes is a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbance of carbohydrate, fat, and protein metabolism resulting from defect in insulin secretion, insulin action or both [1]. Improper lifestyle such as reduced physical activity and poor dietary practices continue to increase the number of people affected with Type 2 diabetes mellitus (T2DM) [2]. Today, India has about 50 million diabetes patients and this number is projected to increase to 79.4 million by the year 2030 [3].

A recent systematic review concluded that practicing yoga is the most effective physical activity for lowering HbA1c levels [4]. Other systematic reviews on the management of T2DM in adults through yoga reported improvements in multiple modifiable indices of T2DM management including glycemic control, serum lipids, body composition [5] and recommended yoga practices as a therapeutic strategy in the management of T2DM and metabolic syndrome in patients with poor adherence to other forms of exercises [6]. Awareness and increasing knowledge about a clinical condition as common as T2DM is essential for better control, compliance to treatment and also alleviating its complications [7]. Interestingly, the Chennai Urban Rural Epidemiology Study revealed that 25% of people in Chennai had not heard about a condition called 'diabetes' [8]. Hence, there is a need to increase the awareness about diabetes

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Peer review under responsibility of Transdisciplinary University, Bangalore.

as it may increase compliance to treatment. Yoga practices as a management technique for diabetes should also be identified. This study is a preliminary attempt to explore the level of knowledge and awareness about T2DM and its management through yoga, in five districts of Tamil Nadu and Kerala.

2. Materials and methods

A cross-sectional survey was carried out as a part of diabetes and yoga awareness program conducted in pre-allocated districts viz. Coimbatore, Krishnagiri and Nilgiri in Tamil Nadu and Palakad and Malapuram districts in Kerala. A total of 317 participants were selected using convenient sampling, in the following locations in each district Coimbatore city (54), Krishnagiri town (49), Ooty town (41), Palakad town (84) and Mallapuram town (89). All the locations in each district were in urban and semi-urban settings Fig. 1. A semi-structured questionnaire was developed in English from previously available questionnaires [3] [Supplementary material 1] and later translated into - Tamil and Malayalam regional languages. Face validity of the questionnaire was checked by the subject matter experts to assess whether the questionnaire measured the study objective. The questionnaire was then pilot-tested in Tamil and Malyalam languages with 10 participants for each language. Modifications were made for based on the inputs received from the participants, before introducing to the actual study population. The questionnaire consisted of 28 items, on demography, behavioral aspects, physical activity, medical information and assessed awareness and knowledge on various aspects of diabetes. Awareness about yoga and subjective belief in the management of T2DM were also obtained. The questionnaire was explained verbally to the participants by the interviewers and a written informed consent was obtained before interview. The

completed questionnaires were later tabulated and analyzed using SPSS (ver. 20).

3. Results

317 people were surveyed, of which 166 (52.4%) were males and 151 (47.6%) were females. The average age of the respondents was 40.84 ± 16.1 years. 24% of the total study population did not receive any formal schooling (Table 1). 95% of the respondents had heard about diabetes mellitus while 75% were aware that it affected a large number of people in recent years. 73% of respondents said diabetes mellitus can affect organs, and the most affected organs are eyes and feet followed by nerves and heart. More than 40% respondents said the main risk factor for getting T2DM was family

Table 1
Socio demographic characteristics of surveyed population.

Socio Demographic Characteristics	Frequency	Percentage
Age Distribution		
Less than 35 years	97	30.6%
35 year to 45 years	83	26.2%
Above 45 years	137	43.2%
Sex distribution		
Male	166	52.4%
Female	151	47.6%
Educational Status		
No formal Schooling	76	24%
<12 years of Education	130	41%
>12 years of Education	111	35%

N = 317

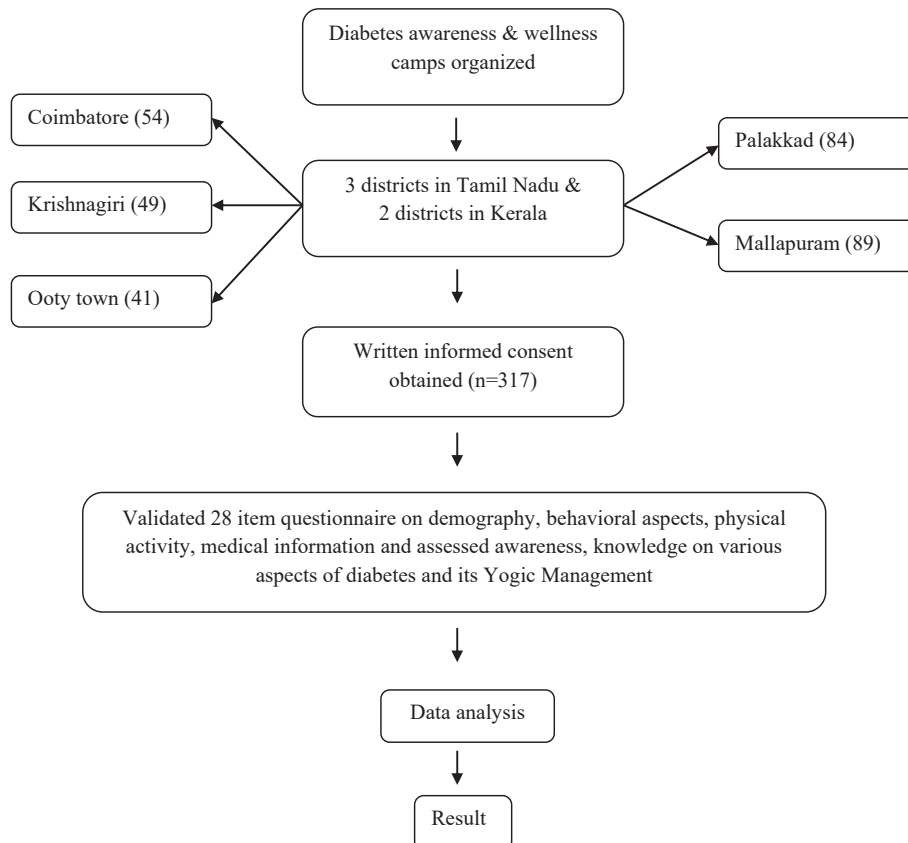


Fig. 1. Flow chart of study methodology.

history and over consumption of sweets. Interestingly only 61.2% people responded that diabetes can be prevented by regular exercise and healthy diet. 62.4% people believed that yoga practices specifically can prevent diabetes mellitus and 59% mentioned that regular yoga practice can help in controlling diabetes and prevent further complications (Table 3). When asked about their opinion on yoga, most of the respondents opined that yoga is more of *asana* and breathing practices while only a few said that meditation is yoga. Despite having awareness on yoga, 65.9% never practiced yoga until we had surveyed and 34.1% people practiced yoga at some point of time in their life and only 13% reported to regularly practice yoga at least three days a week. Content analysis of reasons for not practicing yoga revealed that identifying a qualified yoga trainer was reported to be a limiting factor apart from self constraints like lack of time.

4. Discussion

The increasing prevalence of T2DM and its associated complications have a huge negative economic impact on our nation. While recent literature suggest that self-monitoring of glucose promotes self-regulated health behavior [9], and the cost involved for periodic follow-up and management of T2DM being higher, it is essential to identify and implement cost-effective mass healthcare strategies to improve the outcomes. A study reviewing the economic burden of T2DM in India has reported that there were no conclusive studies to estimate the actual costs. However, it reported that the economic burden for T2DM management increases if comorbidities are associated. With growing body of evidence on yoga practices in the management and alleviation of complications associated with T2DM, it can easily be implemented as a cost-effective mass healthcare strategy for management of T2DM. Hence, this study was conducted as a pilot to assess the awareness level of people about Yogic management of diabetes and its complications in five districts of Tamil Nadu and Kerala. To our knowledge, based on literature review, this is the first study to report awareness of yoga practices and perceived effectiveness of yoga practices in managing diabetes mellitus. This study is expected to help plan and implement yoga awareness programs in public. In this context, 95% of the study population had heard about the condition diabetes mellitus, which contradicts the findings of a previous population-based study done in an urban setting where only 75% knew about a condition called diabetes mellitus [8]. This variation in awareness level might be due to small subset sample size in each venue. The prevalence of diabetes among the study population is 30.6% which is higher compared to the other studies done in South India (Table 2) [10]. The higher prevalence may be attributed to the study population as they were participants of diabetes awareness programs organized to spread awareness on yoga and T2DM. Earlier studies reported that among surveyed population, 99% knew health could be improved but were unable to identify the correct treatment method [10]. In our study, 74.7% respondents reported that practicing yoga has health benefits, 62.4% said yoga practice can help in preventing diabetes, while 59% believed that yoga can help manage T2DM and prevent complication. Only 13% out of the 34.1% who reported to have practiced yoga at some point in life reported to practice yoga regularly atleast thrice a week. While television was reported as the main source for awareness on yoga and its associated health benefits, identifying and accessing qualified yoga teachers, apart from family constraints and lack of time to practice yoga were reported to be major limiting factors for regular yoga practice. The primary limitation of the study was the small sample size from five districts. Due to this, we could not perform a subset analysis based on venue, and the samples were conveniently chosen from the participants of the

Table 2
Prevalence of diabetes among surveyed people.

Affected with Diabetes (n = 317)	Yes	No	Total	P-Value	Odds Ratio
Male	68 (41%)	98 (59.0%)	166	<0.001	2.84 (1.71, 4.74)
Female	29 (19.2%)	122 (80.8%)	151		
Total	97 (30.6%)	220 (69.4%)	317		

Table 3
Awareness & attitude towards yoga for diabetes mellitus.

	Yes	No	Don't know
Is Yoga Scientific?	190 (60%)	18 (5.7%)	109 (34.4%)
Does Yoga have health benefits?	237 (74.7%)	6 (2%)	74 (23.3%)
Can regular yoga practice prevent incidence of diabetes mellitus	198 (62.4%)	11 (2.5%)	108 (34.1%)
Can Yoga help in controlling Diabetes and prevent complication?	187 (59%)	8 (2.5%)	122 (34.1%)

program which might have influenced the study results. Scientific studies have shown that yoga practices are beneficial in the management of T2DM through alleviation of insulin resistance and decrease morbidity.

5. Conclusion

The study found that most of the general population were aware of T2DM and more than half of the population surveyed were aware of yoga practices and believed that yoga can be a tool to prevent and manage diabetes and its associated complications. Despite having awareness, regular yoga practice is poor, mostly contributed by limited access to qualified teachers followed by personal constraints like lack of time for practice. The generalizability of the findings from the study needs further validation in future studies with greater sample size and detailed assessments. The present study suggests that there is a need to increase the access to qualified yoga professionals at community level. Further large scale studies with randomized sampling method to assess the awareness level practice of yoga in different settings is also required.

Sources of funding

None.

Conflict of interest

None.

Acknowledgements

We thank JSS Institute of Naturopathy and Yogic Sciences (JSSINYS) and JSS Management for providing the required support to undertake this study. We extend our special thanks to students and staff of JSSINYS for their support.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jaim.2020.01.001>.

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