Journal of Ayurveda and Integrative Medicine 14 (2023) 100787

Contents lists available at ScienceDirect

Journal of Ayurveda and Integrative Medicine

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

Original Research Article (Experimental)

Practice, prescription habits, experience and perception of Indian homeopathic practitioners in treatment of diabetes mellitus: An online observational study

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ARTICLE INFO

Article history:
Received 24 March 2023
Received in revised form
31 May 2023
Accepted 4 July 2023
Available online 24 September 2023

Keywords:
Diabetes mellitus
Homeopathy
Prescription
Professional competence
Practice patterns
Physicians

ABSTRACT

Background: Studies have shown homoeopathy to effectively control blood sugar levels and improve quality of life (QOL), though a standard treatment protocol is required.
Objective: This study intended to assess the homoeopathic practice, prescription habits, experience, and perception of Indian Homeopathic Practitioners (HPs) in treating DM.
Methodology: A web-based cross-sectional with a snowball sampling method was conducted between 30th July 2021 and 18th August 2021. A questionnaire to record clinical attributes of Indian HPs in the management of DM was formed after the consensus of the subject experts and pilot testing for feasibility.
Results: Participants were 513 HPs with mean age [Standard Deviation (SD)] of 40.44 years (11.16) and a mean duration of the homoeopathic medical practice of 14.67 years [95% Confidence Interval (CI) = 13.71 −15.63]. The majority of HPs made classical homoeopathic prescription (201, 39.2%) though the success in the management of DM was better among HPs who prescribed more than one potentized medicine [vs classical prescription, Odds Ratio (OR) = 2.34, p = 0.032]. As perceived by the HPs, homoeopathic treatment resulted in a major improvement in QOL of the diabetic patients (418, 81.5%) with very few adverse effect (100, 19.5%). The blood sugar level was controlled better when homoeopathy was given alongside conventional medicine (348, 67.8%).
Conclusion: The clinical experience of HPs in this study has shown that homoeopathic treatment can benefit DM patients in preventing complications and improving QOL. It further reported that homoeopathy can be an important adjuvant to conventional treatment in managing DM.

1. Introduction

Diabetes Mellitus (DM) is a metabolic disorder characterized by hyperglycemia that occurs due to defects in insulin secretion, insulin action, or both [1]. In 2021, around 537 million adults had diabetes while 6.7 million deaths occurred due to DM. Its prevalence is steadily increasing, with low and middle-income countries being the most affected [2]. In India, 65 million people were affected with DM in 2016 compared with 26 million cases in 1990, and 2.91% of total deaths were reported from DM in 2019 [3,4].

DM is a leading cause of morbidity and mortality and its treatment cost exerts an enormous economic burden on households. The patient bears the major proportion of healthcare costs, and DM exhausts 5–25% of average household earnings [5,6]. Due to the higher management cost, patients are shifting towards complementary and alternative medicine (CAM) therapies for DM [7,8]. Patients use CAM therapies as an adjuvant to conventional treatment or as an alternative therapy [9]. The World Health Organization (WHO) Traditional Medicine Strategy 2014–2023 has played a vital role in the recognition, regulation, and popularity of CAM [10]. In India, around 30% of households use the traditional system of medicine [11], and more than 25% of AYUSH (an acronym for Ayurveda, Yoga and naturopathy, Unani, Siddha, and Homeopathy)

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Peer review under responsibility of Transdisciplinary University, Bangalore.
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https://doi.org/10.1016/j.jaim.2023.100787

users prefer homoeopathy [12]. Homoeopathy is among the commonest used CAM for DM and its complications [8,13,14]. Studies have reported that 1.5% of DM patients in India avail of homoeopathic treatment [15].

Few researchers doubted the existence of scientific evidence of the efficacy of homoeopathy in DM [16] though other researchers have refuted their claims [17]. Research on managing DM and its complication showed significantly positive results in favour of homoeopathy [14,18–21]. Most studies have focused on evaluating the effect of either specific homoeopathic remedies or complex remedies in DM [14]. Studies on homoeopathic treatment of diabetic distal symmetric polyneuropathy have shown significant improvement in parameters like neuropathy total symptom score-6, nerve conduction study, diabetic neuropathy examination score at 12 months [19,20]. A significant reduction in pathological findings such as fasting blood sugar (FBS) and post prandial blood sugar (PPBS) were also reported [20]. Another study reported a significant improvement in diabetic neuropathy symptom with homoeopathic treatment compared to placebo [21]. A study reported no benefit of dressing the diabetic foot ulcer with Calendula mother tincture when compared with normal saline [22]. Few case reports have reported beneficial effect of homoeopathic treatment in DM especially the symptoms of diabetic foot [23,24].

The available scientific evidence does not put forward a clear management plan for DM with homoeopathic medicine. Homoeopathy is becoming popular globally, and an increasing population depend solely on homoeopathy for their healthcare needs [25]. It is imperative to gain an insight into the pattern of homoeopathic practice in case of DM to develop a better understanding. For this purpose, this study aimed to assess the homoeopathic practice and prescription habits of Indian Homeopathic Practitioners (HPs) in cases of DM and also to study the experiences and perception of HPs towards the treatment of DM.

2. Methods

2.1. Study design and participants

The present study adopted a cross-sectional design. A web-based questionnaire for data collection was circulated from 30th July to 18th August 2021. The HPs who were residents of India and registered with the Central Council of Homoeopathy, New Delhi, or with State Homoeopathic Medicine Boards and had experience treating DM patients were included in the study. The HPs who were unwilling to consent to participate were excluded from the study.

2.2. Study procedure

It was initiated as a convenience sampling and finally broadened a snowball sampling to enrol more participants. An online questionnaire using Google form was widely distributed through text messages and social media platforms such as WhatsApp professional groups of homoeopathic physicians. The development and reporting of the survey followed the Checklist for Reporting Results of Internet E-survey (CHERRIES) guidelines [26]. The study was approved by the Institutional Ethical Committee of the corresponding author's institute (Reference Number 2–28/825). The participants provided their consent for participation in the study.

2.3. Study instruments

A questionnaire to record prescription pattern, experience, and perception of Indian HPs was developed after the consensus of the subject experts. A self-reported questionnaire with 54 questions developed in the English language was sent to seven subject experts for their comments, and their feedback and suggestions were incorporated. Thereafter the revised questionnaire with 41 questions was pilot tested for feasibility, ease of understanding, and ease of filling the form through another five HPs before circulating through social media. The questionnaire took an average of 15–20 min to complete the survey in the pilot testing.

The Google form created for the study had three sections. The first section informed the participants about the background, objectives of the study, and confidentiality of identity. Names and e-mails were collected with a question to provide consent for participation in the study. The HP who gave their consent willingly to participate in the study was directed to the second section, which had questions on sociodemographic characteristics. The third section had 41 questions that included 11 questions on their homoeopathic medical practice, ten on experience, 11 on their prescription habits, and nine on their perception of the treatment of DM. Each question was designed to collect the appropriate response of the HP in such a way that a few questions were open-ended with response validation, some had the option of entering multiple responses, while in others, the HP could select only one option out of all the options available for a particular question. The complete questionnaire is given in Supplementary Table 1.

2.4. Statistical analysis

Fully completed questionnaires were extracted from Google Forms and exported to a spreadsheet for cleaning and coding, which was analyzed using Microsoft Excel software (Microsoft, Redmond, WA, USA). The frequency and percentage of prescription pattern, experience, and perception of HPs were described. Descriptive data are presented in n (%), median (Q1, Q3). Binary logistic regression analysis was performed, and Odds Ratio (OR) and Adjusted Odds Ratio (AOR) were calculated using STATCRAFT, Version 2.0.3 (Bangalore, India), online statistical software to identify factors significantly associated with the successful management of DM cases. Treatment success assessed on a scale of 0–10 (0 being not successful, 10 being most successful) was obtained from the HPs based on the three types of prescription patterns, viz. classical method, prescription of two potencies, and complex homoeopathy. The scores obtained were converted into a binary variable as success (score 5–10) or failure (score 0–5). Univariate and multivariate logistic regression was applied, considering the practical experience and certain demographic variables. The statistical significance level was set at $p < 0.05$.

3. Results

3.1. Characteristics of the study population

We received responses from 537 HPs, of whom seven did not consent to participate in the study. After curating the data and removing incorrect or dubious entries, 513 responses were considered for the final dataset and analysis. The study population is presented in Table 1. The mean age [Standard Deviation (SD)] of 40.44 years (11.16), and the maximum participation was from the age group of 31–40 years (n = 172, 33.5%). Responses were received from 31 states and Union Territories (UT) of India, with a maximum number of responses from the south zone (n = 147, 28.7%) followed by the west zone (n = 136, 26.5%) while the least number of participants were from the central zone (n = 64, 12.5%). The states and UT of India from where the responses were received were divided into five zones, namely, north, south, east, west, and central zones, including Northeastern states [27]. The majority of the HPs in the

Table 1
Sociodemographic characteristics and homoeopathic practice of the study participants (N = 513).

Variables		n (%)
Age	Upto 30 years	111 (21.6)
	31–40 years	172 (33.5)
	41–50 years	130 (25.3)
	Above 50 years	100 (19.5)
Gender	Male	296 (57.7)
	Female	217 (42.3)
Highest degree	DHMS/DMS/Graded BHMS	26 (5.1)
	BHMS	191 (37.2)
	MD	**277 (54.0)**
	PhD	19 (3.7)
Zone or region	North zone	86 (16.8)
	South zone	147 (28.7)
	East zone	80 (15.6)
	West zone	136 (26.5)
	Central zone	64 (12.5)
Place of practice	Rural	79 (15.4)
	Urban	**434 (84.6)**
Present employment	Government job	163 (31.8)
	Private practice	**350 (68.2)**
Homoeopathic practice in years	Upto 10 years	**231 (45.0)**
	11–20 years	142 (27.7)
	More than 20 years	140 (27.3)
Homoeopathic practice of the study participants		Median (Q1, Q3)
Average no of cases seen or treated in a month		150 (50, 450)
Average no of diabetes mellitus cases seen during the same period		15 (6, 35)
How long a diabetes mellitus patient remains under treatment[a]		12 (6, 18)
Average consultation time of a diabetic patient on baseline[b]		30 (20, 45)
Average consultation time of a diabetic patient on follow-up visit[b]		15 (10, 20)

N = Number; % = Percentage; DHMS: Diploma in Homoeopathic Medicine and Surgery; DMS: Diploma in Homoeopathic Medicine; BHMS: Bachelor in Homoeopathic Medicine and Surgery; MD: Doctor of Medicine; PhD: Doctor of Philosophy; Q1: First quartile; Q3: Third quartile.
Bold Font: It indicates the highest frequencies.
[a] = In months.
[b] = In minutes.

Table 2
Practical experiences of homoeopathic practitioners in the treatment of diabetes mellitus.

Variable	Response options	n (%)
Most common treatment mode availed by DM patients	Allopathy	170 (33.1)
	Ayurveda	1 (0.2)
	Homoeopathy	21 (4.1)
	More than one therapy	321 (62.6)
Effect of homoeopathic treatment on dosage of allopathic medicines	Complete withdrawal of allopathic medicines	34 (6.6)
	Tapering of dose of allopathic medicine	**373 (72.7)**
	Maintains the dose of allopathic medicine	104 (20.3)
	Increase in dose of allopathic medicine	2 (0.4)
Effect of homoeopathic treatment on quality of life of DM patients	Major improvement in quality of life	**418 (81.5)**
	Minor improvement in quality of life	84 (16.4)
	Minor deterioration in quality of life	3 (0.6)
	No effect at all	8 (1.6)
Homoeopathic treatment in DM most certainly results in	Cure or marked improvement of symptoms	**326 (63.5)**
	Partial Relief of symptoms	183 (35.7)
	No effect at all	3 (0.6)
	Worsening of symptoms	1 (0.2)
Adverse effect of homoeopathic treatment in DM	Major adverse effect	3 (0.6)
	Moderate adverse effect	14 (2.7)
	Slight adverse effect	83 (16.2)
	No adverse effect	**413 (80.5)**
Medication adherence of homoeopathic medicines among diabetic patients	Patients are irregular in taking their medicines	57 (11.1)
	Patients forgets taking medicine most of the times	7 (1.4)
	Patients forgets taking medicine some of the times	111 (21.6)
	Patients repeat medicines more often than the prescribed dosing schedule	41 (8.0)
	Patients takes medicine regularly	297 (57.9)
Most effectively treat/manage with homoeopathic medicines	Type 1 DM	75 (14.6)
	Type 2 DM	**412 (80.3)**
	Gestational DM	12 (2.3)
	None	14 (2.7)

N = Number; % = Percentage; DM: Diabetes Mellitus; AYUSH: Ayurveda, Yoga & Naturopathy, Unani, Siddha, Sowa-Rigpa and Homoeopathy.
Bold Font: It indicates the highest frequencies.

study were male (n = 296, 57.7%), and female participation was 42.3% (n = 217).

3.2. Experience

In their clinical practice, the HPs revealed that the majority of DM patients presented with multi-morbid conditions (448, 87.3%), i.e., suffering from more than one disease. The three most common symptoms noticed by HP in DM cases were debility/dullness/fatigue (349, 68.0%), frequent micturition (203, 39.6%) and loss of weight (81, 15.8%). The practical experiences of the HPs, as depicted in Table 2, showed that the majority of DM patients availed more than one type of therapy for their complaints (321, 62.6%). The HPs experienced that the homoeopathic treatment of DM resulted in tapering of the dose of allopathic medicines (373, 72.7%) with a major improvement in the quality of life (QOL) of the diabetic patients (418, 81.5%). The HPs observed no adverse effect of homoeopathic treatment in DM (413, 80.5%), and it resulted in a cure or marked improvement of the symptoms (326, 63.5%).

3.3. Practice and prescription pattern

The practice and prescription pattern of the HPs in managing DM is given in Table 3, which shows that the diabetic patients were already taking allopathic or other AYUSH treatments (474, 92.4%) when they visited the HPs for consultation. The majority of HPs made classical homoeopathic prescription (201, 39.2%), i.e., single potentized homoeopathic medicine, 192 (37.4%) HPs preferred complex homoeopathic prescription, i.e., a combination of potentized medicine, mother tincture, or trituration and 120 (23.4%) prescribed more than one potentized medicine in DM. The majority of HPs prescribed two drugs (234, 45.6%) to DM patients on a single visit. The preferred scale of potency for a polychrest/individualized homoeopathic remedy to treat DM was centesimal (262, 51.1%), while mother tincture (212, 41.3%) was the preferred choice while prescribing an organospecific remedy (targeting specific organ).

Lifestyle modification was almost always (446, 86.9%) advised by the HP to DM patients, and 51.1% (262) of patients followed this advice most of the time. The majority of HP followed the practice of medicine textbooks (217, 42.3%) while managing DM cases. The most common polychrest homoeopathic medicines prescribed by HP in cases of DM is given in Fig. 1. The three most common organospecific medicines prescribed by HP in DM cases is given in Fig. 2. The majority of HP observed that the normal blood sugar level in DM patients was maintained when homoeopathic treatment was given along with allopathic medicines (348, 67.8%), as shown in Fig. 3.

Table 3
Practice and prescription pattern of the homoeopathic practitioners in the management of DM.

Variable	Response options	n (%)
When does diabetic patients mostly consults for treatment	Diabetes already under medication (allopathic or other AYUSH treatment)	**474 (92.4)**
	Diabetes not under any medication	39 (7.6)
Diabetic patients approaches for mainly	Treatment of their diabetes	24 (4.7)
	Treatment of their diabetes related complaints	69 (13.5)
	Both	**420 (81.9)**
Type of allopathic medicine mostly taken by diabetic patients	Oral hypoglycemic drugs	288 (56.1)
	Insulin	4 (0.8)
	Both	213 (41.5)
	None	8 (1.6)
Type of homoeopathic prescription usually prefer to treat diabetic patients	Classical homoeopathic prescription[a]	201 (39.2)
	More than one homoeopathic medicine[b]	120 (23.4)
	Complex homoeopathic prescription[c]	192 (37.4)
Average no of homoeopathic drugs prescribed at one consultation to diabetic patients	One	153 (29.8)
	Two	**234 (45.6)**
	Three	104 (20.3)
	Four	10 (1.9)
	More than Four	12 (2.3)
Preferred potency scale for homoeopathic polychrest remedies in DM	Mother tincture	18 (3.5)
	Decimal scale	33 (6.4)
	Centesimal scale	**262 (51.1)**
	LM scale	71 (13.8)
	Combination of all	129 (25.1)
Preferred potency scale for homoeopathic organospecific remedies in DM	Mother tincture	**212 (41.3)**
	Decimal scale	70 (13.6)
	Centesimal scale	98 (19.1)
	LM scale	23 (4.5)
	Combination of all	110 (21.4)
Most common investigation advised for monitoring blood glucose level in DM	Fasting blood glucose	18 (3.5)
	HbA1C (Glycated haemoglobin)	37 (7.2)
	Postprandial blood glucose	5 (1.0)
	Random blood glucose	10 (1.9)
	More than one investigation	443 (86.4)
Outcome measure prefer most to assess effectiveness of homoeopathic treatment	Blood sugar profile	103 (20.1)
	Patient reported outcome	30 (5.8)
	Quality of life (well-being)	35 (6.8)
	Combination of above	345 (67.3)
Advice lifestyle modification along with homoeopathic treatment to diabetic patients	Always	**446 (86.9)**
	Most of the time	59 (11.5)
	Few of the time	5 (1.0)
	Rarely	2 (0.4)
	Never	1 (0.2)
Do patients suffering from DM follow lifestyle modification advised	Always	111 (21.6)
	Most of the time	**262 (51.1)**
	Few of the time	124 (24.2)
	Rarely	13 (2.5)
	Never	3 (0.6)
Do you consult or follow STG on DM published by CCRH, New Delhi	Yes	190 (37.0)
	No	78 (15.2)
	I am not aware of such guidelines	**245 (47.8)**
Guidelines followed in clinical practice for treating DM	Guidelines by Indian Diabetes Associations	15 (2.9)
	Guidelines by International Diabetes Associations	12 (2.3)
	Ministry of Health and Family Welfare, Govt of India guidelines	24 (4.7)
	Practice of Medicine textbooks	**217 (42.3)**
	WHO guidelines	25 (4.9)
	More than one	137 (26.7)
	I do not follow any guidelines on DM	83 (16.2)

N = Number; % = Percentage; DM: Diabetes Mellitus; AYUSH: Ayurveda, Yoga & Naturopathy, Unani, Siddha, Sowa-Rigpa and Homoeopathy.
Specific remedy, biochemic medicine or patented formulations; LM: 50 millesimal scale; STG: Standard Treatment Guidelines; CCRH: Central Council for Research in Homoeopathy; WHO: World health organization.
Bold Font: It indicates the highest frequencies.
[a] Single medicine.
[b] More than one potentized medicine as per indication.
[c] Any combination of medicine among individualized medicine, mother tincture.

3.4. Perception

The perception of HPs on the reason homoeopathy not being the primary treatment option in DM was that there was a lack of awareness about the effectiveness of homoeopathy in DM among the general population (166, 32.4%) and lack of sufficient clinical trials on homoeopathic treatment for DM (126, 24.6%). The HPs felt that the quality of scientific evidence in support of homoeopathic treatment in DM was also not adequate (280, 54.6%) though they recommend homoeopathy as an adjuvant to the conventional therapy in DM (457, 89.12%). The majority of HPs kept themselves updated on research in homoeopathy on DM (443, 86.4%) though only 23.6% (121) of HPs were doing some research on DM (Table 4). The majority of HPs believed that the research in the field of medicine on DM helped in their clinical practice in the management of the cases (Fig. S1).

Treatment success assessed on a scale of 0–10 (0 being not successful, 10 being most successful) was obtained from all types of prescription practices. Univariate logistic regression (Table 5) revealed that the HPs who prescribed more than one potentized

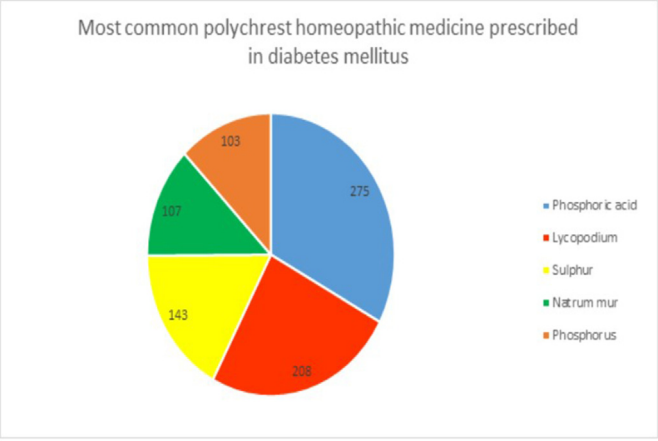

Fig. 1. Most common polychrest homoeopathic remedies prescribed by homoeopathic practitioners in diabetes mellitus.

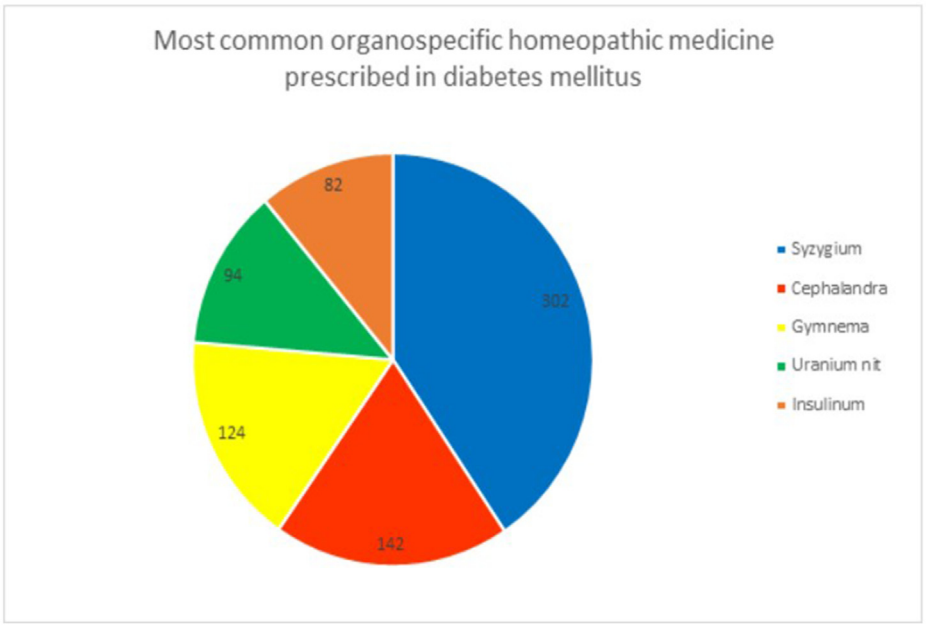

Fig. 2. Most common organospecific homoeopathic medicines prescribed by homoeopathic practitioners in diabetes mellitus.

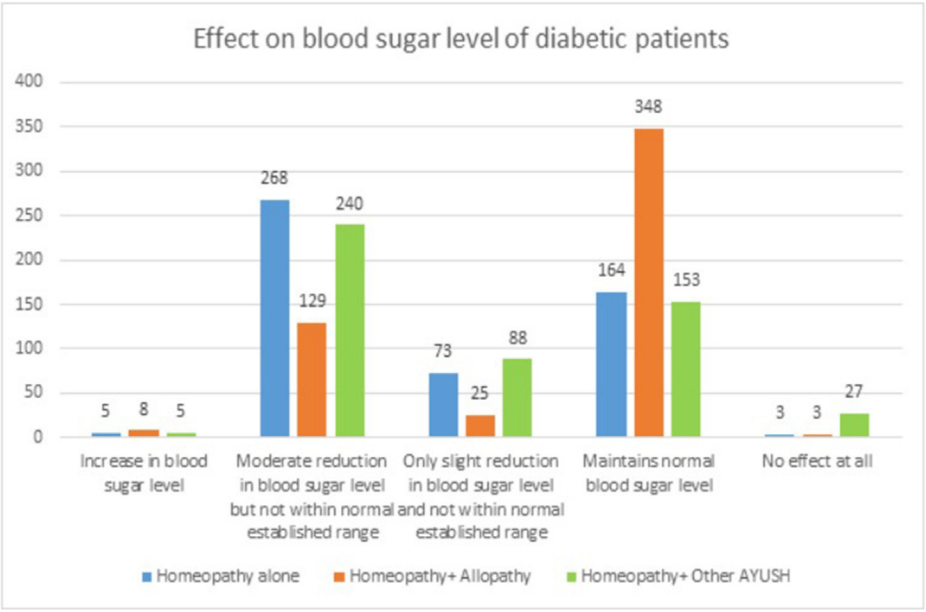

Fig. 3. Effect on blood sugar level with different modes of treatment.

medicine (vs classical prescription, OR = 2.34, p = 0.032) are significantly more likely to achieve success in treating DM cases. Interestingly, the HPs with practical experience of more than 20 years (vs less than 10 years, OR = 0.51, p = 0.020) had a significantly lower probability of success in treating DM. Multivariate logistic regression also showed similar findings with significant success in HPs who prescribed more than one potentized medicine (AOR = 2.76, p = 0.014) and practised in urban areas (vs rural, AOR = 2.44, p = 0.012). The HPs having practical experience of more than 20 years had a lower probability of success (vs less than 10 years, AOR = 0.38, p = 0.003) rate in treating DM cases.

4. Discussion

The present study was one of its first kind that assessed the Indian HP's practice, prescription habits, experience, and perception in treating DM. The HPs reported a better glucose control when homoeopathic medicine was prescribed with conventional medicine. Very few adverse events were noticed by the HPs and the treatment resulted in marked improvement of the symtooms in DM patients. Very few research studies have been conducted on the effect of homoeopathic treatment in cases of DM [8,14,17,19,20]. People suffering from chronic diseases like DM often avail of

Table 4
Perception of homoeopathic practitioners towards management of diabetes mellitus.

Variable	Response options	n (%)
Confidence level in managing DM	Not at all confident	4 (0.8)
	Less confident	39 (7.6)
	Somewhat confident	260 (50.7)
	Very confident	210 (40.9)
Why homoeopathy is not the primary treatment option in DM	Lack of awareness among general public	**166 (32.4)**
	Lack of scientific evidence	53 (10.3)
	Lack of sufficient number of clinical trials on homoeopathic treatment of diabetes	126 (24.6)
	Patient acceptability	37 (7.2)
	Paucity of data showing effectiveness of homoeopathy in diabetes	61 (11.9)
	Paucity of trained homoeopathic practitioners in treating diabetes	70 (13.6)
Quality of evidence in homoeopathic treatment of DM	Poor quality of evidence	29 (5.7)
	Weak quality of evidence	60 (11.7)
	Average quality of evidence	**191 (37.2)**
	Moderately strong quality of evidence	137 (26.7)
	Strong quality of evidence	96 (18.7)
Recommendation of homoeopathy as adjuvant to conventional treatment	Yes	**457 (89.1)**
	No	14 (2.7)
	Maybe	42 (8.2)
Referral of DM cases to practitioners of other system of medicine	Yes, often	74 (14.4)
	Yes, sometimes	**360 (70.2)**
	No	79 (15.4)
Referral by practitioners of other system of medicine	Yes, often	82 (16.0)
	Yes, sometimes	258 (50.3)
	No	173 (33.7)
Keep updated on research in modern medicine on DM	Yes	381 (74.3)
	No	132 (25.7)
Keep updated on research in homoeopathy on DM	Yes	443 (86.4)
	No	70 (13.6)
Keep updated on research on other AYUSH therapy on DM	Yes	261 (50.9)
	No	252 (49.1)
Currently doing research on DM	Yes	121 (23.6)
	No	392 (76.4)

N= Number; % = Percentage; DM: Diabetes Mellitus; AYUSH: Ayurveda, Yoga & Naturopathy, Unani, Siddha, Sowa-Rigpa and Homoeopathy.
Bold Font: It indicates the highest frequencies.

alternative treatments as they focus on a holistic approach [28]. The majority of HPs (89.1%) in this study also recommend homoeopathy as an adjuvant to conventional treatment in DM. A study from the United States suggested that CAM use was more common among patients with DM of longer duration and suffering from functional limitation than those with less severe disease. DM patients mostly preferred CAM as an adjuvant to conventional treatment [29]. A study reported a 51% pooled prevalence of CAM use in DM patients [30], while another study reported no significant difference in the prevalence of CAM use in DM patients compared to non-DM patients ($p = 0.81$) [31].

The DM patients visiting the HPs (92.4%) for consultation already took some kind of allopathic or other AYUSH medication. One study from Germany reported that 18.4% of DM patients used CAM and conventional treatment simultaneously [8]. DM patients often receive more than one conventional drug, like oral anti-diabetic drugs, insulin, and dietary interventions. However, good glycemic control is achieved only in 25% of cases [21]. The 67.8% of HPs in this study experienced that the blood glucose level was controlled better if homoeopathic treatment was given along with conventional medication. Patients using CAM perceive it to be effective in lowering blood glucose levels [30,32–34]. A study reported slightly better control of blood glucose with homoeopathic treatment compared to conventional treatment, however, it recommended an observation time of more than one year to ascertain the complete effect of treatment [21]. Only 57.9% of HPs in this study observed proper medication adherence to homoeopathic medicines by DM patients, similar to studies that reported poor compliance with anti-diabetic medication in India [35,36].

This study revealed that 80.5% HPs did not notice any adverse effects, while 16.2% HPs noticed slight adverse effects in the homoeopathic treatment of DM. Systematic reviews have reported minor and transient adverse effects of homoeopathic treatment in various disease conditions [37,38], while one meta-analysis reported a similar proportion of adverse effects in homoeopathic and conventional or placebo treatment [39]. Another systematic review reported significantly more adverse effects ($p = 0.0004$) with the conventional treatment compared to the homoeopathic treatment [40]. The conventional drugs have effectively controlled the blood sugar level but the tolerability and safety of these drugs, specially the new drugs, are of concern [41]. Drugs such as metformin, gliflozins etc has showed several adverse effects and patients with DM have to take them daily for years [41–43]. Homoeopathy as an add on to the conventional treatment may help in tapering off the usage of conventional drugs as depicted from the experience of the HPs in the present study (373, 72.7%).

The homoeopathic treatment resulted in a major improvement in the QOL of DM patients, as reported by 81.5% HPs in this study. A study reported a significant effect on QOL in favour of the homoeopathic group compared to conventional treatment, with a major improvement in the social and emotional sphere [21]. Doctors of the conventional systems of medicine (74%) also opined that AYUSH therapies could positively impact patients' QOL [44]. Around 67% of CAM users have also reported improved well-being [8].

People suffering from various non-communicable diseases (NCD) often opt for alternative treatment due to relatively low cost, easy accessibility, increasing popularity and relatively low side effects among many other reasons [45]. The holistic method applied in alternative therapies provides diversity, flexibility, and accessibility towards affordable treatment that may improve the QOL of the patients [46]. The etiology, presentation and homoeopathic management has been described in detail by the authorities that may help the HPs to handle the DM cases in an efficient manner [47,48]. Homoeopathic studies on DM has reported frequently used polychrets remedies such as *Lycopodium clavatum, Sulphur, Phosphorus, Phosphoric acid* [19–21] which is consistent with the findings of this study as depicted in Fig. 1. Similarly, majority of preclinical research in DM in homoeopathy was carried on drugs like *Syzygium jambolanum* and *Cephalandra indica* [49] which are the two most common organospecific remedies reported in the present study. There are several limitations to this study. First, the information was collected through Google forms; hence, internet access, computer literacy, and understanding of English might have affected the responses received. However, collecting information through online tools has proven to be an effective way of conducting observational studies because of the convenience and low cost. Second, the snowball sampling method adopted in this study may lead to an unequal response from different regions, but his study received responses from 31 states and UT of India. Third, the questions on the experience of HPs may have been subjected to recall bias. Fourth, the questionnaire used for data collection was self-designed and not a validated questionnaire and hence may restrict the generalizability of the study's findings. The questionnaire was prepared using subject experts' input through various rounds and was pilot tested before

Table 5
Logistic regression showing factors associated with success in homoeopathic practice in DM.

		TOTAL	Success	Failure	OR (95% CI)	p-value	AOR (95% CI)	p-value
			n (%)	n (%)				
Prescription	Classical	201	169 (84.1)	32 (15.9)				
	More than one	120	111 (92.5)	9 (7.5)	2.34 (1.12, 5.37)	**0.032**	2.76 (1.28, 6.53)	**0.014**
	Complex	192	161 (83.9)	31 (16.1)	0.98 (0.57, 1.69)	0.951	1.14 (0.64, 2.01)	0.660
Practice duration	Less Than 10 years	231	204 (88.3)	27 (11.7)				
	11–20 years	142	126 (88.7)	16 (11.3)	1.04 (0.55, 2.05)	0.902	1.08 (0.55, 2.20)	0.817
	Above 20 years	140	111 (79.3)	29 (20.7)	0.51 (0.28, 0.90)	**0.020**	0.38 (0.20, 0.72)	**0.003**
DM cases seen per month	Upto 25	349	295 (84.5)	54 (15.5)				
	Above 25	164	146 (89.0)	18 (11.0)	1.48 (0.86, 2.69)	0.173	1.46 (0.80, 2.75)	0.225
DM case remain under follow up	Upto 6 months	193	161 (83.4)	32 (16.6)				
	7–12 months	170	148 (87.1)	22 (12.9)	1.34 (0.75, 2.43)	0.332	1.32 (0.71, 2.50)	0.377
	Above 12 months	150	132 (88.0)	18 (12.0)	1.46 (0.79, 2.76)	0.235	1.51 (0.77, 3.04)	0.239
Any treatment	No treatment	39	36 (92.3)	3 (7.7)				
	Already under treatment	474	405 (85.4)	69 (14.6)	0.49 (0.12, 1.40)	0.245	0.43 (0.10, 1.27)	0.177
Education	Upto BHMS	217	187 (86.2)	30 (13.8)				
	MD and above	296	254 (85.8)	42 (14.2)	0.97 (0.58, 1.60)	0.907	1.01 (0.58, 1.75)	0.960
Zone	North Zone	86	68 (79.1)	18 (20.9)	0.54 (0.21, 1.30)	0.182	0.55 (0.20, 1.41)	0.227
	South Zone	147	137 (93.2)	10 (6.8)	1.96 (0.71, 5.22)	0.179	1.97 (0.69, 5.45)	0.193
	East Zone	80	68 (85.0)	12 (15.0)	0.81 (0.30, 2.10)	0.667	0.96 (0.34, 2.62)	0.930
	West Zone	136	112 (82.4)	24 (17.6)	0.67 (0.27, 1.52)	0.357	0.80 (0.30, 1.94)	0.630
	Central Zone	64	56 (87.5)	8 (12.5)				
Place	Rural	79	63 (79.7)	16 (20.3)				
	Urban	434	378 (87.1)	56 (12.9)	1.71 (0.90, 3.12)	0.087	2.44 (1.20, 4.83)	**0.012**
Employment	Govt job	163	135 (82.8)	28 (17.2)				
	Private practice	350	306 (87.4)	44 (12.6)	1.44 (0.85, 2.40)	0.163	1.52 (0.83, 2.77)	0.174

N= Number; % = Percentage; OR: Odds Ratio; CI: Confidence Interval; AOR: Adjusted Odds Ratio; DM: Diabetes Mellitus; BHMS: Bachelor in Homoeopathic Medicine and Surgery; MD: Doctor of Medicine.

implementation. Fifth, questions like QOL, medication adherence etc require standard tools but could not be used as this was a survey study. The response of the practitioneres who are the service provider was recorded and is subjected to bias. Sixth, the likert scale was used to record how successfully the homoeopathic practitioners managed the cases of DM which may be subjected to bias. Despite the limitations, this study provides robust data on practice, prescription habits, experience, practice, and perception of HPs in treating DM.

Homoeopathy can play a vital role in managing DM by eliminating its symptoms and preventing or slowing down its complications. Homoeopathy as an add on to the conventional treatment may greatly benefit the patients with DM. The policy makers may formulate strategies to better integrate homoeopathy with the conventional medicine in treatment of DM. Depending upon the progress of the case and its limitations, the HPs may use individualized medicine, organopathic medicine, bio-chemic medicines, or proprietary preparations. The experience of HPs in this study has shown that the homoeopathic treatment greatly improves the QOL of the patients with almost no adverse effects. The results of this study provide valuable information that may aid in conducting research on homoeopathic treatment of DM.

Author contribution

Conceptualization: RV; Methodology: RV, AS, SK, RB; Data Curation: AS; Data Analysis: AS; Writing- Original Draft: AS, RB; Writing- Review & Editing: RV, SK, AS, RB; Visualization: RV, AS; Supervision: RV, SK; Project Administration: RV.

All the authors have accepted responsibility for the entire content of this manuscript and approved submission.

Conflict of interest statement

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter or materials discussed in this manuscript.

Sources of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgment

We want to thank Dr. PrashatTamboli, Director, Department of Research and Medical Informatics, Dr. M L Dhawale Memorial Organizations, Mumbai, Maharashtra; Dr. N. Srinivas Rao, Managing Director, Ramakrishna Homeo Stores [Pvt] Limited, Hyderabad, Andhra Pradesh; Dr. GyandasWadhwani, Consultant Homoeopathic Physician and Independent Researcher, New Delhi; Dr. Debadatta Nayak, Research Officer/Scientist- 3, CCRH, New Delhi; Dr. Anoop-Nigwekar, Professor and Head of the Department (Repertory), Dr. ML Dhawale Memorial Homoeopathic Institute, Palghar, Maharashtra; Dr. ShirishPhansalkar, Honorary Consultant Homeopath, DeenanathMangeshkar Hospital and Research Center, Pune, Maharashtra; Dr. HimaBindu P, Research Officer/Scientist- 3, CCRH, New Delhi; Dr. DivyaTaneja, Research Officer/Scientist- 2, CCRH, New Delhi, and Dr. PrithaMehra, Research Officer/Scientist- 3, CCRH, New Delhi for their contribution in this study.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jaim.2023.100787.

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