

## Evaluation of Non-Pharmacological Remedies Adopted By The Patients with Diabetes Mellitus Type 2

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### ABSTRACT

**Objectives:** To determine the different types of non-pharmacological remedies adopted by the patients with type 2 diabetes.

**Study Design:** Cross-sectional study.

**Place and Duration of Study:** Jinnah Postgraduate Medical Centre, Karachi from Oct 2018 to Nov 2019.

**Methodology:** A total of 280 type 2 diabetes patients were enrolled in the study. All patients with multiple comorbidities and type 1 diabetes were excluded from the study. A pre-designed questionnaire was used to collect data using face to face interviews. The questionnaire was related to the biodata of the patients and the use of non-pharmacological measures to control the diabetes. Data was analyzed by using SPSS version 24.

**Results:** The mean age of the patients was  $54.7 \pm 9.77$  years. About 256 (91.4%) stated that they used non-pharmacological measures along with their medications to control diabetes. Most of the patients 248 (96.8%), were only on dietary modifications; regular exercise 82 (32%) and various types of medicinal herbs/spices were used by 65 (25.3%) patients. Regular walking was the most common exercise chosen by patients and most of them preferred to walk 30 minutes daily. Out of 241 (97%) patients altered their diet to low carbohydrates and rice consumption, increased use of fruits and vegetables 29 (11.6%) and cereals by 24 (9.6%) patients.

**Conclusion:** The study concluded that patients were highly inclined towards the use of non-pharmacological measures to control their illness.

**Keywords:** Diabetes mellitus, Glycemic control, Non-pharmacological remedies, Type-2 diabetes mellitus.

**How to Cite This Article:** Hasan I, Batool SR, Dars JA, Batool R, Ahmad SM, Afridi MI. Evaluation of Non-Pharmacological Remedies Adopted by The Patients with Diabetes Mellitus Type 2. *Pak Armed Forces Med J* 2021; 71(6): 271-274. Doi: <https://doi.org/10.51253/pafmj.v72i1.4700>

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### INTRODUCTION

Diabetes is a metabolic syndrome that results from a defect in insulin secretion or insulin action, or both. It is characterized by hyperglycemia.<sup>1</sup> The disease is prevailing not only in Pakistan, but there is a high universal incidence of this disease along with its long-term complications. Globally, the International Diabetes Federation in 2015 estimated that around 415 million people are enduring this disease.<sup>2</sup> The prevalence of Diabetes Mellitus (DM) in Pakistan ranges from 7.6% (5.2 million population) to 11% in 2011. It is estimated to reach 15% (14 million) by 2030.<sup>3</sup> This places Pakistan among the top 10 countries with the highest prevalence of DM and if the present situation continues, it is expected to move to fourth place.<sup>3</sup>

Evidence has suggested that the pathogenesis and development of diabetes are due to the impact of free radicals, though the exact pathophysiology is still unknown.<sup>4</sup> Many factors have also been highlighted by numerous studies that play a significant role in precipitating DM. An article in India named certain

contributing factors of diabetes as 'seven sinful sisters'. These included sugar, salt, saturated fat, spirits (alcohol), sitting time (sedentary lifestyle), steroids (including other drugs), and stress.<sup>5</sup>

Studies have shown various ways of controlling diabetes other than pharmacological measures such as the use of self-restraint, small size portions, spices (nutrition-based remedies, including sugar and salt substitutes), Slimnastics (a synonym for aerobic exercise), high spirit (a positive attitude), health sleep/siesta, and enjoyment of Sunday (or stress management).<sup>5</sup> Along with controlling blood pressure and adverse lipid profile, physical activity also helps in controlling blood glucose levels, especially in Type 2 Diabetes mellitus (T2DM).<sup>6,7</sup> Besides this, dietary measures and modification have also proved to have an impact on glycemic control. A diet that is incredibly low in carbohydrates helps control the glycemic index and improves the risk factors in T2DM.<sup>8</sup>

There is an increasing trend of using indigenous remedies among South East Asia people for the cure of their diseases.<sup>9</sup> A study conducted in Hunza Valley revealed that older women aged 50 and above do not use allopathic medicine and rely on indigenous plants

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Received: 02 Jul 2020; revision received: 06 Oct 2020; accepted: 21 Oct 2020

for their specific five significant purposes: beauty, smoothening delivery, back pain, and pain and bleeding control during menses.<sup>9</sup> Similarly, with advancements in knowledge, patients tend to look for additional measures to control diabetes.<sup>10</sup> Many people are convinced that additional measures other than medications help reduce blood glucose levels and practice these measures to achieve tight glycaemic controls.

T2DM is a growing pandemic and a leading cause of morbidity and mortality among the Pakistani population. Therefore, the current study was conducted to highlight the non-pharmacological measures adopted by patients with diabetes to control their disease.

**METHODOLOGY**

This cross-sectional study was conducted at the Diabetic Clinic Medical Unit-7, Jinnah Postgraduate Medical Centre, Karachi, in collaboration with the Department of Psychiatry, JPMC, from October to November 2018. The sample size was calculated using a prevalence of DM in Pakistan of 15.0% via select statistics - an online software for sample size calculation, keeping the confidence level of 95%, and a margin of error of 5%.<sup>3</sup> A total of 280 T2DM patients were enrolled in the study after taking ethical approval from the Institutional Review Board, reference no. F.2-81-IRB/2018-GENL/7039/JPMC. A non-probability consecutive sampling technique was used.

**Inclusion Criteria:** Patients of either gender with T2DM, visiting the Diabetic Clinic were included in the study.

**Exclusion Criteria:** All the patients below 30 years of age, having a severe illness, juvenile (Type-1) diabetes and gestational diabetes, were excluded.

Informed consent was taken from all participants. A pre-designed questionnaire was used for the data collection. The questionnaire evaluated the use of non-pharmacological measures including different medicinal herbs/spices to control the diabetes.

Statistical Software for Social Sciences (SPSS version 24) was used along with MS Excel sheets to perform the data analysis. The chi-square test was applied to find out the association. The continuous (non-categorical) data was computed as mean and standard deviation and the categorical data was presented as frequency with percentages. The *p*-value of ≤0.05 was considered significant.

**RESULTS**

This study included 280 T2DM patients, out of which there were 218 females (78%) and 62 males

(22%). Mean age of the patients was 54.7 ± 9.77 years and 225 (80.4%) were married. Patients living in the joint family system were 157 (56.1%) in comparison to the nuclear family system 123 (43.9%). The frequency of illiterate patients was 172. The participants' mean BMI was 27.4 ± 6.90, and only 88 (31.4%) were average in weight.

According to the patients, within the last three months, 251 (89.6%) consulted only a general practitioner for the control of diabetes while only 17 (6.1%) reported consulting Hakeem for treatment other than their general practitioner. A large proportion of patients (256, 91.4%) stated that they used non-pharmacological measures and their medications to control diabetes. Among them, most rely on dietary modifications (248, 96.8%) followed by regular exercise (82,32%) and various types of medicinal herbs/spices (65,25.3%). Only one patient considered sleep as a factor to control diabetes, as shown in Figure-1.

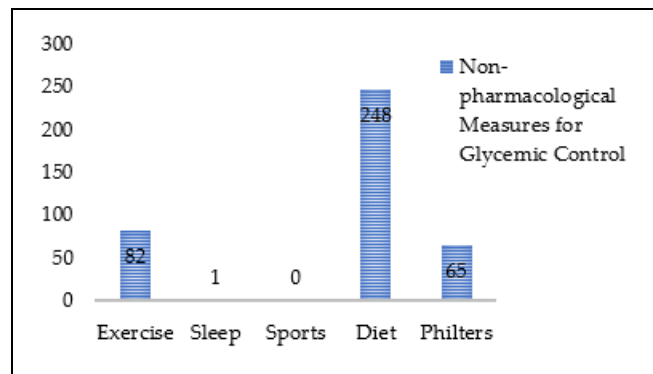


Figure-1: Frequency of patients using non-pharmacological measures for glycemic control.

Walking on a routine basis was the most typical exercise chosen by patients and most of them preferred to walk 30 minutes daily 39 (47.5%). Concerning dietary modifications, 241 (97%) patients altered their diet to low carbohydrates, followed by increased use of fruits and vegetables 29 (11.6%) and cereals 24 (9.6%). Only 22 (8.8%) patients considered a low-fat diet as a measure to control their diabetes. The use of herbs was practiced as the most common medicinal herbs/spices 35 (53.8%), followed by Bitter gourd 17 (26.1%) and Fenugreek 5 (7.6%). Medicinal herbs/spices used by the patients were shown in Figure-2.

Among the patients who were consulting Hakeem for their treatment, most of them belonged to the middle age group (40-59years), were illiterate and overweight (BMI>25). As shown in Table, most of the participants who were using non-pharmacologic mea-

asures in the past three months belonged to the age group of more than 50 years, were females, and were mainly uneducated. 32.8% of patients who opted for non-pharmacological measures were normally weighted (BMI 18.5-24.9). Regarding the use of medicinal herbs/spices to control diet, most participants were females, and the majority were illiterate and overweighted (BMI >25).

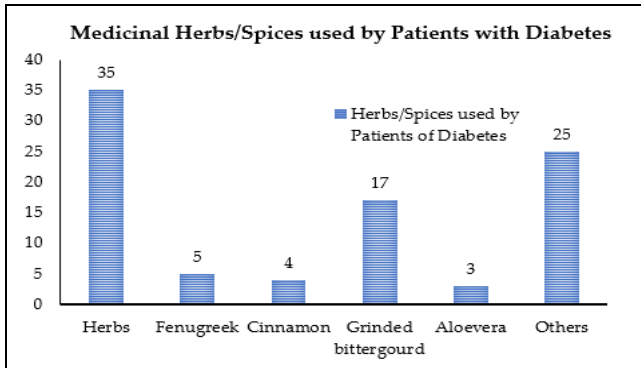


Figure-2: Types of medicinal herbs and spices used by patients with diabetes mellitus type 2 .

Table: Use of non-pharmacological measures in relation to demographic factors.

Parameters	Yes 256 (91.4%)	No 24 (8.6%)	p-value
<b>Age Groups</b>			
Under 40 years	2 (0.71%)	-	0.264
40-49 years	72 (25.7%)	11 (3.9%)	
50-59 years	92 (32.8%)	5 (1.7%)	
>60 years	90 (32.1%)	8 (2.8%)	
<b>Gender</b>			
Male	55 (19.6%)	7 (2.5%)	0.386
Female	201 (71.7%)	17 (6%)	
<b>Education</b>			
Uneducated	154 (55%)	18 (6.4%)	0.684
Primary School	28 (10%)	1 (0.3%)	
Secondary school & higher	74 (26.4%)	4 (1.4%)	
<b>Body Mass Index</b>			
Underweight (<18.5)	4 (1.4%)	3 (1%)	0.006
Normal weight (18.5-24.9)	84 (30%)	4 (1.4%)	
Overweight (25-29.9)	87 (31.1%)	9 (3.2%)	
Obese (>30)	81 (28.9%)	8 (2.8%)	

**DISCUSSION**

Diabetes is a prevalent metabolic syndrome in Pakistan and a significant concern for the health care sector.<sup>11,12</sup> It is mainly treated via oral hypoglycemic agents (OHAs) and insulin. However, OHAs, besides controlling blood sugar levels, have specific side effects as well.<sup>13-15</sup> Due to experiencing such side effects, the fear of using pharmacological measures has increased, and there is a shift towards the use of nonpharmacologic measures to control blood sugar.<sup>10</sup> Our study has

also proven an increased frequency of nonpharmacologic measures along with OHAs to control hyperglycemia (91.4%). A recent study on Arab Americans revealed that participants were well versed in ways to prevent diabetes other than medications. *Catha edulis*, a stimulant drug containing alkaloid cathinone, was also discussed as an effective remedy for diabetes.<sup>11</sup> Farzaei *et al*, highlighted the effectiveness of plant extracts traditionally used in Persian medicine to control diabetes.<sup>12</sup>

Among the non-pharmacologic measures, dietary control through low carbohydrates, fruits and vegetables, and cereals were found to be the most commonly practiced measure (97%). Certain specific diets can treat various medical diseases through medical nutritional therapy, as described by the American Dietetic Association. This therapy has proven to reduce HbA1c levels by 0.5% to 2%.<sup>16</sup>

Besides dietary control, the other most common measure practiced by T2DM patients was exercise (32%), which was comparatively much higher than a study in India, where only 9% of patients practiced exercise daily to control blood sugar.<sup>17</sup> While better results were obtained from studies in Pune (47%) and Bangalore (45.5%),<sup>18,19</sup> Such results depict that there is still a need to increase awareness among diabetes patients regarding the importance of physical activity, which has been proven to be a significant factor in improving Glycosylated hemoglobin (HbA1c) levels.<sup>20,21</sup> Many of the participants in our study preferred walking for at least 30 minutes daily.

Various studies have proven adequate sleep and other factors as an essential element for glycemic control.<sup>22</sup> Unfortunately, our study results highlighted a complete lack of knowledge about the importance of sleep as only one patient reported that sleeping adequately improves blood sugar levels.

Only 6.1% reported to consult Hakeem for the treatment of diabetes, which was consistent with another study conducted in India.<sup>10</sup> 53.8% of the patients using medicinal herbs/spices relied on herbs either raw or in the form of medicines. Increasing trends of using herbs for treating hyperglycemia has been reported from other studies too.<sup>23,24</sup> Practicing herbal medicine may have increased due to fear of side effects and decreased belief in allopathic medicine.

Our study proved that there is an increase in the practice of non-pharmacological measures by T2DM patients. Along with prescribed medicine, they tend to opt for other measures since the use of these measures

satisfies them psychologically. Moreover, dietary control and exercise are a part of their treatment protocol, which further encourages patients to practice them. Many western studies have emphasized self-care practices among diabetes patients; however, such studies are meager in Pakistan. This study showed various herbal remedies that can be further tested and if proven beneficial, can enhance the quality of oral hypoglycemic agents (OHAs).

#### LIMITATIONS OF STUDY

Due to lack of funds, our study yet fails to prove the effectiveness of these measures on HbA1c levels experimentally and is purely based on patients' perspectives and practices. We interviewed diabetes patients only in the Diabetes Clinic of JPMC ward-7 who were already under treatment of general practitioners and were not relying only on non-pharmacological measures. This clinic is in a public sector hospital JPMC and covers patients from Karachi's significant areas but still does not represent the whole population.

#### CONCLUSION

From the study, we concluded that patients are more inclined to use non-pharmacological measures, which may be due to their disbelief in medicines. Moreover, patients' indigenous remedies can be further studied and, if beneficial, can be added to improve the efficacy of oral hypoglycemic agents.

**Conflict of Interest:** None.

#### Authors' Contribution

IH: Concept & study design, SRB: Data acquisition & draft, JAD: Supervision & critical review, RB: Data acquisition & draft, SMA: supervisin & data acquisition, MIA: Supervision

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