COMPREHENSION OF LIFESTYLE MODIFICATION IN PATIENT WITH TYPE 2 DIABETES MELLITUS: A KAP STUDY

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ABSTRACT
OBJECTIVES
The objective of this study is to assess the understanding of lifestyle modification in patients with Type 2 Diabetes Mellitus, including activity, diet, and weight loss (if obese), to explore the reasons which keep them away from adopting the recommended lifestyle modification and to evaluate the interpretation of common foods by Type 2 diabetics.
METHODOLOGY
This hospital-based cross-sectional study was conducted in the MTI - Khyber Teaching Hospital, Peshawar, from 1st October 2022 to 31st January 2023. A validated questionnaire recorded all the pertinent details regarding the demographic profile, presence of comorbid conditions, and comprehension of lifestyle changes like diet, physical activity, and attainment of normal body mass index (BMI). A p-value ≤0.05 was considered a test of significance in this study.
RESULTS
Three hundred and five (305) Type 2 Diabetics, including 196 (64.3%) females and 109 (35.7%) males, were recruited with mean age and HbA1c as 58.52 ± 10.3 years and 9.15 ± 2.1 %, respectively. About 67.2% of patients were from urban areas, while 32.8 % belonged to rural settings. Almost 55% of participants were on oral antidiabetic agents, 34.4% were on insulin therapy, and 10.2% were taking both insulin and oral antidiabetics.
CONCLUSION
General attitudes and behaviors toward lifestyle modifications in T2DM patients are highlighted in this study. Although there is awareness regarding the positive impact, patients still need to transform this aspect into tangible changes in behavior. Although geographical and socioeconomic statuses were considered variables, they were not found to be determinants in compliance with lifestyle changes in T2DM in our settings.
KEYWORDS: _Lifestyle Modifications, Type 2 Diabetes Mellitus, Knowledge, Attitude, Practices_

INTRODUCTION

Diabetes Mellitus (DM), especially type 2 diabetes mellitus (T2DM), is a global health problem now emerging as an epidemic of the 21st century.[1] The adoption of an inactive lifestyle and the increase in the consumption of calorie-dense foods has led to an increase in the prevalence of obesity, which has further increased the incidence and prevalence of T2DM in developed and developing countries.[2] According to the International Diabetes Federation's (IDF) survey published in 2021, it was estimated that around 537 million people worldwide have DM, and in Pakistan, 33 million people have DM. The prevalence of T2DM in adults in Pakistan, as estimated by IDF, is 26.7%.[3] Both microvascular and macrovascular complications are associated with T2DM, leading to increased morbidity, mortality, and health expenditure.[4] Early diagnosis and

management are of paramount importance in decreasing the occurrence of complications. Lifestyle modification and diabetes self-management education and support (DSMES) are integral to the care of T2DM patients.[5] DSMES aims to make patients with T2DM responsible for the self-management of their condition by providing them with knowledge and skills.[6] Self-management has been associated with optimal glycemic control and reduced complications. These self-management practices include lifestyle changes like healthy eating, adherence to dietary modifications, being physically active, self-monitoring of blood glucose, and regular intake of the prescribed medications. Compliance with these practices leads to optimal glycemic control and a reduction in the number of complications.[7] However, there are certain barriers to these self-management practices like poor knowledge of the disease, poor communication with the physician, and reduced

education level and socioeconomic status.[8] In Pakistan, several studies have evaluated the knowledge and self-management behaviors of patients with T2DM. The common barriers to these are cultural and psychological factors.[7] However, the studies have yet to evaluate the comprehension of lifestyle changes in people with T2DM separately. Thus, this study aims to assess the understanding of lifestyle modification in patients with T2DM, including activity, diet, and weight loss (if obese), to explore the reasons which keep them away from adopting the recommended lifestyle modification and to evaluate the interpretation of common foods by people with T2DM far as DM management is concerned. Through this study, we will understand the perspectives of people with T2DM and will also know about the barriers to self-management behaviors. This study will help design approaches for our population, considering their education level, place of living, and other cultural factors, leading to better glycemic control and, thus, a better quality of life with reduced morbidity and mortality.

METHODOLOGY

This institutional-based cross-sectional descriptive study was conducted in the MTI-Khyber Teaching Hospital, Peshawar, from 1st October 2022 to 31st January 2023. The analysis was performed after approval from the hospital's ethical committee Ref. No. 754/DME/KMC. All the enrolled patients gave their written informed consent. Taking 26.7% prevalence of DM in Pakistan, a 95% confidence interval, and 5% as the margin of error, the calculated sample size was 305.[3] Non-probability consecutive sampling technique was adopted. Patients aged 40- 70 years from both genders with T2DM were included in the study. Patients with type 1 DM, mental or psychiatric illness, and on psychiatric medications, critically ill patients with GCS Score <15/15, and those diagnosed with malignancies were excluded from the study. A strict exclusion criterion was adopted to control confounders and bias in the results. All the relevant information regarding the demographic profile, presence of comorbid conditions, and understanding of lifestyle changes like diet, physical activity, and attainment of normal body mass index (BMI) were recorded on a validated questionnaire of Jeppsen K (SKILLD).[9] This questionnaire of spoken knowledge in low literacy in diabetes scale (SKILLD) was validated locally by six subject experts with Lynn criteria of at least 0.8 as the criterion threshold for face validation. At the same time, content validity was performed by pilot testing on 10 T2DM patients who were not included in this study. Data was stored and analyzed by the statistical program SPSS. All the quantitative variables were evaluated for mean ± standard deviation. Frequencies and percentages were measured for qualitative variables. The association of the level of education and place of living of patients with T2DM with lifestyle behaviors was assessed, and a p-value of ≤0.05 was taken significantly. The dietary restrictions of common foods were also evaluated.

RESULTS

A total of 305 patients with T2DM were included in the study, out of whom there were 196 (64.3%) females and 109 (35.7%) males. The mean age and HbA1c of the study population were 58.52 ± 10.3 years and 9.15 ± 2.1 %, respectively. Regarding education status, 256 (83.9%) patients were uneducated, while those with education up to primary level, high school, and university level were 30 (9.8%),15 (4.9%), and 4(1.3%), respectively. Two hundred and five (67.2%) patients were from urban areas, while those from rural areas were 100 (32.8%). The proportion of the study population with hypertension was 47.5 %, while those with dyslipidemia were 12.8%. Regarding treatment for T2DM, 55.1 % of the patients were on oral antidiabetic agents, 34.4 % were on insulin, and 10.2 % were on both insulin and oral antidiabetic drugs. As far as complications of T2DM are concerned, 40.7% had diabetic retinopathy, 28.9% of patients had chronic kidney disease, 24.9% had diabetic foot ulcer, 16.7% had cerebrovascular disease, and 16.6% had cardiovascular disease. More than 50% of the patients had more than five years of duration of DM. The lifestyle of the patients like their status of physical activity, reasons for not being physically active, their adherence to dietary recommendations, reasons for dietary non-compliance, attainment of normal BMI, and barriers to the achievement of normal BMI, were assessed, and their association was compared with the education and living status of the study population. (Tables#1 and 2) Similarly, dietary restrictions of familiar foods like sweets, bread, rice, drinks, fresh juices, and jaggery were assessed, and their association with education status and living place was evaluated. (Tables#3 and 4).

Table 1: Association of the Level of Education with Lifestyle Modification (Activity, Diet, Weight Loss) in Patients with Type 2 DM

Activity					
Education	No	Yes			P-Value
		< 20 min	20-30 min	>30 min	
Nil	122	44	56	34	0.01
Primary	09	04	07	10	
High school	02	04	03	06	
University	01	01	00	02	
Diet					
Education	Not compliant	Compliant to Diet			
		Daily	Few times weekly	Few times monthly	P-Value
Nil	33	57	101	65	0.41
Primary	02	08	13	07	
High school	01	06	03	05	
University	00	02	00	02	
Importance of Weight Loss to Improve BMI for better glycaemic control					
Education	Yes		No		P-Value
Nil	60		196		0.001
Primary	06		24		
High school	07		08		
University	04		00		

Table 2: Association of Place of Living with Lifestyle Modification (Activity, Diet, Weight Loss) in Patients with Type 2 DM

Activity					
Living Place	No	Yes			P-Value
		< 20 min	20-30 min	> 30 Min	
Rural	40	23	21	16	0.3
Urban	94	29	46	36	
Diet					
Living Place	Not Compliant	Compliant To Diet			
		Daily	Few Times Weekly	Few Times Monthly	P-Value
Rural	13	20	35	32	0.41
Urban	23	53	82	47	
Importance of Weight Loss to Improve BMI for Better Glycemic Control					
Living Place	Yes		No		P-Value
Rural	22		78		0.001
Urban	55		150		

Table 3: Association of the Place of Living with Dietary Restrictions of Common Foods in Patients with Type 2 DM

Sweets			
Living Place	Mostly avoid	Do not avoid	P-Value
Rural	46	54	0.6
Urban	94	111	
Bread			
Rural	08	88	0.2
Urban	19	186	
Rice			
Rural	22	78	0.5
Urban	50	155	
Drinks			
Rural	65	35	0.3
Urban	135	70	
Fresh Juices			
Rural	55	45	0.5
Urban	112	93	
Jaggery (Gurh)			
Rural	43	57	0.8
Urban	92	113	

Table 4: Association of the Level of Education with Dietary Restrictions of Common Foods in Patient with Type 2 DM

Sweets			
Education	Mostly avoid	Do not avoid	P-Value
Nil	120	136	0.5
Primary	10	20	
High school	07	08	
University	03	01	
Bread			
Nil	25	231	0.2
Primary	00	30	
High school	02	13	
University	00	07	
Rice			
Nil	60	196	0.5
Primary	06	24	
High school	04	11	
University	02	02	
Drinks			
Nil	162	94	0.3
Primary	22	08	
High school	13	02	
University	03	01	
Fresh Juices			
Nil	142	114	0.5
Primary	14	16	
High school	09	06	
University	02	02	
Jaggery (Gurh)			
Nil	116	140	0.8
Primary	10	20	
High school	07	08	
University	02	02	

DISCUSSION

This study examines the understanding of lifestyle modifications in T2DM patients knowledge, attitudes, and practices. The study population has a mean of 58.52 ± 10.3 years of age and an HbA1c level of 9.15 ± 2.1%, with a majority of uneducated and female participants. The majority of the population (67.3%) is from urban settings. Hypertension is the most common co-morbidity, followed by dyslipidemia (12.8%). Almost 55% of participants are on oral antidiabetic agents, 34.4% on insulin therapy, and 10.2% are taking both insulin and oral antidiabetics. The study found no significant association between activity level, education, diet compliance, or reasons for dietary non-compliance. The study also found no significant association between understanding the importance of weight loss and living place and no significant association between education level and food consumption. The lack of statistically significant associations between education level and food consumption suggests that education alone may not significantly influence dietary choices in the examined food categories. For example, a study conducted in urban and rural areas found that despite living in different environments, individuals in both locations consumed similar amounts of fresh juice and jaggery. This finding indicates that factors such as cultural preferences, availability of resources, and personal taste preferences may significantly impact food choices more than simply where someone lives. Furthermore, the study revealed that while urban residents consumed more processed and packaged foods than their rural counterparts, the overall consumption of fruits and vegetables was similar in both groups. This suggests that factors beyond residence, such as socioeconomic status and access to grocery stores or markets, also significantly shape dietary habits. Additionally, cultural influences and personal beliefs about health and nutrition may further influence food choices, regardless of residence. Therefore, it is crucial to consider a holistic approach when analyzing food consumption patterns, considering various contextual factors that contribute to individuals dietary decisions. While residence may impact nutritional habits, it is essential to acknowledge that other factors, such as socioeconomic status and cultural influences, can also significantly influence food choices. Considering a broader range of contextual factors is necessary when studying individuals dietary decisions. In conclusion, we emphasize the importance of adopting a holistic approach when analyzing food consumption patterns. They highlight that while residence can play a role in dietary habits, it is crucial to recognize the influence of other factors, such as socioeconomic status and cultural influences. Researchers can better understand individuals dietary decisions by considering a broader range of contextual factors. The mean age of our study is comparable with investigations conducted by Rehman SK in Dhaka, Bangladesh (43.45 ± 11.81 years) and Kaur G from New Delhi, India (Mean age of 50 ± 9.64 years).[10,11] Both these studies have a majority of study participants from an urban setting. Just like our study, these studies are documenting more than 50 % of study participants have a DM duration of > 5 years.[10, 11] Our study documents that although there is a positive attitude of T2DM patients towards dietary patterns and healthy lifestyle modifications, still there is poor awareness and practices regarding lifestyle modifications. The same phenomenon has been observed by regional and other developing countries.[12, 13,14,15,16] Lifestyle modification in patients with T2DM shows varying levels of knowledge, attitude, and practice. Several studies have been conducted to assess these aspects. One study found that a lifestyle modification program involving residential visits significantly improved glycemic control, lipid profile, and well-being. [17] Another study showed that lifestyle modification counselling using a holistic model effectively improved glycemic control, blood pressure, and high-density lipoproteins cholesterol.[18] However, adherence to lifestyle modification was found to be low in another study, with factors such as lack of money, attending functions, tempting foods influencing adherence to diet, and illness and lack of time influencing adherence to exercise.[19] Additionally, a study conducted in South Africa found that knowledge regarding the benefits of exercise, weight loss, and a healthy diet could have been better, and participants demonstrated bad practices with lifestyle modifications.[20] Overall, while lifestyle modification has shown positive effects on glycemic control and risk factors, there are challenges regarding knowledge and adherence. Most studies point out positive attitudes, but the awareness and clinical practices could be better in most of these study populations.[13,14,15] Our study highlights the significance of lifestyle modifications in the management of T2DM. This study highlights the need for healthcare providers to educate T2DM patients on the importance of a healthy lifestyle and empower them with the necessary tools to adopt healthy lifestyle practices. These positive attitudes regarding beneficial lifestyle modifications could be harnessed and implicated in healthy lifestyle practices. The results of this study could be used for developing a targeted interventional approach to improve the knowledge and practice of a healthy lifestyle among T2DM. This approach will help the public health authorities to design and implement policies on broader perspectives to curtail this menace. Healthcare providers should

focus on educating T2DM patients about the importance of lifestyle modification. Medical nutrition intervention programs should also be implemented with a multidisciplinary team to stimulate behavioral change and implementation of healthy lifestyle practices by these patients.

LIMITATIONS

A small sample size of study participants attending a single Tertiary Care Hospital in Peshawar may not represent the generalized T2DM patients in Pakistan. This study was conducted on a self-reported questionnaire, so recall bias is possible. Our study has not examined the impact of cultural and social factors on the awareness and practice of lifestyle modifications among T2DM. Our study has not assessed the effects of co-morbidities like hypertension and dyslipidemia on these patients understanding and practice of LSM. Moreover, the cross-sectional design of this study cannot be utilized to develop causal/temporal relationships among various variables. Our analysis has not assessed the quality of life and psychological factors influencing LSM among T2DM. Similarly, this study has yet to attempt to determine the social support level and healthcare services access in our setup. These limitations suggest that further research is needed to validate this study's findings and explore the impact of cultural and social factors and co-morbidities on the awareness and practice of lifestyle modifications among diabetic patients. Future studies regarding multicenter, prospective clinical trials are recommended to address these shortcomings for validation and generalization.

CONCLUSIONS

This study highlights general attitudes and behaviors toward lifestyle modifications among patients with T2DM. Despite a solid understanding and acceptance of the need for adjustments such as increased activity, improved diet, and weight loss, patients need help translating this awareness into tangible changes in behavior. While geographical and socioeconomic status were considered factors, they were not found to be determinants in compliance with lifestyle changes. This raises the potential influence of other factors, broadly within cultural preferences and personal belief systems. It is, therefore, essential to adapt and design healthcare provision methods that address these roadblocks, emphasizing a more comprehensive and individualistic understanding of patients circumstances. The findings raise several new questions, introducing new avenues for future research, particularly regarding the potential influence of cultural and social factors and co-morbidities.

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