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To Study Knowledge Regarding Healthy Lifestyle Modifications in Middle-Aged Diabetic Population

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Abstract

Background: Lifestyle plays a significant role in helping patients with diabetes control their blood sugar levels. Understanding early complications to prevent further adverse effects from uncontrolled sugar levels and a worsening healthy lifestyle is a prerequisite to knowledge regarding healthy lifestyle modifications. Exercise therapy has long been recommended for use in the management and prevention of type 2 diabetes. Dietary habits play an important role in the control of blood glucose levels in diabetic patients. An increase in calorie intake leads to poor glycemic control. Stress levels can affect the increased glucose levels. Middle-aged adults are at increased risk of developing diabetes, and this population may benefit from targeted interventions to promote healthy lifestyle modifications. Therefore, a study is needed to assess the level of knowledge and awareness of middle-aged diabetic populations regarding healthy lifestyle modifications. **Materials and Methods:** A validated questionnaire was prepared on Google Forms and distributed among the diabetic population. Data was calculated automatically on Google spreadsheet. **Results:** Patients with diabetes exhibit little awareness of recommended lifestyle changes. A poor understanding of diabetes and its complications is demonstrated by 83.87 % of the population. 77.41% of persons have a poor understanding of dietary adjustments for diabetes. 86.02% of respondents exhibit insufficient awareness of physical exercise therapies for diabetes. 52.68% of people are unaware of how stress affects insulin secretion. **Conclusion:** According to the study's findings, Given the early onset of diabetes problems, middle-aged diabetics have an increasing need for knowledge regarding appropriate lifestyle adjustments due to their higher risk of diabetes.

Keywords: Diet, Healthy Lifestyle Modifications, Middle-Aged Population, Physical Activity, Physical Activity, Stress, Type 2 Diabetes Mellitus

1. Introduction

Diabetes Mellitus (DM) also known as simply disease of sugar is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. Type 2 diabetes mellitus is now becoming a global epidemic disease in developing countries due to rapid urbanization and changes in lifestyles. The mortality rate is increased due to rising early complications of diabetes[1]. Lack of knowledge regarding a healthy lifestyle leads to early complications of diabetes as well as a negative attitude towards life[2].

The symptoms of elevated blood sugar levels include frequent urination, increased thirst and hunger. Diabetes has a lot of problems if left untreated. Diabetic ketoacidosis is an example of an acute complication. Heart disease, stroke, kidney failure, foot ulcers and eye damage are examples of serious long-term consequences[3]. Further, diabetes results from either insufficient insulin production by the pancreas or improper insulin utilization by the body cells[4].

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Type 2 diabetes leads to various complications which directly affect normal blood glucose levels. Patients mostly with sedentary lifestyles develop type 2 diabetes[5]. A sedentary lifestyle is mostly exhibited in the middle-aged population owing to technology and developments in work patterns. If these people know of healthy lifestyle modifications, they can prevent further arising diabetic complications such as cardiovascular diseases, nerve damage in limbs, diabetic neuropathy, eye complications like cataracts and glaucoma, skin conditions including bacterial and fungal infections, slow healing, hearing impairments etc[6].

Exercise therapy has long been recommended for use in the management and prevention of Type 2 diabetes. Regular exercise increases exercise tolerance, alters abnormal lipid-modified plasma glucose and lowers cardiovascular-related morbidity and death in people with Type II diabetes[7]. Despite overwhelming evidence patients frequently underuse exercise. Most patients make good diet and regular exercise as a part of their lifestyle modifications. Additionally, patients who lack understanding about exercise and diet modifications also have negative attitudes towards it[8].

Physical activity is any skeletal muscle-produced movement of the body that produces a net energy expenditure. For individuals between the ages of 18-65 years, the WHO advises engaging in at least 150 minutes of moderate-level aerobic physical activity throughout the week, at least 30 minutes of high-intensity aerobic physical exercises or a combination of both. Regular physical activity helps to improve insulin sensitivity[7,8]. All body systems improve and change functionally as a result of physical activity; Because physical activity helps people with chronic illnesses function better on a daily basis, it is imperative to preserve their mental and physical health. This ultimately raises the quality of life. It aids in managing fatigue as well. Physical activity is now considered a form of medication and is incorporated into several chronic conditions and medical care plans. According to a recent study, patients with chronic illnesses including heart disorders who engage in physical exercises experience less depression[9].

Dietary habits play an important role in the control of blood glucose levels in diabetic patients. An increase in calorie intake leads to poor glycemic control. Controlled timings and healthy consumption of diet like the inclusion of fruits, pulses, cereals, dairy products, and nuts should be included in the regular meal helps to improve blood glucose levels. Saturated fats like ghee, butter, sweeteners, biscuits, etc. increase cholesterol levels and changes occurring in lifestyles mainly impact dietary habits in day-to-day life. That's why maintaining cholesterol levels due to correct dietary habits can improve to healthy lifestyle and lead to a more positive impact on life[10]. Type 2 diabetes is mostly seen in adults and it is acquired. In this type body produces insulin but fails to use it properly. This is the leading cause of death nowadays due to the increased use of addictive habits in young adults. High levels of nicotine in the body cause less insulin sensitivity in chronic smokers and drinking causes increasing complications due to the effect of alcohol on sugar levels[11].

Stress may play a role in diabetes-related persistent hyperglycaemia. It has long been established that stress has a significant impact on metabolic function. Blood sugar levels may rise as a result of hormones being related in response to stress. So, it is important to bring awareness among diabetic people to change unhealthy lifestyles for their betterment. This will help to create a positive attitude towards the disease and a healthy lifestyle in the diabetic population. Early complications arising due to diabetes can be prevented or reduced also it can help to maintain blood glucose levels[12].

Diabetes is a disease increasing in the world due to lifestyle changes of improper diet, physical activity and increasing stress can lead to serious complications of diabetes. People should know about diabetes-related complications for the betterment of glycemic control. However, knowledge regarding the importance of healthy lifestyle modifications in life can improve their insulin sensitivity and prevent life-threatening complications[13].

2. Materials and Methodology

This was an observational study conducted in Karad, Satara district. The goal of this study was to find knowledge regarding healthy lifestyle modifications, such as knowledge about the importance of physical activity, knowledge about the importance of diet, and knowledge about the effect of stress on diabetes in middle-aged diabetic patients. This study was conducted by survey method in both males and females with Type 2 diabetes. The study was conducted as per inclusion and exclusion criteria. Patients in the age group of 30 to 70 who had been diagnosed with Type 2 diabetes mellitus for 1 year were included in this study. Patients with type

1 or juvenile diabetes, pregnancy-induced diabetes, and patients who were not willing to participate in the study were excluded. This study was conducted on 92 diabetic patients in Karad by the random sampling method. A validated questionnaire was circulated among these attendants via the online Google Form method. This questionnaire was based on basic knowledge about diabetes, such as regular check-ups of sugar levels, age, gender, etc. This questionnaire mainly focused on dietary habits and physical activity, like the inclusion of healthy and unhealthy diets, intake of alcohol and smoking habits, duration of physical activity, and awareness about the effect of physical activity on diabetes. Also, awareness regarding the effect of stress levels on the lifestyle of diabetic patients was included in the questionnaire. The questionnaire was also explained in regional Marathi.

3. Results

93 diabetic patients filled out the questionnaire with 100% responses. Diabetic patients show poor knowledge regarding healthy lifestyle modifications. This report shows the need for prerequisite knowledge about healthy lifestyle modifications among the middle-aged diabetic population for the prevention of early-onset complications of diabetes.

Table 1. Demographic characteristics

		Frequency	Percentage
Age	Less than 30	1	1.07
	31-40	10	10.75
	41-50	17	18.27
	51-60	24	25.80
	61-70	41	44.08
Gender	Males	59	63.44
	Females	34	36.55
Weight	35-45	3	3.22
	46-55	30	32.2
	56-65	23	24.73
	66-75	30	32.2
	76-85	7	7.52
Occupation	Banker	2	2.15
	Doctor	2	2.15
	Driver	2	2.15
	Engineer	1	1.07
	Farmer	24	25.80
	Housewife	25	26.88
	Industry worker	19	20.43
	Painter	2	2.15
	Physiotherapist	1	1.07
	Retired	11	11.82
	Shop worker	2	2.15
	Sugar factory worker	2	2.15
	Teacher	3	3.22
	Weaver	1	1.07
Duration of Diabetes (In Years)	1-5	42	45.16
	5-10	26	27.95
	11-15	12	12.90
	16-20	6	6.45
	21-25	4	4.30
	26-30	3	3.22

3.1 Sociodemographic Characteristics

Ninety-three participants were approached with 100% feedback on the structured and validated questionnaire. Among the 93 participants, 59 (63.44%) were males and 34 (36.55%) were females who had diabetes. Regarding the age of the patients (44.8%), that is 41 individuals out of 93 having greater relevance to diabetes. These individuals are in the 61- to 70-year-old age group. Weight is categorised in the above table. According to the data, 64.4% of people were overweight. By occupation, all farmers and housewives show greater relevance to diabetes. It is 25.80 among farmers and 26.88 among housewives, respectively. Most of the individuals have diabetes ranging from 1-5 years in duration.

3.2 Knowledge about Diabetes

Patients show poor knowledge of diabetes. Though the majority of 13.95% of people with diabetes have good knowledge of diabetes, 83.87% of people with diabetes have poor knowledge of diabetes.

Table 2. Knowledge regarding Diabetes

Knowledge Regarding Diabetes	Good Knowledge	Poor Knowledge
	13.95(15)	83.87(78)
Mean	1.102	
Standard Deviation	0.54	
P value	< 0.0001	

3.3 Knowledge regarding Dietary Habits

Table 3. Knowledge regarding dietary modifications

Knowledge Regarding Dietary Modifications	**Good Knowledge**	**Poor Knowledge**
	22.58(21)	77.41(72)
Mean	0.78	
Standard Deviation	0.68	
P value	<0.0001	

Though the majority 22.58% of people who have diabetes have good knowledge of dietary modifications in diabetes, 77.41% of people with diabetes have poor knowledge of dietary modifications in diabetes.

3.4 Knowledge Regarding Physical Activity

Table 4. Knowledge regarding physical activity

Knowledge Regarding Physical Activity	**Good Knowledge**	**Poor Knowledge**
	13.97(13)	86.02(80)
Mean	1.23	
Standard Deviation	0.71	
P value	< 0.0001	

Though the majority of 13.97% of people who have diabetes have good knowledge of physical activity interventions in diabetes, 86.02% of people with diabetes have poor knowledge of physical activity interventions in diabetes.

3.5 Knowledge Regarding Stress Levels

The above chart describes the effect of stress on normal blood glucose levels. According to the results, 44.08% of individuals are aware of the effect of stress on blood glucose levels, whereas 5.37% are unaware of the effect of stress on insulin secretions, and 52.68% are confused about the effect of stress on insulin secretions.

Table 5. Knowledge regarding stress levels

Response	**Frequency**	**Percentage**
Yes	41	44.08
No	5	5.37
Don't know	47	52.68

4. Discussion

This is an observational study aimed at finding knowledge regarding healthy lifestyle modifications among the middle-aged diabetic population. The presented study was aimed at finding basic knowledge regarding diabetes, the importance of knowledge regarding physical activity and dietary habits, and the effects of stress levels on diabetes. Results were concluded from responses to a structured questionnaire with 100% responses. A survey was conducted in which about 20 knowledge questions were presented and distributed among 93 diabetic people.

In the present study, people aged 35-70 were included. Out of which more patients were seen between age groups 51-70 (out of which more respondents were males than females), this correlates with the study of AE Umeh *et al.,* which also supports that the middle age group, that is, the majority of participants, were aged between 50 and 59 years of age[12].

In the present study, the relevance of obesity was found among 64.4% of individuals. The Nabi G. *et al.*, study reported low awareness about the importance of exercise in diabetic people, which could be attributed to obesity. In the presented study, most of the respondents were housewives. This shows that patients who have a sedentary lifestyle have a greater risk of Type 2 diabetes. As said by AE Umeh *et al.,* in which 44.6% were obese[12].

Diabetes mellitus is an increasing worldwide health issue that creates problems in the routine lives of patients. If it is not controlled, it could severely affect their lifestyle and lead to newly arising complications of diabetes. These problems arise due to a lack of knowledge about diabetes. That might be the reason the patient cannot acknowledge further treatment. Another study by Sharma *et al.,* concluded that better knowledge of diabetes can improve glycaemic control and treatment satisfaction in patients[1].

Education about the problems and complications of diabetes mellitus Diabetic people could prevent complications with good knowledge about healthy lifestyle interventions at an early age. This can help to analyse and resolve arising problems in older age. This supports the study by Nabi G *et al*[4].

Characteristics of lifestyle modifications such as dietary modifications, interventions in physical activity, and stress levels are strong influencers of the development and prognosis of diabetes. So, education about these changes in diet and physical activity can reduce the risk factors arising due to diabetic complications. The study

reported by Liang Chen *et al.,* says lifestyle interventions were beneficial in resolving risk factors that are known to be associated with the development of cardiovascular diseases in diabetic patients[3].

Lack of knowledge limits interventions in a healthy and balanced diet, and this could be the reason for limiting healthy dietary modifications and a positive attitude towards lifestyle modifications. Eating breakfast reduces the chances of hypoglycemia in diabetics, and fruit consumption improves glycaemic control, as reported by Mphasha *et al*[14]. In the present study, the consumption of fruits, pulses, and nuts was inadequate. Respondents show less attention to healthy dietary habits and modifications to diet plans.

The diet for diabetic people should be a low-calorie, high-fibre diet that includes whole grains, vegetables, legumes, and the avoidance of sugar-sweetened foods. It should be a nutrient-dense diet. Also, in this study, 36.55% of respondents were positive for addiction. Visceral adiposity is provoked by the increased action of blood cortisol levels on stimulation of the sympathetic nervous system due to smoking habits. Also, alcohol consumption limits insulin sensitivity. As said by Rajappa *et al.,* knowledge and modifications are needed in smoking and alcohol cessation[10].

Regular physical activity Being in an urban area, the duration of the disease, and the increasing weight of the body were the factors that linked practising physical activity. Every diabetes patient knows the importance of physical activity in diabetes and the factors affecting diabetes, as reported by Edmealem *et al*[8].

Some people are unaware of the relationship between blood glucose levels and stress levels. In the present study. 52.68% of people are unaware of the relationship between high blood glucose levels and stress levels. Surwit *et al.,* reported that although the mechanism of stress responsivity has not been studied directly, some evidence exists for adrenergic sensitivity and stress responsivity[11]. Also, he noted that the onset of diabetes is often preceded by some significant life stresses. So, significant knowledge regarding the effects of stress levels on glycemic control is needed.

Patients experience more psychological burden in middle age due to working spaces. That might predispose to poor glycemic control. Fei-Ling Wu *et al.,* reported that these populations require prerequisite attention in terms of knowledge of stress management in diabetes and for making healthy lifestyle choices[5].

By conducting programmes for healthy lifestyle interventions on diabetes, we can prevent the risks and early complications of the disease suggested by Prabha Shreshtha *et al*[9].

5. Conclusion

The study found that among a hundred per cent of responses, the demonstration of diabetic patients was poor concerning healthy lifestyle modifications. Knowledge about healthy lifestyle modifications is a growing need among the middle-aged diabetic population due to the early age of complications of diabetes. Middle-aged adults are at increased risk of developing diabetes, and this population may benefit from targeted interventions to promote healthy lifestyle modifications. Whereas, knowledge regarding healthy lifestyle modifications in middle-aged people was found low.

However, knowledge regarding lifestyle modifications, such as diet and exercise, are also crucial in diabetes management and can help improve glucose control, reduce the risk of complications, and improve overall health and well-being.

6. References

1. Sharma R, Amin H, Prajapati P. Knowledge and awareness of diabetes amongst diabetic patients in urban and rural areas of Jamnagar District, Gujarat. Journal of Social Health and Diabetes. 2016; 04(01):044–5. https://doi.org/10.4103/23210656.159830
2. Mekonnen CK, Abate HK, Tegegne ET. Knowledge, attitude, and practice toward lifestyle modification among diabetes mellitus patients attending the University of Gondar Comprehensive Specialized Hospital Northwest, Ethiopia. Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy. 2020; 13:1969–77. https://doi.org/10.2147/DMSO.S250787 PMid:32606856 PMCid:PMC7297323
3. Chen L, Pei J-H, Kuang J, Chen H-M, Chen Z, Li Z-W, *et al.* Effect of lifestyle intervention in patients with Type 2 diabetes: A meta-analysis. Metabolism. 2015; 64(2):338–47. https://doi.org/10.1016/j.metabol.2014.10.018 PMid:25467842
4. Nabi G, Azad KA, Rahman NW, Rabbani R, Chowdhury TI. Lifestyle modification among diabetic patients. Journal of Dhaka Medical College. 2017; 25(1):46–52. https://doi.org/10.3329/jdmc.v25i1.33954
5. Wu F-L, Tai H-C, Sun J-C. Self-management experience of middle-aged and older adults with type 2 diabetes:

A qualitative study. Asian Nursing Research. 2019; 13(3):209–15. https://doi.org/10.1016/j.anr.2019.06.002 PMid:31255693

6. LD P. Knowledge, attitude and practice of exercise among patients with type 2 diabetes mellitus. Journal of Medical and Scientific Research. 2020; 8(4):145–9. https://doi.org/10.17727/JMSR.2020/8-19
7. Okonta HI, Ikombele JB, Ogunbanjo GA. Knowledge, attitude and practice regarding lifestyle modification in Type 2 diabetic patients. African Journal of Primary Health Care and Family Medicine. 2014; 6(1). https://doi.org/10.4102/phcfm.v6i1.655 PMid:26245424 PMCid:PMC4565042
8. Edmealem A, Ademe S, Tegegne B. Level of physical activity and its associated factors among type II diabetes patients in Dessie referral hospital, northeast Ethiopia. Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy. 2020; 13:4067–75. https://doi.org/10.2147/DMSO.S279772 PMid:33149646 PMCid:PMC7605610
9. Shrestha P, Ghimire L. A review about the effect of lifestyle modification on diabetes and quality of life. Global Journal of Health Science. 2012; 4(6). https://doi.org/10.5539/gjhs.v4n6p185 PMid:23121755 PMCid:PMC4776966
10. Rajappa T, Ponniraivan K, Kalyan H, Selvaraju K, Karunanandham S. Assessment of degree of awareness about diet, physical exercise, and lifestyle modifications among diabetic patients. International Journal of Medical Science and Public Health. 2018; 1. https://doi.org/10.5455/ijmsph.2018.0205216032018
11. Surwit RS, Feinglos MN. Stress and diabetes. Annals of Behavioral Medicine. 1984; 6(1):8–11. https://doi.org/10.1093/abm/6.1.8
12. Umeh A, Nkombua L. A study of the knowledge and practice of lifestyle modification in patients with Type 2 Diabetes mellitus in Middelburg sub-district of Mpumalanga. South African Family Practice. 2017; 60(1):26–30. https://doi.org/10.1080/20786190.2017.1364012
13. Gedamu AS, Ademe KS, Anteneh AS, Dires NA, Dagnaw TK. Self-care practice and associated factors among Type 2 adult diabetic patients on follow up clinic of Dessie Referral Hospital, Northeast Ethiopia. Clinical Journal of Nursing Care and Practice. 2021; 5(1):031–7. https://doi.org/10.29328/journal.cjncp.1001034
14. Mphasha M, Mothiba T, Skaal L. Assessment of diabetes dietary knowledge and its impact on intake of patients in Senwabarwana, Limpopo, South Africa. Journal of Endocrinology, Metabolism and Diabetes of South Africa. 2021 Jun 7;26(3):89–95. doi:10.1080/16089677.2021.1927584