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Knowledge, Attitude and Practice Regarding Physical Exercise Among Type II Diabetic Patients

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ABSTRACT

Introduction: Diabetes mellitus is one of the most challenging public health problems in 21st century. Diabetes prevalence has been increasing more rapidly in developing countries. Physical activity is the cornerstone of lifestyle modification aimed at preventing and managing type II diabetes and its related comorbidities. Exercise has acute and chronic effects on glucose, lipid and protein metabolism. Our study focuses on awareness of regular exercise which helps in reduction of complications and control blood glucose levels as well as improve quality of life.

Aims: To assess the awareness about physical exercise among type II diabetic patients.

Methods: This was an observational study conducted among 61 type II diabetic patients between the age group of 35-65 years. The participants selection was done according to simple random sampling technique. The study was conducted on the rural population in Karad. Participants were selected according to inclusion and exclusion criteria. A structured questionnaire was distributed among the participants and completely filled questionnaires were taken.

Result: The result of knowledge regarding physical exercise among type II diabetic patients showed that majority of participants 45.9% had good knowledge and 40.9% had average knowledge whereas 13.2% had poor knowledge. The attitude regarding physical exercise in our study was observed that 60.65% participants had positive attitude. The result of practice regarding physical exercise among type II diabetic patients showed that 42.62% participants had poor practice whereas 16.4% participants had good practice and 40.98% participants had average practice.

Conclusion: The study concluded that most of type II diabetic patient had good knowledge and very few had poor knowledge regarding physical exercise. The attitude of patients regarding physical exercise was positive but the practice regarding physical exercise was poor. The study showed that most of the patients showed lack of interest towards exercise due to many reasons such as lack of time, lack of interest, busy in other work, doing other physical tasks and health conditions.

Key Words: Attitude, Knowledge, Practice, Regular physical exercise, Type II diabetes mellitus, Lifestyle modification

INTRODUCTION

Diabetes is a group of metabolic diseases comprised of hyperglycaemia resulting from defects in insulin secretions, insulin action or both. Diabetes Mellitus is broadly classified as type I and type II.¹ Type I diabetes is characterised by insulin deficiency that is typically autoimmune-mediated.² Type II diabetes is characterised by variable degree of insulin resistance, impaired insulin secretions and increased glucose production.¹ The reason for high prevalence of diabetes in India might be attributed to a combination of genetic factors and environmental factors due to urbanization and industrialization.³

As diabetes mellitus is one of the most challenging public health problems in 21st century, according to The International Diabetes Federation, it currently affects over 415 million people worldwide and this is likely to rise to 642 million by 2040. In India more than 69.1 million Indians are affected by diabetes and this number is estimated to increase 123 million by 2040⁴. According to Indian Council of Medical Research, 9.2 million people are affected by diabetes in Maharashtra.⁵

Type II diabetes is a condition marked by deficient insulin secretion by pancreatic islet β -cells, tissue insulin resistance and inadequate compensatory insulin secretory response. Progression of the disease makes insulin secretion unable to

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maintain glucose homeostasis, producing hyperglycaemia. In this condition, adipose tissue promotes insulin resistance through various inflammatory mechanisms, including free fatty acid release and adipokine deregulation.⁶

IMPACT OF DIABETES AS WHOLE

Diabetes prevalence has been increasing more rapidly in developing countries. Persistently high blood sugar levels can lead to severe and life-threatening complications, including heart disease, stroke, nerve damage or neuropathy, foot problems, kidney diseases, eye diseases or loss of vision.⁷

Almost all diabetic patients are on chronic diabetes medications. Antidiabetic drugs have their own side effects such as weight gain, tiredness or dizziness, swelling of legs or ankles, etc.⁸ Physical activity is very important for lifestyle modification. It aims at managing type II diabetes and its related comorbidities. Despite the proof regarding advantages of exercise, several diabetologists do not spend time and efforts convincing type II diabetic patients to practice physical activity.⁹

The risk factors for diabetes include insufficient physical activity, rising levels of obesity, and sedentary lifestyle.¹⁰ Weight reduction, glycaemic control, hypertension, lipid management is important for appropriate management for reducing morbidity and mortality. Diet and physical activity are imperative first line therapies.¹ It is important that efforts should be made to identify the area that needs urgent attention to modify the lifestyle and promote selfcare practices about diabetes and its complications.¹¹

Exercise is a set of physical activity that outlined as any body movement made by skeletal muscles that end in energy expenditure that will increase body calorie output and additionally the heart rate to burn additional calories within the body and maintain fitness.¹² Exercise has acute and chronic effects on glucose, lipid and protein metabolism. Physical activity is an effective therapeutic tool for prevention and management of type II diabetes mellitus. Long-term effects of regular exercise are particularly beneficial for type II diabetic patients. Body weight is reduced by regular aerobic exercise whereas it ameliorates insulin sensitivity, glucose and blood pressure control, lipid profile and reduces cardiovascular risk.⁹

Blood glucose is reduced by exercise through an increase of insulin-dependent and insulin-independent glucose transport to operating muscles. Translocation of glucose transporter 4 (GLUT4) to the surface of muscle cells. There is presence of two distinct pools of GLUT4 in skeletal muscle, one responding to exercise and one responding to insulin. Muscle contraction increases the AMP/ATP and creatinine/phosphocreatine ratios, which rapidly activates adenosine monophosphate protein kinase (AMPK), a key mediator of fatty acid

oxidation and glucose transport. During muscle contraction, AMPK appears to produce translocation of GLUT4 of either insulin-dependent or insulin-independent pools. In type II diabetic patients, physical training increases insulin stimulated non-oxidative glucose disposal which activates glycogen synthesis. Physical exercise might be utilized to enhance insulin sensitivity and endothelial dysfunction.⁹

Lack of exercise is reported as the fourth cause of death in the world. According to FIT India movement 2019, 54% of Indians are physically inactive due to sedentary lifestyle, lack of interest in physical activity, and busy schedule. Less than 10% are engaged in recreational physical activity. There is an inverse relation between physical activity and risk of diabetes.¹³

Aerobic exercises such as aerobic dancing, badminton, cycling, gardening, hiking, housework, jogging, skipping rope, swimming, stair climbing, tennis, and walking. This has advantageous effects on cardiorespiratory fitness, it also involves continuous activity of multiple large muscle groups.⁸

Stress hormones and sympathoadrenal activity influences the immediate response of aerobic exercise on blood glucose. Increased sympathetic nerve activity exacerbates insulin resistance as well as elevates stress hormones during high exercise intensity which neutralizes the glucose lowering effect of physical activity or even increase plasma glucose.^{14,15}

Strength training or resistance exercises such as weightlifting increases muscle strength and endurance, it involves isolated, brief activity of single muscle groups. Elder people may benefit more from resistance training as they have lost more muscle mass through disuse.¹⁶ Resistance training increases muscle strength, lean muscle mass and bone mineral density which could enhance functional status and glycaemic control and assist in prevention of sarcopenia and osteoporosis.¹⁷

Aerobic training and resistance training both improves glycaemic control, but the combination of these two forms of exercises is superior to either exercise alone.¹⁶

The development of technology, sedentary lifestyle of an individual, dietary patterns which are less healthful, and a degree of physical activity has declined. Technological advances like vehicles, lifts, elevators, controllers have prompted a stamped decline in level of physical activity.¹⁸ Despite of this barriers such as lack of time, disinterest in physical activity and state of health of patient also contributes in declining level of physical activity.¹⁹

The patients who have diabetes usually take oral anti-hyperglycemic medication either to upgrade insulin discharge from the pancreas or to enhance insulin activity in metabolically active tissue. It is found that patients who are knowledgeable about DM self-care and physical exercise, have

better long-term glycemic control. Thus, it is necessary to ensure that patient's knowledge, attitude and practices of regular physical exercise is adequate.²⁰

Most people nowadays know about diabetes as a disease and they also know about the importance of medications. But, only a less number of population does know about the effects of exercise in preventing and controlling diabetes or to control it's often effects. Even if they are aware of the exercise or physical activity many of them does not will to practice it regularly. Thus, the main purpose of this study is to spread the awareness of effects of regular exercise in controlling and thus to decrease the prevalence of diabetes.

AIMS AND OBJECTIVES:

AIM

To assess the awareness about physical exercise among type II diabetic patients.

OBJECTIVES

To assess the knowledge, attitude and practice regarding physical exercise among type II diabetic patients.

MATERIAL AND METHODOLOGY

This was an observational study conducted among 61 type II diabetic patients between the age group of 35-65 years. The participants selection was done according to simple random sampling technique. The study was conducted on the rural population in Karad. Participants were selected according to inclusion and exclusion criteria.

INCLUSION CRITERIA-

1. Only type II diabetic patients age group 35 to 60 years
2. Both male and female patients are included.

EXCLUSION CRITERIA

Pregnant women are not included.

SAMPLE SIZE:

The sample size was calculated according to formula: $n = \frac{4pq}{L^2}$

Where, L = 10%

p = 18.4%

q = (100-p) = (100-18.4) = 81.6%

so, $n = \frac{(4)(18.4 \times 81.6)}{(10)^2}$

n = 61

n= sample size

p=relative population of positive knowledge attitude and practice

q= no positive knowledge attitude and practice

L= allowable error of 95% confidence interval

This study was conducted to find out Knowledge, attitude and practice regarding physical exercise among type II diabetic patients. Ethical clearance number- 0123/2019-2020. After getting approval from Institutional Ethical Committee of Krishna Institute of Medical Sciences "Deemed to be University", Karad. Study population was selected based on inclusion and exclusion criteria. Informed Consents were taken from participants and an aim of the study procedure was explained. Data collection sheet was filled by participants. Data collection sheet consist of demographic data, duration of diabetes, family history of diabetes and habits or addictions. Three questionnaires of knowledge, attitude and practice regarding physical exercise were then distributed among participants. Knowledge questionnaire had 7 questions, attitude questionnaire had 10 questions and practice questionnaire had 6 questions. Instructions about filling the questionnaire were given and completely filled questionnaires were taken for analysis. Scoring of knowledge and practice questionnaires were done by 5-point Likert scale, whereas, scoring of attitude questionnaire was done by instructing participants to answer the questionnaire in yes or no form. The highest score was considered as good knowledge and lowest score as poor knowledge. The good, average and poor scores were calculated according to mean and standard deviation. The study population was categorized according to age groups- age below or equal to 52 years and age above 52 years. The scoring of knowledge, attitude and practice was done and responses were calculated as good, average and poor by using mean and standard deviation. MS Excel was used for drawing various graph with given frequencies and the various percentages that were calculated with the software. The Chi-square test was done and p-value was calculated. The study was concluded by statistical analysis of the data.

DISCUSSION

The study "KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING PHYSICAL EXERCISE AMONG TYPE II DIABETIC PATIENTS" was conducted with the aim to assess awareness of physical exercise among type II diabetic patients. The sample size was 61, among which 52.5% participants were male and 47.5% participants were female. The mean duration of diabetes this study was 8.5 years. The sample was classified according to age where 31 participants (50.81%) were with the age of ≤ 52 years and 30 participants (49.18%) were with age > 52 years. The sample was also classified according to the BMI where, 6 (9.8%) participants

were underweight, 25 (40.98%) participants were overweight, 5 (8.19%) participants were obese and 25 (40.98%) individuals with normal weight.

The study result of knowledge regarding physical exercise among type II diabetic patients showed that majority of participants i.e 28 (45.9%) had good knowledge and 25 (40.9%) had average knowledge whereas 8(13.2%) had poor knowledge. The study done by Pavan Kumar Jain,³ in 2012 in Pune city showed that 47.41% participants had average knowledge regarding exercise whereas the study conducted by Aurang Zeb et al.²¹ showed that 61.17% participants had good knowledge regarding diet and exercise. Since the mean duration of diabetes in our study sample was more, participants were informed about the benefits of regular exercise and diet by their physician and therefore the percentage of knowledge was satisfactory.

The attitude regarding physical exercise in our study was observed that 37 participants (60.65%) had positive attitude. Afework Asale¹ conducted a study in Wolaita Sodo University, Ethiopia reported that 82.6% of participants had positive attitude towards importance of physical exercise. The second study conducted in Saudi Arabia by Hind Furaj Al Otaibi et al.¹⁸ reported that attitude of Saudi participants with type II diabetes towards physical activity was significantly higher than that of non-Saudi participants. Since the participants in our study were aware of the comorbidities and complications of diabetes due to lack of inactivity, they showed positive attitude towards regular exercise.

The current study result of practice regarding physical exercise among type II diabetic patients showed that 26 (42.62%) participants had poor practice whereas 10 (16.4%) participants had good practice and 25(40.98%) participants had average practice. In the study of Karin M. Nelson et al.²² 1/3rd of sample reported no regular physical activity and 38% reported insufficient amount of physical activity. In the study 'Knowledge, attitude and practices of diabetics on physical activity' at Dakar, conducted by Sow Djiby et al.¹⁹ showed that physical activity is practiced in 81% participants. This study also reported several barriers in practice of physical activity such as lack of time, state of health of patient. Similarly in the study of Afework Asale¹ some common barriers were found such as lack of exercise education and being busy in other tasks. Participants in our study reported poor practice due to the age factor and being lethargy, lack of time due to household and farming work.

RESULT

The result of knowledge regarding physical exercise among type II diabetic patients showed that majority of participants i.e 28 (45.9%) had good knowledge and 25 (40.9%) had average knowledge whereas 8(13.2%) had poor knowledge. The

attitude regarding physical exercise in our study was observed that 37 participants (60.65%) had positive attitude. The result of practice regarding physical exercise among type II diabetic patients showed that 26 (42.62%) participants had poor practice whereas 10 (16.4%) participants had good practice and 25(40.98%) participants had average practice.

TABLE 1. Shows knowledge regarding physical exercise among type II diabetic patients in age group below and equal to 52 and more than 52 years. When knowledge was compared with age groups the number of participants the age of below and equal to 52 years was 31, out of which 15 participants had good knowledge, whereas 14 participants had average knowledge and 2 participants had poor knowledge. The number of participants above the age of 52 was 30, out of which 16 participants had good knowledge, whereas 8 participants had average knowledge and 6 participants had poor knowledge with p-value 0.1610 and chi-square value 3.653

TABLE 2. Shows attitude regarding physical exercise among type II diabetic patients in age group below and equal to 52 and more than 52 years. In the age group below and equal to 52 years, 21 participants had positive attitude. In the age group more than 52, 16 participants had positive attitude with p-value 0.3946 and chi-square value 1.860

TABLE 3. Shows practice regarding physical exercise among type II diabetic patients. In the age group below and equal to 52 years, 4 participants had good practice, whereas 13 participants had average practice and 14 participants had poor practice. In the age group more than 52 years, 5 participants had good practice, whereas 11 participants had average practice and 14 participants had poor practice with p-value 0.8775 and chi square value 0.2615

TABLE 4. Shows BMI wise classification of knowledge regarding physical exercise among 61 participants. Here, 6 participants were underweight, 25 participants were with normal weight, 25 participants were overweight and 5 participants were obese. In underweight category, 4 participants had good knowledge, whereas 1 participant had average knowledge and 1 participant had poor knowledge. In normal weight category, 10 participants had good knowledge, whereas 13 participants had average knowledge and 2 participants had poor knowledge. In overweight category, 13 participants had good knowledge, whereas 8 participants had average knowledge and 4 participants had poor knowledge. In obese category, 2 participants had good knowledge, whereas 2 participants had average knowledge and 1 participant had poor knowledge. This table also shows p-value 0.6813 and chi-square value 3.66

TABLE 5. Shows BMI wise classification of attitude regarding physical exercise among 61 participants. In underweight category, 3 participants had good attitude, whereas

2 participants had average attitude and 1 participant had poor attitude. In normal weight category, 6 participants had good attitude, whereas 10 participants had average attitude and 9 participants had poor attitude. In overweight category, 15 participants had good attitude, whereas 8 participants had average attitude and 2 participants had poor attitude. In obese category, 3 participants had good attitude, whereas 1 participant had average attitude and 1 participant had poor attitude. This table also shows p-value 0.1580 and chi square value 9.289

TABLE 6. Shows BMI wise classification of practice of physical exercise among 61 participants. In underweight category 1 participant had good practice, whereas 3 participants had average practice and 2 participants had poor practice. In normal weight category 6 participants had good practice, 10 participants had average practice and 9 participants had poor practice. In overweight category 5 participants had good practice, 7 participants had average practice, whereas 13 participants had poor practice. In obese category, 1 participant had good practice, 2 participants had average practice and 2 participants had poor practice. This table also shows p-value 0.9220 and chi-square value 1.975.

CONCLUSION

The study concluded that most type II diabetic patients had good knowledge and very few had poor knowledge regarding physical exercise. The attitude of patients regarding physical exercise was positive but the practice regarding physical exercise was poor. The study showed that most of the patients showed lack of interest towards exercise due to many reasons such as lack of time, lack of interest, busy in other work, doing other physical tasks and health conditions. But regular physical exercise has proved to be beneficial in many ways and keeping patients fit and also preventing further complications. Hence, our study focuses on awareness of regular exercise which helps in reduction of complications and control blood glucose levels as well as improve quality of life.

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Conflict of Interest: No conflict of interest.

Author's contribution:

Aarsha Bute prepared the result and discussion for the study. Amruta Chavan conducted literature review and Dr. T. Poovishnu Devi helped in preparing the background. Aarsha and Amruta collected the sample and analysed the data. All the three authors finalised the manuscript.

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Table 1: Association of knowledge with age and Chi-square and P-value.

AGE WISE ASSOCIATION WITH AWARENESS AMONG TYPE II DIABETIC PATIENTS					
AGE IN YEARS	GOOD	AVERAGE	POOR	CHI.SQ.TEST	P-VALUE
≤52	15	14	2	3.653	0.1610
>52	16	8	6		

Table 2: Association of attitude with age and Chi-square and P value.

AGE IN YEARS	GOOD	AVERAGE	POOR	CHI.SQ.TEST	P-VALUE
≤52	21	9	1	1.860	0.3946
>52	16	11	3		

Table 3: Association of practice with age and Chi-square and P value.

Age in Years	Good	Average	Poor	Chi.sq.test	P-Value
≤52	4	13	14	0.2615	0.8775
>52	5	11	14		

Table 4: Association of knowledge with BMI and Chi-square and P-value

BMI WISE ASSOCIATION AMONG TYPE II DIABETIC PATIENTS					
	Good	Average	Poor	Chi.sq.test	P-Value
UNDERWEIGHT	4	1	1	3.966	0.6813
NORMAL	10	13	2		
OVERWEIGHT	13	8	4		
OBESE	2	2	1		

Table 5: Association of attitude with BMI and Chi-square and P-value

	GOOD	AVERAGE	POOR	CHI.SQ.TEST	P-VALUE
UNDERWEIGHT	3	2	1	9.289	0.1580
NORMAL	6	10	9		
OVERWEIGHT	15	8	2		
OBESE TYPE I	3	1	1		

Table 6: Association of practice with BMI and Chi-square and P value

	GOOD	AVERAGE	POOR	CHI.SQ.TEST	P-VALUE
UNDERWEIGHT	1	3	2	1.975	0.9220
NORMAL	6	10	9		
OVERWEIGHT	5	7	13		
OBESE	1	2	2

Figure 1: Age-wise distribution of knowledge of physical exercise.

X-axis: knowledge (good, average, poor)

Y-axis: no. of people

Figure 3: Age-wise distribution of practice of physical exercise

X-axis: practice (good, average, practice)

Y-axis: no. of people

Figure 2: Age-wise distribution of attitude of physical exercise.

X-axis: attitude (good, average, poor)

Y-axis: no. of people

Figure 4: BMI wise distribution of knowledge of physical exercise.

X-axis: knowledge (good, average, poor).

Y-axis: no. of people

Figure 5: BMI wise distribution of attitude of physical exercise.
X-axis: attitude (good, average, poor)
Y-axis: no. of people

Figure 6: BMI wise distribution of practice of physical exercise.
X-axis: practice (good, average, practice)
Y-axis: no. of people