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Prevalence of Diabetes Mellitus In Relation To Physical Activity and Exercise among Adults in Urban Meerut

Anglica[1] Arun Kumar[2] Seema Jain[3] Ganesh Singh [4] Chhaya Mittal[5]
1. PG Resident, 2.Professor 3.Professor 4. Professor 5. Associate Professor
Dept. of Community medicine, L.L.R.M Medical College Meerut UP

Abstract: *Sedentary life style appears to be an important risk factor for the devepoment of type 2 diabetes. Lack of adequate age appropriate physical activity is a major factor influencing initiation of type 2 diabetes mellitus.* ***Aim and objectives :*** *to know the prevalence of Diabetes mellitus type 2 in relation to physical activity, exercise and yoga and to recommend measures for prevention and control of diabetes.* ***Material methods:*** *The present study was conducted in the field practice area of Urban Health Training Centre, Meerut by house to house survey among adults 30 years and above .* ***Results:*** *it was observed that prevalence of DM was maximum among those who were sedentary worker (20.2%). It was observed that only 43.2% were practicing exercise for more than half an hour a day and 56.8% were practicing exercise for less than half an hour a day. When prevalence of DM in relation to yoga was observed it was found to be more among those who were not practicing yoga (16.1%) .* ***Conclusion:*** *sedentary lifestyle and not practicing exercise and yoga risk factors and were statistically significant in relation to diabetes.* ***Key words:*** *Diabetes Mellitus , Physical activity, Exercise and yoga*

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I. Introduction

Regular physical activity has been recommended for people with diabetes for hundreds of years. Historically, Susruta, a physician in India, was the first to recommend exercise for health reasons roughly 2600 years ago [(1)]. Sedentary life style appears to be an important risk factor for the development of type 2 diabetes . [(2)] Regular physical activity reduces the risk of diabetes and raised blood glucose, and is an important contributor to overall energy balance, weight control and obesity prevention – all risk exposures linked to future diabetes prevalence [(3).] Lack of adequate age appropriate physical activity is a major factor influencing initiation of type 2 diabetes mellitus.[(4)] Yoga is a simple and effective , consider as additional beneficial therapy for type II diabetes mellitus. [(5)]

AIMS AND OBJECTIVES

1. Prevalence of diabetes in relation to Physical activity, Exercise and yoga.
2. To suggest measures for prevention and control of Diabetes Mellitus Type 2

II. Material And Methods

Study Area: Urban Health And Training Centre (UHTC) Surajkund that have ten localities, and is a field practice area of L.L.R.M. Medical College Meerut.

Study Design: Community based Cross-sectional study.

Study Period: November 2019 to October 2020 for a period of one year.

Sample size: taking prevalence 11.1% and absolute precision as 2.5% , sample size for the study was calculated as was calculated using formula $n= (1.96)^2 \, p \, q \, / \, d^2$. Where, n= sample size d = p = prevalence q = (1-p) **.** Sample size was calculated to be 606 .Taking 10% non respondents, sample size came to be 667 which is approximated to 670 .

Inclusion criteria: All males and females of age 30 years and above.

Exclusion criteria: Individuals not willing or severely ill .

Sampling method: This study was conducted by house to house visit in the selected locality . Sampled population was taken equally among all the ten localities . From each of ten localities, sixty seven adults aged thirty years and above were surveyed. Individual below 30 years, and those who declined for informed consent or not available at home after repeated visits were excluded from the study. After selection of area, pencil was dropped and the direction of pencil pointing towards the house was chosen as first house and the next adjacent houses were visited continuously without leaving a single house until the desired number of study subjects was covered. In every house, there were two house visits carried out in each family. First to collect the information

pertaining to socio-demographic characteristics and other factors associated with diabetes on pretested and pre designed questionnaire . Second visit was done on the next day early morning for doing fasting blood sugar of the study subject using glucometer. Every individual was be interviewed and general physical examination was done along with anthropometric measurements. This information will be filled on pretested and pre designed questionnaire and data was entered in MS Excel sheet and was analysed using using Epi Info7 .

III. Results

Prevalence of diabetes mellitus in the present study was found to be 13.1%.
Among the study population, maximum number of study subjects were unemployed or housewife 33.8% and the minimum were those of shopkeeper or clerk 8.6% as shown in the table given below in Table.1.

Table.1 Prevalence of DM among the study population in relation to Occupation

OCCUPATION	DIABETES MELLITUS				TOTAL	
	PRESENT		ABSENT			
	Number	Percentage	Number	Percentage	Number	Percentage
Professional	18	30.5	41	69.5	59	8.8
Semi-professional	7	10.1	62	89.9	69	10.4
Shopkeeper/Clerk	9	15.5	49	84.5	58	8.6
Skilled	6	9.3	58	90.7	64	9.6
Semiskilled	5	4.7	101	95.3	106	15.8
Unskilled/Agriculture	10	11.4	77	88.6	87	12.9
Unemployed/Housewife	33	14.5	194	85.5	227	33.8
Total	88	13.1	582	86.9	670	100.0

X^2=24.41 d.f = 6 p=0.00

Among various occupations, maximum prevalence of DM was observed among professionals being 30.5% followed by 15.5% shopkeeper,14.5% of housewives and unemployed persons were also diabetic. While only 4.7% of semiskilled workers were diabetic and this association of DM with occupation was found to be statistically significant ($p<0.05$).

The distribution of study population according to their physical activity status showed that about 28.9% were heavy workers, 37.8% moderate and 33.3% were those were involved in sedentary work .

Table.2 Prevalence of DM among the study population in relation to Physical Activity

PHYSICAL ACTIVITY	DIABETES MELLITUS				TOTAL	
	PRESENT		ABSENT			
	Number	Percentage	Number	Percentage	Number	Percentage
Sedentary	45	20.2	178	79.8	223	33.3
Moderate	21	10.8	173	89.2	194	28.9
Heavy	22	8.7	231	91.3	253	37.8
Total	88	13.1	582	86.9	670	100.0

X^2=14.97 df=2 P=0.000

Above table.2 depict the distribution of DM among the study population in relation to their physical activity. It can be seen from the table that prevalence of DM was maximum among those who were sedentary worker (20.2%) followed by 10.8% in moderate worker and 8.7% heavy worker were diabetic. The difference of diabetes mellitus in relation to the type of physical activity was found to be statistically significant ($p<0.05$).

Among the study population 51.2% of study subjects were not practicing exercise while 48.8% were practicing exercise as shown in Table.3.

Table.3 Prevalence of DM among the study population in relation to Exercise

EXERCISE(5 DAYS /WEEK)	DIABETES MELLITUS				TOTAL	
	PRESENT		ABSENT			
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	31	9.5	296	90.5	327	48.8
No	57	16.6	286	83.4	343	51.2
Total	88	13.1	582	86.9	670	100.0

X^2=18.7 df=1 P=0.00

It is evident from the Table no.3 that prevalence of DM in relation to exercise was maximum among those who were not practicing exercise 16.6% while it was only 9.5 % among those who were practicing exercise and the difference was found to be statistically significant ($p<0.05$).

Table.no.4 given below shows the distribution of study population in relation to the duration of exercise among the total population who were practicing exercise (n=327). It was observed that only 43.2% were practicing exercise for more than half an hour a day and 56.8% were practicing exercise for less than half an hour a day.

Table.4 Prevalence Of DM among the study population in relation to Duration of Exercise

DURATION OF EXERCISE	DIABETES MELLITUS				TOTAL	
	PRESENT		ABSENT			
	Number	Percentage	Number	Percentage	Number	Percentage
<30 min/day	23	12.4	163	87.6	186	56.8
>30 min /day	08	5.7	133	94.3	141	43.2
Total	31	9.5	296	90.5	327	100.0

X^2= 4.18 d.f=1 P=0.040

Table no.4 reveals that the prevalence of diabetes was more among those who were practicing exercise for less than half an hour a day (12.4 %) while only 5.7% of those who were doing regular exercise for more than 30 minutes per day were diabetic. The association of diabetes with regular exercise for more than 30 minutes per day was found to be s significant ($p<0.05$).

Table.5 given below shows that among the study population 41.6% of study subjects were practicing yoga while 58.4% were not practicing yoga .

Table.5 Prevalence Of DM among the study population in relation to Yoga

YOGA	DIABETES MELLITUS				TOTAL	
	PRESENT		ABSENT			
	Number	Percentage	Number	Percentage	Number	Percentage
Yes	25	9	254	91	279	41.6
No	63	16.1	328	83.9	391	58.4
Total	88	13.1	582	86.9	670	100.0

X^2= 7.29 d.f=1 P=0.006

When prevalence of DM in relation to yoga was observed it was found to be more among those who were not practicing yoga (16.1%) than among those who were practicing yoga (9 %) were diabetic and the difference was found to be statistically significant ($p<0.05$).

IV. Discussion

In the present study ,overall prevalence of Diabetes was found to be 13.1%. The findings were in line with the studies conducted by, Prasad Bahl et al (2018)[5], Subramani kumar et al(2019)[6], Patil et al. (2019)[7], in which prevalence of diabetes was 15.6%, 11.4%, and 9.9% respectively.

The observation provide that prevalence of diabetes in relation to occupation has positive association with p value significant . Similar findings were reported by Subramani kumar et al(2019)[6] and Patil et al. (2019)[7]

Distribution of diabetes mellitus in relation to physical activity was maximum in those who were engaged sedentary work followed by 10.8% in moderate work and was found minimum in heavy workers. The difference of diabetes mellitus in relation to the type of physical activity was found to be statistically significant ($p<0.05$). The findings were in line with the studies conducted by Jha Kant et al. (2018)[(8)] who reported 11.6% prevalence among sedentary workers .This finding was also supported by and Subramani kumar et al.(2019)[6].

Prevalence of type 2 diabetes mellitus in relation to exercise was maximum among those who were not practicing exercise 16.4% while it was only 9.4 % among those who were practicing exercise and the difference was found to be statistically significant ($p<0.05$).It may be because exercise improves the insulin sensitivity ,immune system and metabolic health. In the present study, the prevalence of diabetes was highest among those who were practicing exercise for less than half an hour a day 12.3 % while it was only 5.6% in were practicing exercise for more than half an hour a day . The prevalence of diabetes in relation to the duration of exercise among the total population who were practicing exercise was found to have statistically significant association ($p>0.05$). Similar results were reported by study done by Kelly et al. (2001)[9] and Qiao et al.(2003)[10] . This finding was also supported by the study conducted by Arora et al(2019)[11] documented in his study that exercise for more than 30 minutes per day lead to decreased risk of development of diabetes. In a study by Toppo Anupama et al.(2017)[12] , found that 11.28% of individuals with diabetes were not doing any exercise, and had sedentary life style.

When prevalence of type 2 diabetes mellitus in relation to yoga was observed it was found to be more among those who were not practicing yoga (16.1%) than among those who were practicing yoga (9 %) were diabetic and the difference was found to be statistically significant . Similar findings were reported by Jagannathan, Aarti et al.(2015)[(13)].

V. Conclusion

Present study revealed that prevalence of Diabetes Mellitus was found high among those who were engaged in sedentary type of work such as professionals and shopkeepers. In the present study, it was observed that prevalence of DM was maximum among those who were sedentary worker (20.2%). It was observed that only 43.2% were practicing exercise for more than half an hour a day and 56.8% were practicing exercise for less than half an hour a day.

In the present study, it was observed that type of physical activity, yoga exercise and its duration in relation to diabetes were found to be statistically significant .

VI. Recommendations

All diabetics should have in depth information about symptoms of diabetes and its complications. They should be counselled about the importance of adherence to treatment prescribed and motivated for voluntarily routine health check-up at regular intervals. The treatment compliance of people with diabetes is essential for effective management of diabetes .

Occupation following sedentary lifestyle should be given special attention during IEC (Information Education Communication) and BCC (Behaviour Change Communication) activities.

People should be made aware and motivated for adapting healthy lifestyle and habits like regular exercise , yoga and weight reduction to promote health and live a long and disease free life.

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