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ROLE OF PHYSICAL ACTIVITY IN INCIDENCE OF TYPE 2 DIABETES MELITUS

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ABSTRACT

Type 2 diabetes results from insulin resistance a condition in which cells fail to use insulin properly sometimes combined with an absolute insulin deficiency. Type 2 diabetes has often been described as a "disease of civilization". Physical activity can lower your risk for type 2 diabetes. Exercise has positive benefits for those who have diabetes. It can lower blood sugar levels, improve insulin sensitivity, and strengthen the heart. Strength training, which increases muscle and reduces fat, may be particularly helpful for people with diabetes.

With this preview a survey based study was conducted in Diabetic OPD of A& U Tibbia College, Karol Bagh New Delhi on 484 subjects which were screened for Diabetes. Physical activity was categorized as Severe, Moderate and Sedentary, it was found that most of the patients who had diabetes had sedentary or mild physical activity lifestyle (84%).Physical activity at workplace as mild, moderate, severe and sedentary was also assessed,it was found that people with sedantry lifestyle have chances of getting diabetis than people with physically active which was found stastically extremly significant P<.0001.

INTRODUCTION

The notion that sedentary life style is hazardous to one's health is not new, Ramazzini a distinguished occupational physician, noted as early as the 17th century that a relationship between sedentary behavior and deleterious health consequences were evident in workers whose occupations required them to sit for long hours[21]. In the 1960s, Morris and colleagues reported that workers in occupations requiring primarily less active work (London bus drivers and mail sorters) had a higher incidence of cardiovascular disease than did workers who were required to stand and ambulate (busconductors and postal delivery workers)[22]. In the preceding decade, Homans reported clinical cases of venous thrombosis in the legs following prolonged sitting by theatre- goers and among those spending long hours watching television. Physical activity has been shown to be consistently associated with reduced risk of type 2 diabetes[1], cardiovascular disease[2] and premature mortality [3]. Public-health recommendations on participation in regular moderate-to-vigorous intensity physical activity (sometimes referred to as 'health enhancing exercise') have been widely advertise, with the aim of reducing type 2 diabetes risk, cardiovascular disease and some cancers[4]. US Federal Guidelines recommend at least 30 min of moderate intensity physical activity on at least five days of the week[5]. It is emphasized that this is in addition to the light intensity activities of daily living (referred to as 'baseline activity'), which includes activities such as standing, walking slowly and lifting light objects. Of concern, however, is that due to changes in personal transportation, communication, workplace and domestic entertainment technologies, there are significantly-reduced demands to be active [6]. As a consequence, this background level of physical activity is declining. Much of the reduction in activity can be attributed to exposure to environments and our daily routine. Time spent in sedentary behaviors (typically in the contexts of television viewing, computer and game-console use, workplace sitting, and time spent in automobiles) are a new focus for research in the physical activity and health field [7-9]. Sedentary behaviors are defined by both their posture (sitting or reclining) and their low energy expenditure – typically in the energy-expenditure range of 1.0–1.5 METs (multiples of the basal metabolic rate) [10]. In contrast, moderate-to-vigorous physical activities, such as brisk walking or running involve an energy expenditure of at least 3 METs [11]. In this perspective, light-intensity activities are those with an energy expenditure range of 1.6–2.9 METs. They can include some occupational duties, household tasks, caring and social activities, and a range of other behaviors. These light-intensity activities are the predominant determinant of daily energy expenditure [12]. However, environmental, social and

technological changes have resulted in a high proportion of such normal daily activity being displaced by time spent sedentary [13]. The use of sophisticated activity monitors (that provide valid and reliable duration, amount, frequency, and time of day data on sedentary and activity time) in population-based studies has provided insights into how most adults spend their day, and more specifically, the large contribution that sedentary time makes to adults' overall waking hours [14]. For example, analysis of accelerometer data from over 6000 participants (aged above 20 years) in the 2003–2006 US National Health Nutrition Examination Survey (NHANES) found that mean accelerometer-derived sedentary time across 10 year age categories ranged between 7.3 and 9.3 h/day, with older adults generally the most sedentary[15]. In proportional terms, it can be estimated that some 51–68% of adults' total waking hours are spent sedentary [15,16]. In contrast, moderate to vigorous physical activities accounted for only 5% of the total time across the sample, with the remainder (some 27–44%) is being spent in light intensity physical activity (LIPA) or 'baseline' activity. With this preview present study was conducted to assess role of physical activity in Diabetis mellitus[17].

MATERIAL AND METHODS

Observational Cross-sectional study was conducted in diabetic OPD (Screening and counselling) of A & U Tibbia College & Hospital during May 2011 to February 2013, 484 participants of either sex between the ages of 30 to 75 years were included in the study and Patients of Type 1 diabetes mellitus were excluded from the study and the sample was collected by simple random technique. All patients were asked about their physical activity including type of activity, frequency and duration. According to the Physical activity performed by the patients three categorize were made as Severe, Moderate and Sedentary. The criteria for Moderate intensity activity were taken as ≥150 min/wk such as brisk walking at 5.6 km/h (3.5 miles/h) on a flat surface other common activities of moderate intensity include playing golf, leisure bicycling at 16 km/h (10 miles/h) and gardening (12) Moderate intensity activities are those that burn 3.5–7 kcal/min [23].Vigorous activities were taken as ≥60 min/wk such as running. Vigorous activities are those that burn >7 kcal/minutes and those who did not were taken as sedentary. Basic data including smoking, marital status, education, nature of job, family income and H/O diabetes were collected. The data was collected and analyzed by percentage and chi square test. Statistical comparison was considered significant when p value were < 0.05.

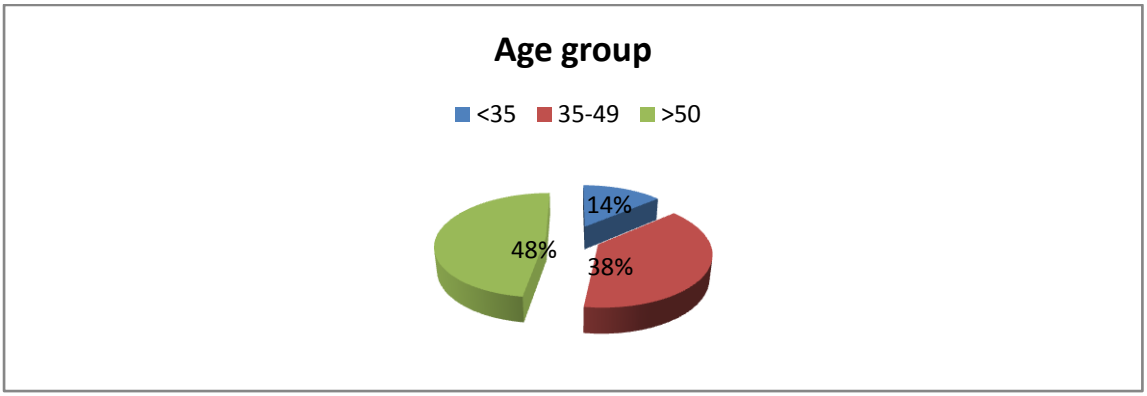
RESULT

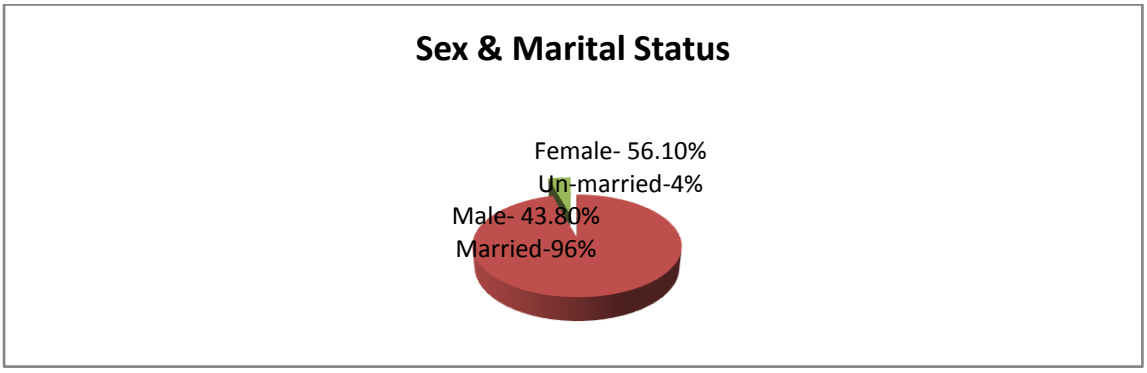
The main results of the study are tabulated below

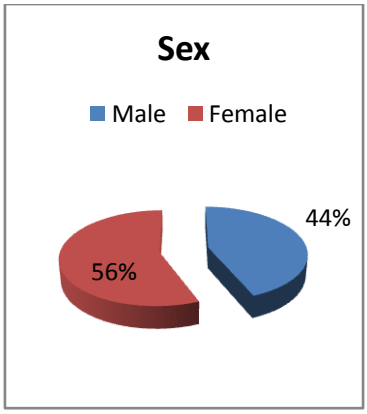
Table I- Distribution of Participants according to Age, Sex & Marital Status, N= 484

Age Group	Number	Percentage	Sex	Number	Percentage	Marital Status	Number	Percentage
<35	67	13.8%	Male	212	43.8%	Married	463	95.6%
35-49	186	38.4%	Female	272	56.1%	Un-married	21	4.3%
>50	231	47.7%						

Majority of the Participants were more than 50 years (47.7%), Females (56.1%) & Married (95.6%).







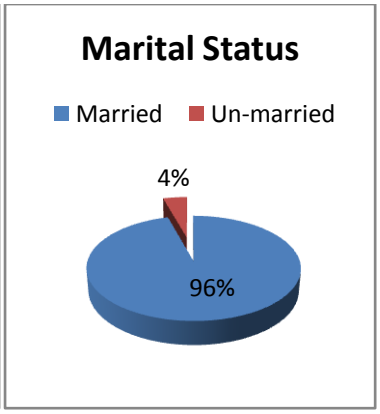
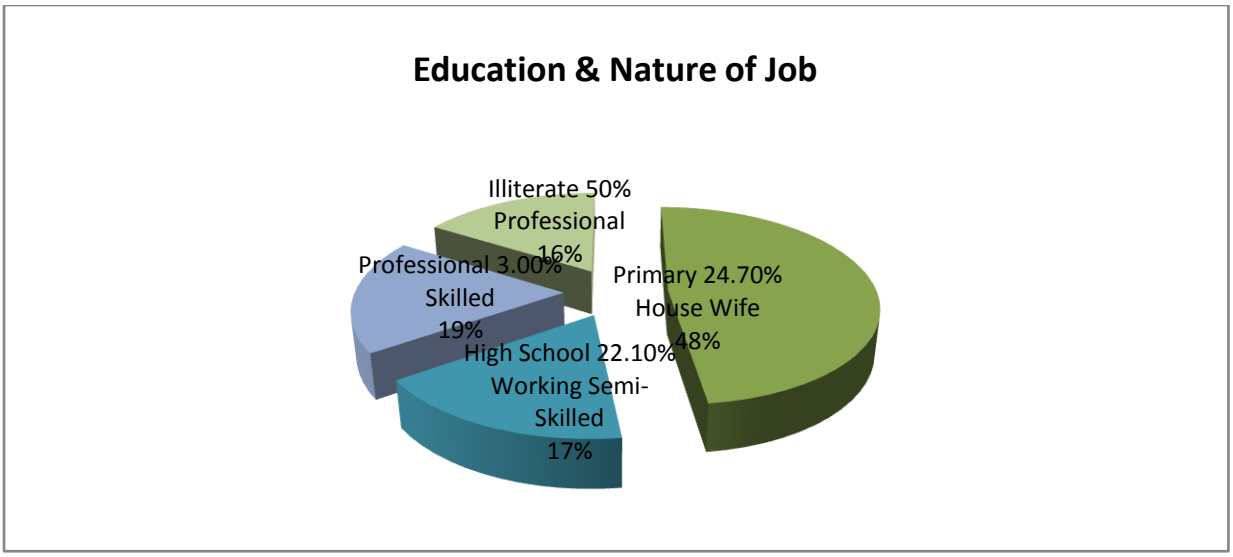
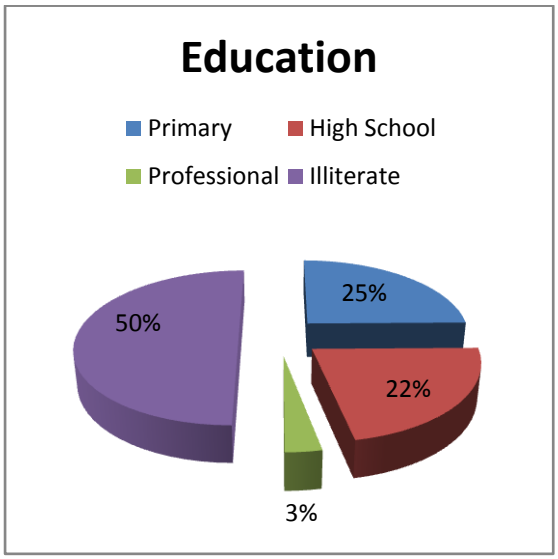


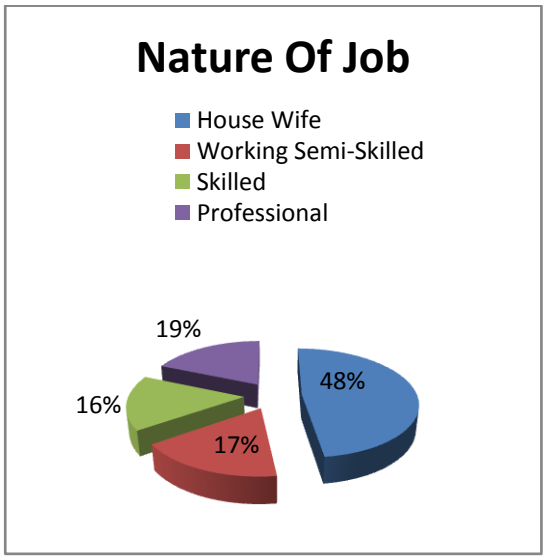
Table – II Distribution of Participants according to Education, Nature of Job & Family Income N=484

Education	Number	Percentage	Nature of Job	Number	%age	Family Income	Number	%age
Primary	120	24.7%	House Wife	232	47.9%	Lower (5000)	257	53.0%
High School	107	22.1%	Working Semi-Skilled	84	17.3%	Lower-Middle (6000- 10,000)	169	34.9%
Professional	15	3.0%	Skilled	90	18.5%	Upper (>25000)	58	11.9%
Illiterate	242	50%	Professional	78	16.1%			

Majority of the Participants were Illiterate (50%), House Wife (47.9%) & Lower Family income (53.0%)







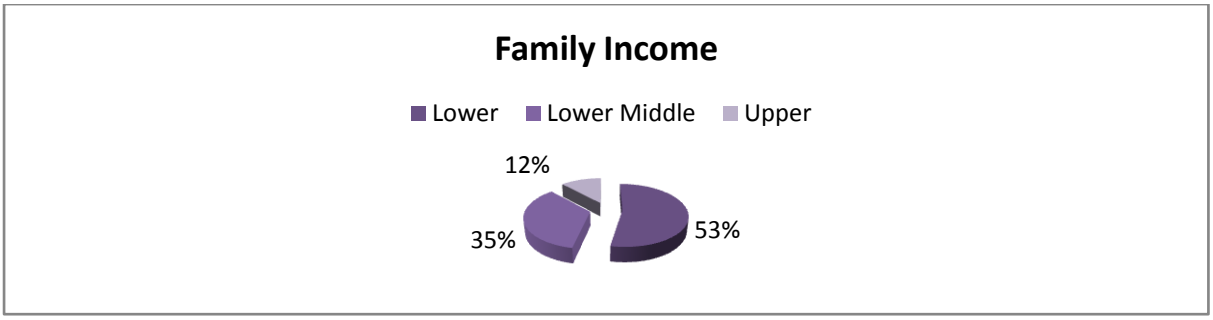


Table – III Distribution of Participants according Diabetes, N=484

Diabetes	Number	Percentage
Yes	397	82.0 %
No	87	17.9%

Majority of the Participants had Diabetes (82.0%) .

Table – IV Distribution of Participants according to Physical Activity, N=484

Physical Activity	Number	Percentage
Severe	29	5.9%
Moderate	130	26.8%
Sedentary	325	67.1%

Majority of the Participants were Sedentary (67.1%).

Table V. Analysis of relation between physical activity severe and moderate and diabetes

	D	ND	
Physically severe & moderate active	97	62	159
Sedantry	300	25	325
	397	87	484

X^2 with yates correction = 68.84 at d.f 1,C.I 95%.Diabetes was found more in people with sedantry lifestyle and it was found extremely significant P>0 .0001.

Table VI.Analysis of relation between severe physical activity and diabetes N=354

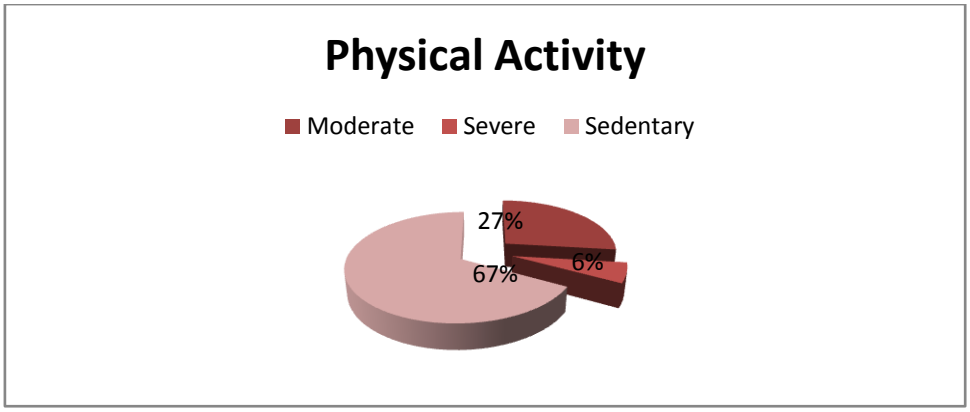
	D	ND	
Physically severe active	9	20	29
Sedantry	300	25	325
	309	45	354

X^2 with yates correction = 84.64 at d.f 1,C.I 95%.Diabetes was found more in people with sedantry lifestyle and it was found extremly significant **P>0 .0001**

Table VII. Analysis of relation between moderate physical activity and diabetes, N=159

	D	ND	
Physically moderately active	88	42	130
Sedantry	300	25	325
	388	67	455

X^2 with yates correction = 42.86 at d.f 1,C.I 95%.Diabetes was found more in people with sedantry lifestyle and it was found extremly significant **P>0 .0003**



DISCUSSION

An observational Cross-sectional study was conducted in diabetic OPD (Screening and counselling) of A & U Tibbia College & Hospital during May 2011 to February 2013, 484 participants of either sex between the ages of 30 to 75 years were included in the study and Patients of Type 1 diabetes mellitus were excluded from the study and the sample was collected by simple random technique. All patients were asked about their physical activity including type of activity, frequency and duration. According to the Physical activity performed by the patients three categorize were made as Severe, Moderate and Sedentary. Majority of the Participants were more than 50 years (47.7%). Majority of the Participants were Females (56.1%) and house wife (47.9 %). Majority of the participants were Married (95.6%) and illiterate (50%) Majority of the Participants had poor monthly income (53.0 %) and belonged to Low SES. Majority of the Participants had Diabetes (82.0%) .majority of the participants were sedentary life style (67.1%). Majority of the participants had diabetes (82.0%) . Majority of the participants had sedentary lifestyle (67.1).Analysis of relation between severe and moderate physical activity with diabetes was done and (x^2 with yates correction = 68.84 at d.f 1,c.i 95%) diabetes was found more in people with sedantry lifestyle and it was found extremly significant **p>0 .0001(Table VI).**Analysis of relation between severe physical activity and diabetes was done (x^2 with yates correction = 84.64 at d.f 1,CI95%) and diabetes was found more in people with sedantry lifestyle and it was found extremly significant **p>0 .0001(Table VII).**Analysis of relation between moderate physical activity and diabetes was done (x^2 with yates correction = 42.86 at d.f 1,c.i 95%.diabetes was found more in people with sedantry lifestyle and it was found extremly significant **p>0 .0003).(Table VIII).**A 2002 review of prospective studies published between 1990 and 2000 concluded that the reduction in the risk of type 2 diabetes associated with a physically active, compared with a sedentary, lifestyle is 30–50%, and that physical activity confers a similar

risk reduction for CHD [24]Physical activity may slow the initiation and progression of type 2 diabetes and its cardiovascular sequelae via favorable effects on body weight, insulin sensitivity, glycemic control, blood pressure, lipid profile, fibrinolysis, endothelial function, and inflammatory defense systems.

CONCLUSIONS

A physically active lifestyle plays a vital role in the management of type 2 diabetes. However, more research is required to identify effective methods of exercise promotion in people with type 2 diabetes.

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