



Level of Physical Activity among Diabetic Patients of Rural and Urban Areas

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Cite this article: Level of Physical Activity among Diabetic Patients of Rural and Urban Areas. Am J Orth and Rhe. 2019; 2(1): 001-004.

Submitted: 19 March 2019; **Approved:** 20 March 2019; **Published:** 21 March 2019

ABSTRACT

Background: Developments in the developing world over the last two decades have dramatically increased diabetes worldwide. Diabetes mellitus (DM) is an important public health problem. The presence of obesity, sedentary lifestyle and physical problems among the patients may increase the effect of diabetes.

Objective: To determine and compare the level of physical activity among diabetic patients of rural and urban areas.

Material and Methods: It was comparative cross sectional study. It was performed at Chaudhary Mohammad Akram Teaching and Research Hospital Lahore, Sialkot Medical Complex, Civil Hospital Sialkot, CMH Sialkot; Kashmir Hospital Sialkot Sameena Nisaar Hospital Sialkot was completed in 06 months. Convenient sampling (Non-Probability) was used for data collection. Sample size calculated from formula and sample size was 400.

Results: Out of 400 patients with diabetes mellitus, 156(39%) were rural and 244 (61%) were urban. The mean age of the participants was 46.53 ± 12.31 . Among participants from rural area 103(66%) were males and 53(34%) were females and among participants from urban areas 119(48.8%) were males and 125(51.2%) were females. The mean age of participants from rural area was 45.48 ± 12.44 and from urban areas was 47.21 ± 12.2 . Out of total 156 participants from rural areas, 2(1.3%) were sedentary, 13(8.3%) were under active, 12(7.7%) were under active regular light activity, 26(16.7%) were under active irregular, and 103(66%) were active. Out of 244 participants from urban areas 9(3.7%) were sedentary, 8(3.3%) were under active, 15(6.1%) were under active regular light activity, 58(23.8%) were under active irregular, and 154(63.1%) were active. P value calculated through chi square test show that there is difference in the level of aerobic activity level and people from rural areas had increased aerobic activity. Out of total 156 participants from rural areas, 140(89.7%) were not performing strength and flexibility. Out of total 244 participants from urban areas, 214(87.7%) were not performing strength and flexibility. The mean score of aerobic activity in rural participants was 5.51 ± 1.63 and in urban participants was 5.17 ± 1.55 . P value ((0.05) calculated through independent sample t test show that there is significant difference in the level of physical activity. The mean score of Strength and Flexibility in rural participants was 0.22 ± 0.71 and in urban participants was 0.28 ± 0.81 . P value ((0.8) calculated through independent sample t test show that there is no significant difference in the level of physical activity. The mean score of total physical activity in rural participants was 5.73 ± 1.93 and in urban participants was 5.75 ± 1.98 . P value ((0.88) calculated through independent sample t test show that there is no significant difference in the level of physical activity.

Keywords: Physical Activity; Exercise; Diabetes Mellitus

INTRODUCTION

Developments in the developing world over the last two decades have dramatically increased diabetes worldwide. Adults should be regularly selected for early detection and care. There is limited research on diagnosis and prevalence in rural communities. (1) Diabetes is the sixth leading cause of death. Approximately estimated 210,000 deaths in the year 1999, Diabetic patients have long-term complications. Diabetes mellitus (DM) is an important public health problem. The presence of obesity, sedentary lifestyle and physical problems among the patients may increase the effect of diabetes. (2) Physical activity, physical fitness, and endurance, as well as proper exercise, are important treatments for diabetes. (3) Exercise is usually recommended for people with diabetes. Nevertheless, in some studies, involvement of activity is assessed, including a change in diet or behavior, or both. (4) Diabetes mellitus is associated with complications in the society. Lack of awareness over the years has been an increase in diabetes. This resulted in less effective work force and enormous economic burden on Pakistan. Studies have been conducted to identify the level of knowledge of diabetes patients in rural and urban areas in Pakistan. The objective of this study is to find areas that require more attention in the field of resources and planning. (5) 4 The lifestyle of the population is changed especially among the youth due to the rapid modernization and urbanization rates, habits and readily fast foods factors. So strong genetic predisposition to metabolic diseases like diabetes the health related problems are more severe in Asian countries population.

Data on the level of consciousness and the presence of diabetes in developing countries is very low. This is important information for planning of public health programs. This study helps to identify

happening, investigate and evaluate with the help of science and research in the research based trial. (1) Most patients with diabetes or at the highest risk of developing diabetes do not perform physical activity regularly according to the national standard rate. There is a need to make efforts in order to increase the physical activity among these people (6).

Objective

To determine and compare the level of physical activity among diabetic patients of rural and urban areas.

Rationale

This study observed that physical activity level of rural and urban patients associated with the diabetes. There are problems in patients affected by diabetes in the forms of obesity, edema and other physical problems. This study conducted to know the extent of physical activity level to which they can perform in order to minimize their disease symptoms. The rationale approach of diabetes begins with the understanding of the disease.

Operational Definition

Rapid Assessment of Physical Activity

This scale is reliable to check the level of physical activity. It has three parts Aerobic, flexibility and strength level. This questionnaire consists of nine questions, if the scoring is less than <6 then the activity level will be suboptimal and if scoring is greater than >6 then the activity level will be optimal. Specificity and sensitivity of this scale is 0.75 and 0.73 respectively (7).

Literature Review

A prospective cohort study is conducted by Rich Edwards et al, 1986, in which they examine physical activity of diabetics and

benefits. The data is collected by quintiles of MET score for walking. After the analysis it was seen that the age, smoking, alcohol consumption, history of hypertension, high cholesterol history and other common variables are closely related to diabetes. The Data indicate that a higher level of physical activity is associated with a significant reduction in the risk of type 2 diabetes, including the physical activity of moderate intensity and duration.(8) Lindstrom J et al conducted a study to determine physical activity, BMI, risk of type2 diabetes with glucose regulation by COX proportional hazards model. The result concluded that there is still a good relationship between BMI and diabetes. Increasing the risk of diabetes could be reduced to increased physical activity. The physical effects on physical activity were observed in patients with excessive BMI and high level of glucose..Regular physical activity and weight control, and normal blood glucose levels in patients with diabetes, are the important factors to prevent [8].

A comparative study which is evaluate and compare RA patterns in relation with HTN and diabetes in urban and rural areas by Unwin NC et al. The data collection was done by random sampling of households. In rural women (P <0.05) as compared to men is more in urban areas. Urban patients have lower physical activity (P <0.001), with high presence and rural have low presence of diabetes. The prevalence of diabetes in the research population in the world if compared to the urban residents is higher. Physical activity is considerably lower than in rural and urban forms. Physical disability is linked with these diseases, but it is not necessary in women.(9) Another study was conducted by Ananth Samith Shetty et al. to evaluate trends in prevalence of diabetes in Asia especially in India and China..The research justified that, most of the countries in Asia especially India and china diabetes is at risk. In the growing number of people there is a significant problem of diseases and complication like the childhood diseases and the presence of T2D developments in children. The lifestyle of the population is changed especially among the youth due to the rapid modernization and urbanization rates, habits and readily fast foods factors. So strong genetic predisposition to metabolic diseases like diabetes the health related problems are more severe in Asian countries population.

By modification of risk factors like physical inactivity that leads to obesity can prevent the diabetes primarily. In the health care agenda, The national programs should be implemented from the young ages among the population for the healthy lifestyle (10).

Material and Method

Study Design

It was comparative cross-sectional study.

Study Setting

- Chaudhry Muhammad Akram Teaching and Research Hospital Lahore
- Sialkot Medical Complex
- Civil Hospital Sialkot
- CMH Sialkot
- Kashmir Hospital Sialkot
- Sameena Nisaar Hospital Sialkot

Study Duration

6 months from 3-1-18 to 30-8-18

Inclusion Criteria

- Male and female diabetic patients with ages from 21 to 71 years or above were included after written informed consent.

Exclusion Criteria

- Patients suffering from respiratory, gastrointestinal, cardiovascular, neurological, hepatic or other infectious disorders.
- Patients suffering from autonomic neuropathy.
- Patients with any musculoskeletal disorders.

Sample size

$$N_1 = \left\{ z_{1-\alpha/2} * \sqrt{p * q * (1 + \frac{1}{k})} + z_{1-\beta} * \sqrt{p_1 * q_1 + (\frac{p_2 * q_2}{k})} \right\}^2 / \Delta^2$$

p1, p2 = proportion (incidence) of groups #1 and #2

$\Delta = |p_2 - p_1|$ = absolute difference between two proportions n1 = sample size for group #1

n2 = sample size for group #2

α = probability of type I error (usually 0.05) β = probability of type II error (usually 0.2) z = critical Z value for a given α or β

K = ratio of sample size for group #2 to group #1

Z1- $\alpha/2$ (Z score for level of significance in two sided test) = 1.96

Z1- β (Z score for power of the test) = 0.84 (80% power) Estimated proportion derived from literature is

Proportion in urban (P1) = 16.1%. (11) Proportion in rural (P2) = 7.1%(12)

Sample size through above mentioned formula is 400.

Sampling Technique

Convenient Sampling (Non-Probability) was used.

Sample Collection Procedure

Sample was collected from government & private hospitals of Lahore and Sialkot. Informed consent was taken before collection of data. Subjects were selected according to inclusion criteria. Physical activity was determined through RAPA questionnaire. Participants was divided into two groups, 1st group included the rural area with diabetes mellitus while 2nd group include urban area with diabetes mellitus. The two groups provided with rapid assessment of physical activity questionnaire. This questionnaire was helpful in providing required information regarding to know the physical activity of both respected groups with diabetes mellitus. Data was collected after taking an informed consent by participant. Both groups have total independency of leaving the study at any time.

Data Collection Tool: In this study rapid assessment of physical activity was used.

Statistical Tool

Data was analyzed by using SPSS 20 version. Mean $\pm$ SD was calculated for numeric variables. Chi squared test was used.

Ethical Consideration

Permission was taken from patient by using consent form on the paper and verbally, written permission was taken by Hospital Administration, Head of emergency department of Hospitals.

RESULTS

Table 1: Socio demographic Profile

Age	Minimum	Maximum	Mean	SD
	21	71	46.53	12.31

Socio- demographic profile is summarized in Table-1. The minimum age of participants in socio demographic profile is 21 and maximum age is 71. The mean age of participants is 46.53 and Standard deviation is 12.31

Table 2 : Comparison of Age and Gender

Variable		Rural n=156	Urban n=244	Total n=400
Gender	Male	103(66%)	119(48.8%)	222(55.5%)
	Female	53(34%)	125(51.2%)	178(44.5%)
Age		45.48 $\pm$ 12.44	47.21 $\pm$ 12.2	46.53 $\pm$ 12.31

diabetic patients participated in the study. The mean age of the participants was 46.53 $\pm$ 12.31. Out of total 156 participants were from rural area and 244 were from urban area. Among participants from rural area 103(66%) were males and 53(34%) were females and among participants from urban areas 119(48.8%) were males and 125(51.2%) were females. The mean age of participants from rural area was 45.48 $\pm$ 12.44 and from urban areas was 47.21 $\pm$ 12.2.

Table 3: Comparison of Aerobic Activity

Aerobic Activity	Residence			p value
	R u r a l n=156	U r b a n n=244	Total n=400	
Sedentary	2(1.3%)	9(3.7%)	11(2.8%)	0.05
Under Active	13(8.3%)	8(3.3%)	21(5.3%)	
Under Active Regular light Activity	12(7.7%)	15(6.1%)	27(6.8%)	
Under Active Regular	26(16.7%)	257(64.3%)	84(21%)	
Active	103(66%)	154(63.1%)	257(64.3%)	

Out of total 156 participants from rural areas, 2(1.3%) were sedentary, 13(8.3%) were under active, 12(7.7%) were under active regular light activity, 26(16.7%) were under active irregular, and 103(66%) were active. Out of 244 participants from urban areas 9(3.7%) were sedentary, 8(3.3%) were under active, 15(6.1%) were under active regular light activity, 58(23.8%) were under active irregular, and 154(63.1%) were active. P value calculated through chi square test show that there is difference in the level of aerobic activity level and people from rural areas had increased aerobic activity.

Table 4: Comparison of Strength and Flexibility

Strength & Flexibility Activity	Residence			p value
	Rural n=156	U r b a n n=244	Total n=400	
None	140(89.7%)	214(87.7%)	354(88.5%)	0.8
Strength Activity	6(3.8%)	10(4.1%)	16(4%)	
Flexibility Activity	2(1.3%)	2(0.8%)	4(1%)	
Both	8(5.1%)	18(7.4%)	26(6.5%)	

Out of total 156 participants from rural areas, 140(89.7%) were not performing strength and flexibility, 6(3.8%) were performing strength activity, 2(1.3%) were performing flexibility, and 8(5.1%) were performing both strength and flexibility. Out of total 244 participants from urban areas, 214(87.7%) were not performing strength and flexibility, 10(4.1%) were performing strength activity, 2(0.8%) were performing flexibility, and 18(7.4%) were performing both strength and flexibility.

Table 5: Comparison of score of activity

Variable	Rural n=156	Urban n=244	p value
Aerobic Activity	5.51±1.63	5.17±1.55	0.05
Strength and Flexibility	0.22±0.71	0.28±0.81	0.8
Total Activity Score	5.73±1.93	5.75±1.98	0.88

The mean score of aerobic activity in rural participants was 5.51±1.63 and in urban participants was 5.17±1.55. P value ((0.05) calculated through independent sample t test show that there is significant difference in the level of physical activity. The mean score of Strength and Flexibility in rural participants was 0.22±0.71 and in urban participants was 0.28±0.81. P value ((0.8) calculated through independent sample t test show that there is no significant difference in the level of physical activity. The mean score of total physical activity in rural participants was 5.73±1.93 and in urban participants was 5.75±1.98. P value ((0.88) calculated through independent sample t test show that there is no significant difference in the level of physical activity.

Discussion

Diabetes is the sixth leading cause of death. Approximately estimated 210,000 deaths in the year 1999, Diabetic patients have long-term complications. Although, participants from rural are physical more active than participants from urban area in terms of aerobic activity but there is no difference in the strength and flexibility among both groups and as a whole participants from both group had equal level of physical activity.

A similar study shows that the study data is conducted from different government and private sector hospitals. The Data indicate that a higher level of physical activity is associated with a significant reduction in the risk of type 2 diabetes, including the physical activity of moderate intensity and duration.(8) Another study shows that increasing the risk of diabetes could be reduced to increased physical activity. The physical effects on physical activity were observed in patients with excessive BMI and high level of glucose. Regular physical activity and weight control, and normal blood glucose levels in patients with diabetes, are the important factors to prevent. [8] It was taken into account that the patients who were diabetic showed a decrease level of motivation towards the physical activities as although through physical activity both of these groups can be managed. The patients were more reluctant on doing whatsoever no physical activity at all as they had complains related to the pain and swelling of feet which they had to suffer in DM. As for other factors patients with DM had to face many domestic and social issues from the society due to which they were more depressed and had psychological issues which fatigued them more during their daily routine stress which they have to face every day from their closed ones thus showing very less motivation towards any type of physical activity or continuing any sort of exercise program.

The patients with diabetes mellitus should be motivated to promote their level of physical activity and should be informed of the beneficial effects of physical exercise program, the physical therapists must have an effective direct two way communication between the patients and themselves thus eliminating the risk factors and educating them more about the beneficiary effects of the physical activity program.

CONCLUSION

Although, participants from rural are physical more active than participants from urban area in terms of aerobic activity but there is no difference in the strength and flexibility among both groups and as a whole participants from both group had equal level of physical activity.

The time for our study to be carried out limited. The patients had a difficulty in reading out the questionnaire as their education was not enough to sort it out. Patients with diabetes mellitus were difficult to isolate as they did not visited the hospitals regularly in our community.

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