ORIGINAL ARTICLE

Physical Activity and Its Related Factors Among Type 2 Diabetic Patients in Hamadan

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Abstract

Objective: Lack of exercise is the fourth cause of death in the world. There is an inverse relationship between physical activity and the risk of diabetes. The aim of this study was to determine physical activity status and its related factors among type 2 diabetic patients in Hamadan, west of Iran.

Materials and Methods: This analytical-observational study was performed on320 type 2 diabetic patients recruited with a convenient sampling method. The participants completed a self-administered checklist including demographic characteristics, International Physical Activity Questionnaire (IPAQ) and psychological factor such as Knowledge, attitudes and self-efficacy. Data analysis was done with the SPSS software (version 16), using, one way ANOVA, chi-square tests and Fisher's exact test.

Results: Physical activity of most patients (57.5%) was moderate. The associations between physical activity and age, education, occupation and marital status were significant (P<0.05). One way ANOVA indicated that attitude and self-efficacy were significantly associated with physical activity.

Conclusion: The demographic and psychological variables relationship with physical activity is important. These findings can be used as an introduction to design effective intervention to promote physical activity.

Keywords: Attitude, Awareness, Intention, Physical activities, Self-efficacy

Introduction

Diabetes is a metabolic disorder in which defect in insulin secretion or function or both can lead increase of blood sugar. In long term, high blood sugar can damage organs and tissues (1). Diabetes is the cause of more than 1.3 million deaths in the world, the main cause of kidney failure in most countries, and consume over 15% of the health care budget (2). One of every 20 Iranians suffer from diabetics and half of them do not know about their disease. Every 10 seconds one person in the world will die due to lack of awareness about control of diabetes (3).

However, lack of exercise is the fourth cause of death in the world, and accounts for 6% of the deaths (4). Around 21-25% of breast and colon cancers, 27% heart diseases and 30%

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diabetes have been caused by lack of physical activity (5). Physical activity is a key element in energy consumption and consequently has an important role in weight management and energy balance (5). Physical activity has a direct relationship with healthy metabolic system (6-7). Diabetes can be prevented with a healthy diet, proper physical activity, weight control and avoiding tobacco usage (1).

World health organization estimated 285 million diabetic patients live worldwide in 2012 (8). Urbanization causes increase of elderly population, prevalence of a sedentary life style and population growth. Thus, for the disease control, preventing of impaired blood sugar control and keeping it in the ideal range is necessary (9-10). To achieve this goal, it is necessary to encourage diabetic patients to follow healthy recommendations such as exercise, complying with diabetic medication, lifestyle modification and regular checking of blood glucose.

Researchers have estimated that 37-60 % of diabetics do not do exercise (11) .Eighty percent of people with diabetes suffer from lack of awareness, knowledge and practical skills about physical activity and healthy lifestyle (12). In Farghani's study, the physical activity during leisure time among noninsulin dependent diabetic was walking in 36.6 % men and 28.6 % in women (13). Hosseinpour's study showed that 90% of noninsulin diabetic patients are inactive at leisure time and housekeeping activities were also very low. Physical activity causes energy expenditure that its result is weight loss (14).

A diabetic patient's inactivity may be due to demographic, social and psychological reasons. Their knowledge and understanding help health care providers to design powerful interventions to physical activity promotion. The present study was conducted to investigate the status of physical activity, and its psychological and demographic reasons that influence the type 2 diabetic patients.

Materials and Methods

This analytical cross-sectional study was conducted on 320 patients with type 2 diabetes who referred to the Diabetes Center of Hamadan in 2013. Study samples were randomly selected between diabetic research center patients. The unnamed questionnaires were used for data collection. Two trained interviewers completed the questionnaires. Interviewers introduced themselves to the patients and explained the purpose of study and requested them to avoid writing their names on the questionnaires. All questionnaires maintained confidentially and were stored for statistical analysis. All research subjects enrolled an informed consent .

The data collection tool was a questionnaire, consisting of three main parts, which were completed by the self-report method. The first part included the demographic characteristics of the participants such as age, gender, educational level, marital status, occupation, height, weight and smoking history. The second part is the reliable and valid Persian form of the International Physical Activity Questionnaire (IPAQ). The questionnaire assessed the physical activity and classified it into three categories: low, moderate and severe. International Physical Activity Questionnaire, measures physical activity during the past 7 days and according to the final score determined the intensity of activity during the last 7 days (15). Psychological factors: this section was measured based on a standard questionnaire (16-17) and included 3 constructs including attitude, self-efficacy and knowledge. In this regard, 7 items and 4 items were designed to measure attitude toward physical activity and self-efficacy, respectively. The items were rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate more positive attitude and high self-efficacy to physical activity. Moreover, patients' knowledge about physical activity consequences was measured using 13 items. The items were rated on 3-options.Score of 1 was always given to correct option (Yes), and

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score of zero was given to incorrect option (No and I don't know).

Scoring :

Activities such as aerobics, speedy cycling, hiking and basketball that needed more than 6 calories per minute were determined as intense and activities such as volleyball, badminton, walking, cleaning rooms that need 3.6 calories per minute, as moderate. In addition, activity duration less than 10 minutes will be removed. Total intensity during the last 7 days was calculated according to the IPAQ protocol. Low-intensity physical activity was considered when consumption was 600 met / cal /for a total week , if the activity was 600 to 3000 met / cal / week was considered as medium, and severe category is more than 3000 met / cal / week. Data analysis was by means of SPSS software (version 16); and descriptive statistics, one way ANOVA, chi-square tests and Fisher's exact test were performed .

Results

Totally 320 patients with type 2 diabetes participated in this study. Patients were between 20-65 years old. The mean age was 55 years old. Most of participants (61.9%) were between 45 to 65 year old and 0.6% was less than 25 years old. About 12.2% of participants were college graduates and a majority of them were illiterate or primary educated. Most of them were female (71.6%) and married (74.1%). Only 27 patients (8.43%) were smokers and 20 of them (74.08%) were men and women are only 7 of them (25.92%). About 231 patients (72.18%) were self-employed (Table 1**).**

Regarding physical activity status, a number of 184 patients (57.5%) had moderate levels of physical activity, and 83 (25.9%) and 53 (16.5%) patients had low and high level of physical activity, respectively. Most their physical activity was walking and traveling by motorized vehicles such as subway, bus, motorcycle or car. Also, vigorous physical activities such as, aerobic exercise, running, fast cycling, fast swimming, football had the lowest frequency (Table 2) .

The effects of psychological variables on physical activity in type 2 diabetic patients were investigated (Table 3). According to the results Attitude and self-efficacy were significantly associated with physical activity (P>0.001). The people with high physical activity have a more positive attitude to physical activity and had higher levels of self-efficacy.

Table 4 shows association between demographics variables and physical activity. The associations between physical activity level and age, education, occupation and marital status were significant (P<0.05).But there was no association between physical activity and gender, tobacco consumption, and body mass index (P>0.05).

Table 1. Demographic variables among diabetic patients

Demographic variables		Frequency N (%)
Marrital status	Married	237(74.1%)
	Single	14(4.4%)
	Widow	63(19.7%)
	Divorced	1(0.3%)
	Other	5(1.6%)
Occupation	Unemployed	7(2.2%)
	Self-employ	231(72.2%)
	Sear	24(7.5%)
	Employee	20(6.2%)
	Retired	38(6.9%)
Gender	Male	91(28.4%)
	Female	229(71.6%)
Age	<25	2(6%)
	25-45	59(18.4%)
	45-65	198(61.9%)
	>65	61(19.1%)
Smoking	Yes	27(8.4%)
	No	293(91.6%)
Body mass index*	Underweight	11(3.4%)
	Natural	77(24.1%)
	Overweight	123(38.4%)
	Obese	61(19.1%)
	Obesity Type 1	21(6.6%)
	Obesity type 2	5(1.6%)
Education	Illiterate	100(31.2%)
	Primary	99(30.9%)
	Guidance	41(12.8%)
	High School	41(12.8%)
	Collegiate	39(12.2%)

*Body mass index have 22 missed people.

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Table 2. Distribution of physical activity type among study participants.

Type of Activity	Frequency N (%)
Travel by motorized vehicles such as subways, buses, motorcycles and passenger cars	231 (27.19%)
Cycling	9(2.8%)
Walking	237(74.1%)
Vigorous physical activities like heavy lifting, chopped firewood, shoveling snow or things like digging and plowing the land in the garden or yard	53(16.6%)
Moderate physical activities like carrying light loads, sweeping, cleaning glass windows, working with fork (for collecting the leaves, smooth surface, etc.) in the yard or garden.	181(56.6%)
Moderate physical activities like carrying light loads, cleaning glass windows and sweeping the floor grate in your home	162(50.6%)
Walking at leisure	137(42.8%)
Vigorous physical activities such as aerobic (aerobic exercise), running, fast cycling, fast swimming, football Leisure	30(9.4%)
Moderate physical activities like cycling with average speed, average speed swimming, tennis doubles (team), volleyball leisure	52(16.2%)

Discussion

The present study examined the related demographic and psychological factors effecting physical activity of diabetic patients as a prelude to designing effective interventional strategies to improve physical activity. Based on the findings, most patients had a moderate level of physical activity. About 71.1% of the patients chose walking as part of their activity. Only 2.8% of patients do cycling. However, other studies reported a lower level of physical activity among diabetic patients. For example, Abhinav et al. reported 43.3% of Nepalian diabetic patients had low level of physical activity (18). Cultural differences between Iran and Nepal, and methodological differences between studies could be the cause of these controversies. In Farghani et al. study only 36.6% of diabetic men and 28.6% of diabetic women walked during their leisure time and 19.6% of men and 11 % of women did other exercises (13). Also in a study by Hosseinpoor et al, 90% of diabetic women reported sedentary leisure time (14). In Galileans et al. study 64.9% of the patients did light-intensity physical activity, 29.8 % moderate and 5.3% of them did high intensity of physical activity(19). The Difference between these studies can be explained by the interval between the studies and methodological differences. Patient's gender can also justify the different results, and our study has included both sexes. Since physical activity is an important protective factor of cardiovascular disease, osteoporosis, cancer and diabetes. Therefore proper physical activity in a broad spectrum such as Gardening, walking, housework, vigorous aerobic exercise and walking can be recommended (15). The planning and carrying out educational programs, employing physical-trainers and health education specialists in urgent care centers seems necessary.

According to the findings of our study, attitude and self-efficacy are associated significantly

Table 3. Relationship between psychological variables and physical activity levels among study participants.

psychological variable	Physical activity level			P-value
	low	moderate	high	
	Mean (±SD)	Mean (±SD)	Mean (±SD)	
Knowledge	5.37 (2.33)	5.7 (2)	6.11 (2.16)	0.14
Attitude	75 (22.82)	83.3 (18.82)	90.49 (13.79)	0.001
Self-efficacy	47.66 (23.33)	57 (21.27)	63 (20.81)	0.001

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Table 4. Relationship between demographic variables and level of physical activity among study participants (n=320)

Demographic variables		Physical activity levels			*P*-value
		Low	Moderate	High	
		Frequency (%)	Frequency (%)	Frequency (%)	
Marring status	Marred	53(63.9)	144(78.3)	40(75.5)	0.011
	Single	3(3.6)	10(5.4)	1(1.9)	
	Died	27(32.5)	27(14.7)	9(17)	
	Divorced	0	0	1(1.9)	
	Other	0	3(1.6)	2(3.7)	
Occupation	Unemployed	1(1.2)	6(3.3)	0	0.017
	Self-employ	62(74.7)	134(72.8)	35(66)	
	Sear	12(14.5)	11(6)	1(1.9)	
	Employee	1(1.2)	12(6.5)	7(13.2)	
	Retired	7(8.4)	21(11.4)	10(18.9)	
Gender	male	17(20.5)	59(32.1)	15(28.3)	0.155
	female	66(79.5)	125(67.9)	38(71.7)	
Age	<25	0	2(1.1)	0	0.001
	25-45	10(12)	39(21.2)	10(18.9)	
	45-65	45(54.3)	117(63.6)	36(67.9)	
	>65	28(33.7)	26(14.1)	7(13.2)	
Smoking	Yes	4(4.8)	20 (10.9)	3(5.7)	0.236
	No	79(95.2)	164(89.1)	50(94.3)	
Body mass index	Underweight	5(6.5)	4(2.3)	2(4.3)	0.591
	Natural	13(16.9)	53(30.5)	11(23.4)	
	Overweight	34(44.2)	68 (39.1)	21(44.6)	
	Obese	19(24.7)	36(20.7)	6(12.8)	
	Obesity Type 1	5(6.4)	10(5.7)	6(12.8)	
	Obesity type 2*	1(1.3)	3(1.7)	1(2.1)	
Education	Illiterate	43(51.8)	44(23.9)	13(24.4)	0.001
	Primary	25(30.1)	64(34.8)	10(18.9)	
	Secondary	6(7.3)	25(13.6)	10 (18.9)	
	High School	5(6)	26(14.1)	10(18.9)	
	Collegiate	4(4.8)	25(13.6)	10(18.9)	

* BMI ≥ 35

with physical activity. People who do physical activity more than others have positive attitude to physical activity. They also had higher levels of self-efficacy. Studies showed that attitude is the strongest predictor of intending to engage in physical activity (11). In this regard, a study by Ghahremani et al. showed that self-efficacy and positive attitudes explained physical activity behavior (20). A positive attitude is a strong predictor for behavioral intention. Attitude and perceived behavioral control effect physical activity with variance of 8.32%. Also attitude and perceived behavioral control were significantly related to the intention to physical activity behavior in Fortier (21) study.

Didarlo et al. confirmed our findings, which self-efficacy is the most powerful and effective variable in performing physical activities, also directly and indirectly influence the physical activity (22). Variables such as attitudes, social pressure, awareness and education had highest predictive power on physical activity. In Daniel et al study, there was significant association between physical activity and self-efficacy (23). Understanding patient's beliefs about exercise can help researchers and health care providers

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contribute and develop strategies for increasing physical activity, promote positive change and facilitate lifestyle changes , long - term behavior, and ultimately enhance health and quality of life. To increase self-efficacy toward physical activity in diabetic patients, interventional procedures such as verbal persuasion, emotional motivation modeling and previous successful experiences can be useful in physical activity. The patient's self-efficacy improves with educational interventions and adopts self-care behaviors, particularly physical activity for a better control of the disease.

In this study, a significant correlation between variables such as education level, age, occupation, marital status and physical activity level was found. Further, there was a significant association between education level and physical activity. Education is an indicator of participation and duration of physical activities: the Humphreys et al. (24) and Brown (25) studies showed. Also, Momenan et al. (26) And Dydarlu et al. (22) believed that education is a powerful predictor of physical activity. But in Daniali et al study (23) no significant relationship was found between education and physical activity level. Perhaps this difference could be attributed to other reasons such as lack of time and responsibilities of the family and other psychological barriers of physical activity that reduced it’s levels. This difference may be because of differences in the study population (age, gender and occupation in Momenan et al. study). Dydarlu's et al. (22) study was conducted on diabetes people.

Abhinav et al. (18) studied the Nepalese society, and demonstrated negative relationship between physical activity and age which could be due to the social differences among the studied populations. In Habibi's study, instrumental activities are associated with age, gender and education, but showed no statistically significant relationship with marital status and physical activity level (27).

Tools and methods of measuring and the time interval between studies are the causes of these differences. Also Between gender, tobacco consumption and BMI with physical activity did not have a significant relationship .

Self-reporting limits about the patient's physical activity condition is one of the most important limits for present study and their psychological variables perfectly qualitative. Observation is a best method for collecting behavioral manners data. Cross- Sectional study is the major limits for this study, longitudinal studies is needs to studding the behavior of physical activity among patients.

Conclusion

The results of the present study showed physical activity and demographic variable such as education, age, job and marital status as well as psychological variables like attitudes and self-efficacy are associated. The relationship between these variables and physical activity is important and these findings can be used as a prelude to the design of effective intervention strategies to promote physical activity.

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