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Original Research Article

The magnitude, determinants and barriers for physical activities among diabetic patients in Qassim area of Saudi Arabia

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ABSTRACT

Background: To review the level of physical activity (PA) among adult diabetics and barriers to PA in this population.
Methods: This survey was performed in 2017 and enrolled adult diabetics from primary health center of the National Guard in Qassim, Saudi Arabia. International Physical activity questionnaire was used to grade the level of PA. The three intensities of PA (walking, moderate and vigorous exercise), and number of days per week and hours per day were queried for each participant. Metabolic equivalent (MET), a proxy indicator of PA was calculated. Data were analyzed for associations to demographic and diabetes-related factors. Participants were queried on barriers to PA such as time, space, high cost, physical disability, preoccupation with other priorities and languor.
Results: We interviewed 395 diabetic patients. The low and moderate levels of PA were noted for 320 (81%) and 75 (19%) participants respectively. None had a high level of PA. Gender (P=0.4), age (P=0.45), body mass index (P=0.66) were not associated to PA. Joint problems (43%), languor (35.2%) and family time (33.9%) were the main barriers that lowered PA.
Conclusions: There was a low level of PA among diabetics in Qassim. Barriers to PA should be proactively addressed during patient counseling to improve PA in this population. Counseling direct towards increasing PA may mitigate the physically disabling complications of cardiovascular events among diabetics.

Keywords: Barriers, Cardiovascular risk factors, Diabetes, Physical activities

INTRODUCTION

Decreased physical activity (PA) in modern times is blamed an increased burden of chronic noncommunicable diseases (NCD) globally.[1,2] Therefore, member countries of the United Nations endorsed efforts to address this decrease in PA.[3] The PA have been found to have positive impact on diabetes management.[4] PA was significantly and negatively associated to hypertension and obesity in adult Australians.[5] Data on the presence of chronic NCDs among adults may assist in addressing factors that reduce participation in PA. Universal confounders such as age and gender may influence the association of PA and chronic NCDs.[6] Females with diabetes have been found to have less physical limitations compared to male diabetics.[7] The risk of osteoporosis and accidental falls are more common among diabetic females.[8] This could negatively affect the extent of physical activities carried out by diabetic individuals especially females. European adults not interested in PA were found to have a higher body mass index (BMI), lower self-rated health, less education, female and unemployed.[9]

A number of studies focused on diabetic patient perceived barriers for doing exercise.[9,10-12] In UK,

diabetic patients considered tiredness, difficulty in participating in exercise, preoccupation in watching television, lack of time and facilities for exercise were main barriers.[9] In Ireland, obese diabetics were interviewed to find barriers they faced.[10] Lack of time and physical inability to do exercise were main barriers reported in this study. In a mountainous country; Nepal, diabetic identified other ailments, cold climate, laziness, lack of time as main barriers for exercise.[11] In neighboring country UEA, the diabetic reported that arthritis, lack of time, cultural issues, lack of interest, and family responsibilities were main barriers for undertaking PA.[12] Surprisingly in a country with high prevalence of NCD, Saudi Arabia, to the best of our knowledge no evaluation of barriers for PA among diabetic is undertaken.

We present the level of PA and its barriers among adult diabetics in the Qassim region of Saudi Arabia.

METHODS

The research committee of the primary health center of the National Guard in Qassim. approved this study. Adult diabetics registered at healthcare institutions were invited to participate in 2017. A written informed consent was obtained from all participants. This study adhered to the tenets of the declaration of Helsinki.

For sample size calculations, we assumed that the prevalence of physical inactivity among the adult Saudi diabetic population was 31%.[13] To achieve 95% confidence interval (CI) and 5% margin of error, at least 330 randomly selected diabetic patients were required. To compensate for nonparticipation or dropout, we increased the sample by 10%. Thus the final study sample size was 395 adult diabetics.

Seven family physicians were the field investigators for this study. Data were collected on patient age, gender, educational level, marital status, current occupation, history of hypertension, ongoing medication to manage hypertension, history of diabetes and other ailments and medications or treatments. Blood pressure (BP) was measured in sitting position using a digital sphygmomanometer.

The measurements were repeated twice and the mean value was documented. The average systolic and diastolic blood pressure (in mmHg) were noted for each patient. If the patient was taking medications for hypertension, he/she was classified as hypertensive irrespective of BP readings. Hypertension was defined as systolic pressure ≥140 mmHg and/or diastolic BP ≥ 90 mmHg.[14] A self-administered International Physical Activity questionnaire was used to determine the level of physical activity (PA) of each participant.[15] A Excel (Microsoft Corp., Redmond, WA, USA) IPAD (Apple Inc., Cupertino, CA, USA) spreadsheet was used to automatically calculate the metabolic equivalent (MET) and three grades of PA; mild (<600 MET), moderate (600 to 3000 MET) and high (>3000 MET). Data were collected on the perceived barriers to PA. Each participant was asked to select the barriers and rank based on their personal life from the options of no time for exercise, no place for exercise, friction joints or joint pain, busy with family, inclement weather, expensive gym, work pressure, fatigue/tiredness and laziness.

BMI was graded as normal (18.5-24.9 kg/m^2), overweight (25 to 29.9 kg/m2), obese (30 to 39.9 kg/m^2) and extremely obese (>40 kg/m^2). The HbA1c test report was used to define glycemic control. Poorly controlled diabetes was defined as a HbA1c level greater than 7%.

The data were recorded in an Excel spreadsheet (Microsoft Corp., Redmond, WA, USA) and transferred to Statistical Package for the Social Sciences (SPSS 25; IBM Corp., Armonk, NY, USA). The frequency and percentage proportions were calculated for qualitative variables. If the data were normally distributed, the mean and standard deviation was calculated. If the distribution of data was non-normal, the median and 25% quartile was calculated. The PA grades were associated to other factors using Odd's ratio (OR), its 95% CI and two sided P value. P values <0.05 were considered statistically significant. The barriers were presented as numbers and percentage proportions.

RESULTS

We interviewed 395 adult diabetics. Their mean age was 55.1 ± 10.7 years. The demographic details are presented in Table: 1.

Table 1: Profile of adult diabetics that responded to physical activity related survey in Qassim area of Saudi Arabia.

		Number	%
Gender	Male	159	40.3
	Female	236	59.7
Marital status	Married	343	86.8
	Divorced	1	0.3
	Widowed	39	9.9
	Bachelor	1	0.3
	Missing	11	2.8
Literacy	Illiterate	205	51.9
	Informal education	35	8.9
	Schooling	93	23.5
	College	35	8.9
	Missing	15	3.8
Occupation	Employed	51	12.9
	No job	3	0.8
	Own business	2	0.2
	Retired	106	26.8
	Housewife	225	57.0
	Missing	8	2.0

Based on the feedback of participants, low grade of PA was noted in 320 (81%) participants and moderate PA was reported by 75 (19%) diabetics.

Their responses revealed that 8(2%) of them were doing vigorous exercise for a mean of 5.1±2 days in a week and 1±0.75 hour in a day. Moderate grade of exercise was performed by 42 (10.6%) diabetic. They performed moderate grade of exercise for 5±1.9 days in a week and 1.4±1.3 hours per day. Walking was daily activity for 210 (53.2%) diabetic patients. They used to walk 4.3±2 days in a week and 20 ±13 minutes per day. The PA by diabetic was median 3 hours per week (25% quartile 0.5 hours, minimum 0 hours and maximum 50.75 hours). Table 2 presents the association of PA level to demographic and other chronic ailments. The subjective impression of the participants regarding barriers to PA is presented in Table 3. Only 10.4% of participants stated there were no barriers to PA. Joint problems prevented regular PA in four out of ten diabetics. Languor and preoccupation with family matters were other main barriers reported by more than one third of the participants.

Table 2: Determinants of Physical Activities among diabetics of Qassim, Saudi Arabia.

		Low PA		Moderate PA		Validation
		Number	%	Number	%	
Gender	Male	132	41.3	27	36.0	P = 0.4
	Female	188	49.3	48	64.0	
Education status	Read and write	193	61.9	47	66.2	P = 0.5
	School + college graduates	119	38.1	24	33.8	
Marital status	Married	277	36.0	66	90.4	P = 0.6
	Non-married/ Divorcee	34	64.0	7	9.6	
Age	Mean	55.2		54.8		Mean difference 0.45 (95% CI -2.2; 3.1) P = 0.73
	SDv	10.9		9.9		
Body Mass Index	Normal	28	8.8	4	5.3	Chi square = 0.05 Df =3 P = 0.8
	Overweight	78	24.4	21	28.0	
	Obese	181	56.6	42	56.0	
	Extreme obese	30	9.4	6	8.0	
	Missing	3	0.9	2	2.7	
Glycemic control	Poor	213	66.6	39	52.0	OR = 1.9; 95% CI 1.1 to 3.2; P = 0.02
	Adequate	101	31.6	35	46.7	
	Missing	6	1.9	1	1.3	
Hypertension	Yes	165	51.6	39	52	P = 0.64
	No	154	48.1	34	45.3	
	Missing	1	1.3	2	2.7	

P<0.05 is statistically significant; CI=confidence interval; Df=degrees of freedom

Table 3: Barriers to participating in physical activity reported by adult diabetics in Qassim area of Saudi Arabia.

Barriers for physical activities	Number	%
No time for exercise	52	13.2
No place for exercise	36	9.1
Friction joints/joint pain	164	41.5
Busy with family	134	33.9
Not sure if exercise is good	23	5.8
Going to Gym is expensive	2	0.5
Work pressure	5	1.3
Fatigue/tiredness	97	24.6
Languor	139	35.2
No barrier for exercise	39	9.9
Not participated in survey	2	0.5

DISCUSSION

In the present study study of adult diabetics indicates, a large proportion were not physically active. Additionally, their health behavior for controlling chronic ailments was poor. In a population with free (state-funded) medical services including medications, the barriers such as joint problems, languor, preoccupation with family affairs seem to be major hurdles for proactively participating in PA.

Despite a high level of tertiary health services in the study region, the barriers identified to address primary prevention of chronic NCDs in the study area warrants significant attention. Active participation of population in addressing the underlying causes of NCD, health

promotion, inclusion of PA in school curriculum and providing affordable and accessible facilities for PA to all including diabetics is recommended in the study area.

The prevalence of depression among diabetics in eastern and western regions of Saudi Arabia was 50% and 34% respectively.[16,17] Obesity, poor self-esteem and binge eating are interlinked resulting in depression, less PA and chronic NCD.[18] Dietary recommendations for depression are the same for chronic NCDs.[19]

Personal counselling sessions and medications to manage depression (if required) could improve PA levels in these diabetic patients.

In the present study, gender was not significantly associated to level of PA among diabetics. In a study that evaluated the predictors of improved PA following diagnosis of ischemia, the level of PA at baseline and at five years were not significantly different.[20]

In a study in Kuwait patients with hypertension of diabetes reported that adverse climate, women facing cultural difficulties, lack of time and other ailment were main barriers.[21]

In the present study, 40% of diabetics reported joint pain as a reason for low participation in PA. In an Italian study, the prevalence of osteoarthritis was high in elderly diabetics compared to nondiabetics.[22] The researchers in that study concluded that it would be challenging to treat diabetics who have additional physical ailments.

The level of PA was moderate among one fourth of diabetics who did not have any barriers. This implies that the overall health behavior is prohibiting them for participating in greater levels of PA. Low levels of PA even in a young healthy Arab population has been reported in the UAE.[23]

The present focus on PA among diabetics should be complimented with other component of lifestyle change related to dietary intake. Consumption of high calorie diet especially red meat, sweets, dates, fizzy drinks is common in Saudi population.[24]

The diabetic patients need to be counselled to alter their diet habit to address hyperglycemia, obesity and laziness related to depression that could discourage then for improving their PA levels.

An effort is going by Nongovernmental organization and supported by the government to encourage general population to adopt healthy lifestyle by organizing marathons in different parts of Saudi Arabia.[25]

There were some limitations to this study. This was a cross-sectional study, therefore a relationship between level of PA to diabetes cannot be established and reverse causalities cannot be ruled out. In the current study, the assessment of PA was performed through a time-tested method based on the patient feedback.

Social desirability bias influencing the outcome cannot be totally ruled out when this method is used. Digital technology can be use to measured PA through the amount of calories burnt. This objective method of measuring PA could minimize observation bias.

There is an urgent need to proactively encourage adult diabetics to participate in PA in Saudi Arabia to combat the tsunami of diabetes that is negatively affecting the health of a young and productive segment of the population.

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