



Factors Influencing Physical Activity in Kandahar City of Afghanistan

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Physical inactivity refers to a condition where individuals do not engage in the recommended levels of physical activity. It is recognized as the fourth leading risk factor for global morbidity and mortality associated with chronic diseases, including diabetes mellitus (DM). This cross-sectional study utilized secondary data. The data collection included demographic profiles, household characteristics, behavioral characteristics, physical activity inquiries, and diabetes-related questions. Physical activity levels were classified as light, moderate, or vigorous based on the number of hours of exercise performed. Data analysis was conducted using the IBM Statistical Package for Social Sciences (Version 22), employing the Chi-square test to evaluate significant relationships between physical activity and various factors, including diabetes mellitus. A total of 800 persons were surveyed, with a mean age of 47.6 years (± 12.6), 65.4% were women, and 46.5% participants were aged 40–54 years. In terms of physical activity, 34.8% of individuals engaged in either light or moderate physical activity (17.4% in each category). The prevalence rates of overweight, obesity, central obesity, and diabetes mellitus were 29.2%, 36.4%, 71.5%, and 15.1%, respectively. A chi-square test found that sex, age, marital status, literacy, and significantly associated ($p < 0.05$), and Body Mass Index (BMI) was strongly associated with physical activity ($p < 0.0001$). The findings indicate that physical inactivity was more prevalent than physical activity within the study population and that several factors were associated with physical activity. Addressing these factors can contribute to promoting physical activity, which may, in turn, help prevent diabetes mellitus.

Keywords: Afghanistan, Kandahar City, Light Activity, Physical Activity, Vigorous Activity

Introduction

Physical activity (PA) is defined as any movement of the body produced by skeletal muscle that requires energy expenditure¹. Conversely, physical inactivity refers to individuals who do not meet the recommended levels of PA [2]. It is recognized as a significant risk factor for multiple causes of death, chronic morbidity, and disability [3]. Specifically, physical inactivity ranks as the fourth leading risk factor for global mortality,



following high blood pressure, smoking, and high blood glucose levels, with rising rates of inactivity observed in many countries [3].

The World Health Organization estimates that physical inactivity is the primary cause of approximately 21–25% of the burden associated with breast and colon cancer, 27% of diabetes, and roughly 30% of ischemic heart disease [4]. Moreover, it is understood that adolescents exhibit higher levels of physical inactivity compared to their childhood years [5]. Severe chronic diseases and premature mortality are often attributed to life-threatening morbidities stemming from physical inactivity. It is estimated that physical inactivity accounts for 10% to 20% of the global burden of disease, with 13.7 million disability-adjusted life years (DALYs) attributable to inactivity in 2013 [6].

Research indicates that the risk of developing diseases such as hypertension, stroke, obesity, metabolic syndrome, and DM escalates with increased physical inactivity [6]. The economic costs associated with physical inactivity are significant, ranging from 0.3% to 4.6% of national healthcare expenditures [7]. Various factors, including gender, socioeconomic status, history of physical activity, access to physical activity facilities, scheduling for physical activity, and educational attainment, serve as predictors of PA.

Prior to this study, no comprehensive research had been conducted to assess the prevalence of PA within the community. However, there is a hospital-based study primarily aimed at determining the prevalence of DM, which also yielded findings related to the prevalence of PA [8]. Consequently, this study is designed to fill the gap in community-based research concerning the prevalence of PA and its association with type 2 diabetes mellitus (T2DM), utilizing a large sample from the community.

Materials and methods

This cross-sectional study was conducted on secondary data in which variables of interest were extracted from primary data. That we collected from 15 districts of Kandahar city (located in the south of Afghanistan) to study the prevalence of type 2 diabetes (T2DM) in Kandahar city. In this study, secondary data was extracted to determine the physical activity (PA) and its relation with T2DM. About 800 study subjects were randomly selected from 1303 primary data, and below inclusion and exclusion criteria were applied: Individuals having data on PA in the data set were included in the study, while respondents that did not complete the PA section of the data set and respondents with physical disabilities were excluded.

Sample Size and Sampling Technique

Sample size is calculated by using the below formula where “N” represents sample size, “Z” represents the level of confidence according to the standard normal distribution, “D” is the precision or tolerated margin of error, and “P” represents the estimated proportion of the population that presents the characteristic (when unknown we use $p = 0.5$). $n = Z^2 P (1-P)/d^2$.



Statistical Analysis

Randomly extracted secondary data were analyzed using IBM Statistical Package for the Social Sciences (SPSS) Version 22, employing both descriptive and analytical statistics. Microsoft Word and Excel were used for the graphical presentation of data.

Results

A total of 800 cases were randomly extracted for secondary analysis from 1303 primary cases to find out the prevalence of physical activity (PA) and its association with type two diabetes mellitus (T2DM) in 15 districts of Kandahar city of Afghanistan. The data was analyzed in terms of general and demographic profile, characteristics and available facilities in-house, behavioral characteristics, necessary PA-related physical examination, PA-related questions, diabetes-related questions, and other comorbidities, including hypertension.

The mean age of the study population was noted as 47.6 ± 12.6 years. Out of 800 participants, 367 (45.9%) were aged less than 45 years while 433 (54.1%) were older than 45 years. Other demographic characteristics of the patients are shown in Table (1).

Table – 1 Demographic and socioeconomic characteristics of study population.

Variables	Frequency (%)
Age class	
1. 25 to 39 years' old	228 (28.5)
2. 40 to 54 years' old	375 (46.9)
3. 55 to 69 years' old	128 (16.0)
4. 70 years and older	29 (8.6)
Gender	
1. Male	277 (34.6)
2. Female	523 (65.4)
Marital status	
1. Married	693 (86.6)
2. Single	21 (2.6)
3. Widowed	86 (10.8)
Literacy level	
1. Illiterate	693 (86.6)
2. Literate	107 (13.4)
Occupation	



1. Housewives	509 (63.3)
2. Jobless	129 (16.1)
3. Non-manual workers	101 (12.6)
4. Farm workers	
5. Manual workers	28 (3.5)
	33 (4.1)

Most of the diabetic patients, 95 (11.9%), had medium or high economic status, and most of them were illiterate. Diabetes affected daily activities among 104 (13%) patients, and the rest 17 (2.1%) responded that it had no effect on their daily activities (Table 2).

Table 2: Frequency distribution of known diabetes based on demographic characteristics.

Variable	Total
	Frequency (%)
Gender	
1. Male	54 (6.8)
2. Female	67 (8.4)
Aged groups	
1. Less than 45 years old	27 (3.4)
2. More than 45 years old	94 (11.8)
Economic status	
1. Low	26 (3.2)
2. Medium or high	95 (11.9)
Education status	
1. Illiterate	108 (13.5)
2. literate	13 (1.6)
Effect of DM on daily life activities	
1. Yes	104 (13.0)
2. No	17 (2.1)
Total	121 (15.1)

Normal waist participants comprised 288 (28.5%), and the rest were categorized as 572 (71.5%) in central obesity. During classification of BMI, underweight comprised 25 (3.1%), normal weight participants were 250 (31.1%), overweight participants were 234 (29.2%), and obese participants were 291 (36.4%) (Table 3).



Table- 3: Anthropometric characteristic of study population.

Variables	Frequency (%)
Central obesity	
1. Normal waist	228 (28.5)
2. Central obesity	572 (71.5)
Body Mass Index (BMI)	
1. Underweight	25 (3.1)
2. Normal weight	250 (31.2)
3.Overweight	234 (29.2)
4.Obese	291 (36.4)
Overweight	
1. Yes	234 (29.2)
2. No	566 (70.8)
Obese	
1. Yes	291 (36.4)
2. No	509 (63.6)

Positive response for overweight was 234(29.2%) while the rest 566(70.8%) had negative response. Obese population comprised of 291(36.4%) and non-obese were 509(63.6%) (Table 3).

PA is initially analyzed based on active and inactive, and then it was further analyzed based on its level or type. Around 460 (57.5%) were physically active, and 340 (42.5%) were inactive. The prevalence of light physical activity was 115 (25.0%), moderate physical activity was 265 (17.4%), and vigorous physical activity was only seen in 80 (17.4%). Among 340 (42.5%) physically inactive participants,

106 (13.2%) were male, and 234 (29.2%) were female. The most common age groups who were physically inactive were participants aged 40-54 years old, 161 (20.1%), followed by 55-69 years, 76 (9.5%), 25-39 years, 55 (6.9%), and 70 years and older, 48 (6.0%) (Figure 1).

Among 121 (15.1%) diabetic participants, 60 (7.5%) were physically active and 61 (7.6%) were physically inactive, which is almost equal. Most of them perform light 61 (7.6%) and moderate 40 (5%) physical activity, and only 20 (2.5%) perform vigorous physical activity (Figure 2).

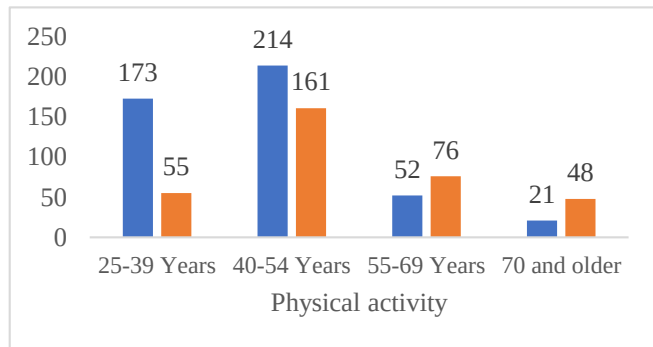


Figure 1: Status of physical activity based on age groups.

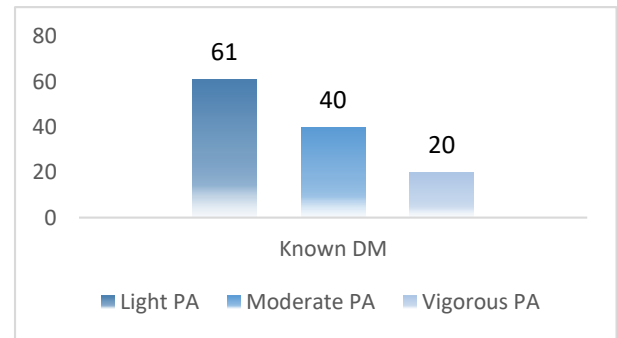


Figure-2: Shows levels of physical activity among diabetic patients.

Factors associated with physical activity: A chi-square test is performed to find out the association and of factors with physical activity. There are factors such as gender ($p=0.046$), age ($p=0.000$), marital status ($p=0.001$), literacy status ($p=0.046$), BMI ($p=0.000$) and DM ($p=0.035$) which were significantly associated with physical activity level (Table 4).

For sociodemographic characteristics, physical activity was significantly different among gender, age, marital status, and literacy status. Gender was strongly associated with physical activity status, in which females were more likely to be physically active compared to males in status of physical activity; similarly, age of population was strongly associated with physical activity status, in which younger populations (age < 45 years) were more likely to be physically active compared to older populations in status of physical activity. In addition, marital status was strongly associated with physical activity status, in which married participants were more likely to be physically active compared to males in the status of physical activity. Meanwhile, literacy status was strongly associated with physical activity status, in which the illiterate were more likely to be physically active compared to the literates in the status of physical activity (Table 4).

Table – 4: Factors associated with physical activity.

Variables	Physical activity status		Values	P-
			X ²	value
	Active	Inactive		
Gender				
1. Male	171	106	3.107	0.046
2. Female	289	234		
Age				
1. < 45 years	269	98	69.241	0.000
2. > 45 years	191	242		
Marital status			10.641	0.001



1. Married 414 279

2. Single and 46 61

Widowed

Literacy status

1. Illiterate 390 303 3.171 0.046

2. Literate 70 37

BMI

1. Under and

Normal weight 131 144 16.683 0.000

2. Overweight

and Obese 329 196

Smoking

1. Yes 42 36 0.472 0.284

2. No 418 304

There are some variables that are not significantly associated ($p < 0.05$) with physical activity, such as smoking, which was not significantly associated with physical activity ($p > 0.05$) (Table 3).

Discussion

It is well known that physical activity is the main factor in the prevention and management of many non-communicable diseases, including T2DM, and so does have a positive effect on lipids, blood pressure, cardiovascular events, mortality, and quality of life [9]. Physical activity along with modest weight loss has been proven to decrease T2DM risk by up to 58% in high-risk populations [10]. However, another study found that regular physical activity significantly reduces the risk of T2DM by 20-30% [11].

The fourth leading risk factor for global mortality after high blood pressure, smoking, and high blood glucose is considered physical inactivity, and it is estimated as being the principal cause for approximately 21–25% of breast and colon cancer burden, 27% of diabetes, and approximately 30% of ischemic heart disease burden. Physical inactivity is on the rise in many countries [4].

The prevalence of physical activity in this study was 57.5%, which is near to a study conducted in Iran (30%) [12]. A study conducted in Karachi province of Pakistan, which was 72.6% [13]. We observed that physical activity status was in parallel or sometimes better than that of above-developed countries, which have longer physical activity promotion strategies [14].

The mean age of the study population was 47.6 ± 12.6 years with a predominant female gender. Physical inactivity was seen more (46.9%) in older analysis of (40-54 years). A study from Pakistan indicated that increasing age exhibits increasing levels of physical inactivity [15]. Males are more physically active compared to females [16]. A general feature of the data was that women tended to be more physically active compared to men based on all three physical activities measured; this finding is consistent with other studies



[17]. It is possibly explained by a higher level of taking care of household work and supporting extended family members' physical activity among females. However, a study in Pakistan is in accordance with this study result, which found that females (52.4%) were slightly more physically active than males (47.6%) [17]. Similarly, a study in India also reported insufficient physical activity among females (54.7%) compared to males (42.7%) [18]. A study in China concluded that men were generally shown to spend less than women [19].

Diabetes is a global burden to both individuals and societies, with a global prevalence of about 8.3%, which is almost near to a study conducted in Afghanistan (8.6%) and neighboring countries like Iran (8.7%) [19], but lower than Pakistan (12.4%) [20] and higher than China (7.3%) [21]. The prevalence of DM (15.1%) in the present study was almost similar to studies conducted in Kabul (13.2%) [22], but lower (22.4%) from a study conducted in Kandahar [23] and higher (9.9%) from a study conducted in Herat [24]. Females (8.4%), older age groups >45 years (11.8%), and illiterate populations (13.5%) in the current study were found to be more diabetic compared to males (6.8%), younger <45 years (3.4%), and literate populations (1.6%), which is in accordance with a study conducted in the urban setting of the Kandahar province [25] and a study conducted in Lahore, Pakistan [26].

This study found that T2DM is significantly related ($p < 0.05$) to physical activity. Participants who were physically inactive were more diabetic compared to those who were physically active. Most of the diabetic patients with physical activity performed light (low) physical activity followed by moderate and vigorous physical activity; it found a higher prevalence of diabetes mellitus and lower levels of physical activity [10, 7, 27, 28].

The findings of our study show an overall prevalence rate of 36.4% for obesity and 29.2% for overweight. Generally, 44.4% of women and 21.2% of men were found to be overweight or obese in this study. In Thailand, 22.4% of men and 34.3% of women had general obesity, but the percentage was higher in women than men, but their study reported a lower prevalence in comparison with the present study [29]. In Iran, the prevalence rates of obesity and overweight were 37.8% and 30.5%, respectively, which is almost in accordance with the present study [30].

Smoking and physical inactivity are strongly related to a deterioration in overall health status and are among the most important modifiable risk factors for chronic disease and premature death [31]. In contrast to many other nations, the current study found a low prevalence (9.8%) of smoking among the study population, which may be due to strict enforcement of smoke-free provisions being essential. It is low among women (2.8%) compared to men (7.0%), which might be the reason that in Afghan society, smoking among females is regarded as impolite. The low level of smoking was also observed in a study conducted in 2016 in Kandahar (9.7%) [25] and in Herat (9.8%) [24]. Nevertheless, smoking or snuffing did not show a significant relation. We should be cautious about recommending snuffing and cigarette consumption for overall human health because a strong association between smoking and PA was found in other studies [19].



Conclusion

This study found that physical inactivity was more prevalent than physical activity among the surveyed population, with only 34.8% of individuals engaging in light or moderate physical activity. Notably, females were more physically active compared to males. The study also identified significant associations between physical activity and factors such as sex, age, marital status, literacy, and BMI. Given the high prevalence of obesity, and diabetes mellitus, promoting physical activity is crucial for mitigating these health risks. Addressing the identified determinants of physical activity can play a vital role in developing effective interventions to enhance physical activity levels and contribute to diabetes prevention.

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