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# Study on physical activity level and its barriers among patients with diabetes mellitus attending primary healthcare

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**Abstract**
In this paper the diabetes mellitus is a major global public health problem affecting huge number of the population and Qatar is ranked among the top 10 countries with high diabetes prevalence. Identification of factors associated with poor glycemic control may help in planning for more comprehensive strategy of care, and better quality of life of diabetic patients.

**Keywords:** physical activity level, barriers among patients, diabetes mellitus

## Introduction
Diabetes Mellitus is a Major cause of illness and premature death in most countries. Efforts to reduce the impact of diabetes complications have been predominantly aimed at controlling hyperglycemia, hypertension, and dyslipidemia by using medication strategies, despite the lack of evidence of long-term benefits. However, diabetes management should extend to an overall intervention strategy that includes lifestyle modification to reduce the risk of complications.

Lifestyle measures, including physical activity (PA), are key factors for self management in patients with diabetes to prevent macro vascular complications and premature mortality. Increased PA has long been considered a cornerstone of diabetes management. Persons with diabetes are recommended to engage in at least 150 minutes per week of moderate intensity aerobic PA. Walking has been of particular interest because it requires no specific facilities, can be easily implemented in the daily routine, and is relatively safe. In the general population, being physically active has been associated with a lower risk of overall and cardiovascular disease (CVD) mortality compared with being inactive. Because persons with diabetes are at higher risk for CVD and premature death, it is important to determine whether PA can produce similar beneficial effects in this high-risk population. Indeed, a met analysis of 14 controlled trials in diabetic persons showed that exercise programs had beneficial effects on glycemic control. Several prospective cohort studies have found that higher PA levels were associated with reduced CVD and total mortality rates, but conclusive high level evidence is lacking.

## Material and Method
This study is a cross-sectional study which was carried out at three PHCs All adult patients with T2DM who could walk, regardless of their sex and type of management, age between 25 and 75 years, were eligible and invited to participate in this study between February and June 2018. Questionnaires with more than 30% of missing. The data were excluded from the analysis Data collection was conducted using face-to-face interview. Participants were interviewed before entering the clinic while waiting for their medical appointment. A particular private location was selected in each center for the interview.

## Results & Discussion

Table 1 reveals that the highest percentage of patients was from the age category 50- 59 years (41.0%) followed by those aged 60 years or more (30.2%) with a mean age of 53.4 ± 8.5 years. The majority of patients were males (61.2%), non-Qatari (73.3%), living inside Doha (79%) and most of them were married (85.1%). Near to half of the patients (48.7%) had secondary education and above, around one third of patients were not working or housewife (32.5%) and had a household income of less than 5000 QR (33.3%).

**Table 1:** Distribution of type 2 diabetic patients according to socio-demographic characteristics, Primary Health Care.

| Variable | Frequency | Percentage (%) |
|---|---|---|
| **Age (years)** | | |
| < 40 | 35 | (6.8) |
| 40-49 | 112 | (22.0) |
| 50-59 | 209 | (41.0) |
| ≥60 | 154 | (30.2) |
| Mean (± SD) = 53.4 (± 8.5) | | |
| **Gender** | | |
| Male | 312 | (61.2) |
| Female | 198 | (38.8) |
| **Nationality** | | |
| Qatari | 136 | (26.7) |
| Non-Qatari | 374 | (73.3) |
| **Residential area** | | |
| Inside Doha | 403 | (79.0) |
| Outside Doha | 107 | (21.0) |
| **Marital status** | | |
| Married | 434 | (85.1) |
| Others* | 76 | (14.9) |
| **Education** | | |
| Illiterate/Read and write | 142 | (27.8) |
| Primary/Preparatory | 120 | (23.5) |
| Secondary | 161 | (31.6) |
| University and higher | 87 | (17.1) |
| **Occupation** | | |
| Not working/Housewife | 166 | (32.5) |
| Manual | 102 | (20.0) |
| Clerk/administrator | 136 | (26.7) |
| Others** | 106 | (20.8) |
| **Household income (QR)** | | |
| <5,000 | 170 | (33.3) |
| 5,000 - | 160 | (31.4) |
| 15,000 - | 37 | (7.3) |
| 25,000 + | 143 | (28.0) |

*Single, divorced and widowed; **Professional, technical and free business.

Table 2 shows that the majority of the patients were nonsmoker (63.1%) and all of them were not performing vigorous physical activity. According to physical activity types, firstly the table reveals that only 22 patients (4.3%) were performing moderate physical activity, 17 patients of them (77%) were practicing it for three days or more and half of them were doing it for half an hour per day. Secondly, the table demonstrates that only 27.3% of the patients were practicing walking; usually for 3-4 days/ week (13.9%). More than two thirds of the patients who were practicing walking (69.7%), were doing it for half an hour or more per day. According to physical activity levels, it was found that most of the patients (95.7%) were categorized as having a low physical activity level. Finally, the table reveals that most of the patients (87.7%) used to sit for four hours or more daily without doing any kind of physical activity.

**Table 2:** Distribution of type 2 diabetic patients according to smoking history and physical activity, Primary Health Care

| Variables | Frequency | Percentage (%) |
|---|---|---|
| **Smoking history** | | |
| Regular/Occasional smoker | 121 | (23.8) |
| Ex-smoker | 67 | (13.1) |
| Non-smoker | 322 | (63.1) |
| **Physical Activity** | | |
| Types | | |
| **Moderate physical activity** | | |
| **Days** | | |
| 0 | 488 | (95.7) |
| 1-2 | 5 | (1.0) |
| 3+ | 17 | (3.3) |
| **Time/minutes (n=22)** | | |
| 20- | 3 | (13.6) |
| 30- | 11 | (50.0) |
| 40+ | 8 | (36.4) |
| **Walking** | | |
| **Days** | | |
| 0 | 371 | (72.7) |
| 1-2 | 38 | (7.5) |
| 3-4 | 71 | (13.9) |
| 5+ | 30 | (5.9) |
| **Time/minutes (n=139)** | | |
| ≤15 | 9 | (6.5) |
| 20- | 33 | (23.8) |
| 30+ | 97 | (69.7) |
| **Levels** | | |
| Low | 488 | (95.7) |
| Moderate | 22 | (4.3) |
| **Sitting (hours/day)** | | |
| ≤3 | 62 | (12.2) |
| 4-5 | 292 | (57.3) |
| 6+ | 156 | (30.5) |

**Table 3:** Relationship between lifestyle and glycemic control (HbA1c level) among type 2 diabetic patients, Primary Health Care

| Socio-demographic characteristics | Glycemic control | | | | Total | $\chi^2$ (*p*-value) |
|---|---|---|---|---|---|---|
| | Good ($HbA_{1c} \leq 7\%$) | | Poor ($HbA_{1c} > 7\%$) | | | |
| | No. | (%) | No. | (%) | | |
| **Smoking** | | | | | | |
| Regular/Occasional smoker | 43 | (35.5) | 78 | (64.5) | 121 | 4.475 (0.107) |
| Ex-smoker | 32 | (47.8) | 35 | (52.2) | 67 | |
| Non-smoker | 110 | (34.2) | 212 | (65.8) | 322 | |
| **Physical activity levels** | | | | | | |
| Low | 177 | (36.3) | 311 | (63.7) | 488 | 0.000 (0.993) |
| Moderate | 8 | (36.4) | 14 | (63.6) | 22 | |
| **Sitting hours/day** | | | | | | |
| ≤3 | 22 | (35.5) | 40 | (64.5) | 62 | 0.022 (0.989) |
| 4-5 | 106 | (36.3) | 186 | (63.7) | 292 | |
| 6+ | 57 | (36.5) | 99 | (63.5) | 156 | |

Table 3 reveals that poor glycemic control was more common among non-smoker patients (65.8%) compared to regular/occasional and ex-smokers (64.5%, 52.2% respectively).

According to physical activity levels, the table reveals that poor glycemic control was nearly similar among those with low and moderate physical activity (63.7%, 63.6% respectively).

Moreover, the prevalence of poor glycemic control was nearly similar among patients who used to sit without doing any kind of activity for less than or equal three hours, four to five hours and six hours or more (64.5%, 63.7% and 63.5% respectively). However, the differences in glycemic control as regards smoking, physical activity levels and sitting hours per day were not statistically significant (p-value>0.05).

Physical activity was associated with a lower total mortality risk in diabetic individuals. These associations are in line with those found in the general population, where PA relates to a 33% lower risk of overall mortality and a 35% lower risk of CVD mortality compared with inactivity.

The present meta-analysis was a "high vs low" comparison. This is a common practice for meta analyses of observational studies, but results can be difficult to interpret because absolute levels of PA will vary between studies and are unknown.

However, this was the best option based on the available data. Statistically significant heterogeneity was found for the associations between total PA and walking and total mortality. Because statistical heterogeneity is based only on the effect estimates and their precision, it is important to consider clinical heterogeneity. All the studies included in the meta-analysis were comparable in terms of study design, diabetes population, and outcome. However, an important issue when performing meta-analyses of PA is comparability of the exposure assessment, which was heterogeneous across the included studies. Physical activity was assessed by questionnaire or interview, with varying questions, categories, and classifications. Questionnaires, including interviews, are the most common tools for PA assessment in large epidemiologic studies because they are inexpensive and feasible. In general, PA questionnaires have a low reliability and low validity but can be adequately used to rank individuals. It was considered appropriate to combine the studies by meta-analyses because all measured common perceptions of PA levels.

## Conclusion

Based on the findings of the study, it can be concluded that about two thirds of patients with T2DM in Qatar had a poor glycemic control with HbA1c level of >7%. Despite a high level of perceived benefits and barriers score of physical activity, very few numbers of the patients were performing physical activity; mostly of the low-grade level. There was a significant positive correlation between perceived benefits and barriers score of physical activity and each of the days and time of moderate physical activity and days and time of walking.

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