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# The knowledge and practice of Saudi type 2 diabetic patients regarding lifestyle habits in Riyadh city

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## RESEARCH

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## ABSTRACT

**Background**

Diabetes mellitus (DM) is a chronic metabolic disease; on the long term it will lead to a serious damage to certain body organs such as: heart, nerves, eyes, blood vessels and kidneys. Saudi Arabia is considered in top ten countries in the prevalence of DM globally.

**Aims**

To estimate the level of knowledge and practice in type 2 diabetic patients regarding the effect of lifestyle habits. Also, to estimate the knowledge of diabetic smokers toward smoking cessation benefits and its relation in decreasing diabetic complication, and to estimate the ratio between men and women about the knowledge and practice regarding the effect of lifestyle habits.

**Methods**

A cross-sectional study was done using a structured questionnaire amongst 332 type 2 diabetic patients seen at the outpatient clinics in 5 hospitals across Riyadh city. Baseline characteristics of the participants were obtained and their knowledge, and practice regarding lifestyle modification were assessed.

**Results**

Out of 332 participants almost 84.6 per cent of participants know that physical exercise improves diabetic symptoms but unfortunately 49.4 per cent doesn't exercise at all. We also found that almost (45.1 per cent) of the participants didn't know about the effect of cigarette smoking/Alcohol on the progression of diabetes, and (50 per cent) of active smokers had no awareness about its effect on the progression of the diseases. Also (13.6 per cent) of the participants didn't know about the effect of diet on the progression of Type 2 diabetes.

**Conclusion**

Despite the high level of awareness on the effects of lifestyles in DM2 patients, in addition to lack of physical limitations, few proportions of patients translated that knowledge into routine physical activity.

## Key Words

Type 2 diabetes mellitus, Knowledge, practice, Saudi Arabia

## What this study adds:

**1. What is known about this subject?**

Little is known about knowledge and practice of DM2 patients in Saudi Arabia.

**2. What new information is offered in this study?**

It showed the high level of awareness among this population; however, it has not translated into their lifestyle practice.

**3. What are the implications for research, policy, or practice?**

It urge for thorough appraisal of current used prevention methods, and further promotion of healthy lifestyle.

## Background

Healthy lifestyle behaviour is an essential element in improving quality of life and reducing chronic disease complications, it lies on four main elements: Physical activity, healthy body weight, diet and bad habit cessation like smoking and alcohol consumption. It appears that the combination of physical and well planned diet has a major role in keeping the body fit and healthy. It has been shown that this synergy helps in preventing and/or maintaining glucose levels in the body[1]. Diabetic patients are advised to

follow nutrition therapy.

Diabetes mellitus (DM) is a chronic metabolic disease which can be identified by increase blood sugar levels therefore, on the long term it will lead to a serious damage to certain body organs such as: heart, nerves, eyes, blood vessels and kidneys [World health organization]. DM can be differentiated into three main types which are; Type 1 diabetes (T1DM) characterized by low insulin secretion also known as juvenile diabetes or insulin dependent diabetes mellitus, Type 2 diabetes mellitus (T2DM) that starts with insulin resistance that's why it is also known as non-insulin dependent diabetes mellitus or adult onset diabetes mellitus. The major risk factor of this type of diabetes is increased body weight and absence of physical activity, Gestational diabetes affects pregnant women and characterized by increase in blood glucose level but not as high as the other types of diabetes WHO fact sheet.

DM rates has risen world widely in the past decades[2]. DM is now considered as one of the most prevalent diseases globally as it reached 425 million people who have diabetes in the world. Saudi Arabia is considered in top ten countries in the prevalence of DM globally[3]. A study done in Saudi Arabia in 2017 showed that DM rate has reached (18.5 per cent) of the adult population which is 3,852,000 out of 20,770,000 [IDF]. It is estimated that in 2035 the number of DM patients will reach 592 million globally[4]. A study showed that increasing facilities that support physical activity and healthy diets in neighborhoods was controversial with DM type 2 rates[5].

This cross-sectional study aims to assess the knowledge and awareness of Diabetic patients regarding the effect of lifestyle changes and to identify attitudes of diabetic patients on the degree of lifestyle changes effect.

## Method

This study was conducted in the outpatient clinic in five hospitals in Riyadh city (King Khalid University Hospital, King Abdulaziz University Hospital, King Saud Medical City, King Abdullah University Hospital and National Guard Hospital covering all five regions in the city using multistage sampling. The study was conducted from September 2019 until April 2020 using an observational cross-sectional study design. Our study sample was 338 using stratified random sampling. The inclusion criteria for this study were DM Type 2 Saudi adults from the Age 35 and above who are able to perform their physical activities normally and are not pregnant.

We took a verbal consent and consent at the start of the survey. Participants were asked to finish the survey on their own. Participants' privacy was assured by giving each participant a different number which changed each new survey entry. All the participants will be informed about the purpose of the study and the right of the participants to withdraw at any time without any obligation towards the study team. The team will appreciate the cooperation of all the participants, and no incentives or rewards will be given to participants. The study was reviewed and approved by the Research Ethics Review Committee (Research project no.E-19-4419).

Our questionnaire was based on three previously published studies[6]. Which considered knowledge and practice for DM type 2 patients? Some changes were done to suit the targeted sample. Our pilot study was conducted on 24 participants and was asked about the clarity of the questions and the time to finish the survey.

Our questionnaire had four parts. The first part included the demographic details that included the age group, gender, nationality, educational level, marital status, income and if they were diagnosed with DM type 2 or not.

The second part assessed the health status of diabetes which included how frequent is the participant following up for diabetes with their physician, have the participant encountered any complications related to DM and what are they and how does the participant control his Diabetes.

The third and fourth parts assessed lifestyle, knowledge and practice for DM type 2 patients which includes if the participant is able to do his activity normally and how active he is, if he is a smoker and does the participant know the effect of physical work, smoking, alcohol and dietary modification on his diabetes.

Data was analyzed using SPSS 24.0 version statistical software. Descriptive statistics (frequencies, percentages, mean, and standard deviation) were used to describe the categorical and quantitative variables. The associations between the gender and outcome variables (knowledge, and practice) were tested using a t test and chi-square. A p-value of $<0.05$ was used to report the statistical significance.

## Results

### Characteristics of the study population

Overall, the total responses collected were 332. After exclusion of individuals due to age (n=17) the final sample size for analysis consisted of 315 responses. 332 individuals participated in the study, of them 315 (100 per cent) completed the optional survey. The participants were almost equally distributed as male (50.6 per cent), and female (49.4 per cent) Table 1. More than half of them had at least some college education (64.2per cent). Most of the participants were married (91.1 per cent). The majority of the participants were older than 40 (88per cent). More than half of the participants had total house income of more than 12000 riyals (63per cent). Almost half of the

participants were following up every 3 months with their physicians (45.5 per cent) of the participants (31.9 per cent) had complications of which Neuropathy and retinopathy had the most occurrences of which (21.7 per cent). Of the participants (72.3 per cent) were using tablets to control their diabetes.

**Knowledge and practice toward Type 2 Diabetes**

Almost (16.2 per cent) of the participants didn't know about the effect of Physical activity on diabetes Progression (Table 2). We also found that almost (45.1 per cent) of the participants didn't know about the effect of cigarette smoking/Alcohol on the progression of diabetes, also (13.6 per cent) of the participants didn't know about the effect of diet on the progression of Type 2 diabetes. of the participants (50.8 per cent) were doing Physical activities weekly. Only (14.6 per cent) of the participants were active smokers. Also (27.4 per cent of the participants had a sedentary lifestyle of more than 11 hours per week.

**Knowledge, and practices for Type 2 diabetic patients who also are smokers:**

(50per cent) Active smokers had no awareness about its effect on the progression of the diseases Table 3.

Knowledge and practice regarding the effect of lifestyle habits by gender:

As you can see in Table 4 The p-value score for "Physical Activity practice", "Sedentary lifestyle", and "Smoking practice" with a significance of (p=0.008) (p=0.003) (p=<0.001) respectively. There was no other statistically significant p-value across the other variables Table 4.

## Discussion

In this cross-sectional study we aim to assess the knowledge and awareness of Diabetic patients regarding the effect of lifestyle changes and to identify correlation between knowledge and practices of diabetic patient's lifestyle changes. It is believed that type 2 diabetes mellitus has an age of onset of 40 years[7]. The study supports this statement as most participants were in the age group of more than 40 years 88per cent. In this study we found that the majority of respondents 87per cent had a high level of knowledge about dietary lifestyle modifications, in contrast to another study in South Africa patients' extremely poor knowledge of lifestyle modification, in which a majority of respondents 92.1 per cent had poor knowledge of the advantages of lifestyle modification[8]. These different findings may be because of the differences in literacy level, economic status and availability of information on type 2 diabetes mellitus for the study patients. (35.8 per cent) of participants has high school education or less, whereas 50.6per cent of participants have Bachelor's degree and 13.6 per cent of participants with higher education. So bachelor's degree and higher education resembles the majority 64.2per cent of the participants in this study. This demonstrates that most participants have a high education level.

Most of the participants were in the category of high income with 75.3 per cent earning more than 9000 Riyals. The prevalence of T2DM in developed countries is inversely associated with socioeconomic status which is assessed by educational level, position, and income[9]. Although in our study we found out that most of the sample is considered high-moderate socioeconomic status. This may be due to most of the sample taken from university hospitals which the patients must be working in the university faculty to enter the hospital.

If a person with T2DM implicates physical activity and exercise in their lifestyle it could increase Insulin sensitivity and glucose tolerance, also it can improve the blood lipid profiles[10–12]. We found out that 84.6per cent of participants know that physical exercise improves diabetic symptoms but unfortunately 49.4 per cent doesn't exercise at all. So, we should increase the public gyms and walking areas to encourage people to exercise. In another south African study 91.7 per cent had poor lifestyle modification practices which could be due to limited access of information and knowledge about T2DM. This study showed that 15.4 per cent of the participants were smokers and 72.9 per cent never smoked at all, while 11.7 per cent used to smoke in the past, meanwhile These results are similar to a Study that was done in Saudi Arabia which showed that 5.7per cent of the participants were smokers and 8.5per cent smoked in the past, while 71.8 per cent never smoked at all[14]. Moreover, we found that the majority of female participants 94.51 per cent don't consume any tobacco products in contrast to only 51.79 per cent of male participants who don't consume any tobacco products, the difference in the number of tobacco products non-consumers between male and female participants is maybe due to cultural barriers on female smokers, because the female participants level of knowledge toward smoking cessation benefits in preventing T2DM complications was only 62.20 per cent.

This study has strengths and limitations. The relatively large sample size from five different regions of the capital of Saudi Arabia Riyadh gives strength to this study[13].

The use of electronic questionnaires which were pretested and validated to reduce data errors adds strength to this study. The burden of diabetes is clear in the study, which also shows the importance of knowledge and practices given the high prevalence of diabetic patients in Saudi Arabia, because the risk of complications to develop in these patients is high. On the other hand, the study took place in only one city which is Riyadh as the reason behind

that is limited time and resources. Also due to the recent outbreak of COVID-19 that disturbed the process of data collection, we couldn't reach the number of participants.

Future efforts should aim to enhance the quality of life for diabetic patients, throughout raising the awareness of people with diabetes about their risk, and to ease access to information sources and to reach out stakeholders to help the society by providing public gyms, walks, and public diet centers. Which will motivate them to adhere to the management plan and lifestyle modifications?

## Conclusion

Despite the high level of awareness on the effects of lifestyles in DM2 patients, in addition to lack of physical limitations, few proportions of patients translated that knowledge into routine physical activity. Further interventions and measures are recommended to promote healthy physical exercise.

## References


1. Pines A. Lifestyle and healthy aging. J. Gynaecol. Endocrinol. 2014;30(9):609-11. Doi: https://doi.org/10.3109/09513590.2014.945905
2. Evert AB, Boucher JL, Cypress M, et al. Nutrition therapy recommendations for the management of adults with diabetes. Diabetes care. 2014;37(Supplement_1):S120-43. Doi: https://doi.org/10.2337/dc14-S120
3. Albright A, Franz M, Hornsby G, et al. American College of Sports Medicine position stand. Exercise and type 2 diabetes. Medicine and science in sports and exercise. 2000;32(7):1345-60. Doi: 10.1097/00005768-200007000-00024
4. Robinson CC, Barreto RP, Plentz RD. Effects of whole body vibration in individuals with diabetic peripheral neuropathy: a systematic review. J Musculoskelet Neuronal Interact. 2018;18(3):382.
5. Aguiree F, Brown A, Cho NH, et al. IDF diabetes atlas.
6. Guariguata L, Whiting DR, Hambleton I, et al. Global estimates of diabetes prevalence for 2013 and projections for 2035. J. Diabetes Res. 2014;103(2):137-49. Doi: https://doi.org/10.1016/j.diabres.2013.11.002
7. Christine PJ, Auchincloss AH, Bertoni AG, et al. Longitudinal associations between neighborhood physical and social environments and incident type 2 diabetes mellitus: the Multi-Ethnic Study of Atherosclerosis (MESA). JAMA Intern Med. 2015;175(8):1311-20. Doi: 10.1001/jamainternmed.2015.2691
8. Okonta HI, Ogunbanjo GA, Ikombele JB. Knowledge, attitude and practice regarding lifestyle modification in type 2 diabetic patients. Afr J Prim Health Care Fam Med. 2014;6(1):1-6. Doi: https://hdl.handle.net/10520/EJC163850
9. Kautzky-Willer A, Harreiter J, Pacini G. Sex and gender differences in risk, pathophysiology and complications of type 2 diabetes mellitus. Endocrine reviews. 2016;37(3):278-316. Doi: https://doi.org/10.1210/er.2015-1137
10. Manson JE, Hu FB, Rich-Edwards JW, et al. A prospective study of walking as compared with vigorous exercise in the prevention of coronary heart disease in women. N Engl J Med. 1999;341(9):650-8. Doi: 10.1056/NEJM199908263410904
11. Goodyear LJ, Kahn BB. Exercise, glucose transport, and insulin sensitivity. Annu Rev Med. 1998;49:235.
12. Mayer-Davis EJ, D'Agostino Jr R, Karter AJ, et al, IRAS investigators, IRAS Investigators. Intensity and amount of physical activity in relation to insulin sensitivity: the Insulin Resistance Atherosclerosis Study. JAMA. 1998;279(9):669-74. Doi:10.1001/jama.279.9.669
13. Alramadan MJ, Magliano DJ, Alhamrani HA, et al. Lifestyle factors and macro-and micro-vascular complications among people with type 2 diabetes in Saudi Arabia. Diabetes Metab Syndr Clin Rev. 2019;13(1):484-91. Doi: https://doi.org/10.1016/j.dsx.2018.11.007


## Tables

Table 1: Demographics of survey respondents

| Demographics of survey respondents | n(%) |
|---|---|
| Gender | |
| Male | 168 (50.6%) |
| Female | 164 (49.4%) |
| Marital status | |
| Married | 3304 (91.6%) |
| Un married | 228 (8.4%) |
| Age group | |
| <35 | 17 (5.1%) |
| 35-40 | 23 (6.9%) |

| | |
|---|---|
| >40 | 292 (88%) |
| Education level | |
| High school or less | 119 (35.8%) |
| Bachelor's degree | 168 (50.6%) |
| Higher education | 45 (13.6%) |
| Total Household income (Riyal) | |
| Less than 3000 | 17 (5.1%) |
| 3000-6000 | 27 (8.1%) |
| 6001-9000 | 38 (11.4%) |
| 9001-12000 | 41 (12.3%) |
| More than 12000 | 209 (63%) |
| How frequent are you following up for diabetes with your physician? | |
| Never | 11 (3.3%) |
| Monthly | 44 (13.2%) |
| Every 3 months | 151 (45.5%) |
| Every 6 months | 86 (25.9%) |
| Yearly | 40 (12.0%) |
| Did you get any complications related to your diabetes? | |
| Yes | 106 (31.9%) |
| No | 226 (68.1%) |
| Specify the complication | |
| Neuropathy | 72 (21.7%) |
| Nephropathy | 13 (3.9%) |
| Retinopathy | 69 (21.7%) |
| How do you control your diabetes currently? | |
| Diet | 136 (41%) |
| Tablet | 240 (72.3%) |
| Insulin | 101 (30.4%) |
| Physical activity | 111 (33.4%) |

Table 2: Knowledge and practices for Type 2 diabetic patients

| | **n(%)** |
|---|---|
| Knowledge | |
| Does physical work or exercise contribute in preventing diabetic complications? | |
| Yes | 281 (84.6%) |
| No | 14 (4.2%) |
| I don't know | 37 (11.2%) |
| Can smoking/alcohol caseation contribute in preventing diabetic complication? | |
| Yes | 190 (57.2%) |
| No | 13 (3.9%) |
| I don't know | 129 (38.9%) |
| Can dietary modification contribute in preventing diabetic complications? | |
| Yes | 289 (87%) |
| No | 19 (5.7%) |
| I don't know | 24 (7.3%) |
| Practices | |
| Do you have any health condition that limits your physical activity? | |
| Yes | 6 (1.8%) |
| No | 326 (98.2%) |

| | |
|---|---|
| Do you do any sports, fitness or recreational (leisure) activities weekly? | |
| Yes | 168 (50.6%) |
| No | 164 (49.4%) |
| Do you or did you smoke any tobacco products? | |
| Yes | 51 (15.4%) |
| No, never smoked | 242 (72.9%) |
| In the past | 39 (11.7%) |
| How many hours a week do you spend doing the following? (Watching T.V. - Reading - Internet/Computers) | |
| None | 13 (3.9%) |
| 1-5 hours | 166 (50%) |
| 6-10 hours | 64 (19.3%) |
| 11-15 hours | 35 (10.5%) |
| 16 - 19 hours | 0 (0%) |
| More than 20 hours | 54 (16.3%) |

Table 3: Knowledge, and practices for Type 2 diabetic patients who also are smokers

| | | **Yes n (%)** | **No n (%)** | **I don't know n (%)** |
|---|---|---|---|---|
| **Practices smoking** | Yes | 22 (50%) | 3 (6.8%) | 19 (43.2%) |
| | No, never smoked | 139 (59.9%) | 6 (2.6%) | 87 (37.5%) |
| | In the past | 19 (48.7%) | 2 (5.1%) | 18 (46.2%) |

Table 4: Knowledge and practice regarding the effect of lifestyle habits by gender

| | | **Male** | | **Female** | | **P value** |
|---|---|---|---|---|---|---|
| | | **N** | **%** | **N** | **%** | |
| Do you have any health condition that limits your physical activity? | Yes | 1 | 0.60 | 5 | 3.05 | 0.102 |
| | No | 167 | 99.40 | 159 | 96.95 | |
| Do you do any sports, fitness or recreational (leisure) activities weekly? | Yes | 97 | 57.74 | 71 | 43.29 | 0.008* |
| | No | 71 | 42.26 | 93 | 56.71 | |
| How many hours a week do you spend doing the following? | 1-5 hours | 70 | 41.67 | 96 | 58.54 | 0.003* |
| | 6-10 hours | 31 | 18.45 | 33 | 20.12 | |
| | 11-15 hours | 21 | 12.50 | 14 | 8.54 | |
| | > 20 hours | 39 | 23.21 | 15 | 9.15 | |
| | None | 7 | 4.17 | 6 | 3.66 | |
| Does physical work or exercise contribute in preventing diabetic complications? | Yes | 142 | 84.52 | 139 | 84.76 | 0.995 |
| | No | 7 | 4.17 | 7 | 4.27 | |
| | I don't know | 19 | 11.31 | 18 | 10.98 | |
| Do you or did you smoke any tobacco products? | Yes | 45 | 26.79 | 6 | 3.66 | <0.001* |
| | No, never smoked | 87 | 51.79 | 155 | 94.51 | |
| | In the past | 36 | 21.43 | 3 | 1.83 | |
| Can smoking/alcohol caseation contribute in preventing diabetic complication? | Yes | 88 | 52.38 | 102 | 62.20 | 0.058 |
| | No | 10 | 5.95 | 3 | 1.83 | |
| | I don't know | 70 | 41.67 | 59 | 35.98 | |
| * Significant p value | | | | | | |

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## PEER REVIEW

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## CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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## ETHICS COMMITTEE APPROVAL

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