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Examining The Diabetic Patient's Awareness of Their Conditions and Physical Activity Level in Saudi Arabia

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ABSTRACT

Over the past decade, thousands of research described the effects of increased physical activity on diabetic patients. Diabetes mellitus (DM) is considered one of the most chronic diseases that face humankind; it is a severe and long-term condition with a significant impact on the lives and well-being of individuals, families, and societies worldwide. The study participants comprised 41 males and 59 females. Their age ranged from less than 18 to more than 51. We asked the participants how old they were when they were diagnosed with diabetes. Their responses were % in 36-50 and followed by 53%. Our result shows that the first-degree kinship was 36%, and the Second-degree kinship was 51%. Our study indicated that recent studies show that Saudi populations have a high level of diabetic disease among Saudi individuals. Our results confirm that half of them have Second-degree kinship regarding the diabetic's history of DM, and diabetes is relevant among KSA individuals. The majority of the respondents are using insulin as their treatment. Furthermore, 57% lack knowledge of who got the DM. Additionally, we found that those who are inactive in their lives are 50%, while those who are highly active are 8%.

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Introduction

Over the past decade, thousands of research described the effects of increased physical activity on diabetic patients, with the majority of investigations suggesting that high physical activity levels will promote the prevention of non-communicable diseases such as diabetes and other chronic diseases; however, fewer studies have demonstrated that there is no correlation between physical activity and its benefits for people with diabetes. Diabetes mellitus (DM) is considered one of the most chronic diseases that face humankind; it is a severe and long-term condition with a significant impact on the lives and well-being of individuals, families, and societies worldwide.

Diabetes is a set of metabolic illnesses characterized by hyperglycemia caused by abnormalities in insulin production, insulin action, or both [1]. It is a non-infectious chronic condition caused by the pancreas' failure to generate sufficient insulin or the body's inability to use the insulin supplied by the pancreas adequately. Uncontrolled Diabetes will inevitably result in hyperglycemia or high blood sugar. Several bodily systems, including the nerves and blood vessels, may suffer irreparable harm over time [2]. It impacted humanity; the worldwide burden of diabetes mellitus is enormous. It is estimated that the total number of people with diabetes will reach 221 million in 2010, which will rise to 366 million by 2030; Saudi Arabia has the seventh-highest incidence of diabetes in the world [3]. In recent decades, Saudi Arabia has seen substantial economic growth. This transformation has encouraged the adoption of Westernized food habits, which have had a significant detrimental influence on community health, increasing the prevalence of non-communicable diseases.

Regarding physical activity, there is a decline in physical activity among the populace of KSA. Several studies demonstrate the importance of physical activity in managing diabetes. Physical activity is vital for the health and well-being of individuals of all ages. It has been shown to lower the morbidity and mortality associated with a variety of chronic conditions [4]. Physical inactivity, a sedentary lifestyle, and poor levels of physical fitness are becoming more widespread in Saudi culture [5]. Numerous consensus statements and government studies have highlighted the significance of regular physical exercise to the health and well-being of individuals of all ages. Physical activity is a health practice that prevents the majority of existing disease [6]. Our study aimed to examine diabetic patient's awareness of their conditions and their physical activity level in Saudi Arabia.

The main research questions are:

- What is the respondent's awareness level of their DM diseases?

- What is the relationship between physical activity and diabetes from the respondent's perspectives?

Literature Review

DM is rising as a pandemic in KSA [7]. The prevalence of DM reached an alarming level. 2019 DM will affect almost half a billion individuals [8]. In Saudi Arabia, both epidemiologically and economically, diabetes mellitus offers a severe health burden. A group of researchers found that Around 18% of the Saudi population has a moderate to high risk of developing T2DM [9].

Also, T2DM significantly impacts the sadness, anxiety, and stress subscales [10]. Nearly all cases of T2DM manifested with vitamin D deficiency or insufficiency; a documented relationship between vitamin D insufficiency and increased insulin resistance or a malfunction in the insulin [11]. Obesity is a recognized risk factor for T2DM and other chronic diseases. In KSA, women with GDM during pregnancy have an elevated chance of developing T2DM. Risk factors for the development of T2DM include advanced age, multiple pregnancies and births, and a history of GDM [12]. Preventative measures for women at risk for GDM are thus crucial for preventing the development of GDM. The prevention of GDM is equally essential for children since it poses a danger to the newborn [13]. Implementing a national prevention program to combat diabetes and address modifiable risk factors at the community level is essential [14].

Diabetes education is essential for controlling the disease and reducing the incidence of diabetes-related complications [15]. Researchers found that many high school pupils needed a proper understanding of the DM [16]. The previous study indicated that participants with diabetic problems had a much higher proportion of those with a solid knowledge of the DM [17]. Accessibility to diabetic care, availability of diabetes care, primary health system amenities, and health education resources all influence the diabetes patient care [18]. Patients with type 2 diabetes had an insufficient dietary outlook. It is highly recommended that these patients be counseled using an empowerment approach, as it can result in changes to their deeply ingrained nutritional behavior. Patient-centered diabetes education improves glucose management and other risk factors [19]. It is necessary to develop individualized techniques to expand their access to high-quality diabetic information, such as structured diabetes self-management education.

To improve glycemic control, healthcare professionals should employ a patient-centered strategy [17]. A group of researchers recommends initiating community-wide

awareness initiatives to enhance young people's understanding and attitudes surrounding obesity, type 2 diabetes, and associated comorbidities [18]. The rising prevalence of T2DM in Saudi Arabia shows that governments must take immediate corrective action [19].

Unfortunately, knowledge of this medical condition among people with diabetes and the general Saudi Arabian community is poor [20]. The patient's awareness of diabetes risk factors, symptoms, and complications are significantly correlated with the patient's occupation and age [21]. Researchers revealed that 62.8% of T2DM patients have poor health literacy [22]. Saudi women's awareness of GDM needed to be improved, but their understanding of managing the disease through physical activity, lifestyle, and dietary changes was adequate [23].

A group of researchers found that PA is extremely low in the KSA and that very few Saudis engage in any form of PA [24]. A study showed relatively high rates of physical inactivity among young men from Saudi Arabia [25]. According to their study results, younger persons perceive more hurdles to PA than middle-aged and older adults [26]. researchers reported that nearly half of the participants did not perform regular physical activities [27]. An examination was conducted for determinants influencing physical activity in female patients with T2DM; the result indicated that low levels of physical exercise were prevalent [28]. Middle-aged and elderly Saudi Arabians participate in minimal physical exercise [29]. The high prevalence of inactivity in Saudi Arabia, particularly among females, represents a significant public health burden and a precursor for the increased prevalence of numerous chronic diseases. , Also, most students need to reach the required levels of PA, even though most students have a strong understanding of the significance of PA [30].

Material And Methods

A systematic search was conducted using MEDLINE and Google Scholar databases up to January 15, 2018, while utilizing keywords such as DM, T1DM, T2DM, GDM, PA, physical inactivity, PA barriers, and PA determinants, in combination with the words “Saudi Arabia,” “Saudi population,” and “Saudi people.” In addition to the electronic search, all references of the selected articles were manually examined and identified for possible inclusion as relevant papers in this search. The inclusion criteria were articles in English literature, which included Saudi adults, adolescents, children, and pregnant women with diabetes and low physical activity. Full reports were obtained for all the inclusive studies and were then thoroughly read and analyzed.

A. Study Area and Subjects

A survey was distributed in January 2022 to Saudi Arabian individuals. This study investigated diabetic patient's awareness of their conditions and physical activity level in Saudi Arabia.

B. Study Design

The data collection method for this study relies on distributed questionnaires, and it is a cross-sectional descriptive-analytic study. This questionnaire was developed by researchers and two professors at the University of Hail to ensure the validity and reliability of the questionnaire.

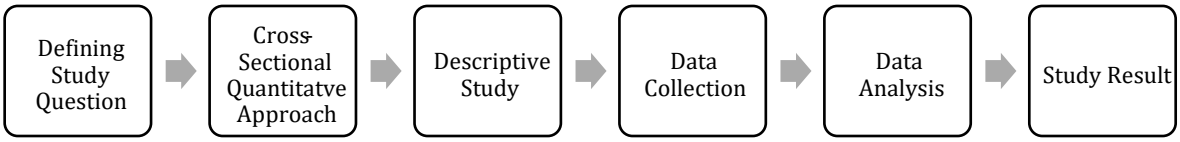


Fig. 1. Research study approach.

C. Sample Size

In this study, 100 Saudi Arabians were recruited from various regions of the country to participate in the study.

D. Data Collection, Instruments, and Measurements

Researchers developed a questionnaire according to the objectives and criteria of the study. The risk factors associated with DM in patients were also determined by creating a questionnaire. It consisted of two sections and was based on two variables. Throughout the research process, the researcher ensured that the statements were accurate. Based on Table 1, our first section (6 items) focuses on demographic data. For the study's second section [16], items are used to explore DM patients and their PA levels. A 5-point Likert scale was used to record responses to the statements. There are five levels of agreement on the scale, ranging from (1) strongly disagree to (5) strongly agree. We calculated the total score by adding up the items on each subscale. Therefore, a mean score and related statistics were calculated.

E. Statistical Analysis

The data were analyzed using SPSS version 17. On the questionnaire, all negative items were reverse-coded. All sample attributes and questionnaire items were calculated using descriptive statistics. Pearson's correlation coefficient was used to determine the risk factors associated with DB patients and PA.

Results and Discussion

A. Descriptive Analysis of Participants' Responses

The below table shows the participants' demographic information, including gender and age. The study participants comprised 41 males and 59 females. Their age ranged from less than 18 to more than 51. As illustrated below, the participants aged between 19-25 and 26-35, and the highest percentages were for those who aged less than 18 (37.3), then 19-25, and 26-35, respectively. The lowest group was older people (more than 51 years old). Regarding the education level, we found that classified as Illiteracy 12%, and 48 % were (postgraduate studies). Then the questionnaires focused on getting data on our research questions; we asked the participants how old they were when they were diagnosed with diabetes. Their responses were less than 18 years by 38 which is the highest.

The following item was to identify the genetic history of diabetes; our result shows that the first-degree kinship was 36%, and the second-degree kinship was 51%. And they illustrate a lack of knowledge on how they got the DM 13%. Furthermore, one item was about the treatments of DM; for instance, 77.5% of the study participants used insulin. Additionally, 11% of the study participants used Sugar-lowering drugs as treatment, and the least 10% of the proportion used both insulin and sugar-lowering drugs. Moreover, the use of insulin alone or in combination with oral medication is used by six million people with diabetes [37].

Table 1. Participants' Demographic and Work Characteristics

Variable	Categories	Frequency	Percent
Gender	Male	41	41.0
	Female	59	59.0
Total		**100**	**100.0**
Age	Less than 18	38	37.3
	19-25	25	24.5
	26-35	25	24.8
	36-50	53	15.1
	More than 51	12	11.8
Total		**100**	**100.0**

B. Instruments Validity

The below table shows the validity of the instrument.

Table 2. Cronbach's Alpha Coefficient

Cronbach's alpha	Items
0.848	16

The below pie chart represents the participant's responses regarding whether there is no relationship between sports and DM, 58 % disagreed, and only 1 % strongly agreed. Also, 21% (1% strongly agreed) indicated agreement with the statement.

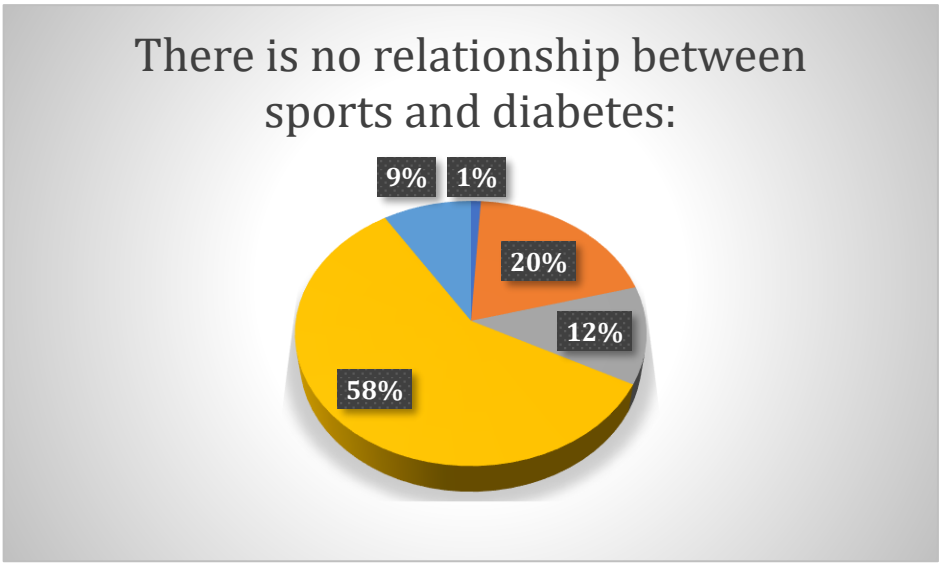


Fig. 2. Participants' information of DM.

We found that 43.1% have information about the case of DM, while 55.9% lack information about how and why individuals get diabetes. Also, an investigation showed that the knowledge of diabetes in the patients was poor by 32 % [31].

Furthermore, research conducted in Malaysia showed that it appears that diabetic patients have moderate knowledge of medication and disease [32].

After the implementation of an educational diabetes program, a group of researchers found that patients' knowledge about the disease had significantly increased ($p<0.05$), with emphasis on the topics regarding diabetes mellitus: concept, psychopathology, and treatment; physical activity and eating [33].

Table 3. Respondent Information on How a Person Gets DM.

Do you have information on how a person gets diabetes?	Yes	44	43.1
	No	57	55.9

A research based on family and twin studies, type 2 diabetes is thought to result from a combination of environmental, behavioral, and genetic factors [34]. Other findings demonstrated that diabetes type 2 (T2D) is caused by environmental factors and a vital genetic component [35]. Furthermore, one item was about the treatments of DM; for instance, 78% use insulin. This is consistent with results that reported that Diabetes had been treated with insulin for longer than with any other medication [36].

Table 4. Participants' Information of DM.

Item		Freq. (N=100)	%
Education level (N=100)	Illiteracy	4	3.9
	Secondary School	15	14.7
	Bachelor	34	33.5
	Postgraduate Studies	48	47.1
How old were you when you were diagnosed with DM (N=100)	Less Than 18	38	37.3
	19-25	25	24.5
	26-35	25	24.8
	36-50	53	15.1
	More Than 50	12	11.8
Genetic history of DM (N=100)	First-Degree Kinship	37	36.3
	Second Degree Kinship	51	50.0
	Nothing	13	12.7
What kind of DM have you been diagnosed with (N=100)	Diabetes Type 1	81	79.4
	Diabetes Type 2	13	12.7
	Gestational Diabetes	3	2.9
	Lack of Knowledge	4	3.9
What treatment do you currently use to treat DM? (N=100)	Insulin	79	77.5
	Sugar-Lowering Drug	11	10.9
	Insulin and Sugar-Lowering Drug	10	10

Regarding the activity level of the study participants, the researchers found that 50% were not active, while only around 10% were highly active. Furthermore, around 22% of the respondents were low active, whereas 20% were moderately active.

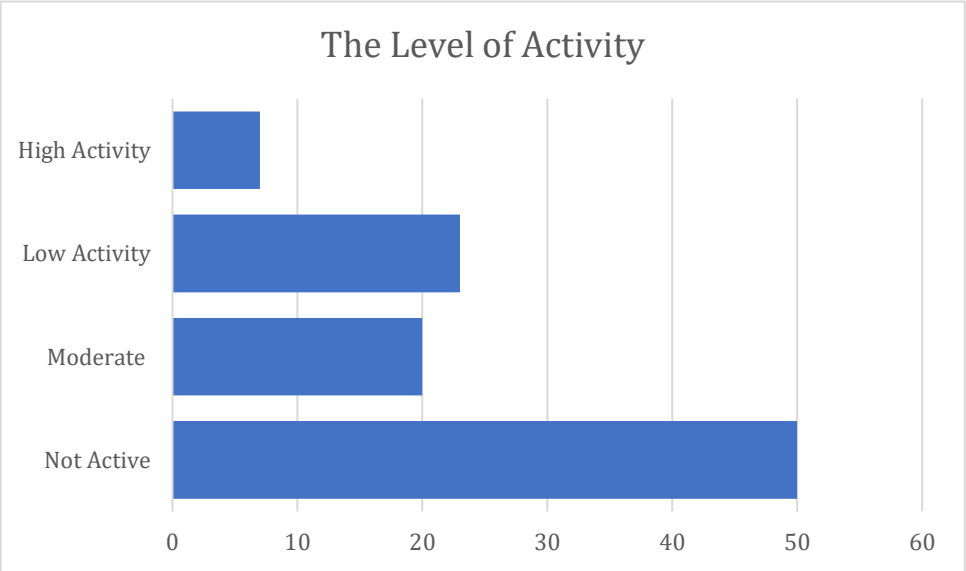


Fig. 3. Participants' activity level.

The table below indicates the Body mass index (BMI) of the respondents. We found that 23% are overweight and 25% obese. Furthermore, the analysis shows that 9% are underweight and 43% of the 43% are female, and only 4% are male.

Table 5. Participants' Body Mass Index (BMI).

Gender	Classification	Frequency
Female	Underweight	54%
Female	Normal Weight	27%
Female	Overweight	14%
Female	Obesity	12%
Gender	**Classification**	**Frequency**
Male	Underweight	4%
Male	Normal Weight	16%
Male	Overweight	9%
Male	Obesity	13%
Gender	**Classification**	**Frequency**
Both Male and Female	Underweight	9%
Both Male and Female	Normal Weight	43%
Both Male and Female	Overweight	23%
Both Male and Female	Obesity	25%

Conclusion

Our study indicated that Saudi populations have a high level of diabetic's disease among Saudi individuals. This investigation explored diabetics patients' knowledge of their disease and physical activity level in Saudi Arabia. Our results confirm that half of them have second-degree kinship regarding the diabetic's history of DM, and diabetes is relevant among KSA individuals. The majority of the respondents are using insulin as their treatment. Furthermore, 57% lack knowledge of who got the DM. Additionally, we found that those who are inactive in their lives are 50%, while those who are highly active are 8%.

The researchers recommend multiple points based on the study findings, which must be considered. Firstly, primary healthcare organizations should increase health promotion programs to increase DM patients' knowledge regarding their diseases. Second, as most of our respondents are under 18 years old, we strongly recommend implementing educational programs at schools. Last but not least, future research should examine the factors that lead Saudi Arabia individuals to be inactive in daily activities.

Conflict of Interest

We declare that there is no conflict of interest.

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