



## AWARENESS OF THE PHYSICAL EXERCISE, AND GENERAL HEALTH AMONG OLDER PEOPLE WITH TYPE 2 DIABETES DURING COVID-19 PANDEMIC IN PRIMARY HEALTH CARE CENTER IN TAIF CITY, SAUDI ARABIA 2022: CROSS-SECTION STUDY

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### Abstract:

**Background:** The Kingdom of Saudi Arabia is renowned for its high incidence of type-2 diabetes mellitus, which is expected to increase by 2030. Physical Therapists Exercise, and General Health is an important aspect of among older People with Type 2 Diabetes during COVID-19 Pandemic there is an increasing awareness of Physical Therapists diabetes control also nutritional therapy breakfast skipping, late dinner and meal contents on diabetes control. Engagement in regular physical activity has been shown to significantly attenuate non-communicable diseases including type-2 diabetes. A public health endorsement during the present COVID-19 pandemic has led the governments of largely affected countries to imply policies that restrict social mobility to slow COVID-19 spread. The COVID-19 pandemic has resulted in significant alterations to and implications for the lives of millions of people, and especially for those with pre-existing medical conditions, COVID-19 Pandemic affected also of daily Life, Physical Exercise, and General Health among Older People with Type 2 Diabetes. **Aim of the study:** To evaluate awareness of the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic in primary health care center in Taif city, Saudi Arabia. **Methods:** cross-sectional descriptive study conducted at among Older People with Type 2 Diabetes during COVID-19 Pandemic patients attending primary healthcare centers in Taif City in 2022. This commentary, describes the type 2 diabetes epidemic in the older People during COVID-19 and Physical Exercise, and General Health among Older people . Our total participants were (300 ) **Results:** shows most of the participants (33.0%) were in the age group 60-70 years, gender the majority of them were male (72.0%), regarding Nationality the majority of participant are Saudi were(83.0%) regarding level of education the majority of participant are Primary school/belowwere (34.0%), regarding Marital status the majority of participant are Married were (34.0%). **Conclusion** The proposed awareness of the Physical Exercise, and General Health among older People with Type 2 Diabetes during COVID-19 Pandemic will explore the effects of a physical activity programme in Saudi Arabian older with Type 2 Diabetes, on outcomes pertinent to the etiology of type-2 diabetes mellitus considering the high incidence of this condition in the Kingdom of Saudi Arabia.

**Keywords:** Awareness, Type 2 Diabetes, Physical, Exercise, General , health, Older, People , COVID-19, PHC, taif city, Saudi Arabia .

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**DOI:** 10.53555/ecb/2022.11.03.31

## **Introduction**

The COVID-19 pandemic has occurred in conjunction with a worsening type 2 diabetes pandemic, which the world has been struggling to control for many decades. Diabetes mellitus is a clinical condition characterized by abnormal glucose metabolism and hyper-glycaemia due to absolute or relative insulin deficiency, insulin resistance or both.(1)

Over time, various guidelines have emphasized the importance of physical activity and exercise training in the management of type 2 diabetes especially in the elderly, chronic diseases, including cardiovascular disease and musculoskeletal disorders.(2) the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic may provide important clinical information regarding the non-pharmacological management of type-2 diabetes.(3) However, the overall rate of physical inactivity among Saudi Arabian older is currently 80.5%, owing to time pressures, high-density traffic, poor air quality, lack of suitable exercise places/sports facilities, lack of social/friends support, gender, cultural barriers, low self-confidence, lack of time and environmental factors. Previous analyses have shown that home-based activity interventions can be effective.(4) Therefore, given the aforementioned barriers to physical activity in Saudi Arabia; a home-based physical activity may be an ideal solution in among Older People with Type 2 Diabetes during COVID-19 Pandemic patients(5) .

The present pandemic of COVID-19 has caused governments of largely affected countries to force harsh lockdown precautionary rules on their citizens. These included working from home, closing shops, schools, restaurants and any non-essential service or business to slow down the spread of the outbreak and prevent health care system collapse. These quarantine rules resulted in unhealthy behaviors which adversely affected the general population health.(6) Furthermore, restrictions in physical activity was due to closed sport centers/gyms and limited social mobility(7). These limitations may aggravate sedentary lifestyle, an unhealthy habit highly prevalent in developed nations, including Saudi Arabia (8). In fact, before the pandemic, being sedentary was already deemed a major public health problem, with more than a quarter of all older People with Type 2 Diabetes not meeting the required physical activity levels for maintaining good health(9). During the pandemic however, a recently released

data for physical activity low indicated. (10) It is well known that the adoption of a healthy lifestyle i.e., physical exercise helps to prevent complications, improve insulin action, and benefits glycaemic control in this population older People(11). Researchers have conducted studies that have raised concerns about the impact of COVID-19 on different aspects of the lifestyle and health of people with T2DM. Perceiving themselves as being a high risk group, they were found to be more worried about contracting the virus and, due to this, show evidence of negative effects of COVID-19 on psychosocial health distress, loneliness, feeling isolated(12), glycaemic control (i.e., glycated hemoglobin, fasting plasma glucose)(13), dietary patterns (14), exercise habits and body composition(15). However, most of these studies focused on an exploration of the socio-behavioral changes in terms of descriptive data through cross-sectional design. To the best of our knowledge, no qualitative research has yet been published to explore a comprehensive understanding of the impact of the pandemic on the lifestyle exclusively of older people with T2DM, for which any disruptive changes may affect the control of the disease and general health (16)

## **Literature Review**

Solomou et al (2020), who found that COVID-19 had a great impact on the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic and quality of life (QOL) of the general population. (17) Additionally, Satici et al (2021) They explained that the increased Older People with Type 2 Diabetes during COVID-19 might be due to the coincidence of specific factors during the pandemic, such as fear of high mortality rate and even health consequences after recovery, financial instability, insecurity regarding job stability, insufficient social support, length of isolation time, and high exposure to the media (particularly problematic social media). (18)

Demonstrated by Bawazeer et al.(2021)Due to westernization of the Saudi Arabian diet, the increased intake of high levels of fat, free sugars, sodium and cholesterol have become much more common in the daily dietary pattern(19). Cheikh et al.(2020) reported a lower level of leisure time physical activity among the Saudis. An increase in the prevalence of T2DM is also observed during the same period, which is attributed to the dramatic changes in lifestyle, in addition to genetic predisposition of Saudi people to diabetes, and a high prevalence of consanguineous marriages(20).

Some meta-analysis studies indicate significantly greater risk for T2DM and metabolic syndrome in people having a sedentary lifestyle(21). Physical activity contributes positively in delaying or preventing progression towards T2DM either by improving insulin sensitivity or affecting BMI (22). Apart from its positive impact on the development of T2DM regular physical activity is associate with several other benefits for the individual with diabetes (23), and is suggested as the first step towards glycaemic control in individuals with T2DM. The American College of Sports Medicine and American Diabetes Association joint position statement (24), and the American Heart Association(25) exercise guidelines has recommended exercising no less than every 48 hours to manage blood glucose levels and insulin resistance for people suffering with T2DM. The effects of exercising on insulin resistance may be lost after 48 to 72 hours (26), and short and vigorous bouts of exercise has been shown to improve insulin sensitivity in diabetic patients (27). Some clinical studies from Saudi Arabia, it is reported that not only the Saudi patients have poor knowledge of diabetes (28), but the physicians at primary care centres also have suboptimal awareness of proper diabetes management. (29) 66% of adult men and 71% of adult women are either overweight or obese in Saudi Arabia . The prevalence of diabetes in Saudi Arabia as demonstrated by Alshayban et al. (30)

Alsomali, et al.(2019) found in study Over the last few decades, the tremendous surge in socioeconomic growth probably contributed to unhealthy dietary habits in Saudi Arabia. In addition to the consumption of high-calorie traditional food (e.g. dates), excessive consumption of high calorie and fat based diets (e.g. fast food) is very common in Saudi Arabia (31).

The most of systematic review has shown that there is generally low Knowledge about the Risk of Type 2 Diabetes among Adults with Visiting the attending primary healthcare also about the risk factors and its complications among the Saudi population in particular .(26) Most diabetes mellitus patients had low to moderate knowledge scores in Riyadh, Jeddah, Al Also unexpectedly, health professionals in Saudi Arabia also had low knowledge scores about diabetes mellitus especially type 2.(30)

Moreover, the management of diabetes and its risk factors is still suboptimal. Some clinical studies from Saudi Arabia, it is reported that not only the Saudi patients have poor knowledge of diabetes, but the physicians at primary care centres also have

suboptimal awareness of proper diabetes management (22)

### **Rationale**

Most of older People with Type 2 Diabetes during COVID-19 Pandemic not Awareness of the important of Physical Exercise the patients reported changes in their management of the disease after the pandemic onset. Over the last few decades, the tremendous surge in socioeconomic growth probably contributed to unhealthy dietary habits in Saudi Arabia. In addition to the consumption of high-calorie traditional food (e.g. dates), excessive consumption of high calorie and fat based diets (e.g. fast food) is very common in Saudi Arabia. Moreover, the management of diabetes and its risk factors is still suboptimal. Physical Exercise should be the provider of choice to assist patients who have been diagnosed with diabetes type 2 or who are at risk for diabetes in achieving their physical activity goals.

### **Aim of the study:**

To evaluate awareness of the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic in primary health care center in Taif city, Saudi Arabia 2022.

### **Objective:**

To evaluate awareness of the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic in primary health care center in Taif city, Saudi Arabia 2022

### **Methodology:**

#### **Study design:**

This study is descriptive cross-sectional study was conducted among 300 of the Type 2 diabetes among Older People with Type 2 Diabetes during COVID-19 Pandemic attending primary healthcare centers.

### **Study Area**

The study has been carried out in the Taif city has 17 PHCCs affiliated to MOH, among which 8 centers were selected, using random number generator software program. This study was conducted among the patients attending primary healthcare centers in Taif city, Saudi Arabia. During the August to December 2022, and it reflects a diversified demographic profile with a considerable portion of the population comes from rural descent, while others come from an urban one. This difference translates into biological, socioeconomic and lifestyle differences in the Taif

city population. The participants were selected using “systematic random sampling” technique..

### **Study Population**

The study has been conducted regarding To evaluate awareness of the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic in primary health care center in Taif city, Saudi Arabia patients attending primary healthcare centers Taif city, Saudi Arabia in 2022 During the period of study .

### **Selection criteria:**

#### **Inclusion criteria**

- Type 2 Diabetes Epidemic patients
- Diagnosis of Type 2 diabetes.
- Attending in primary health care center.
- Resident Taif city in province.
- Sound cognitive abilities
- All nationalities
- Both males and females.

#### **Exclusion criteria:**

- Pediatric patients.
- Patients with severe cognitive impairment such as dementia or delirium.
- Patients unwilling to give written consent to participate.

### **Sample size**

Evaluate awareness of the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic in primary health care center in Taif city, Saudi Arabia, the sample size has been calculated by applying Raosoft sample size calculator based on (The margin of error: 5%, Confidence level: 95%, and the response distribution was considered to be 20%) accordingly the Sample size is (300) of the type 2 Diabetes Epidemic patients during COVID-19 Pandemic with attending in primary health care center Taif city, Saudi Arabia in 2022 (male and female) after official communication with the primary health care center Taif City, and adding 10 more to decrease margin of error. After adding 5% oversampling, the minimum calculated sample has been 300. Computer generated simple random sampling technique was used to select the study participants.

### **Sampling technique:**

Systematic random sampling technique is adopted. After that, by using random number generator, then simple random sampling technique has been

applied to select the participant. Also, convenience sampling technique will be utilized to select the participants in the study. By using systematic sampling random as dividing the total Older People with Type 2 Diabetes during COVID-19 Pandemic patients by the required sample size; (300 ).

### **Data collection tool**

The data was collected through a questionnaire that was developed by the researchers after reviewing the related literature. It was translated into simple Arabic language to suit the understanding level of the entire study subjects. Self-administrated questionnaire was used. The questionnaire contains four sections. First section: containing items related to demographic data as age, sex, marital status, and occupation. The second section questions to assess the diagnosis of Pre diabetes and Diabetes during COVID-19 Pandemic . The third section consisted of questions of risk factor and Complications from diabetes of Type 2 Diabetes.

### **Data collection technique:**

Researcher has been visiting the PHC Taif City , Saudi Arabia in 2022. The city has seven sectors of PHC divided into three inners and four outers. Each sector consists of a group of Primary Health Care Centers. The researcher is concerned with one of the inner PHC after getting the approval from the ministries of health . The researcher has been obtained permission from participants. After the arrival of the participants has been explained the purpose of the study to all participants attending

### **Data entry and analysis:**

The data were coded and introduced to the Statistical Package of Social Sciences (SPSS, version 24). The data were analyzed to present the findings in descriptive and inferential statistics. The descriptive statistics include frequencies and percentages for categorical variables and standard deviations were used to summarize numerical data. The significant associations between demographic and background variables were detected at  $< 0.05$  significance level.

### **Pilot study:**

A pilot study has been conducted in the same sector due to the similarity to the target group using the same questionnaire to test the methodology of the study. As a feedback, the questionnaire has been clear and no defect has been detected in the methodology

**Ethical considerations:**

Permission from the directorate of health , verbal consents from all participants in the questionnaire were obtained. All information was kept confidential, and results will be submitted to the department as feedback. The researcher described

the aim and objectives of the study for the residents. No names were required to assure confidentiality of data, and all information was kept confidential only for this study’s purposes.

**Budget:** Self-funded

**RESULT**

**Table 1: Distribution of Socio-demographic characteristics of participants among older People with Type 2 Diabetes during COVID-19 Pandemic of participant in the study (n=300)**

	N	%
<b>Age (year)</b>		
<50	93	31
50-60	63	21
60-70	99	33
>70	45	15
<b>Gender</b>		
Male	216	72
Female	84	28
<b>Nationality</b>		
Saudi	249	83
Non-Saudi	51	17
<b>Educational level</b>		
Primary school/below	102	34
Intermediate school	63	21
High school	60	20
University	45	15
Postgraduate	30	10
<b>Marital status</b>		
Single	81	27
Married	102	34
Divorced	60	20
Widowed	57	19
<b>Monthly family income (SR)</b>		
<5000	84	28
5000-10000	114	38
>10000	102	34

Table 1 shows that most of the participants (33.0%) were in the age group 60-70 years follow by the (31.0%)were in the age >50 years. Regarding the gender the majority of them were male (72.0%) while female(28.0%), also regarding Nationality the majority of participant are Saudi were(83.0%) non- Saudi were(17.0%), also regarding level of education the majority of participant are Primary

school/belowwere (34.0%) while Intermediate school were(21.0%). Regarding Marital status the majority of participant are Married were (34.0%) while Single were(27.0%). Regarding the Monthly family income (SR) the majority of participant between 5000-10000 were(38.0%) follow by >10000 were(34.0%).

**Table 2 Distribution of risk factors among older People with Type 2 Diabetes during COVID-19 Pandemic of participant in the study .**

Risk factor	No	%
<b>Duration of diabetes, years</b>		
<5 years	159	53
5-14 Y	66	22
>15 y	75	25

<b>Chronic disease</b>		
No co-morbidity	111	37
1–2 co-morbidities	126	42
>3 co-morbidities	63	21
<b>Of which</b>		
Ischaemic heart/ artery disease or cardiac failure	102	34
Asthma or COPD	69	23
Diabetic complication	129	43
<b>Diabetes treatment</b>		
Lifestyle advise only	81	27
Oral antihyperglycaemic therapy only	93	31
Insulin ± oral antihyperglycaemic therapy	126	42
<b>Complications from diabetes</b>		
Yes	132	44
No	168	56
<b>Physical activities or exercise</b>		
Yes	123	41
No	177	59
<b>COVID–19 complaints during lockdown</b>		
Yes, tested positive	54	18
Yes, but tested negative	111	37
Yes, but not tested	66	22
No	54	18
I don't know	15	5

Table (2) shows the risk factors among older People with Type 2 Diabetes during COVID-19 Pandemic of participant in the study, regarding the Duration of diabetes, years the most of participant in <5 years were (49.0%) while >15 years were (29.0%) while 5-14 years were (22.0%). Regarding the Chronic disease the most of participant in >3 co-morbidities were (66.0%) while No co-morbidity were (52.0%), while 1–2 co-morbidities were (38.0%), regarding of which the most of participant in Diabetic complication were (43.0%) followed by Ischaemic heart/ artery disease or cardiac failure were (34.0%) but the Asthma or COPD were(23.0%), regarding the Diabetes

treatment, the most of participant in Insulin ± oral anti hyperglycemic therapy were (42.0%) while Oral anti hyperglycemic therapy only were (31.0%) but Lifestyle advise only were(27.0%). While regarding the Complications from diabetes the most of participant answer No were (56.0%) while Yes were (44.0%), regarding the physical activities or exercise the most of participant answer No were (56.0%) while Yes were (41.0%) regarding the COVID–19 complaints during lockdown the most of participant answer Yes, but tested negative were (37.0%) while Yes, but not tested were (22.0%) but Yes, tested positive were (18.0%)and No were(18.0%)

**Table 3 Distribution of diagnosis of Pre diabetes and Diabetes among older People with Type 2 Diabetes during COVID-19 Pandemic of participant in the study.**

	Normal		Pre diabetes		Diabetes		Chi-square	
	N	%	N	%	N	%	X <sup>2</sup>	P-value
Fasting plasma glucose, mg/dL	81	27	87	29	132	44	47.715	<0.001*
2-h plasma glucose after 75-g OGTT, mg/dL	39	13	81	27	180	60		
Random plasma glucose, mg/dL	81	27	93	31	126	42		
Glycated hemoglobin, %	57	19	57	19	186	62		

Abbreviation: OGTT, oral glucose tolerance test

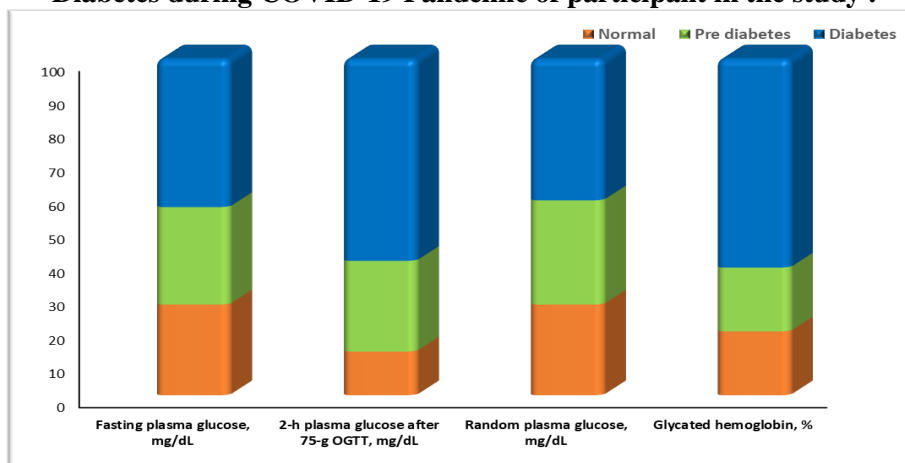
Table (3) shows in the study a significant relation the while P-value = 0.001 and X<sup>2</sup> 47.715, regarding the Fasting plasma glucose, mg/dL, the most of participant from Diabetes were (44.0%) while Pre

diabetes were (29.0%) while normal were (27.0%), while Regarding the 2-h plasma glucose after 75-g OGTT, mg/dL, the most of participant from Diabetes were (60.0%) while Pre diabetes were

(27.0%) and Normal were (13.0%), regarding the Random plasma glucose, mg/dL, the most of participant from Diabetes were (42.0%), while Pre diabetes were (31.0%). while normal were (27.0%),

regarding the Glycated hemoglobin, %, the most of participant from Diabetes were (62.0%) while Normal were (19.0%) while Pre diabetes were (19.0%)

**Figure (1) Distribution of diagnosis of Pre diabetes and Diabetes among older People with Type 2 Diabetes during COVID-19 Pandemic of participant in the study .**



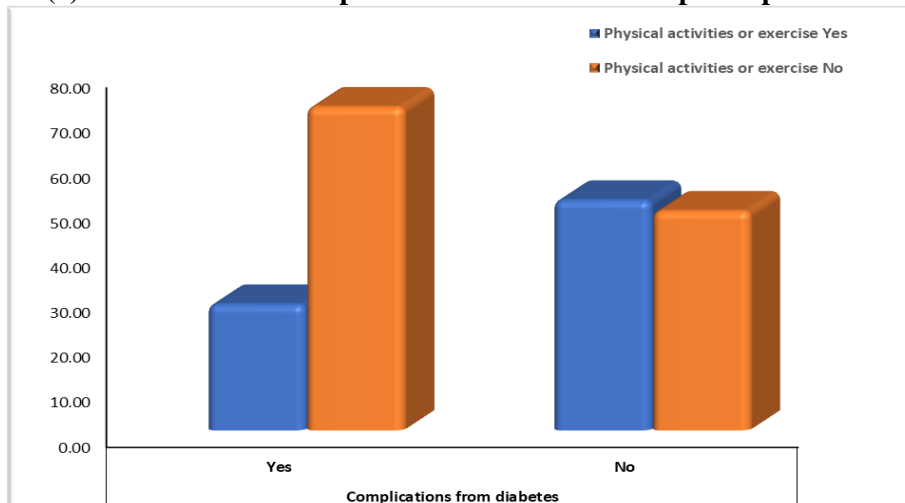
**Table 4 Distribution of complications from diabetes of participant in the study**

		Complications from diabetes					
		Yes		No		Total	
		N	%	N	%	N	%
Physical activities or exercise	Yes	37	28.03	86	51.19	123	41
	No	95	71.97	82	48.81	177	59
	<b>Total</b>	132	100.00	168	100.00	300	100
Chi-square	X <sup>2</sup>	15.448					
	P-value	<0.001*					

Table 4 Regarding distribution of the patient's with of complications from diabetes of participant in the study show a significant relation between the Complications from diabetes and physical activities or exercise while P-value = 0.001 and X<sup>2</sup> 15.448, regarding the physical activities or exercise

in YES the most of participant answer No were (51.19%) while Yes were(28.3%) while total (41.0%), regarding Physical activities or exercise in NO the most of participant answer Yes were (71.97%) while No (48,81%) while total (59.0%).

**Figure (2) Distribution of complications from diabetes of participant in the study**



## **Discussion**

The current assessment surveyed a large number of participants, 300 participants to evaluate awareness of the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic in primary health care center in Taif city, Saudi Arabia 2022. Although the role of awareness of the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic in Taif city, Saudi and bad life style to olde people attending primary healthcare centers very important but the prevalence of diabetes mellitus (DM) is high among populations in Taif City, patients often lack the Physical Exercise, and General Health among Older People with Type 2 Diabetes during COVID-19 Pandemic patients and bad life style (32). There may be a gap between knowledge about the risk of Type 2 Diabetes during COVID-19 Pandemic among older patients with Visiting the PHC, despite the high prevalence . Cross-sectional studies have suggested that the prevalence of T2DM in Saudi ranges from 10% to 30% (22)

In the present study shows that most of the participants (33.0%) were in the age group 60-70 years follow by the (31.0%)were in the age >50 years. Regarding the gender the majority of them were male (72.0%) while female(28.0%), also regarding Nationality the majority of participant are Saudi were(83.0%) non- Saudi were(17.0%), also regarding level of education the majority of participant are Primary school/belowwere (34.0%) while Intermediate school were(21.0%(. Regarding Marital status the majority of participant are Married were (34.0%) while Single were(27.0%(. Regarding the Monthly family income (SR) the majority of participant between 5000-10000 were(38.0%) follow by >10000 were(34.0%). (See Table 1)

The COVID-19 pandemic has resulted in significant alterations to and implications for the lives of almost everyone. Such repercussions in everyday life may have been most evident for those belonging to vulnerable groups of the population. The present study reported the lived experience—including the role of physical exercise—of older people with T2DM throughout the pandemic situation. The findings were summarised into five themes: (1) an altered social and relational life; (2) changes in routine and attitude regarding physical activity behaviour; (3) home-related activities gained relevance; (4) health and well-being impact and management; and (5) thoughts about the post-pandemic period. Research shows that prior to the pandemic, socialisation and physical activity were

common and important for health and well-being (23). Our findings indicated that, due to the pandemic situation, the participants changed their daily routines, and spent more time at home, and had limited interaction with family and friends. This scenario reflects the public measures of social distancing imposed by government authorities, which were some of the most important preventive strategies to contain the spread of the virus (24)

Regarding risk factors among older People with Type 2 Diabetes during COVID-19 Pandemic of participant there are no modifiable and modifiable risk factors for development of type 2 diabetes (Table 2). No modifiable risk factors include age, sex, socioeconomic position, race/ethnicity, genetic predisposition, history of gestational diabetes, and low birth weight.(33) While European studies show a higher risk of diabetes in men compared with women, this was not consistently observed in the United States.(34) similar in the United States, the risk of developing type 2 diabetes was higher among those in lower socioeconomic positions, including lower levels of education, occupation, and income. American Indians/Alaska Natives have the highest prevalence of diabetes, followed by non-Hispanic blacks and Hispanics. African Americans are more likely to develop diabetes than white and Asian individuals.(35) For American Indians, the rates of diagnosed diabetes range from 5.5% to 33.5% in different tribes and population groups.(22) Although genetic factors also play a role, primary risk factors appear to be those that are not genetic.(36)

Regarding distribution of the patient's with of complications from diabetes of participant in the study show a significant relation between the Complications from diabetes and physical activities or exercise while P-value = 0.001 and X<sup>2</sup> 15.448, regarding the physical activities or exercise in YES the most of participant answer No were (51.19%) while Yes were(28.3%) while total (41.0%), regarding Physical activities or exercise in NO the most of participant answer Yes were (71.97%) while No (48,81%) while total (59.0%).(See table 4)

## **Conclusion**

An altered social and relational life, changed routines and attitudes regarding physical activity behaviour, increased relevance of older-related activities, the impact and management of health and well-being, and thoughts about the post-pandemic period were the main themes identified from the lived experience of older people with



T2DM throughout the pandemic period. The findings showed that ~9 months after the start of the pandemic, older people with T2DM were still isolated, afraid of contracting the virus and presenting low levels of physical exercise. Given the health risks associated with an unhealthy lifestyle, mental health problems and difficulties in the management of the disease reported by the participants, there is a growing need for a multidisciplinary approach to tackle the problem. Government policies should be addressed for older people with T2DM who need particular attention, and strategies should be created to manage emergent psychological issues, to promote a healthy lifestyle, and to manage the control of the disease until the desired normality is reached.

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