

Perceived Barriers to Physical Activity in Type 2 Diabetes Mellitus (T2DM) Patients during COVID-19 Pandemic in the UAE

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Abstract

Physical activity plays a vital role in the prevention and treatment of Type2 Diabetes Mellitus (T2DM) (Hayes and Kriska, 2008). During the COVID-19 pandemic, physical activity is shown to be imperative in helping support a strong immune system (Chastin *et al.*, 2021) and patients with COVID-19 who have been consistently physically inactive have a significantly higher risk of severe outcomes than patients who were doing some activity (Sallis *et al.*, 2021). Therefore, the objective of this qualitative study was to evaluate the sufferer's perception of physical inactivity and its social determinants among people with diabetes. Interviews were conducted with 14 participants with diabetes aged 40-60 years old living in the UAE in June-July 2021. The barriers of physical activity were explored through in-depth, semi-structured, audio-taped interviews. Barriers for physical inactivity were grouped around five themes: (1)Life-altering COVID-19: the pandemic that changed the world (2)Social and cultural norms: Islamic faith and family are the two most important influences among Arabs (3)Fatigue: prolonged sitting (due to long commute and sedentary jobs) and in some participants post-viral fatigue syndrome due to COVID-19 infection (4)Fear of illness: due to hyperthermia and comorbidities (5)Impact of lockdown. The prevalence of physical inactivity is high among Arabs. Weather restrictions and cultural obligations may lead to reduction in physical activity levels. Therefore, meeting physical activity guidelines can reduce the risk for severe COVID-19 outcomes among infected adults and is likely to prevent increases in diabetes incidence in this population.

Keywords: Physical inactivity, Type2 diabetes mellitus, COVID-19, Cultural influence, barriers, lockdown.

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INTRODUCTION

The declaration of the COVID-19 pandemic by the WHO (World Health Organization) at a time when the UAE (United Arab Emirates) was making efforts to increase physical activity to combat diabetes is a life-altering challenge the people of this country are facing. Lockdown was imposed to control the spread of this contagious virus; closure of sports and fitness clubs and outdoor activities potentially lead to a further decline of already low levels of physical activity in the general population of the UAE (Sharara *et al.*, 2018).

Since December 2019, COVID-19 is a newly identified coronavirus which has caused a worldwide pandemic of respiratory illness (WHO, 2019). This virus is transmitted through direct or indirect contact and airborne routes. Airborne transmission refers to the presence of microbes within droplet nuclei through aerosols dispersed in air and can occur over an extended distance and time, and directly deposit along the human

respiratory tract (Zhang *et al.*, 2020). It is a high risk, rapidly evolving medical crisis. Its symptoms include cough, sore throat, high temperature, diarrhoea, headache, muscle or joint pain, fatigue, and loss of sense of smell and taste. Symptoms of COVID-19 pneumonia include breathlessness, loss of appetite, confusion, pain or pressure in the chest, and high temperature (above 38 celsius) (Struyf *et al.*, 2020). The UAE imposed a lockdown to curb the spread of COVID-19 which reduced the already low levels of physical activity in the region (Dalibalta *et al.*, 2021). This lockdown can have adverse effects because daily exercise may help combat the disease by boosting the immune systems and counteracting some of the comorbidities like obesity, diabetes, hypertension, and serious heart conditions that are more susceptible to severe COVID-19 illness (Siordia Jr. *et al.*, 2020).

In addition to this, Type 2 Diabetes Mellitus (T2DM) was one of the most commonly reported

condition among those hospitalized with COVID-19 (Riddle *et al.*, 2020) and there is evidence that T2DM causes an increased risk in the mortality and severity of COVID-19 (Singh and Singh, 2020).

T2DM is defined as a chronic health condition and signals an impairment in the way the body regulates and uses glucose as fuel (CDC, 2020). T2DM is dubbed as a silent pandemic and the UAE is among the top 10 countries with the highest diabetes incidence in the world. It is one of the top 10 causes of premature death (Vos *et al.*, 2020). Over 1 million people are living with diabetes in the UAE, expecting to double to 2.2 million by 2040 (IDF, 2020). Another major concern is that the majority of the people with diabetes are unaware of their condition (Alawadi *et al.* 2020) and in addition its recent prevalence among the young age Emirati group (aged 18 – 29 years) (Alzaabi *et al.*, 2019).

T2DM is associated with multiple risk factors, such as increasing age, male gender, hypertension, obesity, low education, and genetics (Alawadi *et al.*, 2020). Excess blood sugar decreases the elasticity of blood vessels and causes them to narrow, impeding blood flow (Ighodaro and Adeosun, 2017) which is strongly associated with macrovascular and microvascular conditions. Macrovascular complications of diabetes include coronary heart disease, stroke, and peripheral vascular disease, and microvascular complications include end-stage renal disease, retinopathy, and neuropathy, along with lower-extremity amputations (Harding *et al.*, 2019). These diabetes-related health issues increase the body's vulnerability to infection and can make an individual more likely to become severely ill from COVID-19 (CDC, 2020). Jelinek *et al.*, (2017) found that in the UAE, prevalence of diabetes-related comorbidities among people with diabetes is estimated at over 80%, with the prevalence increasing with age to 94.4% in the over 65-year-old age group. Significant progress has been noticed in T2DM research in the UAE during the last two decades (Shieb *et al.*, 2020).

Physical activity has proven to induce improvements in glycaemic regulations and lowers the risk of heart disease and nerve damage in diabetes patients (Colberg *et al.*, 2016). However according to the UAE National Health Survey Report, 2017-18 the majority (70.8%), of respondents interviewed from the UAE population did not meet the WHO recommended guidelines of physical activity (MOHAP, 2019). Marçal *et al.*, (2020) assert that physical inactivity-derived metabolic consequences can be hazardous for diabetic individuals during COVID-19.

Rationale

To date, numerous clinical studies have evaluated the impact of physical activity as an effective intervention for the prevention and management of

T2DM (Manson *et al.*, 1991; Colberg *et al.*, 2016; Healy *et al.*, 2008). However inadequate knowledge and behavioural beliefs, shortage of resources, comorbidities, negative emotions, and lack of support may be preventing the people living with diabetes from taking part in physical activity during COVID-19 pandemic (Shi *et al.*, 2020). Therefore, T2DM patients were interviewed during this pandemic to investigate barriers to physical activity faced by them and its effects on their health.

Aims and objectives

This paper aims:

- To explore barriers to physical activity for people living with diabetes before and during COVID-19 in UAE.
- To discover how physical inactivity has affected their lives.
- To explore what people believe might make them exercise regularly.

Therefore, the research question for this dissertation is: What are the perceived barriers to physical activity in T2DM patients during COVID-19 pandemic in the UAE?

METHODS

STUDY DESIGN

A constructivist paradigm was selected for this study. The social environment plays a significant role in shaping behavioural development and constructivism supports the acquisition of cognitive processing strategies, self-regulation, and problem-solving through socially constructed learning opportunities (Honebein, 1996). Therefore, these are critical skills for evidence-based knowledge uptake and implementation in clinical practice (Thomas *et al.*, 2004). Volkwein-Caplan (2004) suggests that a person's culture shapes their attitudes toward and involvement in physical activity. This study uses a cultural relativism ontology because the UAE has a rich culture and heritage that reflects traditional Arab and Islamic values. Cultural relativism is the view that all beliefs, customs and ethics are relative to an individual's own social context (Donnelly, 1984). Epistemology is the theory of knowledge. It is concerned with how a person's mind views reality and is concerned with how people know what they know, what justifies them in believing what they believe, and what standards of evidence they should use in seeking truths about the world and human experience (Audi, 2010). The study takes a stance of Interpretivist epistemology because it looks for 'culturally derived and historically situated interpretations of the social life-world' (Crotty, 1998 Page.67). The methodology used for this research project is qualitative methodology as it focuses on generating meaning and understanding through rich data descriptions. It integrates more subjective human experience rather than just focussing on purely objective external reality (Mohajan, 2018).

SAMPLE SIZE

THE PROCESS OF RECRUITMENT

Participants were recruited using a combination of convenience and purposive sampling. The inclusion criteria for this study were: men and women who are (a) 40 – 60 years old, (b) living in the UAE, either locals or expatriates, Arab ethnicity, (c) diagnosed with diabetes, (d) willing to commit to an interview that lasts at least 30 minutes, (e) provided a written or verbal consent. Individuals who did not meet one or more of these criteria were excluded from the study.

A sample of 14 participants (8 males, 6 females) were interviewed with the duration of diabetes of 3 – 20 years.

RIGOUR

Standards for Reporting Qualitative Research - SRQR (2014) were implemented in this research, as it aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research (O'Brien *et al.*, 2014). To ensure rigour, specific methodological strategies were implemented such as the audit trail, member checks when coding, categorizing, or confirming results with participants, peer debriefing, negative case analysis, structural corroboration, and referential material adequacy (Guba & Lincoln, 1981) and Lincoln and Guba's parallel perspectives were considered (anonymity, confidentiality, and informed consent) (Unluer, 2012).

ETHICS

The researcher received approval from the Middlesex University Ethics Committee, London. Before commencing the research process, a copy of the participant information sheet along with the consent form (in English and Arabic) was emailed to them. The participants were informed that if any topic arose which is sensitive for them, they had the choice to pause the conversation to regain composure and were given the option not to answer it.

This qualitative research is conducted by an insider researcher. There are many benefits of being an insider researcher, he/she is not seen as a stranger, is familiar with the culture, language, local conditions, and is less inclined to construct stereotypes (Bonner *et al.*, 2002). There are some disadvantages too, role duality, overlooking certain behaviours, making assumptions, and unable to see all dimensions because of being close to the situation (Unluer, 2012). For this reason, preventive measures were taken such as the results were viewed by the participants, and findings were reviewed with peers. Practising reflexivity was a major methodological tool with which the researcher became more attentive to participant's sensitivity in

communicating about physical inactivity. This was done by giving extra attention in non-verbal cues, questioning appropriately, and by building rapport. To ensure confidentiality, interviews were not viewed by anyone except the researcher and the supervisor, and pseudonyms were assigned during the transcription. Those pseudonyms are used in this paper.

DATA COLLECTION

All the participants were interviewed either in a café or through Zoom app and were transcribed shortly after. Each interview was around 30-40 minutes long. Interviews were undertaken in June-July 2021.

DATA ANALYSIS

Data were analyzed using thematic content analysis incorporating inductive procedures (Elo and Kyungas, 2008) to code the data. The process began with the researcher reading the transcript many times to get a deeper understanding of the experiences of the participants to devise a code. The overlapping codes were gathered together in categories, which were then conceptualized into broad themes. Thematic analysis is a method of identifying, analysing, and reporting themes within data (Castleberry and Nolen, 2018). It was performed manually and by using NVivo V.12 (QSR International) which was used to assist in coding and analyzing transcripts. The analysis was stopped when no new themes were emerging, indicating thematic saturation was achieved (Lowe *et al.*, 2018).

DISCUSSION AND INTEGRATION OF FINDINGS

This qualitative study explored the barriers faced by people with diabetes in the UAE. Key themes arising from the qualitative data were: life altering COVID-19, cultural and social norms, fatigue, fear of being hurt, and impact of lockdown.

1. LIFE ALTERING COVID-19

The current pandemic of COVID-19 had a huge impact on the people with diabetes in the UAE. *"Covid pandemic came as a big shock, and it was an unknown entity. When it started, I think it threw us all off guard kind of a thing and the whole life changed completely"*. (Danish)

In a study conducted by Ismail *et al.*, (2020), it was shown that physical inactivity was exacerbated during the home confinement. This lockdown has also increased the feelings of stress in people with diabetes since they have been considered a high-risk group according to health authorities (Joensen *et al.*, 2020). Maryam, a morbidly obese and self-conscious person, avoided public places and could only work out in a gym during off-peak hours. Closure of gyms during lockdown had left her with no other option for physical activity.

“The gyms were shut down. I am a gym person, I'm a very shy person to go out and walk and, I'm a very body conscious person, so I would always be feeling that the people are looking at me, maybe, so I prefer gym in the close place and then the gyms shut down, when they opened after around four months, they were only accepting 30% of the total capacity along with the all the SOPs of COVID, I am not able to work out with a mask on, or the gloves on, and plus because my immunity system is I think the worst thing on entire mother earth, so I was myself avoiding going to the gym because I got covid positive in the month of Feb” (Maryam).

Before COVID-19 people's lives revolved around their work commitments, going to the malls for grocery shopping, and gatherings with their friends. Walking, a simple health behavior that can reduce chronic diseases (Lee *et al.*, 2008) has been the most preferred method of exercise mentioned by most of the participants.

“I would say for the past three years at least, 10,000 steps is a religious thing that we do almost every day” (Alia).

Now people are forced to adapt to the new normal of working from home, online shopping, distance learning, and zoom meetings which has further reduced their physical activity levels. Closures of parks, beaches, shopping malls has hindered the opportunities further. It has never been easier to be physically inactive. However, other participants took working from home during this pandemic as an opportunity. They compensated the time saved from daily commute during lockdown which increased their physical activity at home.

“Prior to let's say the pandemic we were going to the office, and it was like almost 7 to 8 hours in the office or a lot of time on the roads and it left me very tired, and not really wanting to do exercise but ever since the pandemic happened, we've been regularly exercising at home with the Zumba videos on the YouTube and walking videos” (Sidra).

2. FATIGUE

Almost all participants reported fatigue. Jameel complained,

“How can I work out when I feel so lethargic 24/7”.

Furthermore, the COVID-19 infection among the immunosuppressed diabetic population induced chronic fatigue. For participants (6/14) who were infected with COVID-19, it was problematic to start working out again after recovery. Post-viral fatigue syndrome lingers for months (Islam *et al.*, 2020) and was noticed especially in participants who were not vaccinated. After recovering from COVID-19, Sarah said

“the only thing I feel is that I'm not able to walk the way (I used to). I was a person who could do gym continuously for four hours, which includes Zumba, power classes and HIIT, all of these, without taking a break, but right now, if you ask me to walk for 30 minutes, I cannot walk, the way I used to”.

Long hours sitting (desk-based jobs, daily commute, time spent watching TV, and on social media) was reported by majority of the participants. Prolonged uninterrupted sitting increases fatigue in T2DM patients (Dempsey *et al.*, 2018). Inactivity induces muscular wasting and loss of cardiorespiratory function, which contributes to fatigue (Bogdanis, 2012). According to a study in American Journal of Epidemiology, the recommended physical activity guidelines of 30 minutes a day can counteract a day of sitting (Diaz *et al.*, 2019). Moreover, this increased sitting time and sedentary behavior, which have been reported during the lockdown, is also associated with multiple adverse health outcomes, further aggravating the risk to health (Prasad and Das, 2009).

Working hours along with long commuting time takes the whole day and adds unwanted stress, which leads to fatigue (Kageyama *et al.*, 1998).

“My office timings are 8 to 5 but just because you know, the kind of traveling between the emirates is horrible, so I leave my house at around 7:00 and then I come back at around 7:00, so it's 12 hours out of the house and it's six days (a week) basically, because I'm outsourced, not directly employed with the organization”. (Alia)

This agrees with Halonen *et al.*, (2020) who evidenced that long commuting time increases the risk of physical inactivity and sleep problems if individuals have longer than normal weekly working hours.

3. CULTURAL AND SOCIAL NORMS

Religion is a big part of the daily life among Arab participants. People plan and schedule their activities around prayer times. At the time of interview, none of the participants was following a structured exercise regime. Daily household chores and performing religious duties were considered as ample physical activities by most of them which demonstrates the lack of awareness of the importance of regular physical activities towards combating chronic diseases. For Muhammad going to the mosque and praying contributes to his daily exercise

“I walk to the nearby mosque by foot, which is 25 meters away, for all the five prayers”.

Women prefer spending the day doing religious duties after their children reach adulthood.

“I have my whole day planned to do prayers, reciting Quran, and supplicating to the Creator, I am not left with any spare time then” (Rabia).

In the Arab world, in accordance with Islamic principles, men are seen as the family guardians and breadwinners, and women are responsible for all the physical and educational needs of children (Crabtree and Ashencaen, 2007).

"I should have continued but I have kids, and I have responsibilities and I have lots of things, so that's why I stopped" (Alia).

She said she will start working out once her children are grown up. Moreover, reminiscing about her workout days, she referenced pleasure she derived from working out in groups,

"we were in the group of 5 ladies and the whole week they will make us do vigorous exercise like running on treadmill, circuit classes, power pump and then in the end of the week, we used to go for a 6km hike or we'll go to the beach for a straight long walk, so it was very exciting".

Even though spending time doing the physical activities was considered as enjoyable by the majority, the responsibilities of family was set as a priority. This may suggest that taking out time for themselves to work out alone might be conceived as egocentric, although Islam promotes physical fitness. In one of the Hadiths, Abu Hurairah mentioned that the Messenger of Allah, Muhammad (Peace and Blessing be upon him) said that: "A strong believer is better and dearer to Allah than a weak one, while there is good in both" (Sahih Muslim 2664, 52). This particular Hadith outlines the importance of being healthy and strong physically, which shows that exercise and keeping fit are important for Muslims. In another hadith Prophet Muhammad (pbuh) said "Any action without the remembrance of Allah is either a diversion or heedlessness except four acts: walking from target to target (during archery practice), training a horse, and learning to swim" (Sahih Muslim Book 20, Number 4711).

Healthy lifestyle starts with parents leading the way and setting good fitness examples. Various studies have assessed the efficacy of parental behavior on activity practices of their children (Springer *et al.*, 2006, Liszewska *et al.*, 2018, Munoz-Galiano *et al.*, 2020).

"I think even I have been indisciplined because you know from childhood, I have never (engaged in physical activities) and now it's like an effort" (Danish).

In Arab culture family/tribe is most important (T.D.H., 2006). For most of the participants taking out time for themselves is challenging while living in the extended family households where relatives such as grandparents, parents and aunts live together.

"I have my whole family here, like my parents, myself and we are Seven Sisters one brother, all are married, and we have a big family over here and many relatives

here, alhamdulillah, so I'm busy with my relatives, my family" (Maryam).

It is expected from a son to take care of his parents in advanced age. Khalid takes care of his old father who is affected by multiple chronic diseases.

"I also like to walk but as my father is old and sick now, I have to arrange my time around him after work, he is my priority" (Khalid).

While traditional religious norms define acceptable behaviors of women and prevent them from engaging in regular physical activities, modest Islamic clothing for workout and women-only fitness centers have helped in overcoming these cultural barriers in the UAE.

The majority of the participants reported insufficient motivation and lack of skills. To overcome this, community based physical activity interventions using peer support was recommended by the participants. Participants spoke highly about the fitness initiative by Shaikh Hamdan in 2017. In November every year over 13,000 free fitness classes are available throughout Dubai via Dubai fitness app for the whole month and people are encouraged to participate in it for at least 30 minutes a day. Despite their commitments and hectic routine, most of the participants mentioned that they made an effort to join it every year since its inception.

Good manners and courtesy are prized attributes in UAE. When it comes to hospitality, Arabs are well-known for being masters in the art of welcoming. The traditional social interaction with Arabs takes a more detailed route than in the west. The greetings alone take around 10 minutes and a dinner from 3 to 4 hours. Starting with the welcome dates with coffee, an array of teas, foods that are sweet, followed by food that are sour, all before the dinner even begins. This has been happening for centuries, and the tradition still lives on. There are days when these lengthy meetings leave no time for any other engagements for them.

4. FEAR OF BEING HURT

Several comorbidities including hypertension, obesity, osteoarthritis, chronic kidney disease, atherosclerosis, depression, and hyperlipidemia were reported. These comorbidities were a cause of hindrance to engage in regular physical activity. The occurrence of diabetes-related comorbidities further reduces Quality of Life and create complications and build fear in engaging in any physical activity. Naeem (diabetic for 12 years) does not know the reason for his shin splints and fears longer workouts.

"I cannot even think of working out continuously for one hour, I think I will not be able to do that kind of stretch, I will not. I don't want to stretch that much,

because even if I jog, after 100 meters my leg will start paining” (Naeem).

The weather of UAE is not feasible for outdoor activities. In summers the temperature exceeds 50 degrees Celsius. People avoid physical activity outdoors to avoid hyperthermia.

“The moment I step out I start sweating, I can’t breathe either, I am scared that I will faint, that will worry my family, I would rather not move” (Rabia).

Deserts constitute around 80% of the UAE’s land area. It has mild winters and very hot and sunny summers due to its position near the line of the Tropic of Cancer. To combat heat the National Center of Meteorology to Emirati operations started carrying out cloud seeding to increase rainfall by four inches. Therefore, the hot climate limits outdoor physical activity to relatively short seasons and requires special indoor facilities, which leaves no option other than the gym. Gym memberships are not affordable for the working class. Most personal trainers at gyms push their novice clients beyond their limits assuming that they are as excited about sports as they were, causing people to stop exercising (Phillips and Drummond, 2001). After being diagnosed from hypertension and diabetes, Javed made an effort and joined the gym. He expressed frustration with the experience

“that kind of a rigorous exercise, I don’t want to do, because everybody else is doing that rigorous thing that doesn’t mean that we also have to do that”.

Even though it happened a decade ago, he never stepped in the gym again.

5. IMPACT OF LOCKDOWN

The lockdown further reduced the physical activity of all the participants.

“More problem came with corona as I used to travel a lot and that make you walk, move, see places. But now 2 years we are here” (Khaled).

Along with that increased screen time and increased caloric intake was reported too.

“Difference is we cannot order from outside and we have to cook, whole day we’ll cook and when you cook, you end up eating more, and even if you want healthy option, you can’t because your children don’t want that” (Alia).

Although UAE is one of the sunniest regions in the world, Vitamin D deficiency in the UAE residents (50-90%) is one of the highest in the world (Nimri, 2018). During the lockdown minimum exposure to sunlight, which is the main source of vitamin D, can result in further lowering the already low levels of Vitamin D.

“I miss sitting outside, we are living in a flat, and there is no direct sunlight here. My vitamin D is very low,

and my doctor recommended sitting outside at 7am and 5pm for half an hour daily, which I can’t do anymore” (Javed).

According to these data, it can be inferred that a wave of worsening non-communicable diseases appears inevitable.

STUDY STRENGTHS AND LIMITATIONS

This study was characterized by strengths and limitations. The finding that participants attended 30 days of free activities during Dubai fitness challenge which happens once a year, despite work and family commitments shows the importance and need of more community-based interventions to promote physical activity in this region. Furthermore, participants who were physically inactive had severe COVID-19 infections. This shows the urgency of increasing physical activity among this cohort. The findings from this study suggest that in order to promote physical activity in this region, existing and forthcoming policies and interventions must take into consideration ethnicity-oriented and environmental factors which influence physical activity. The limitation of this study is its timings. This study was conducted during COVID-19 pandemic. This is the time when people were skeptical about any kind of research and were hesitant to give out any information which would be recorded to avoid any unforeseen issues, because social media is filled with conspiracy theories related to the origin of COVID-19 (Papakyriakopoulos *et al.*, 2020) and vaccine rumors. It is acknowledged that fourteen is a very small sample of participants, thus limiting the capacity to extrapolate these findings to UAE population in general. Further studies involving larger representative sample are needed.

CONCLUSION

The result of this investigation shows that the combination of physical obstacles such as hot weather, comorbidities, and the present circumstances due to pandemic along with low valuation of exercise over work and family commitments translates into insufficient interest and motivation to exercise. Though the participants were aware of the importance and benefits of physical activity, in the absence of supportive environment, their knowledge might not translate into action. Community-based physical activity interventions were recommended to increase awareness. As the UAE has one of the world’s highest prevalence of T2DM and physical activity helps to control blood sugar levels, understanding physical activity habits during the lockdown in this specific population will help the national health authorities shape their response to future pandemics or other unavoidable global disasters where lockdown measures would be encouraged. This study shows further research should be undertaken to investigate the indirect health effects of COVID-19 lockdown in the UAE.

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APPENDIX

