Orginal Article Open Access

Iranian Journal of Diabetes and Obesity (IJDO)

Are COVID-19 Protective Behaviours and Risk Perception More Common in Diabetic Women than Non-Diabetics?

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Abstract

Objective: Diabetic patients are more likely to be infected and are at the higher risk of morbidity and mortality in COVID-19 pandemic. The aim of this study was to compare the preventive behaviours and perceived risk of COVID-19 in women with and without type 2 diabetes mellitus (T2DM).

Materials and Methods: The analytical cross-sectional study was conducted from June to July 2020 on 151 participants. Among T2DM patients who were referred to Yazd diabetes center 79 patients were selected by using simple random sampling method. The healthy none diabetic participants (n=72) were selected from the patients' relatives. Data were collected by a validated questionnaire including demographic information, information about diabetes, information about protective behaviours and risk perception questions. Data were analyzed using SPSS version 22.

Results: The mean (±SD) score of protective behaviours in the diabetic group was 24.34 (±3.05), which was significantly higher than the non-diabetic group (*P*: 0.001). The mean risk perception in the group of diabetic patients was slightly more than the group without diabetes but this difference was not statistically significant (*P*= 0.16). In general, there was a significant positive correlation between protective behaviours and risk perception in diabetic (r= 0.26; *P*< 0.01) and non-diabetic (r= 0.39; *P*< 0.001) groups

Conclusion: Increased perceived risk promotes preventive behaviours of COVID-19 among diabetic and non-diabetic people.

Keywords: Behaviours, Covid-19, Diabetes, Risk perception, Women

QR Code:

Citation: Mehrabbeik A, Askari M, Namiranian N. Are COVID-19 Protective Behaviours and Risk Perception More Common in Diabetic Women than Non-Diabetics?. IJDO. 2022; 14 (3) :145-151

URL: http://ijdo.ssu.ac.ir/article-1-727-en.html

10.18502/ijdo.v14i3.10740

Article info:

Received: 12 June 2022

Accepted: 18 July 2022

Published in September 2022

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Introduction

The World Health Organization (WHO) has faced its third coronavirus crisis in less than 20 years. Severe acute respiratory syndrome (SARS) was revealed in 2002 (1) and in 2012, Middle East respiratory syndrome (MERS) pandemic occurred (2). Now once again, the world is suffering from the outbreak of novel coronavirus 2019 (3). The pathogenesis of the virus ranges from mild respiratory illness to severe complications such as acute respiratory distress syndrome, septic shock, other metabolic disorders, and even death (4-6). Previous researches have suggested that individuals with type 2 diabetes mellitus (T2DM), are more likely to be infected and are at a higher risk of mortality and morbidity of COVID -19 (7,8). A retrospective study on patients with SARS-Cov-2 showed that patients with diabetes were at higher risk of severe pneumonia, the release of tissue injury-related enzymes, excessive uncontrolled inflammation responses, and hypercoagulable state associated with dysregulation of glucose metabolism (9). In other words, diabetic patients with novel coronavirus have more challenges and subsequently, they need extra treatment and nursing due to their complicated condition (10).

It should be noted that an important part of the success in controlling epidemics is due to public protective behaviours. While governments around the world have started unprecedented public policies such as social distancing, segregation, and self-quarantine in order to prevent and control the infection of the novel coronavirus, following the preventive behaviours in diabetic patients seem very important (11).

Protection methods are generally divided into three groups: preventive behaviours, avoidance behaviours, and management behaviours. Hand washing with soap and warm water often and for a minimum of 20 seconds, wearing a face mask and not touching eyes, or nose with dirty hands, are mentioned as preventive behaviours. Avoidance behaviours include staying at home and not being in public and crowded places and having a social distance of 1.80 meters, and ultimately management behaviours, consist of the correct use of antiviral drugs and telephone counselling, and following the advice of health care professionals (12,13).

Because the real risk of infection is often unclear, individual behaviour is affected by perceived risk (14). Perceived risk is a subjective judgment that people make about the risks threaten their personal well-being. One of the key components of understanding risk is the concept of "sensitivity", which relates to how people assess the likelihood of developing a particular disease. The successful adoption of preventive behaviours to control the spread of diseases largely depends on perceived susceptibility (15). Rogers' (1983) protection motivation theory (PMT) assumes that individuals engage in health behaviours when their perceived susceptibility and severity are high and perceived rewards of maladaptive behaviours are relatively low (16).

Furthermore, some research determined that engaging in health-related activities such as preventive behaviours would increase if people believed that they had a high likelihood of being affected by disease or if they perceived the illness with severe consequence (14-17).

Considering the high prevalence of diabetes in Yazd and the importance of adopting preventive behaviours against COVID-19 in diabetic patients, this study was designed to investigate the protective behaviours among T2DM compared with a non-diabetic population in Yazd. The findings will be helpful to plan appropriate and effective interventions for COVID-19.

Materials and Methods

This analytical cross-sectional study was conducted from June to July 2020 on 151

[DOI: 10.18502/ijdo.v14i3.10740]

participants. Among T2DM patients who were referred to the Yazd diabetes center, 79 patients were selected. The healthy or none diabetic participants (n= 72) were selected from the relatives of Yazd diabetes research centre patients. Participants were selected based on a simple random sampling method among all patients who are under Yazd diabetes centre coverage and then divided into two groups: 1) diabetics and 2) non-diabetics. Non-diabetics had no chronic health conditions.

The participants between 30-60 years old were included. The exclusion criteria were definitive coronavirus infection (positive test or hospitalization due to COVID-19 during the past two months), confirmed hearing and speech problems, Alzheimer or dementia.

The data collection tool in this study was a researcher-made questionnaire, which consists of four parts including 1- demographic information of participants such as age, educational level, and job status, 2- information about diabetes (duration of diabetes, type of treatment and diabetes complications such as diabetic neuropathy, nephropathy, retinopathy and, macrovascular complications), 3- information about protective behaviours in two terms including *preventive behaviours* such as using of personal protective equipment (wearing a face mask, hand washing, and hand sanitizer use) and *avoidance behaviours* such as leaving home and being in high-risk settings and social distancing, and 4- risk perception questions (likelihood to become infected and the fear of becoming infected). Protective behaviours scores ranged from 6 to 33 and risk perception scores ranged from 2 to 10.

An expert panel consisting of one epidemiologist, one environmental health specialist; two health educators, and one social medicine specialist confirmed the validity of the questionnaire. This tool had good reliability, with Cronbach's alpha of 0.7. A trained person completed questionnaires for all participants. Data were analysed using SPSS version 22. Independent T-test, Pearson correlation was done.

Ethical considerations

This research was approved by the Ethics Committee of Yazd Medical Sciences University (IR.SSU.REC.1399.052).

Results

Table 1 presents the demographic characteristics of participants with and without T2DM. Of the total number of participants, 52.3% (n= 79) were diabetic and 47.7% (n= 72) were non-diabetic. The mean age of two studied groups was 48.8 (± 7.7) and 46 (± 10), respectively. There was no significant difference between the two groups in terms of age and educational level.

Table 2 shows the frequency of protective behaviours among participants in diabetic and non-diabetic groups. Among personal

Table 1. Participants characteristics according to diabetes status

Characteristic		Diabetic (n=79)	Non-diabetic (n=72)	*P*
Age (years) Mean (±SD)		48.8 (± 7.7)	46 (± 10)	0.06*
Education (N,%)	Elementary	48 (60.8)	28 (38.8)	0.06**
	High school	12 (15.2)	13 (18.1)	
	Diploma	14 (17.7)	20 (27.8)	
	College degree and above	5 (6.3)	11 (15.3)	
Career (N,%)	Housewife	74 (93.7)	44 (61.1)	0.01**
	Employed	5 (6.3)	28 (38.9)	
Diabetes duration	<5 years	40 (50.6)	-	-
	6-10 years	25 (31.6)	-	-
	>10 years	14 (17.7)	-	-
Insulin treatment	Yes	25 (31.6)	-	-
	No	54 (68.4)	-	-
Diabetes complications	Yes	18 (22.8)	-	-
	No	61 (77.2)	-	-

*Independent Samples T-test
**chi-square

[DOI: 10.18502/ijdo.v14i3.10740]

protective equipment, the mask was the most used in both diabetic (78%) and non-diabetic (90.9%) groups. Regarding the duration of hand washing, most participants stated that they did not pay attention to the duration at all. In addition, more than half of the participants in both groups reported that they kept always 1.5 meters distance from others outside the home.

Table 3 shows the mean score of protective behaviours and risk perception in two groups. The mean score of preventive behaviours in non-diabetic group 3.01 (±1.31) was higher than diabetic group 2.87 (±1.51) but, there was no statistically significant difference between the two groups (*P*= 0.50). The mean score of avoidance behaviours in diabetic patients was calculated to be 21.46 (±2.72), which was statistically significantly different from the mean score in participants without diabetes (*P*: 0.0001). The mean score of protective behaviours (preventive behaviours+ avoidance behaviours) in the diabetic group was 24.34 (±3.05), which was significantly higher than the non-diabetic group (*P*: 0.001). The mean risk perception in the group of diabetic patients was slightly more than the group without diabetes but this difference was not statistically significant (*P*= 0.16).

Table 4 illustrates the results of Pearson's correlation coefficient. There was no significant relationship between preventive behaviours and risk perception in both groups. But the relationship between avoidance

Table 2. Frequency of participants protective behaviours

Protective behaviours		Diabetic N (%)	Non-diabetic N (%)	*P**
Wearing a face mask	Yes	46 (78)	61(90.9)	0.0001
	No	13 (22)	6(9.1)	
Wearing gloves	Yes	41 (69.5)	30 (43.9)	0.117
	No	18 (30.5)	37 (56.1)	
Using hand rub	Yes	28 (47.5)	32 (47)	0.194
	No	31 (52.5)	35 (53)	
Washing hand for at least 20 seconds	Yes	28 (35.4)	25 (34.7)	0.123
	No	9 (11.4)	11 (15.3)	
	Not sure	42 (53.2)	36 (50)	
Maintaining social distance	Always	40 (67.8)	41 (61.2)	0.026
	Often	6 (10.2)	11 (16.4)	
	Sometimes	6 (10.2)	5 (7.5)	
	Rarely	2 (3.4)	8 (11.9)	
	Never	5 (8.5)	2 (3)	

* chi-square

Table 3. Mean score of protective behaviours and risk perception in 2 groups

Variables	Diabetic Mean (±SD)	Non-diabetic Mean (±SD)	*P**
Preventive behaviours	2.87 (±1.51)	3.02 (± 1.31)	0.50
Avoidance behaviours	21.46 (± 2.72)	19.61 (± 2.87)	0.0001
Protective behaviours (Total score)	24.34 (± 3.05)	22.63 (± 3.37)	0.001
Risk perception	(±2.76) 6.22	(±2.36) 5.63	0.16

* Independent Samples T-test

Table 4. Correlation of protective behaviours dimensions and risk perception

Variables	Risk perception in diabetic	Risk perception in non-diabetic
Preventive behaviours	r= 0.13	r= 0.17
	P= 0.24	*P*= 0.25
Avoidance behaviours	r= 0.22*	r= 0.39
	P= 0.04	*P*= 0.001
Protective behaviours	r= 0.26*	r= 0.39**
	P< 0.01	*P*= 0.001

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

[DOI: 10.18502/ijdo.v14i3.10740]

behaviours and risk perception in both groups was statistically significant. In general, there was a significant positive correlation between protective behaviours and risk perception in diabetic ($r = 0.26$; $P < 0.01$) and non-diabetic ($r = 0.39$; $P < 0.001$) groups.

Discussion

The present study compared the preventive behaviours and perceived risk of COVID-19 in women with and without T2DM in Yazd. The results showed that preventive behaviours such as washing hands for at least 20 seconds and wearing a face mask outdoors were more common in people with diabetes than in healthy people, but this difference was not statistically significant.

Several studies on Iranian adults showed that a large number of people adopted preventive behaviours at moderate to high levels (18-20). Similar results were reported in the US where the population's preventive behaviours in the first week of the COVID-19 pandemic were at an appropriate level (21).

The results could indicate the importance of preventive behaviours toward COVID-19 for the general public during the first wave of the pandemic. In other words, due to the emergence of the disease, its prevalence and mortality rate and extensive media coverage to inform the public, the majority of people regardless of their health status, followed preventive advice against COVID-19 disease.

In the present study, the mean score of avoidance behaviours among diabetic patients was significantly higher than non-diabetic people. In other words, more people with diabetes in the first two months of the outbreak than others were present in crowded places such as banks, shops, drugstores, etc.

An investigation of U.S. adults demonstrated that people with chronic health problems were more likely than others to stay home and avoid crowded places (22).

In our study diabetic patients in terms of protective behaviours got a significantly better score than non-diabetic individuals. These findings were supported by a similar study that cancer survivors were more likely than others to engage in preventative behaviours, including social distance, wearing a face mask, and avoiding crowded places (23). But in another study conducted in China, most people with chronic illnesses performed poorly in preventing behaviours of COVID-19 (24).

This difference might be due to differences in the samples because the present study was performed on women but in the Chinese study the majority of participants were male and their mean age was 10 years higher than the mean age of the participants in our study. In addition several studies have shown that women had better adherence to COVID-19 preventive behaviours than men (25-27) so, it could be attributed to the age and gender differences of the participants.

Based on the findings, the mean score of perceived risk was moderate in both groups and was slightly higher in the diabetic group than in the healthy group, but this difference was not significant. In contrast, a study in China indicated that people with diabetes, significantly consider themselves at higher risk and were more concerned about COVID-19 than non-diabetic people (9). While another study showed that half of the people with risk factors for severe COVID-19 infectious, did not feel more threatened than the general population and such feelings affected their beliefs, attitudes, and practices toward the disease (28).

In this study, since the perceived risk was a cumulative score of the likelihood to become infected and the fear of becoming infected, those patients who followed protective behaviours recommendations believed that they were less likely to be infected. And therefore the perceived risk score in them decreased to the extent that there was no significant difference with non-diabetic people.

According to the Pearson correlation test, there was a positive correlation between protective behaviours and perceived risk in both groups, which was statistically significant. This result is similar to the results

[DOI: 10.18502/ijdo.v14i3.10740]

of previous studies in which perceived risk predicted individuals' social distance (27) or other preventive behaviours in various health contexts (29,30). To sum up, when people feel threatened, they try to find some strategies to avoid it, and these strategies can appear in various forms such as maintaining social distance, avoiding being in crowded places, or improving personal protection equipment used.

Conclusions

Based on our findings during the first wave of the pandemic, participants followed the recommended COVID-19–related protective behaviours at an acceptable level but, these behaviours were more common among T2DM patients than healthy people. In fact, diabetics because of their disease condition had more perceived risk than others, and this reinforced their adoption of COVID-19 preventive behaviours.

Acknowledgments

Researchers wish to thank the Diabetes Research Center of Yazd and all T2DM patients and their relatives who helped us with this project.

Conflict of Interest

The authors declare no conflict of interest.

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[DOI: 10.18502/ijdo.v14i3.10740]