The Psychological Impact of the COVID-19 Pandemic on Egyptian Diabetic Patients

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*Abstract:

Background: Since the onset of the COVID-19 pandemic, concerns about health-related and economic hazards of the virus, the restrictions imposed by the public health measures, the lack of social interactions, and the financial losses have affected people's mental health in various ways. People with diabetes are more vulnerable to comorbid mental illness that may interfere with treatment adherence and disease prognosis. This study explores the psychological state of Egyptian patients suffering from diabetes mellitus (DM) during the COVID-19 pandemic. ***Methods:*** Egyptian adults with DM were invited to participate through an online survey in the period from April 24 to May 12. The survey included sociodemographic information, questions assessing diabetes status, and general assessment of the psychological health status using the General Health Questionnaire (GHQ-12). ***Results:*** In total, 849 participants shared in the survey. 51.4% of the studied population were at risk, while 21.2% were at high risk of psychological distress. There was a statistically significant difference with the non-working group with a mean GHQ-12 score of 17.44, SD= 6.267, SE 0.491, 95% (16.47-18.41), and p-value of 0.01. Regarding the disease precautions, there was a statistically significant difference between home isolation and those who did not home isolate with a mean 16.23 and SD 6.285 compared to a mean 15.32 SD 5.701 p-value 0.028. There was a significantly increased number of 4 or more diabetes complications and comorbidities with a mean 20.60 SD 8.675, SE 2.240, (95% CI 15.80-25.40) with a p-value of less than 0.001 and mainly with hypertension as comorbidity. ***Conclusion:*** The current study shows that Egyptian patients suffering from DM are likely to psychological distress amid the COVID-19 pandemic. Risk factors included female gender, non-working, and patients with diabetic complications, particularly hypertension. Further attention to the psychological needs of Egyptian patients with DM amid the COVID-19 is recommended.

Keywords:Diabetes Mellitus, COVID-19, Psychological vulnerability, GHQ-12

Introduction:

Since the onset of the pandemic of the new corona virus disease (COVID-19) in December 2019 among the citizens of Wuhan in China, concerns about the health-related and the economic hazards of the virus have created an impact on global mental health. In the middle of this alarming health crisis, the psychological impact of the COVID-19 is likely overlooked or neglected even if it represents a challenge for patients, the general population, and health care professionals [1].

The WHO has labeled this emerging respiratory disease as COVID-19 that has now infected more than 10 million patients, caused more than 500 thousand deaths and reached 215 countries all over the world. As for the current situation in Egypt, the estimated total number of cases is 63,923 and 2708 deaths [2].

The early cases of this pandemic were men, less than half of them suffering from comorbid diseases in the form of hypertension, diabetes, and cardiovascular disease. The common symptoms at the onset of illness were cough, fever, muscle pain, and fatigue. Less common symptoms were cough with expectoration, hemoptysis, headache, diarrhea, and loss of smell and taste. Complications include acute respiratory distress syndrome, bacterial pneumonia, and acute cardiac injury[3].

The unpredictability of COVID-19, which may range from mild symptoms to lethal outcomes, has affected people's mental health, leading to mental health problems such as stress, anxiety, depression, insomnia, anger, and fear. Moreover, the restrictions imposed by the public health measures that interfere with personal freedoms, the lack of social interaction, and the financial losses are sources of major stressors that contribute to psychological distress and increased need for psychological support services. Some groups may be more vulnerable to the psychological effects of COVID-19 than others. Among these, people who contract the disease, those at increased risk including the elderly, people with impaired immune function, people with preexisting medical and/or psychiatric problems, and health care professionals [4].

In a cross-sectional study among Chinese citizens, a total of 4872 participants from 31 provinces were assessed using an online survey. Depression was assessed by The Chinese version of the WHO-Five Well-Being Index (WHO-5), and anxiety was assessed by the Chinese version of the generalized anxiety disorder scale (GAD-7). The prevalence of depression, anxiety, and the combination of both was 48.3%, 22.6%, and 19.4%, respectively, during COVID-19 outbroke in Wuhan, China [5].

The International Diabetes Federation (IDF) lists Egypt among the world's top 10 countries in the number of patients with diabetes with a prevalence of type 2 diabetes (T2D) around 15.2% of all adults aged 20 to 79 [6]. People with diabetes are more vulnerable to comorbid mental illness and worries of accepting the diagnosis, adherence to treatment, living with diabetes, fear of complications, and fear of hypoglycemic events can result in marked distress, making diabetes difficult to self-manage. As a result, the rates of depression and anxiety are higher [7].

Design and participants

This cross-sectional study was conducted online from April 24 to May 12, 2020. Egyptian adults and older adults were invited to participate through an online survey through Survey Monkey platform. Written consent in the first section of the online survey was requested from all participants before filling the questionnaire. The survey was divided into three parts, the first included sociodemographic information; the second included questions assessing diabetes, the third included general assessment of the psychological health status using the General Health Questionnaire (GHQ-12) amid of the COVID-19 pandemic.

Sociodemographic information included age, gender, marital status, level of education, current occupational status, in addition to information regarding previous exposure to COVID-19 or direct contact with cases, and protective measures taken by the participant to reduce risk of exposure to the virus.

Questions assessing diabetes included questions concerning the duration of illness, presence of cardiovascular, metabolic, and neurological complications of diabetes, current diabetic control through the results of the glycosylated Hemoglobin A1c, type of antidiabetic medications used and number of recent visits to the diabetes clinic.

The General Health Questionnaire (GHQ-12) was used in this study to assess the psychological health state of adult and older adult Egyptian patients who have diabetes amid the COVID-19 pandemic. The GHQ-12 is a brief, simple, easy to complete, a measure of current mental health that has been extensively used in the research setting. The scale is a self-rated scale composed of 12 questions assessing mood state, anxiety, sleep quality, concentration, interest, and self-esteem. Each item is rated on a four-point scale (less than usual, no more than usual, rather more than usual, or much more than usual). An overall score higher than 15 denotes evidence of psychological distress, and greater than 20 denotes severe distress [8]. There is evidence that the GHQ-12 is a consistent and reliable instrument when used in general population samples [9]. It is available in the Arabic version that was proved reliable in a sample of primary health care patients [10].

Three groups of patients were studied against the given variables according to GHQ-12 score, Group A, a score of 15 and less, Group B, a score between 15 and 20, and Group C, a score 20 and above.

Statistical Analysis:

Data were analyzed using SPSS v.25. Frequencies and percent were presented to describe categorical data; Mean and SD were used to describe numerical data. Chi-Square and T-test were performed to compare groups according to the type and distribution of variables. P values below 0.05 were considered significant.

Results:

In total, 849 participants took part in the survey, out of which 768 participants fulfilled all requested parts of the survey. The mean age was 46.7, with standard deviation (SD)=10.6 years. The male participants represented 64.5% (535 participants), while female participants represented 35.5% (295 participants).

For participants with GHQ score A (GHQ < 15), 403 patients with 48.6% representation, and their mean age were 47.7 years, and a history of diabetes of mean 9.38 years. For participants with GHQ score B (GHQ 15-20), were 251 patients representing 30.2% of the population, and their mean age was 44.9 years, and a history of diabetes of mean 8.77 years. For participants with GHQ score C (GHQ > 20), 176 patients, and representing 21.2% of the population, their mean age was 45.9 years, and a history of diabetes of mean 9.48 years (Table 1).

There was no significant correlation between either the age or the number of years with diabetes and the GHQ score (r = -0.082, P= 0.02).

Table (1) Sociodemographic, psychological and medical characteristics of the participants

GHQ-12 Score		Mean Score	SD	p-value	Count (%) kindly add percent below					
					A		B		C	
					N=	%	N=	%	N=	%
Gender	Male	15.07	5.9	0	291	54.4%	151	28.2%	93	17.4%
	Female	17.15	5.9		112	38.0%	100	33.9%	83	28.1%
Level Of Education	Uneducated	16	4.8	0.943	3	37.5%	4	50.0%	1	12.5%
	Intermediate	16.37	6		73	44.0%	57	34.3%	36	21.7%
	University Graduate	15.48	5.8		257	50.7%	151	29.8%	99	19.5%
	Post Graduate	16.19	6.6		75	48.1%	41	26.3%	40	25.6%
Marital Status	Single	17.15	6.2	0.106	24	35.3%	23	33.8%	21	30.9%
	Married	15.51	5.9		360	50.8%	212	29.9%	136	19.2%
	Divorced	20	7		6	26.1%	7	30.4%	10	43.5%
	Widow/er	16.66	5.3		16	45.7%	10	28.6%	9	25.7%
Job	Nonworking	17.44	6.3	0.067	61	36.1%	62	36.7%	46	27.2%
	Employee	15.27	5.9		245	52.2%	138	29.4%	86	18.3%
	Free Business	15.66	6		62	50.4%	29	23.6%	32	26.0%
	Pensioner	15.55	5.4		40	53.3%	24	32.0%	11	14.7%
Home isolation	Yes	16.23	6.3	0.028	196	45.7%	128	29.8%	105	24.5%
	No	15.32	5.7		218	52.3%	126	30.2%	73	17.5%
Mask	Yes	15.43	5.9	0.26	130	51.2%	79	31.1%	45	17.7%
	No	15.94	6.1		285	47.9%	176	29.6%	134	22.5%
Hand Hygiene	Yes	15.57	5.7	0.113	303	49.7%	191	31.3%	116	19.0%
	No	16.36	6.8		112	46.9%	64	26.8%	63	26.4%
Physical Distancing	Yes	15.77	5.7	0.927	207	48.4%	138	32.2%	83	19.4%

Category	Subcategory	Mean	SD	p	N	%	N	%	N	%
	No	15.81	6.3		208	49.4%	117	27.8%	96	22.8%
Contact & Infection	No Contact	15.77	6	0.488	394	48.6%	247	30.5%	169	20.9%
	Contact but no infection	16.29	6.1		17	54.8%	6	19.4%	8	25.8%
	Infection & home isolation	10.67	4.2		3	100.0%	0	0.0%	0	0.0%
	Infection & hospital admission	15.5	2.1		1	50.0%	1	50.0%	0	0.0%
Social Media	Yes	16.23	6.1	0.007	233	44.9%	165	31.8%	121	23.3%
	No	15.09	5.9		182	55.2%	90	27.3%	58	17.6%
Ministry of Health web site	Yes	15.32	5.7	0.005	271	52.4%	157	30.4%	89	17.2%
	No	16.52	6.4		144	43.4%	98	29.5%	90	27.1%
Media	Yes	15.89	5.9	0.66	177	47.1%	119	31.6%	80	21.3%
	No	15.71	6.1		238	50.3%	136	28.8%	99	20.9%
Family & Friends	Yes	16.89	6.1	0.016	62	42.8%	45	31.0%	38	26.2%
	No	15.56	6		353	50.1%	210	29.8%	141	20.0%
WHO Web Site	Yes	15.4	5.9	0.124	175	52.2%	95	28.4%	65	19.4%
	No	16.05	6.1		240	46.7%	160	31.1%	114	22.2%
Cardiovascular disease (CVD)	Yes	16.8	6.3	0.082	50	48.1%	25	24.0%	29	27.9%
	No	15.65	6		365	49.0%	230	30.9%	150	20.1%
Hypertension	Yes	16.85	6.2	0.001	152	44.4%	100	29.2%	90	26.3%
	No	15.25	5.9		263	51.9%	155	30.6%	89	17.6%
Cerebrovascular affection (CVA)	Yes	18.5	7.5	0.279	3	30.0%	5	50.0%	2	20.0%
	No	15.76	6		412	49.1%	250	29.8%	177	21.1%
Chronic Kidney disease (CKD)	Yes	21.63	6.7	0.001	3	15.8%	6	31.6%	10	52.6%
	No	15.65	5.9		412	49.6%	249	30.0%	169	20.4%
Diabetic Neuropathy	Yes	16.26	6	0.113	127	46.0%	88	31.9%	61	22.1%
	No	15.56	6		288	50.3%	167	29.1%	118	20.6%
Retinopathy	Yes	16.41	5.8	0.128	75	44.9%	55	32.9%	37	22.2%
	No	15.64	6.1		340	49.9%	200	29.3%	142	20.8%
Treatment	Oral Hypoglycaemics	15.71	6	0.103	266	49.4%	165	30.7%	107	19.9%
	Insulin	15.46	6		89	52.4%	45	26.5%	36	21.2%
	Both	16.71	6.1		54	41.2%	42	32.1%	35	26.7%
Treatment Adherence	Not	18.18	9.3	0.466	7	41.2%	5	29.4%	5	29.4%
	Little	17.52	6.2		25	40.3%	21	33.9%	16	25.8%
	Somewhat	16.44	5.6		127	43.2%	101	34.4%	66	22.4%
	Very	15.09	6		254	53.7%	128	27.1%	91	19.2%
HbA1c	Not done	15.68	5.9	0.497	128	50.6%	72	28.5%	53	20.9%
	Less than 7%	14.98	5.8		10	54.2%	54	28.1%	34	17.7%

		Mean	SD	p-value		Group A		Group B		Group C	
					4						
	7% to 10%	15.91	5.9		149	46.9%	104	32.7%	65	20.4%
	More than 10%	17.49	7.1		33	39.8%	24	28.9%	26	31.3%
Follow up visits	None in the past year	15.68	6.3	0.341	102	51.3%	53	26.6%	44	22.1%
	once or twice	15.95	6		177	47.7%	114	30.7%	80	21.6%
	2 to 5 visits	15.24	5.5		90	52.6%	54	31.6%	27	15.8%
	more than 5 visits	16.32	6.2		44	41.9%	34	32.4%	27	25.7%

Group A: GHQ < 15 denoting no distress, Group B: GHQ from 15-20 denoting mild distress, and Group C: GHQ > 20 denoting severe distress.

There was a statistically significant difference between male and female participants. The male group with a mean score of 15.07, SD=5.939, 95% CI (14.56-15.57) p-value less than 0.001, Female group with a mean score of 17.15, SD=5.892 95% CI (16.48-17.83) p-value less than 0.001 as shown in figure 1
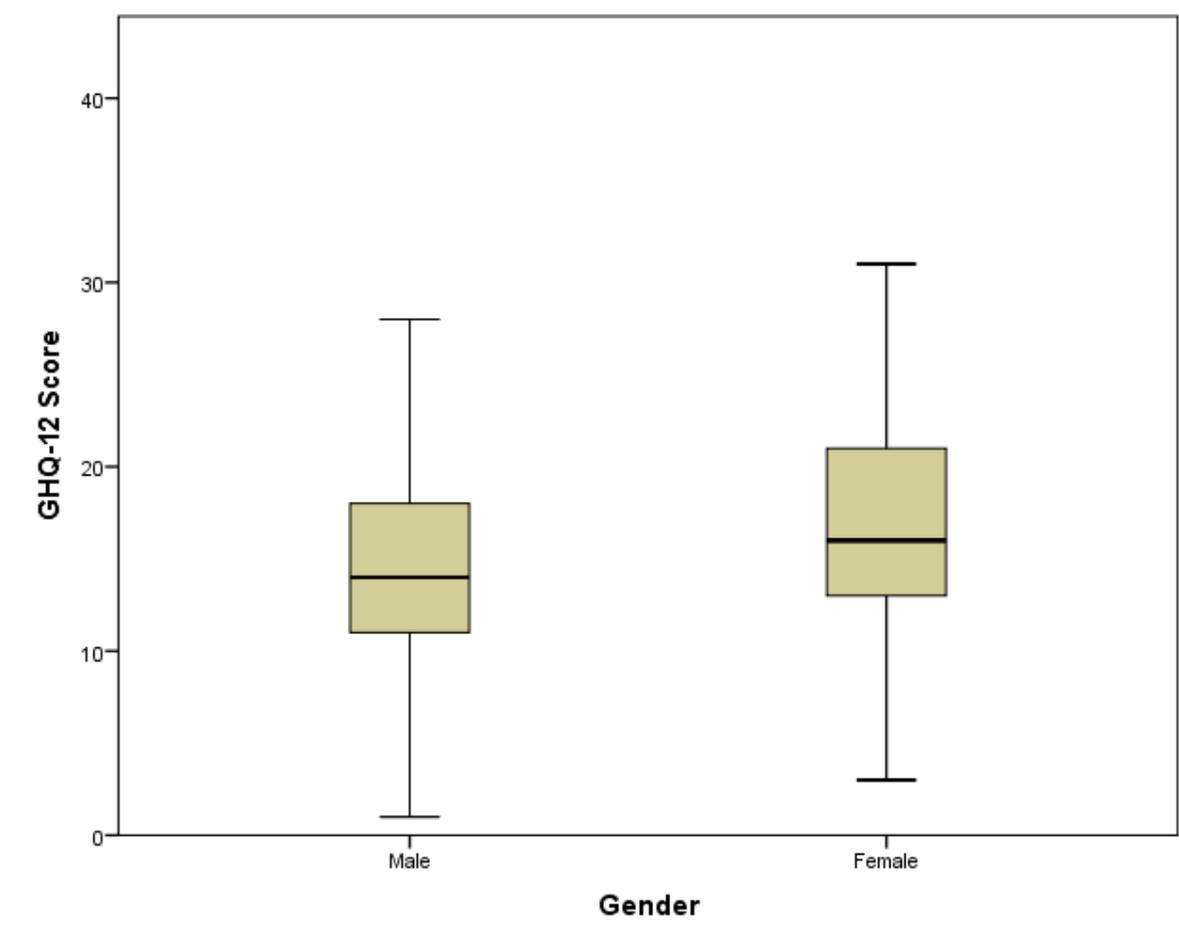
Figure (1) GHQ-12 Score for male and female participants

There was a statistical significance with a non-working group with a mean GHQ-12 score of 17.44, SD= 6.267, SE 0.491, 95% (16.47-18.41), and p-value of 0.01.

There were no significant differences among different educational levels. There were no significant differences among groups with different levels of exposure or infection.

Social media and the ministry of health website were the most used source for information about the disease among the studied groups with 62%, 62.1% respectively, the least used source was the friends and families comprising 17.1% of the study group.

There was a statistically significant difference between the group which used social media as a source of information compared to the group that did not concerning GHQ-12 score with a mean of 16.23 SD=6.056 compared to a mean of 15.09 and SD= 5.896 p-value 0.007.

There was also a statistically significant difference between the group using the ministry of health website as a source of information compared to those who did not, concerning GHQ-12 score, with a mean 15.32 and SD 5.720 compared to 16.52 and SD 6.396 p-value 0.005.

There was no statistically significant among other sources of information as WHO website, newspapers, and media.

Regarding the precautions, there was a statistically significant difference between home isolation and those who did not with a mean 16.23and SD 6.285 compared to a mean 15.32 SD 5.701 p-value 0.028.

There was no statistically significant difference among other groups using other precautions, as shown in figure 2, and the p-value was 0.260.
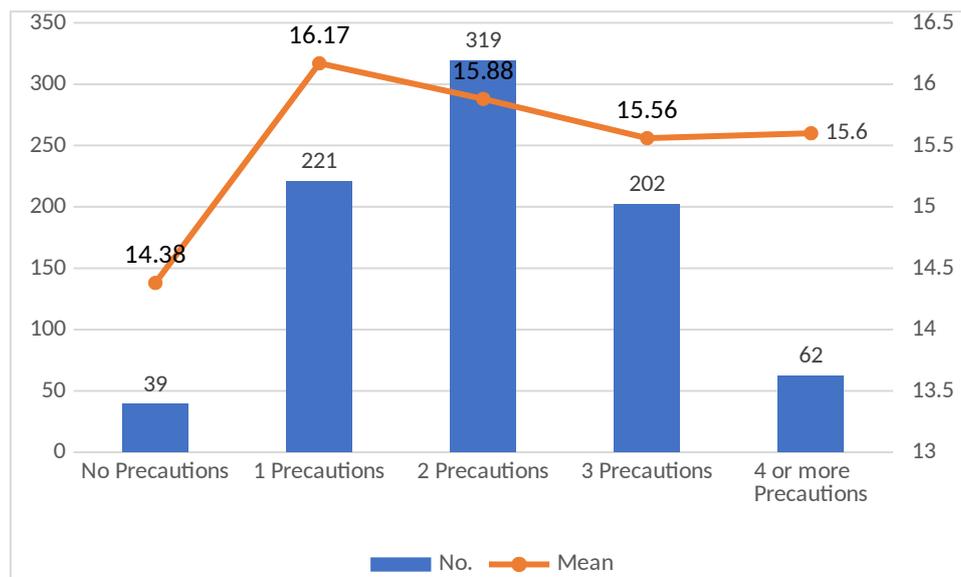

**Figure (2) GHQ-12 Score compared to the number of precautions used against COVID**
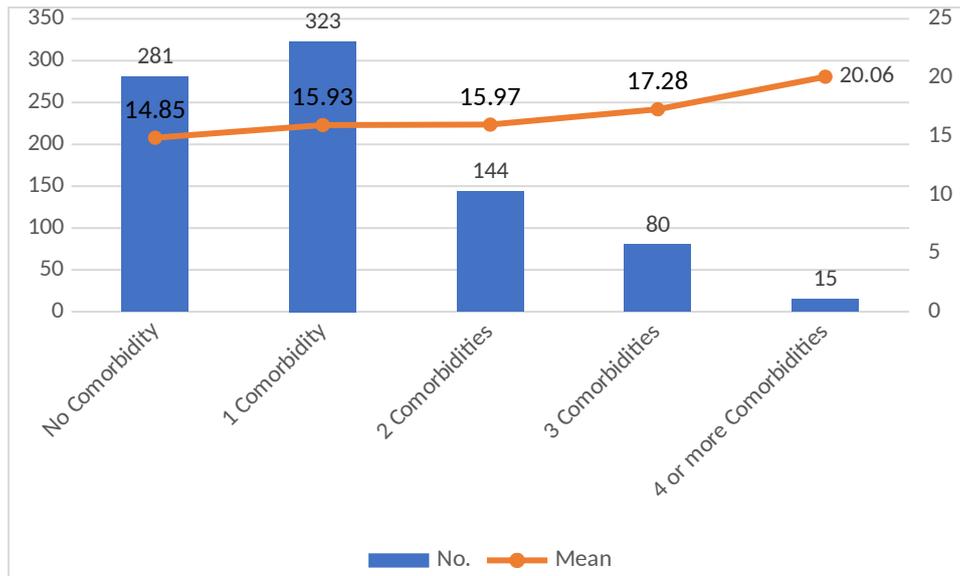
Figure (3) GHQ-12 Score compared to the number of comorbidities

There was a significantly increased number of 4 or more diabetes comorbidities with a mean 20.60 SD 8.675, SE 2.240, (95% CI 15.80-25.40) with a p-value of less than 0.001 as shown in figure 3.

There was a statistically significant difference among hypertensive patients with a mean score of 16.58, SD=6.174, 95% CI (15.25-25.853) p-value 0.01. There was no statistical significance for other comorbidities
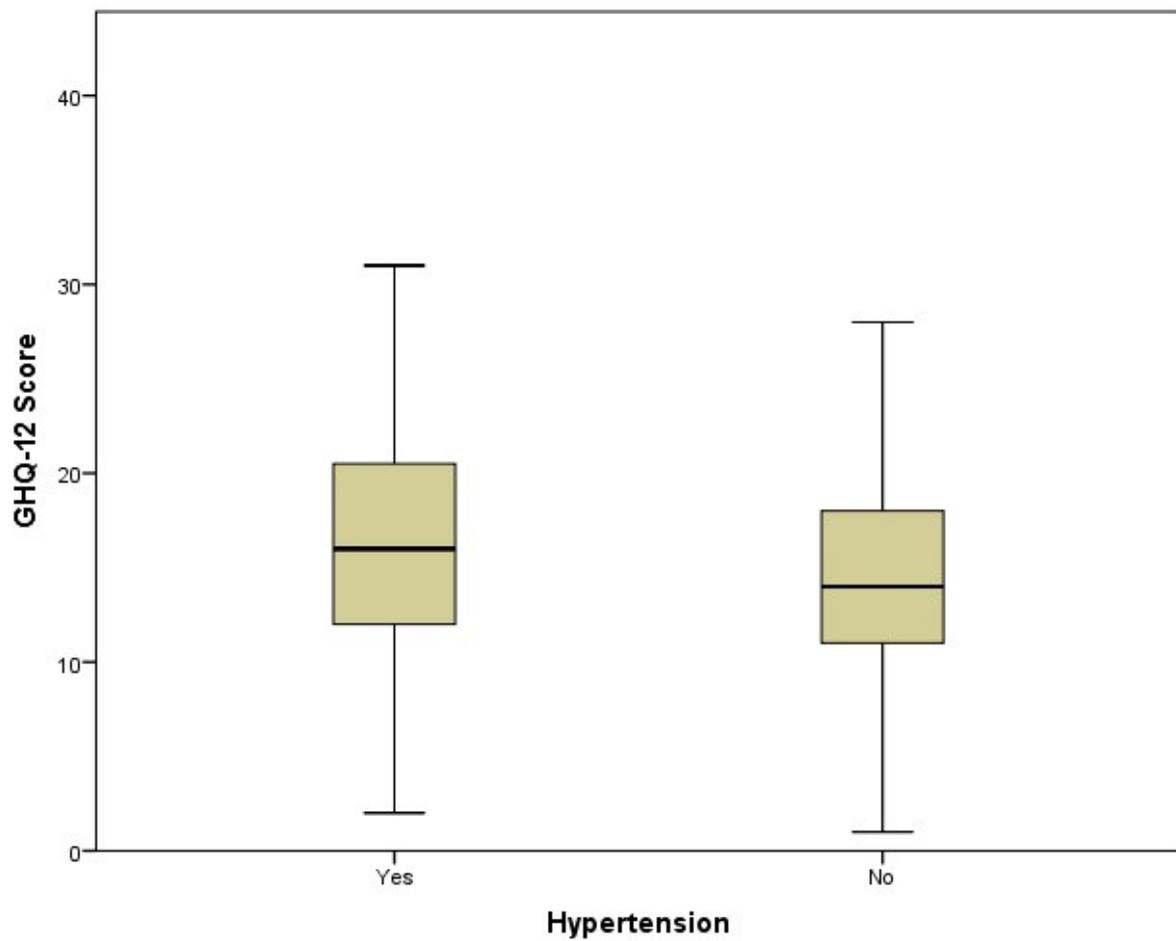

Figure (4) GHQ-12 in hypertensive patients

Discussion:

To our knowledge, no studies investigating the impact of COVID-19 pandemic on the mental health state of patients with DM in Egypt have been published, although diabetes is considered a risk factor for both COVID-19 complications and mental health problems.

Diabetes has a prevalence of 15.2% in Egypt which was considered our target–population because of its impact on mental stress and the effect of mental stress on control of diabetes and developing complications, rendering it suitable for the study of the psychological state of the Egyptians with DM amid of the COVID-19 pandemic that has affected Egypt considerably [6].

International studies on the psychological impact of the disease during epidemics denote the prevalence of psychological distress in the general population between 22.9% and 56.7% [11]. In our study, 51.4% of the studied population (diabetic patients) were at risk. In comparison, 21.2% of the population was at high risk of psychological distress, which is higher than the reported prevalence in the general population.

Concerning the role of gender in affecting psychological vulnerability in epidemic situations, some studies stated that being male gender was associated with more vulnerability [11]. However, most of the studies showed that females were associated with more psychological vulnerability [12]. Our study showed that female gender is a risk for psychological burden when compared to male gender (28.1 % of females were severely distressed compared to 17.4 % of males with a P-value of)

Unlike expected, the age groups had no specific impact on the vulnerability risk, groups with high risk represented mean age of 44.9 and 45.9 years while the low-risk group was of mean age of 47.7 years. These data are consistent with data-driven from previous studies in epidemic situations where younger people were associated with increased distress risk [13] or increased psychiatric morbidity [14]. However, it was evident that the more the duration of diabetes, the more the risk of psychological vulnerability.

For the relationship to the employment situation, most of the studies showed that the less income and unemployment state, the more the psychological vulnerability impact [15], in a COVID-19 study in Spain concerning the psychological vulnerability, it came that employment and working during the COVID-19 time showed more stress and are more vulnerable [16]. In our study, the highest impact was in those with pension and not working with 28.1% and 27.2% respectively in the group with the highest vulnerability, mostly because of low income, then the self-employee with 26% high risk which is mostly due to economic burden of the disease on the country.

There was evidence that home isolation and quarantine in Egypt, as per our results, had a significant effect on the psychological vulnerability, which was consistent with the results of similar studies across the countries [16].

Our study, as well, shows that subjects who are using many protective measures against contracting the virus were less likely to psychological vulnerability. This is consistent with the study conducted in Spain [16]. However, it was noted that exposure to infected people irrespective of protective measures, increased the psychological vulnerability risk.

Concomitant with our expectations, the primary source of information for our patients was the Social media and the Ministry of Health website.

There was a significantly increased number of 4 or more diabetic complications and comorbidities with a mean 20.60 SD 8.675, SE 2.240, (95% CI 15.80-25.40) with a p-value of less than 0.001. Among different comorbidities, mainly hypertension showed more vulnerability when compared to others.

Concerning participant adherence to diabetes treatment plan and protocol, we found that the group of patients with the highest adherence and those with the lowest adherence showed lower GHQ-12 scores when compared to other groups. Possible explanations for this finding may be the impact of the level of self-awareness and control on the psychological state.

Study Limitations:

Limitations of this study include the use of an online survey which offers a subjective assessment of psychological distress rather than using an objective mental health state examination done by an expert that may further provide estimates of mental health disorders like anxiety, depression and acute stress disorders at the time of the COVID. Furthermore, the crossectional study design of the study precludes the examination of causality. Moreover, the assessment of DM among participants was based on patients' answers rather than a medical registry because of obligatory stay-home policy to decrease exposure to SRS Cov-2 virus..

Conclusion:

Our study shows that our diabetic population understudy shows more psychological vulnerability risk in females, non-working people, and self-employed and single population. Home isolation affected negatively on the mental health and psychological status of the patients.

Social media and the MOH website played an evident role in driving information to our population. It can be used further in managing the mental health status of the community.

Patients with multiple comorbid conditions are more prone to have psychological affection with particular attention to hypertensive patients.

Further attention to the psychological needs of Egyptian patients with DM amid the COVID-19 is recommended.

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Conflict of Interest:

The authors declare no conflict of interest

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