Medical Science

Psychological stress after Covid-19 in hypertensive patients in Madinah: Cross-sectional study

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ABSTRACT

Background: Corona virus disease 2019 pandemic had a major impact on the general wellbeing of people. Hypertension patients are more liable to psychological stress. This study aims to assess the prevalence of psychological stress in hypertensive patients affected by Covid-19 in Madinah. *Methods:* Hypertension patients in Al Madinah were invited to participate in an online questionnaire in the period from December 2020 to May 2021. It included the personal data, questions assessing hypertension and psychological health status using the General Health Questionnaire. *Results:* Total number of participants in our study was 588. 30.8% of participants were mildly distressed and 6.8% were severely distressed. Females are being more at risk of severe distress. Regarding taking prescribed medications there was a significant relationship between groups. *Conclusion:* The prevalence was found to be 0.376. Hypertensive patients in Al Madinah are at more risk of psychological stress especially females, students, unemployed, and those who are not adherent to their medications. More psychological care should be provided to them in pandemics. *Objectives:* To evaluate the prevalence of psychological stress after Covid-19 in hypertensive patients in Madinah.

Keywords: Hypertension, COVID-19, psychological stress

1. INTRODUCTION

The global health threat of psychological stress is deemed one of the most important emerging threats (Shern et al., 2016). People deal with stress-inducing complexities and dangers every day for a wide variety of reasons, including geopolitical, social, environmental, and personal (Mc Ewen, 2015). Even though people have the capability to adapt to such stressors over time, the rapidity with which these pressures have grown has resulted in altered

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psychological stress loads with which many are unable to cope (Park and Iacocca, 2014). In our highly complex and stressful modern world, we must adapt to cope with rapidly changing conditions. In the UK, study on the prevalence of stress among the general population has done showing 74% of people have felt overwhelmed or not able to cope due to stress in the past year and in the last year, 30% of older people have not felt overwhelmed or unprepared, compared to 7% of young adults (Salari et al., 2020).

The novel corona virus disease (COVID-19) which emerged first in December 2019 among the people of Wuhan in China has made an impact on both the health- related issues and the economic hazards of the virus which affected the global mental health. Due to the health crisis created the virus, the psychological effects of the COVID-19 are likely to be omitted with the fact that it represents a challenge for patients, the general population, and mental health (Torales et al., 2020). This emerging respiratory disease has been labeled as COVID-19, which has now infected more than 64 million, more than one million deaths, and has reached 215 countries across the world. As far as the current situation in Saudi Arabia is concerned, the estimated total number of cases is 300 thousand; 30 thousand cases are in Madinah (Algaissi et al., 2020).

In Saudi Arabia there were a lockdown for nearly 4 months due to the pandemic. Clinics were closed during the lockdown which affected the access to healthcare services for patients (Al-Hanawi et al., 2020). At the early onset of the disease most of the cases were men. Comorbid diseases like hypertension, diabetes, and cardiovascular diseases were found in less than half of the cases. Cough, fever, muscle pain, and fatigue were the common symptoms at the onset of the disease. Productive cough, hemoptysis, headache, diarrhea, taste and smell loss were fewer common symptoms of COVID-19. The complications of the disease were acute respiratory distress syndrome, bacterial pneumonia, and acute cardiac injury (Huang et al., 2020).

The unpredictability of COVID-19, which can vary from mild to lethal symptoms, the results have affected the mental health of people, leading to mental health problems such as stress, anxiety, sleeplessness, anger, and fear (Faheem et al. 2021). In addition, the restrictions imposed by actions on public health that interfere with personal freedoms, lack of social interaction, and the financial losses are the main causes of psychological distress and growing need for psychological support services. People who are at more risk to be affected by the psychological effects of COVID-19, the elderly, patients with impaired immune function, people with preexisting medical and/or psychiatric problems, and health care professionals (Pfefferbaum and North, 2020; Almalki et al., 2022).

A total of 4872 participants from 31 provinces were assessed using an online survey in a cross-sectional study among Chinese citizens. Assessment of depression is done by The Chinese version of the WHO-Five Well-Being Index (WHO-5), and assessment of anxiety done 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%, 19.4%, respectively, during COVID-19 outage in Wuhan, China (Hegazi et al., 2015). In KSA, the hypertension prevalence is increasing, affecting more than 25% of the adult Saudi Population (Al-Nozha et al., 2007). People with hypertension are more vulnerable to stressful life events then normotensive patients (Cuffee et al., 2014).

Objectives
To assess the prevalence of psychological stress in hypertensive patients affected by Covid-19 in Madinah

2. METHODOLOGY

Cross-sectional study was conducted through an online questionnaire in Medina. The first section of the online questionnaire includes written consent before filling the questionnaire. The second section of the online questionnaire divided into three parts, first part includes personal and sociodemographic data; the second part include questions assessing hypertension, the third part include psychological health status assessment using the General Health Questionnaire (GHQ-12) amid of the COVID-19 pandemic. Socio-demographic data include age, gender, occupation, marital status, nationality, level of education. Questions assessing hypertension include number of years have been diagnosed, medication used, compliance on medication, control of hypertension, hospital admissions due to hypertension, complications, other co-morbidity.

The psychological health state is assessed by the General Health Questionnaire (GHQ-12). It is a simple, short, easy questionnaire. It is a self-rated scale composed of 12 questions assessing sleep quality, anxiety, mood state, self-esteem, interest, and concentration. Each one of them is rated using four-point scale (from 0-3). Total score more than 15 indicates evidence of psychological distress, and higher than 20 indicates severe distress (Cuffee et al., 2014). In general population samples there is evidence that the GHQ-12 is a reliable and consistent tool (Goldberg and Blackwell, 1970). It is proved that the Arabic version reliable in a primary health care patients' sample (Pevalin, 2000).

Study Setting (place of the study) and duration of the study
The study was conducted in Al Madinah Al Munawara during the period from December 2020 to May 2021.

Study population and sampling

Study participants (inclusion and exclusion criteria)

The participant who included in this study were patients with Hypertension who live in Al Madinah Al Munawara

Sampling method

The patient's contact information was collected from the primary care centers. After taking consent from the patient an online survey was sent electronically.

Sampling size

Hypertensive patients who attend primary care centers were recruited to participate in the study. Sample size is calculated using the online OpenEpi software, version 3 open-source calculator (Emory University, Atlanta, Georgia, USA) (Cuffee et al., 2014), assuming 7.7%±5% frequency of hypertension among citizens in Madinah (Goldberg and Blackwell, 1970) and at a 95% CI, using the formula: Sample size n = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1) +p*(1-p)] (12). This yielded a sample size of at least 383 participants.

Pilot study

Pilot study was done on 10 Participants to evaluate the validity of the tool; the 10 participants who participated in the pilot study were excluded from the study sample.

Data Management and Analysis plan

Data was entered and analyzed by Statistical Package for Social Sciences (SPSS) program version 22. Descriptive statistic was used to describe the sample major variables. Quantitative variables were summarized using measures of central tendency and dispersion, whereas qualitative variables were presented as frequencies and percentages.

Ethical considerations

The ethical approval was obtained from Review Ethical Committee of the faculty of medicine at Taibah University. Regarding the Administrative approval was taken from the Primary care centers. An informed consent was obtained by the interviewers before conducting the interview from the participants and it included the purpose of the study, the participation will be voluntary, and they have the right to withdrawal from the study. All responses will be treated with confidentially and for the study purpose only. The participants will be anonymous throughout the study.

3. RESULTS

It is clear from (table 1) that There was significant relationship between gender and groups (Chi^2=7.2, P-value<0.05) (Figure 1). There was significant relationship between taking prescribed medicine and groups (Chi2=7.15, P-value < 0.05) (Figure 2).

Table 1 Socio-demographic and clinical characteristics of the participants

Variable			First group	Second group	Third group	Total	Chi^2	P-value
			Group					
Gender	Male	N	181	81	11	273	7.20	.027*
		%	30.8%	13.8%	1.9%	46.4%		
	Female	N	186	100	29	315		
		%	31.6%	17.0%	4.9%	53.6%		
Age	≤20	N	93	40	10	143	8.10	.619//
		%	15.8%	6.8%	1.7%	24.3%		
	21-30	N	121	48	14	183		
		%	20.6%	8.2%	2.4%	31.1%		
	31-40	N	45	24	5	74		
		%	7.7%	4.1%	0.9%	12.6%		
	41-50	N	38	28	3	69		
		%	6.5%	4.8%	0.5%	11.7%		

	51-60	N	49	26	4	79		
		%	8.3%	4.4%	0.7%	13.4%		
	>60	N	21	15	4	40		
		%	3.6%	2.6%	0.7%	6.8%		
Educational level	Did not attend any school	N	10	4	1	15	10.06	.610//
		%	1.7%	0.7%	0.2%	2.6%		
	Did not Complete primary education	N	2	4	1	7		
		%	0.3%	0.7%	0.2%	1.2%		
	Primary certificate	N	12	5	2	19		
		%	2.0%	0.9%	0.3%	3.2%		
	Intermediate Certificate	N	17	12	0	29		
		%	2.9%	2.0%	0.0%	4.9%		
	High school Certificate	N	135	71	15	221		
		%	23.0%	12.1%	2.6%	37.6%		
	University degree	N	169	80	19	268		
		%	28.7%	13.6%	3.2%	45.6%		
	Postgraduate	N	22	5	2	29		
		%	3.7%	0.9%	0.3%	4.9%		
Marital status	Unmarried	N	189	84	22	295	4.65	.589//
		%	32.1%	14.3%	3.7%	50.2%		
	Currently married	N	153	88	14	255		
		%	26.0%	15.0%	2.4%	43.4%		
	Divorced	N	14	4	2	20		
		%	2.4%	0.7%	0.3%	3.4%		
	Widowed	N	11	5	2	18		
		%	1.9%	0.9%	0.3%	3.1%		
Job for the last 12 months	Government employee	N	85	37	6	128	16.86	.264//
		%	14.5%	6.3%	1.0%	21.8%		
	Private sector employee	N	36	13	5	54		
		%	6.1%	2.2%	0.9%	9.2%		
	Business owner	N	13	4	2	19		
		%	2.2%	0.7%	0.3%	3.2%		
	Unpaid	N	5	3	0	8		
		%	0.9%	0.5%	0.0%	1.4%		
	Student	N	146	59	16	221		
		%	24.8%	10.0%	2.7%	37.6%		
	House wife	N	31	29	4	64		
		%	5.3%	4.9%	0.7%	10.9%		
	Retired	N	25	20	5	50		
		%	4.3%	3.4%	0.9%	8.5%		
	Unemployed	N	26	16	2	44		
		%	4.4%	2.7%	0.3%	7.5%		
Smoking	Yes	N	94	43	8	145	.726	.695//
		%	16.0%	7.3%	1.4%	24.7%		
	No	N	273	138	32	443		
		%	46.4%	23.5%	5.4%	75.3%		
Taking prescribed medicine	Yes	N	274	119	24	417	7.15	.028*
		%	46.6%	20.2%	4.1%	70.9%		
	No	N	93	62	16	171		

		%	15.8%	10.5%	2.7%	29.1%		
Complication	No	N	241	133	24	398	15.37	.222//
		%	41.0%	22.6%	4.1%	67.7%		
	Kidney disease	N	15	5	1	21		
		%	2.6%	0.9%	0.2%	3.6%		
	brain attack	N	2	1	1	4		
		%	0.3%	0.2%	0.2%	0.7%		
	Retinopathy	N	17	3	0	20		
		%	2.9%	0.5%	0.0%	3.4%		
	heart and blood vessels	N	20	8	5	33		
		%	3.4%	1.4%	0.9%	5.6%		
	Other	N	5	4	0	9		
		%	0.9%	0.7%	0.0%	1.5%		
	I do not know	N	67	27	9	103		
		%	11.4%	4.6%	1.5%	17.5%		

*Statistically significant at 0.05   **highly significant at 0.01 // Not statistically significant

First group: GHQ < 15 denoting no distress, second group: GHQ from 15-20 denoting mild distress, and third group: GHQ > 20 denoting severe distress
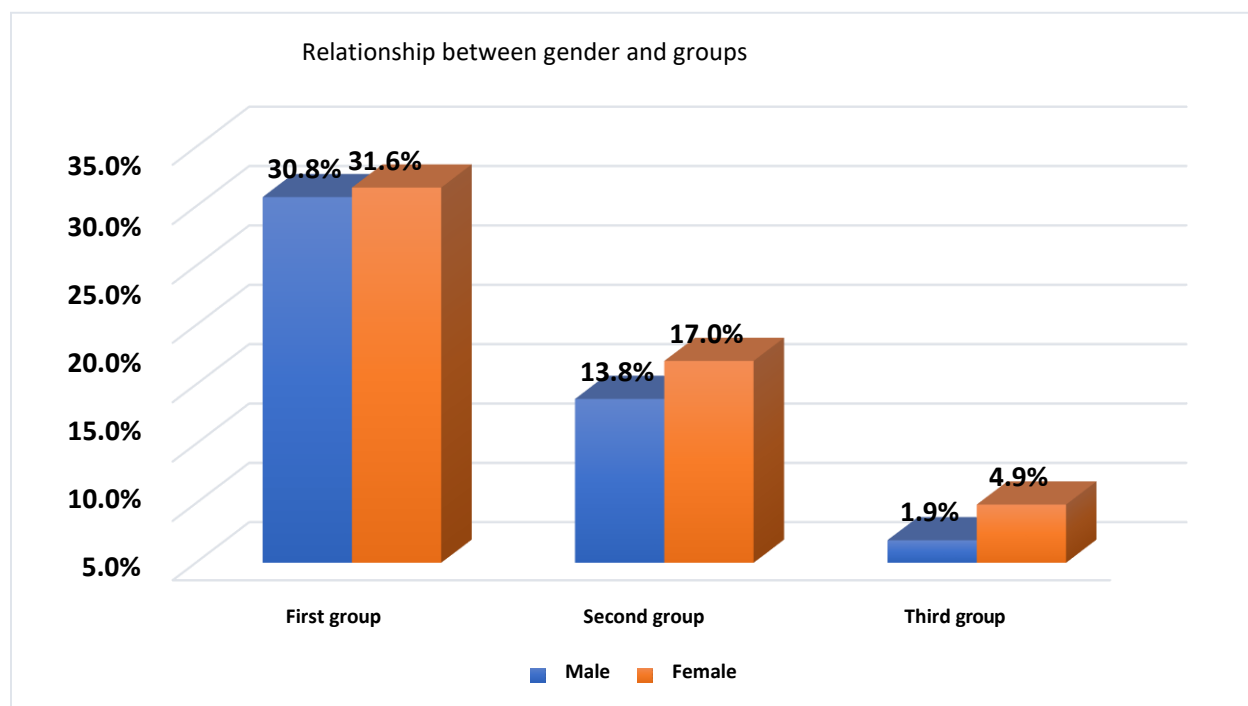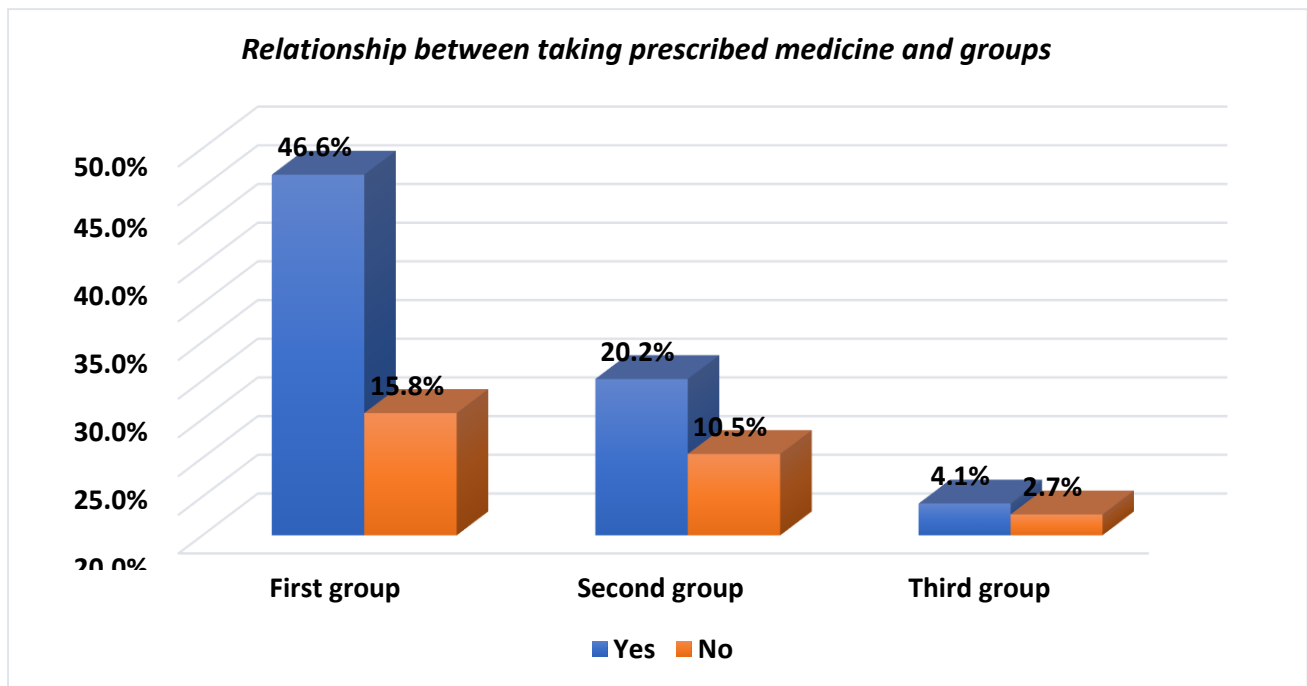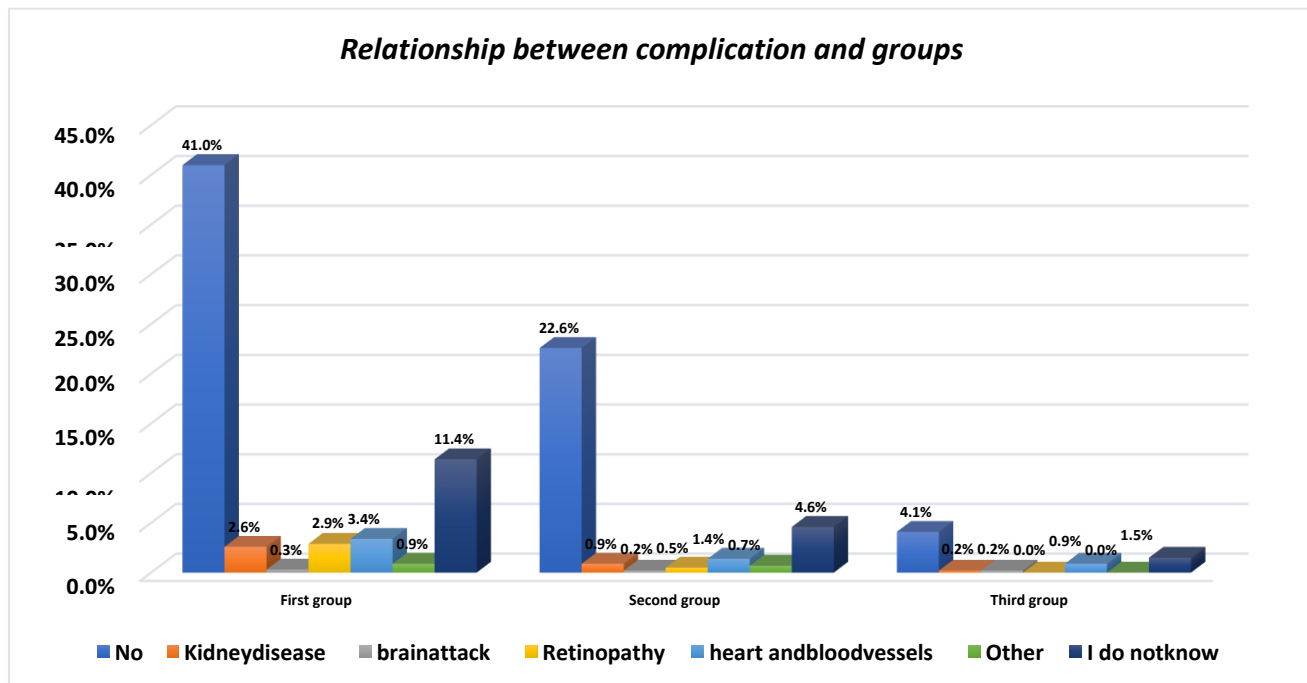

Figure 1 Relationship between gender and groups

Figure 2 Relationship between taking prescribed medicine and groups:

There was no significant relationship between age and groups (Chi2=8.1, P-value>0.05); educational level and groups (Chi2 =10.06, P-value >0.05); marital status and groups (Chi2 =4.65, P- value >0.05); job for the last 12 months and groups (Chi2=16.86, P-value > 0.05); smoking and groups (Chi2 =0.726, P-value> 0.05); complication and groups (Chi2 =15.37, P- value >0.05) (Figure 3).

Figure 3 Relationship between complication and groups

4. DISCUSSION

There are no previous studies as far as we know determined the impact of COVID- 19 pandemic on psychological stress in hypertensive patients in Madinah have been published, although Pre-existing hypertension appears to be common in patients with severe COVID-19 (Kario et al., 2020) as well as higher incidence of psychosocial stress compared to normotension patients (Liu et

al., 2017). Hypertension has a prevalence of 3.9% % (Al-Nozha and Osman, 1998) in Madinah which was considered our target population because of its impact on mental stress (Liu et al., 2017) and the effect of mental stress on control of hypertension and developing complications (Thomas, 2001), rendering it suitable for the study of the psychological state of the Madinah population with hypertension amid of the COVID-19 pandemic that has affected Madinah considerably.

Studies around the world confirmed the presence of psychological distress during infectious disease outbreak. A study confirmed that the percentage is around 22.9% and 56.7% (Mihashi et al., 2009). Our study showed that the studied population (hypertensive patients) were generally not distressed (62.4 %) and (30.8%) were mildly distressed. While (6.8%) were severely distressed. Regarding the role of gender in affecting psychological vulnerability some studies in epidemic situation suggested that males are associated with more vulnerability (Mihashi, 2009). However, females were more affected in other studies (Lau et al., 2010). In our study females are at more risk to developed psychological risk compared to males (4.9 % of females are severely distressed compared to 1.9% of males).

In the current study, we found out There was no significant relationship between age and groups (Chi2 =8.1, P-value > 0.05). However, the data are consistent with data derived from past studies where young people suffering from epidemics had higher risk of distress (Taylor et al., 2008). Regarding the relationship to the financial status, many studies showed that the less income and unemployment state, the more the psychological impact (Brooks et al., 2020), in a COVID-19 study in Spain about the psychological impact, it showed that employment and working during the COVID-19 time showed more stress and are more vulnerability (Gómez-Salgado et al., 2020). In our study, we found that the highest impact was in the student's group with 2.7% followed by the retired and employee groups in the group with the highest vulnerability, mostly because of low income. A study concluded that individuals with poor psychological state were more predisposed to smoking and to smoke more cigarettes per day (Schmidt et al., 2021). This relationship between smoking and psychological health increased with age.

In this study, we found that 24.7% of the studied populations were smokers. 64.8% of them showed no psychological distress at all. While 29.6% showed mild distress, and only 5.6% of them showed severe distress. There was no significant relationship between smoking and groups (Chi2 =0.726, P-value > 0.05). In respect to the complications of hypertension, the number of patients who had complications was significantly increased in our studied group (Chi2 =60.99, P- value <0.05). This could possibly be due to the cancelation of the routine visits to the hospital to control their blood pressure or the difficulty to obtain medications during the shutdown. Moreover, the most common complication for our patients was heart and blood vessels diseases 5.6% in all groups followed by kidney diseases 3.6% of all patients and lastly retinopathy 3.4% of all patients. We have also noticed that the complication was more in the first group patients but there was not a significant relationship between complication and groups (Chi2 =15.37, P-value > 0.05).

Regarding medication adherence, it showed that 70.9% of our data sample were adherent to antihypertensive medication while 29.1% weren't fully compliant with treatment plan, The majority of adherent group (46.6%) were in 1st group (lowest GHQ group), same thing applies to the majority of the non-adherent group (15.8%) as they were also in the 1st group, this shows that Most of Hypertensive patients in our data sample had good perception and in control of the psychosocial aspect of the pandemic.

Study limitations

Using an online survey and self-reported data can be a potential source of bias. Especially since we are assessing a mental health disorder it can affect a patient subjectivity of assessing his/her psychological state.

5. CONCLUSION

This study concludes that the prevalence was found to be 0.376%. The studied population of hypertensive patients in Al Madinah shows an increased psychological stress in females, students and unemployed and those who are not adherents to their medications. With these findings more psychological assessment and care should be provided to the population with hypertension in pandemics.

Authors' contributions

HI, AM, AK and AI developed the concept and deigned the manuscript MJ, AA and AF collected the data AN and MM interpreted and analyzed the data, all authors participated in initial and final draft of the manuscript and in critical revision of the manuscript and approved the final draft and are responsible for the content.

Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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