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PREVALENCE OF DEPRESSION, ANXIETY, AND STRESS AMONG THE EXPATRIATE POPULATION IN SAUDI ARABIA'S EASTERN PROVINCE

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ABSTRACT

The novel coronavirus (COVID-19) has not only affected the physical health of those infected by it but has also taken a toll on the mental health of those experiencing the pandemic. With the rise in the number of cases an increase in depression, stress and anxiety has been observed. This research was conducted to study the impact of COVID-19 on the mental health of the expatriate community living in the Eastern province of Kingdom of Saudi Arabia (KSA). A cross-sectional study was carried out using an online questionnaire consisting of the Depression, Anxiety and Stress Scale (DASS-21). The sample consisted of 336 individuals including 12 males and 324 females aged 18 and above. After data collection and analysis, prevalence rates of depression, anxiety and stress were calculated. The research revealed that the pandemic has affected the mental health of this population. The survey across the Eastern region showed that 65.47% of participants exhibited depressive symptoms, 73.8% showed the symptoms of anxiety and 57.14% reported stress. Females were reported to be more psychologically distressed than males. Similarly, the older population were found to have higher levels of depression, anxiety and stress than the younger one. This study demonstrates that stress, anxiety and depressive symptoms are considerably prevalent in the expatriate community of Eastern region of KSA during the pandemic and calls for significant measures to be taken to mitigate these effects.

KEYWORDS: COVID-19, Coronavirus, Pandemic, Saudi Arabia, Depression, Anxiety, Stress, DASS-21, Mental Health

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1. INTRODUCTION

The coronavirus disease (COVID-19) has played havoc in the entire world after its discovery in December, 2019 in Wuhan province, China. This disease has spread faster and more rapidly than the severe acute respiratory syndrome (SARS) and Middle Eastern Respiratory Syndrome (MERS) also caused by different strains of the coronavirus (NIH, 2020; Sanche et al., 2020). A large number of people were affected globally by this virus, including 13 million plus people getting infected and around 600 thousand people losing their lives within the first six months (WHO, 2020). On March 11, 2020, the World Health Organization (WHO) declared the outbreak of coronavirus (COVID-19) to be a global pandemic. WHO Director-General, Dr. Tedros Adhanom Ghebreyesus, reported that the number of cases outside China had increased 13-fold and the number of countries with cases increased threefold just in the past 2 weeks of the news briefing he was addressing (WHO, 2020).

With the quick spread of the virus and lockdowns to contain the spread, many researchers started to study the effect of this pandemic on the mental health of people. Initially the studies pertaining to psychological challenges of people during the pandemic were conducted in China and Europe (Qui et al., 2020; Porcheddu et al. 2020), and soon after the rest of the world caught up and studies were conducted across the globe. Hence, many research were carried out and results showed that the pandemic has been very distressful for the general public high prevalence rate of psychological disorders (such as insomnia, depression, anxiety, and stress) has been reported in Saudi Arabia (Alkhamees et al., 2020), Pakistan (Hayat et al., 2021), China (Qui et al., 2020), India (Grover et al 2020) Bangladesh (Islam et al., 2020) and Egypt (Arafa et al., 2021). A study conducted to highlight the psychological impact of quarantine and the ways to reduce its psychological toll reported that depression, anxiety, loneliness and suicidal thoughts have been reported frequently during the pandemic (Brooks et al., 2020).

The American Psychological Association (APA) defines depression as "*a negative affective state, ranging from unhappiness and discontent to an extreme feeling of sadness, pessimism, and despondency, that interferes with daily life*." (APA Dictionary of Psychology, 2020)**.** According to APA, anxiety is defined as *"an emotion characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune. The body often mobilizes itself to meet the perceived threat: Muscles become tense, breathing is faster, and the heart beats more rapidly*." (APA Dictionary of Psychology, 2020).

The definition of stress is "*the physiological or psychological response to internal or external stressors. Stress involves changes affecting nearly every system of the body, influencing how*

people feel and behave. It may be manifested by palpitations, sweating, dry mouth, shortness of breath, fidgeting, accelerated speech, augmentation of negative emotions (if already being experienced), and longer duration of stress fatigue." (APA Dictionary of Psychology, 2020).

The Eastern region of Saudi Arabia's main cities are Dammam, Al-Hasa, Al-Jubail, Ras Tanura, Dhahran, Al-Khobar and Al-Qatif (Ashraqia Chamber, 2021). In this geographical context, we focus on the expatriate community, i.e. those people living in a country that is not their own (Oxford Learners Dictionaries, 2021).

The COVID-19 breakout was declared to be pandemic by the World Health Organization on 11th March, 2021. The first case of Coronavirus infection was discovered in the Kingdom of Saudi Arabia on 2nd March, 2020. (Ministry of Health, 2020). In a month's time, the educational institutions including schools, universities and madrassas (religious schools), as well as malls, restaurants, beaches, and resorts were shut down and a 24-hr curfew was implemented in almost all the cities of the Kingdom along with ban on intercity travels (Abdullah, 2020). The general population was only allowed to leave their homes to buy food and medications between 6 a.m. and 3 p.m. and that too, within the limits of their living areas and more than one passenger on a single vehicle was not allowed (Abdullah, 2020). All international and national flights were suspended (Arab News, 2020). Religious pilgrimages (Umrah) were also banned (Ahmed, 2020). The first round of lockdown and restrictions was very distressing for the people since most of them had hardly experienced anything of this sort earlier in their lives. This is the reason that several studies have been conducted to study its psychological impact on the people throughout the world. Many studies have been conducted in Saudi Arabia to understand the psychological challenges people are going through during the pandemic in this country as well. However, the data available on the expatriate population is limited.

The present study aims to assess the psychological impact of COVID-19 through a public cross-sectional survey that tends to estimate the prevalence of depressive symptoms, anxiety symptoms, and stress during the pandemic. The objective of this research is to identify potentially vulnerable groups which will help mental health professionals understand the level of psychological discomfort and design tailored interventions for the expatriate population according to their demographic details. The result of this study will also help to create awareness among the expatriate population and encourage the help seeking behavior.

The remaining parts of this paper are organized as follows: The next section represents a literature review. The third section discusses the methodology and results followed by discussion and conclusion discussing the strength and weakness the paper and suggestions for future work along the same lines.

2. LITERATURE REVIEW

The International Epidemiology Association's Dictionary of Epidemiology defines pandemic as *"an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people*". In contrast to this, the World Health Organization (WHO) defines the pandemic as "*the worldwide spread of a new disease*". Throughout history, the world has seen a number of such outbreaks where the infectious agents have wreaked havoc in the entire world. The noteworthy ones include the Black Death, Spanish flu, human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) and Zika virus pandemic (Madhav et al., 2018).

To date, a lot of psychological studies in almost all the major parts of the world have been conducted to study the effects of pandemic and associated changes in life on the mental health of the general public. Saudi Arabia has also conducted many studies to address the psychological wellbeing of its people. One such research conducted by Alamri et al. (2020) studied the impact of the COVID pandemic on the mental health of the general population of Saudi Arabia. They had a total of 1597 respondents who completed the survey, however only 62 participants making 3.9% of the total population sample were non-Saudis (expatriates). The subsequent results of this study showed that 37.1% non-Saudi participants showed the signs of depression, while 24.2% and 22.6% were reported to have symptoms of anxiety and stress respectively.

Algarni et al. (2021) conducted a study on the "Perception of Threat and Psychological Impact of COVID-19 among Expatriates in Makkah Region". This study was specifically conducted to study the effects of the pandemic on the mental health of the expatriate population. In this study, a total of 292 expatriates participated. The prevalence of self-reported depression was nearly 40%, anxiety was 32%, and stress was 43%.

Another similar study was conducted by Alkhamees et al. (2020) to understand the psychological impact of COVID-19 pandemic on the people of Saudi Arabia. Their survey had 1160 participants of the general public and to the best of our knowledge, this study does not indicate any difference between locals and expatriate population. Their results showed that 23.6% reported moderate or severe psychological impact of the pandemic, 28.3%, 24%, and 22.3% reported moderate to severe depressive, anxiety, and stress symptoms, respectively.

The psychological effects of changes brought about by COVID-19 were also studied in other parts of the Middle East. Uvais et al. (2021) conducted research to understand the psychological distress and coping mechanisms among Indian expats working in the Middle East during the COVID-19 pandemic. Their study concluded that out of 94 respondents, 52% reported clinically significant anxiety levels, and 41% reported clinically significant depression levels.

Mass media have been actively involved in bringing the latest news to every individual on the planet, but this information overload can also lead to mental health challenges. An interesting study was conducted by Zakout et al. (2020) in which they studied the magnitude of COVID-19 related stress, anxiety and depression associated with intense mass media coverage in Saudi Arabia. In this study, a total of 215 respondents were included. Higher mental distress rates were reported in non-Saudi participants compared to Saudi ones (i.e., 50.74% vs. 30.40%; 34.23% vs. 13.51% and 59.70% vs. 27.70%; for depression, anxiety and stress, respectively).

Assessment of the Quality of Life during COVID-19 Pandemic was determined by Algahtani et al. (2020) in a Cross-Sectional Survey from the Kingdom of Saudi Arabia. The study sample comprised 754 participants out of which 195 were non-Saudis. The Depression, Anxiety and Stress Scale–21 (DASS-21) was used to assess depression, anxiety, and stress. The median and inter-quartile range were used to describe the QoL scores. The non-Saudi residents were almost two times (OR = 1.69; 95% CI: 1.06–2.57) more at risk to be in the first quartile. (Algahtani et al., 2021)

Alyami et al. (2021) in their research "Depression and anxiety during the COVID-19 pandemic in Saudi Arabia: A cross-sectional study" found that non-Saudi residents (expatriates), individuals aged 50 years and above, divorced people, retired people, university students and low-income groups had a higher risk of having depression.

Apart from the above-mentioned study, various other studies indicate that socially disadvantaged groups (e.g., low-income groups, ethnic minorities) experience more mental health problems than socially advantaged groups (Purtle, 2012). This is the reason that current research has studied the demographics in detail to be able to provide the relationship between psychological distress and different demographic variables.

3. METHODOLOGY

The purpose of the research was to determine the prevalence of mental health issues among the expatriate community living in the Eastern province of Saudi Arabia during the second wave of COVID-19 period during February and March, 2021. To conduct the study, a questionnaire, DASS-21 (depression, anxiety and stress scale) was used.

This study is quantitative in nature. A cross-sectional study was conducted to explore the prevalence rates of mental health construct (which are depression, anxiety, and stress). DAS scale is a set of three self-reported scales (Appendix 3). It is a 21-item scale and is designed to measure the emotional states of depression, anxiety and stress. This is a summarized version of the 42–item DASS. Each subscale measures depression, anxiety and stress respectively and has seven items. It is a 4-point Likert scale having a range of 0-3. Zero (0) =Did not apply to me; One (1) = Applied

to me to some degree or for some of the time; Two (2) = Applied to me to a considerable degree or for a good part of time; Three (3) = Applied to me very much, or most of the time.

The depression scale measures hopelessness, dysphoria, lack of interest / involvement, anhedonia, devaluation of life, self-deprecation, and inertia. The anxiety scale is sensitive to skeletal muscle effects, autonomic arousal, situational anxiety, and subjective experience of anxious affect. The stress scale assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable, and over-reactive and impatient.

Demographic details such as gender, age, education, marital status and employment status were also obtained. Pearson correlation was used to study the association of demographic variables and with DASS subscales.

Summing the scores for the relevant items gives the scores for depression, anxiety and stress. The DASS-21 is based on a dimensional rather than a categorical conception of psychological disorder. The assumption on which the DASS-21 development was based (and which was confirmed by the research data) is that the differences between the depression, anxiety and the stress experienced by normal subjects and clinical populations are essentially differences of degree. Its reliability analysis shows that it has Cronbach's alpha values of 0.81 for depression subscale, 0.89 for anxiety and 0.78 for anxiety subscales (Coker et al., 2018).

DASS-21 was set in Google Forms (Google LLC, Mountain View, California, USA), and distributed online to collect data pertaining to psychological disorders. Social Media website (Facebook) and WhatsApp were used to share the questionnaire along with a request to spread the survey in this particular community of expatriates. This study is based on a convenience sampling method in which the sample is taken from a group of people easy to contact or to reach. People had to simply click the link created for the questionnaire and enter the data. After clicking on the link, a cover page appeared which showed the research title, objective, and consent. If the participants gave their consent to participate, they were asked to click "start the questionnaire," and start answering the survey questions. As for demographic details, age, gender, educational qualification, employment, and marital status were asked. Participants were requested to fill in all the items. The questionnaire remained open and accessible from 1st February to 15th March, 2021.

Sum scores for the total DASS-total scale thus range between 0 and 120, and those for each of the subscales ranged between 0 and 42. Cut-off scores of 60 and 21 were used for the total DASS score and the depression subscale, respectively. These cut-off scores were derived from a set of severity ratings, proposed by Lovibond and Lovibond (Table 1). Once multiplied by 2, each subscale was categorized as follows.

Table 1. Cutoff Points for DASS-21 Scale

Severity	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extreme	28+	20+	34+

3.1 Ethical Consideration

Participants' consent was taken and they were informed of the potential risks (such as emotional distress) associated with the survey as it might trigger them or remind them of negative experiences. The objective of the survey was also explicitly explained and participants were given full autonomy to withdraw from the study at any time. Only the participants who gave their consent were directed to the main survey. Anonymity was maintained by not asking for their names. Since the research was conducted in an individual capacity, no legal permission was sought from any Government body.

4. RESULTS

A total 336 respondents completed the survey. They ranged in age from 18 to 45 years old; Males made up 3.6 % of the sample (n = 12). The number of female participants was way higher than men in this study (96.42%, n=324). More than 92% of respondents were unemployed (n = 312), and 62.7% (n = 211) had a bachelor (or above) degree. More than half of the respondents (n=218) were married (64.8%).

Table 2. Demographic Data of the Participants

Variable	*n*	Percentage
Sex	336	
Male	12	3.57%
Female	324	96.43%
Age		
18-30	220	65.48%
31-45	116	34.52%
Education		
Bachelor and above	211	62.80%
Below bachelor	125	34.23%
Employment		
Unemployed	312	92.86%
Self Employed	11	3.27%
Employed	13	3.87%
Marital Status		
Married	218	64.88%
Unmarried	118	35.12%
Divorced	0	0.00%

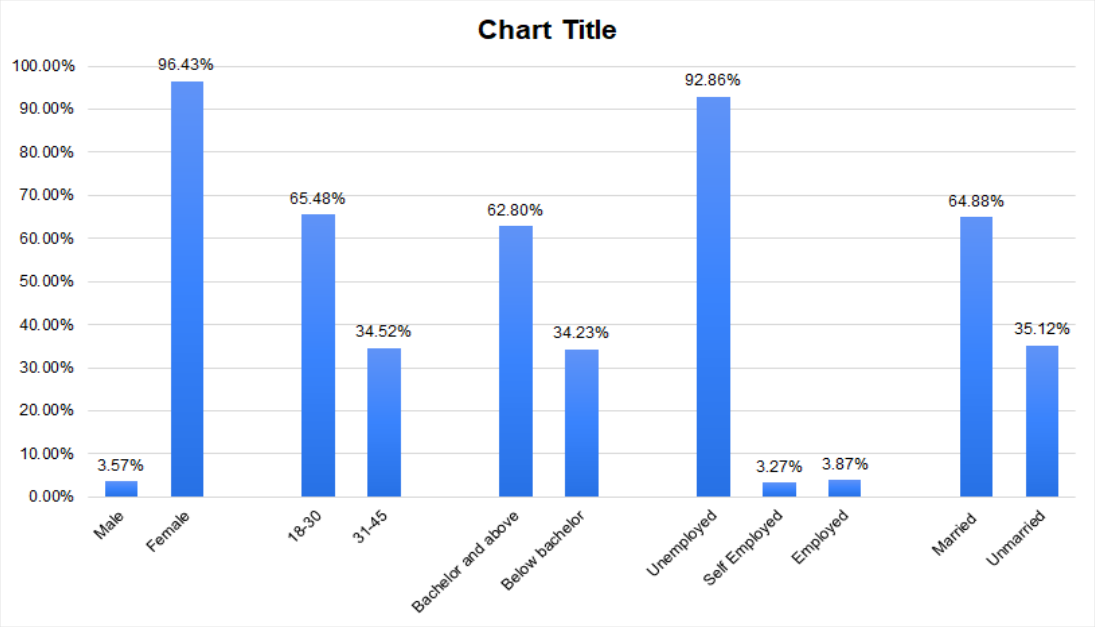

Figure 1. Distribution of Demographic Data

Table 3. Depression distribution among survey respondents during COVID-19 pandemic

Severity	**Depression**		
	Range	Value	Percentage
Normal	0-9	116	34.52%
Mild	10-13	68	20.24%
Moderate	14-20	76	22.62%
Severe	21-27	24	7.14%
Extreme	28+	52	15.48%
Total		220	65.47%

Table 4. Anxiety distribution among survey respondents during COVID-19 pandemic

Severity	**Anxiety**		
	Range	Value	Percentage
Normal	0-7	88	26.19%
Mild	8-9	36	10.71%
Moderate	10-14	92	27.38%
Severe	15-19	56	16.67%
Extreme	20+	64	19.05%
Total		248	73.8%

Table 5. Stress scale distribution among survey respondents during COVID-19 pandemic

Severity	**Stress**		
	Range	Value	Percentage
Normal	0-14	144	42.86%
Mild	15-18	76	22.62%
Moderate	19-25	60	17.86%
Severe	26-33	48	14.29%
Extreme	34+	8	2.38%
Total		192	57.1%

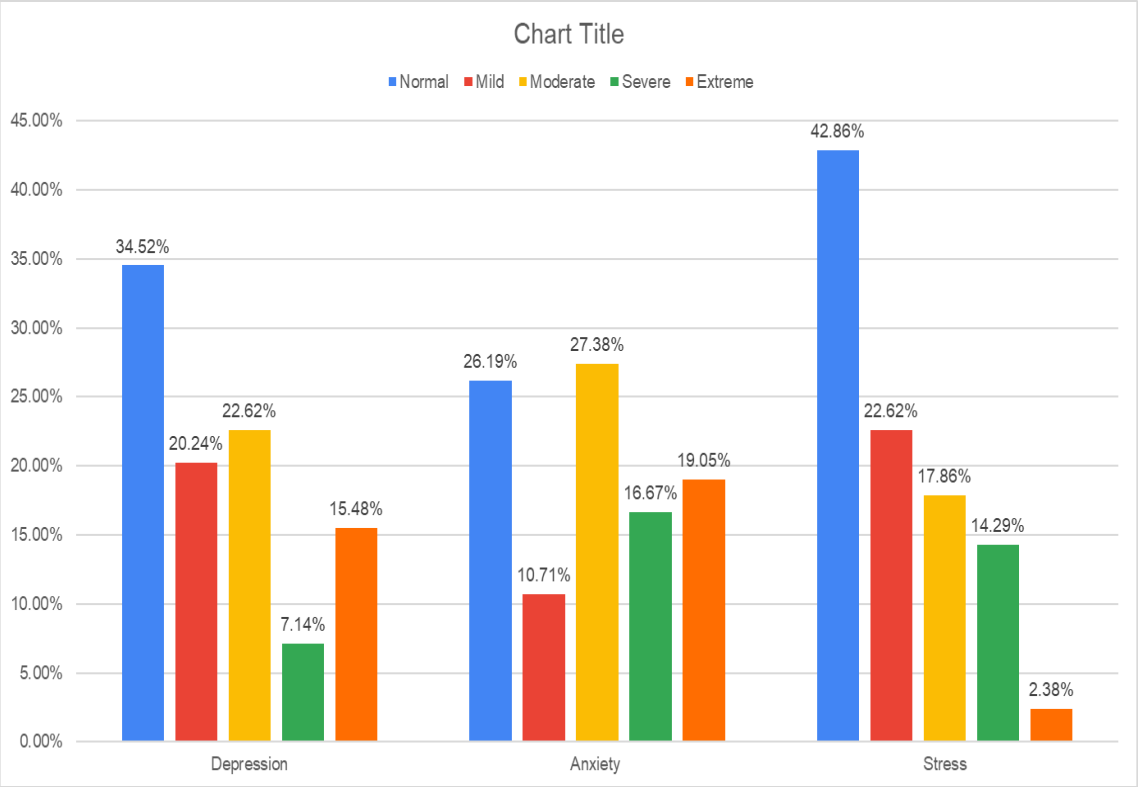

Figure 2. Distribution of psychological health parameters among expatriate population in the Eastern Region of Saudi Arabia during COVID-19 pandemic, 2021.

Participants' psychological health status during COVID-19 pandemic (Table 3, Figure 2) demonstrate that that more than half of the respondents (65.47%; n = 220) reported experiencing any depression, with 20.24 percent reporting mild symptoms, 22.62 percent reporting moderate symptoms, 7.14 percent reporting severe symptoms and 15.45 percent reporting extreme symptoms More than 73 percent of respondents were experiencing anxiety (n = 248) with 10.71 percent reporting mild symptoms, 27.38 percent reporting moderate symptoms, 16.67 percent reporting severe symptoms and 19.05 percent reporting extreme symptoms. Almost 192 (57.14 percent) of sample respondents reported experiencing stress, with 22.62 percent reporting mild symptoms, 17.86 percent reporting moderate symptoms, 14.29 percent reporting severe symptoms and 2.38 percent reporting extreme symptoms.

Table 6. Distribution of participants psychological health aspects by their biodemographic data

Bio-Demographic Data			**Depression**		**Anxiety**		**Stress**	
		Total	No.	%	No.	%	No.	%
Gender	Male	12	5	41.67%	6	50.00%	5	41.6%
	Female	324	215	66.36%	242	74.69%	187	57.7%
p-Value			**0.07**		**0.05**		**0.2**	
Age	18-30	220	141	64.09%	154	70.00%	118	53.64%
	31-45	116	79	68.10%	94	81.03%	74	63.79%
	>45	0	0	0.00%	0	0.00%	0	0.00%
p-Value			**0.4**		**0.02***		**0.07**	
Education	Below Bachelor	125	95	76.00%	109	87.20%	98	78.40%
	Bachelor and above	211	125	59.24%	139	65.87%	94	44.55%
p-Value			**0.001****		**0.00001****		**0.000****	
Employment	Unemployed	312	213	68.27%	241	77.24%	187	59.94%
	Employed	13	3	23.08%	4	30.77%	3	23.08%
	Self Employed	11	4	36.36%	3	27.27%	2	18.18%
p-Value			**0.0004***		**0.000****		**0.00092***	
Marital Status	Married	218	151	69.27%	187	85.78%	112	51.38%
	Single	118	69	58.47%	61	51.69%	80	67.80%
	Divorced	0	0	0.00%	0	0.00%	0	0.00%
p-Value			**0.04***		**0.000****		**0.003****	

Pearson correlation - * $p < 0.05$ (significant).

Pearson correlation - ** $p < 0.01$ (significant).

Table 4 shows the distribution of participants' psychological health aspects by their biodemographic data. Pearson correlation was used to study the association of demographic variables with DASS subscales scores. A p value lower than 5 percent ($p \leq 0.05$) was considered statistically significant. Depression, anxiety and stress were significantly higher among females than males (66.36% vs. 41.67%, 74.69% vs. 50.00% and 57.7% vs. 41.6%, respectively; $p \geq 0.05$).

Moreover, older respondents (>30 years) were significantly more depressed, anxious, and stressed than younger respondents (<31) (68.1% vs. 64.1%, 81.03% vs. 70%, and 63.79% vs. 53.64%, respectively; p = 0.4, 0.02, 0.7 respectively. Participants with bachelor degree and above (62.79%) exhibited lesser psychological distress than those have educational accomplishment below bachelor (values of depression, anxiety and stress for participants with bachelor and above versus below bachelor being 59.24% vs. 76%, 65.87% vs 87.2%, 44.55% vs 78.4% respectively, $p<0.05$). Unemployed participants (92.86%) were more likely to experience depression, stress and anxiety than those who were working/self-employed. Married respondents were more depressed and anxious than the singles (69.27 vs. 58.47 and 85.78% vs. 51.69%, respectively, $p<0.05$) but singles were more stressed (67.80%) than married people (51.38%).

5. DISCUSSION

This study was aimed to assess the psychological impact of COVID-19 pandemic on the expatriate population living in the Eastern region of Saudi Arabia. Participants exhibiting depressive symptoms on DASS-21 scale were 65.48%, of which 20.24% were mild, 22.62% moderate, 7.14% severe and 15.48% extreme while those reporting the symptoms of anxiety were 73.81%, of which 10.71% were mild, 27.38% moderate, 16.67% severe and 19.05% reported extreme anxiety. 57.14% of the people reported stress of which 22.62% were mild, 17.86% moderate, 14.29% severe and 2.38% extreme cases were reported.

This prevalence rate of depression is close to what Uvais et al. (2020) reported (52%) in the Indian expats of the Middle east. However, the rate is significantly higher than what was found in the study conducted on the expatriate population living in Makkah region of Saudi Arabia where the prevalence of self-depression was nearly 40%, anxiety was 32%, and stress was 43%. (Algarni, 2021).

The possible explanation for this difference is that the study conducted in Makkah had a significantly higher number of male participants (72%) than females. The females tend to be more susceptible to psychological distress across the globe (Piccinelli & Wilkinson, 2018). Similar findings about the susceptibility of the female population was reported in Egypt by Arafa et al. in 2020. Depression rate is also reported to be more in females as per the discussion of Albert (2015) in his article “Why is Depression more prevalent in women”? In our studies, females reported the problems of depression, anxiety, and stress more than males which is consistent to the similar studies conducted in Saudi Arabia such as the one by Alamri et al (2020) while studying the Prevalence of Depression, Anxiety, and Stress among the General Population in Saudi Arabia during Covid-19 Pandemic.

According to our findings, the older respondents (>31 years) were experiencing more psychological distress as compared to the younger ones (<30 years). Al Omari et al. 2020 conducted a study to explore the prevalence of Depression, anxiety and stress among youth (15-24 years old) in six Middle Eastern countries. The prevalence of depression, anxiety and stress was found to be 47.9% and 33.1%. Similarly, the study conducted on expatriate population of Makkah region found that the age group of 18-34 (similar to the age group of our study; 18-30) reported to have 38.9 % depression, 42.28 %anxiety and 32.89% stress respectively (Algarni, 2021) which is lesser than our findings of 64.09% depression, 70% anxiety and 53.64% stress. This can again be explained on the basis of an overwhelmingly greater female sample in our study. Also, the older adults have to arrange for the bread and butter of the family which puts them more at risk of developing psychological disorders as compared to the younger population which does not have to worry about food and shelter at this stage of life.

Participants with bachelor degrees and above exhibited lesser psychological distress than those having educational accomplishment below bachelor. Depression 59.24%, anxiety 65.87% and 44.55% stress was reported in our studies from respondents who had bachelor or higher qualification. These levels are higher than previous studies conducted in the Kingdom. Use of different tools, time of the study conducted and survey methods etc. can lead to inconsistency of our results with the previous literature.

Unemployed participants (92.86%) were more likely to experience depression, stress and anxiety than those who were working/self-employed. This is in line with the finding of Alyami et al. (2021) who conducted a cross sectional study to find Depression and anxiety during the COVID-19 pandemic in Saudi Arabia and concluded that unemployed individuals were at a higher risk of having depression and anxiety. It is also to be noted that most expatriate women live as a dependent on their husband's permit and are not allowed to work in the Kingdom. Therefore, the percentage of employed population was very less.

Married respondents were more depressed and anxious than the singles (69.27 vs. 58.47 and 85.78% vs. 51.69%, respectively) which is in line with the findings of Alyami et al. (2020) and can be justified with the additional responsibilities of feeding and taking care of the family on married couples as compared to the singles.

6. CONCLUSION

Unprecedented and unpredictable changes have been faced by human beings during the COVID-19 pandemic. Consequently, a large population is experiencing some level of pathological distress. In order to be able to address and limit the negative impact of this pandemic, it is mandatory to identify the high-risk group. Our study aimed to identify such a group by conducting a cross-

sectional study. Since lockdown and strict SOPs limited the human-to-human interaction, an online survey served as the only option to conduct such a study. Our research has used descriptive analysis to analyze the sociodemographic variables and their relationship with psychological distress. The findings suggest that among the expatriates, being a female, having lower education, being an older person is related to depression, anxiety and stress in the Eastern region of Saudi Arabia. The high rate of depression, anxiety and stress in expatriates indicates that this pandemic and all the limitations and changes associated with it are significant stressors in the personal and social lives of this population. Our results can contribute significantly in formulating new guidelines to assist expatriate communities, not only in Saudi Arabia, but also in the other parts of the Middle East with a good majority of non-citizens working in those countries.

This study has demonstrated several strengths. First, it has addressed the prevalence of depression, anxiety and stress in the expatriate population of Eastern region of Saudi Arabia. To the best of the author's knowledge, no study has been conducted to assess the psychological discomfort experienced by this particular group earlier during COVID-19 spread. This may give valuable information to policymakers that can assist them to make decisions which can help this high-risk group and also introduce mental health interventions that can address and mitigate psychological distress in the expatriate community.

However, this study also has several limitations. First, the study was based on an internet-based survey method which means that people who do not have access to or limited knowledge of the internet were not a part of the study. Secondly, the study design was such that it made use of self-reported questionnaires to measure psychological symptoms. Self-reported questionnaires are not as reliable a tool as structured clinical interviews and functional neuroimaging (Ho et al., 2020).

Moreover, this study has not done any comparative analysis of the mental health state of these individuals since the data prior to the pandemic was never taken. This can be attributed to the sudden outbreak of the pandemic.

Another limitation is that the research has neither considered the profession of the participants nor taken their monthly salary into account. A major population of the expatriates belong to the labor class and it would have been interesting to see the psychological impact of COVID on this particular class.

Yet another limitation is the time period for which the study was conducted which was limited to 1.5 months. Convenience sampling can also be a limitation and there can be a bias in the sample as only those who were interested in mental health and understand the importance of such a study would have participated.

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APPENDICES

Appendix 1: Consent Form and Information sheet

Prevalence of Depression, Anxiety, and Stress among the Expatriate Population

This is an independent study aiming to explore the prevalence of Depression, Anxiety and stress among the expatriate population living in the Eastern Province of Saudi Arabia. Please only proceed if you are a part of this community. This research is being conducted by Bela Khan, Sr. Lecturer at International Open University.

Informed consent and participation in the study

You are invited to fill in a web-based questionnaire. Some of the questions may cause some level of discomfort or remind you of a negative incident. Your participation is completely voluntary. Should you find the questionnaire distressful, you may leave at any moment. No questions asked.

All the information collected will remain confidential and shall not be used for anything other than the said study. You have not been asked to mention your names. Other demographic data is purely for the sake of research. Should you still have doubts, this is the best time to quit.

The objective of this study is to find the prevalence of psychological distress caused by COVID-19 pandemic in the expatriate community. Such studies have been conducted before but the data is very limited when it comes to the expatriate population. Your participation will help us understand the predicament of this community better. The findings of this study will help us create awareness and knowledge about mental health problems.

Please do not participate in the study if you are not an expatriate living in the Eastern province of Saudia. One you press submit, you give your consent to participate in the survey and acknowledge that you have studied this form and you take the responsibility of going ahead and filling in the survey.

Your time and contribution will make all the difference for this community.

Thanking in anticipation

Bela Khan

Select one answer from each of the following questions

1. I have completely understood the objective of the study and I am ready to participate
   - Yes
   - No
2. I am an expatriate living in the Eastern Province of KSA.
   - Yes
   - No
3. I understand that this can cause some level of discomfort and I choose to take the responsibility for proceeding
   - Yes
   - No

When you choose to click “Next”, you choose to participate in the study voluntarily.

Appendix 2: Questionnaire (demographics)

1- Gender
   a. Male
   b. Female
2- Age
   a. 18-30
   b. 31-45
   c. Above 45
3- Education
   a. Bachelor and above
   b. Below Bachelor
4- Employment
   a. Unemployed
   b. Self employed
   c. Employed
5- Marital Status
   a. Married
   b. Unmarried
   c. Divorced

Appendix 3: DAS S 21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree, or a good part of time

3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (e.g., in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3