Seeing the unforeseen: an insight into kingdom-wide psychological impact of COVID-19 pandemic

A.A. HAYAT[1], A. MENY[2], Q.U. HAMDAN[3], W. SAMI[4,5], G. ALBADRANI[6]

[1]Department of Neuropsychiatry, Maternity and Children Hospital, Makkah Al Mukarma, Kingdom of Saudi Arabia
[2]Department of Occupational Therapy, College of Applied Medical Sciences, King Saud bin Abdulaziz University for Health Sciences, Jeddah, Kingdom of Saudi Arabia
[3]Department of Psychiatry, Rawalpindi Medical University, Rawalpindi, Pakistan
[4]Department of Community Medicine and Public Health, College of Medicine, Majmaah University, Kingdom of Saudi Arabia
[5]Azra Naheed Medical College, Superior University, Lahore, Pakistan
[6]Department of Biology, College of Science, Princess Nourah bint Abdulrahman University, Riyadh, Kingdom of Saudi Arabia

Abstract. – **OBJECTIVE:** The aim of the manuscript was to measure the levels of psychological stress, both acute and post-traumatic in the Saudi Arabian population during the situation resulting from the COVID-19 outbreak.

MATERIALS AND METHODS: A cross-sectional survey was carried out among people of Saudi Arabia (SA) to measure levels of psychological stress, both acute and post-traumatic during the COVID-19 outbreak. Data were collected from five regions in SA using validated questionnaires including Kessler Psychological Distress Scale (K10) and Impact of Events Scale (IES) through social media channels from March 2021 to January 2022.

RESULTS: The total number of participants was 1,560. Most of participants (60.2%) were females. Around 53.6% of the sample were aged between 16-24 years old. The majority of participants (87.3%) was Saudi national. About 82% of participants was from Eastern (40.1%) and Western (42.2%) regions, followed by those from Central, Northern, and Southern. More than 60% of them had a college degree or above. The mean K 10 score was 28.33 for the sample which was above the cut-off of 25, implying significant levels of acute stress in the sample. IES values showed a mean of 28.19, well above the cut-off of significant Post Traumatic Stress Disorder (PTSD) symptoms (24). K-10 and IES scores revealed that about 76.7% of the participants suffered from significant acute stress and 59.1% suffered from symptoms of PTSD during the COVID-19 era.

CONCLUSIONS: The nationwide study emphasizes the fact that the Saudi population was found to be extremely stressed and traumatized during the COVID-19 pandemic era and calls for effective and specific national strategies to address and manage these conditions in short and long term.

Introduction

The world has been facing an unprecedented challenge since the beginning of 2020 in the form of the COVID-19 pandemic[1]. It is by no means the first pandemic in living memory, nor it is the largest one in recorded history[2], making it unprecedented in the "global village" that the world had become before the outbreak[3].

It means that the present-day human was enjoying such efficient and multiple modes of transportation that a microbe that could infect people without showing symptoms had traveled far and wide before the first batch of serious patients reached healthcare facilities[1,4]. As a result, we have seen one country after the other declaring health emergencies and many of them putting their populations in some kind of lockdown or curfew. Saudi Arabia faced a similar situation and chances of rapid spread of infection were high owing to a significant number of pilgrims and visitors travelling there from all over the world. As a result, the government had to impose restrictions early and hard[5]. A population lockdown is a situation that disrupts the usual routine life for everyone. The people who have not become ill nor they have come in contact with a COVID-19 case may have felt like it was unnatural coercion to stay at home. It also generated a sense of fear and uncer-

Corresponding Author: Waqas Sami, MD;
e-mail: w.mahmood@mu.edu.sa; waqas_sami@hotmail.com

tainty about the future, especially in the context of a novel infection with unknown risks and complications and was bound to lead to adverse mental health outcomes and social impacts[6,7].

We have quite a sum of reports from previous pandemics, including SARS, MERS, and Ebola virus outbreaks which point to adverse psychological impacts on the public[8-11]. These impacts can be many and variable, including but not limited to exhaustion, fear, irritability, low mood, insomnia, anxiety, and post-traumatic stress disorder[8]. Studies[9] have also looked into factors associated with a higher risk of developing psychological symptoms. Certain demographic factors such as being parents of young children, being health-care workers, having past psychiatric history, or directly losing income due to quarantine situations were linked to adverse psychological outcomes[10]. Saudi Arabia has been under an ongoing threat of MERS-CoV since 2012, and a steady number of cases have been reported regularly[11]. Moreover, it is a unique country hosting the largest number of pilgrims in the world every year, thus this puts it in an especially precarious condition in such an outbreak, notwithstanding the simultaneous impact of oil prices plummeting[12].

Our study aimed at measuring the levels of psychological stress, both acute and delayed, due to global pandemic and mass quarantine situations. We have also evaluated factors linked to a greater likelihood of suffering from these psychological reactions in order to identify vulnerable groups. Our findings will help guiding the allocation of resources for treatment and rehabilitation of the population suffering from non-physical health problems as a result of pandemic circumstances.

Materials and Methods

Ethical approval was taken from the ethical committee at Princess Nourah bint Abdulrahman University to conduct the study (project number PNU-DRI-Targeted-20- 011). An analytical, cross-sectional design was used to conduct the study using the convenience sampling technique. The study tool was disseminated and circulated using all the social and electronic media platforms like Twitter, LinkedIn, Facebook, WhatsApp, Instagram, Pinterest, and Tumblr throughout the Kingdom by a team of IT professionals using SurveyMonkey software. Participants who were aged between 16 to 64 years old, spoke and understood Arabic or English languages fluently, and were residents or na-

tionals of SA were included in the study. Data were collected from March 2021 to January 2022, where the sample size was 1,536 people. The research tool included a demographic section followed by the two psychometric scales to assess stress.

Kessler Psychological Distress Scale (K10)

It is a 10-item subjective measure of psychological distress[13,14]. This is a screening instrument with a validated Arabic version[15]. People who score between 20-24 are likely to have mild psychological distress, scores 25-29 show moderate psychological distress, and scores 30 and over indicate severe psychological distress. For research purposes, we defined acute stress as a score of 25 or more.

Impact of Events Scale (IES) – English Version

It is recognized as one of the earliest self-reports tools[16] developed to assess post-traumatic stress, a valid instrument to measure the subjective response to a specific traumatic event in the adult population, especially in the response sets of intrusion and avoidance, as well as a total subjective stress score. The higher the score, the greater the concern for PTSD and associated health and well-being consequences. While there is no specific cut-off score, scores higher than 24 were of concern, so we took 24 as a cut-off for research purposes.

Impact of Events Scale – Arabic Version

Though translations of the revised version of IES, IES-R were done and validated, no validated Arabic translated version of the original IES was found during the literature search. Therefore, a translated and validated version was produced by a group of experts in the field, including bilingual translators based on the WHO guidelines[17].

Statistical Analysis

The data were entered and analyzed using IBM SPSS v.28 (IBM Corp., Armonk, NY, USA). Frequencies and percentages are reported for qualitative variables, whereas quantitative variables are expressed as Mean ± SEM. Pearson-Chi square was applied to observe associations between qualitative variables. A p-value of less than 0.05 was considered statistically significant.

Results

The total number of participants (N) was 1,560. Females comprised 60.2% of the sample. More

Table I. Demographic data of participants (n = 1,560).

Variables	n (%)	Variables	n (%)
Age (years)		**Region**	
16-24	836 (53.6)	**Central**	156 (10.0)
25-34	378 (24.2)	**Eastern**	625 (40.1)
35-44	220 (14.1)	**Northern**	95 (6.1)
45-54	97 (6.2)	**Southern**	19 (1.2)
55-64	29 (1.9)	**Western**	665 (42.6)
Gender		**Education Status**	
Male	621 (39.8)	**Illiterate**	8 (0.5)
Female	939 (60.2)	**Primary**	18 (1.2)
Nationality		**Middle**	100 (6.4)
Saudi	1,362 (87.3)	**High school**	448 (28.7)
Non-Saudi	198 (12.7)	**College and above**	986 (63.2)
Employed		**Marital Status**	
Yes	755 (48.4)	**Married**	968 (62.1)
No	805 (51.6)	**Single**	545 (34.9)
		Divorced	36 (2.3)
		Separated	11 (0.7)
Psychiatric comorbidity		**Income per month**	
Yes	395 (25.3)	**<5,000**	1,134 (72.7)
No	1,165 (74.7)	**5,000-10,000**	426 (27.3)
Affected by COVID-19		**Quarantined**	
Yes	1,134 (72.7)	**Never**	95 (6.1)
No	426 (27.3)	**Home**	401 (25.7)
		Facility	1,064 (68.2)

than half (53.6%) of the sample lay in an age range of 16-24. The representation of non-Saudis was a mere 12.7% compared to 87.3% of Saudi nationals. Most of the participants were married (62.1%), and about 3% were divorced or separated. About 82% of the participants were from Eastern (40.1%) and Western (42.2%) regions, followed by those from Central, Northern, and Southern ones. Almost all participants were literate, with about 63.2% having a college degree or above. Nearly half of the population was employed (48.4%). All the participants reported their income to be under 10,000 riyals, with about 22.7% earning less than 5,000 Saudi riyals per month (Table I).

About three-fourths of the participants (72.7%) were affected by COVID-19. Most of the study participants (93.9%) were quarantined at either home or a facility. About 25.3% of par-

ticipants reported having psychiatric morbidity. Psychological impact/stress was assessed using two tools. Acute stress was gauged by K10, whereas chronic stress or PTSD was estimated using the IES scale.

The mean K10 score was 28.33 with 12 as minimum and 44 as maximum for the sample, which was above the cut-off of 25, implying significant levels of acute stress in the sample. Similarly, IES values showed a mean of 28.19 with 4 as minimum and 71 as maximum, where the cut-off of significant PTSD symptoms was 24. K10 and IES scores revealed that about 76.7% of the participants suffered from significant acute stress and 59.1% suffered from symptoms of PTSD (Table II).

Around 61.8% of the study population who reported elevated levels of stress were females,

Table II. Descriptive data of K10 and IES (n=1,560).

Variables	n (%)	Mean ± SEM	Min-Max
K10 scores			
No Stress	363 (23.3)	**28.33 ± 0.134**	**12.0-44.0**
Acute Stress	1,197 (76.7)		
IES scores			
No	638 (40.9)	**28.19 ± 0.31**	**4.0-71.0**
Yes	922 (59.1)		

Table III. Association between demographic variables with K10 and IES.

	K-10			IES		
	No Stress	**Acute Stress**	**Total**	**No**	**Yes**	**Total**
Marital Status						
Married	230 (23.7)	738 (76.2)	968	384 (39.6)	584 (60.3)	968
Single	121 (22.2)	424 (77.8)	545	236 (43.3)	309 (56.7)	545
Divorced	9 (25.0)	27 (75.0)	36	15 (41.6)	21 (58.3)	36
Separated	3 (27.2)	8 (72.7)	11	3 (27.2)	8 (72.7)	11
p-value	0.888			0.430		
Gender						
Male	164 (26.4)	457 (73.6)	621	245 (39.4)	376 (60.5)	621
Female	199 (21.1)	740 (78.8)	939	393 (41.8)	546 (58.1)	939
p-value	0.017*			0.345		
Age Category						
16-24	192 (52.9)	644 (53.8)	836	336 (52.7)	500 (54.2)	836
25-34	95 (26.2)	283 (23.6)	378	159 (24.9)	219 (23.8)	378
35-44	50 (13.8)	170 (14.2)	220	87 (13.6)	133 (14.4)	220
45-54	22 (6.1)	75 (6.3)	97	42 (6.6)	55 (6.0)	97
55-64	4 (1.1)	25 (2.1)	29	14 (2.2)	15 (1.6)	29
p-value	0.682			0.838		
Employment						
Yes	178 (23.6)	577 (76.4)	755	329 (43.6)	426 (56.4)	755
No	185 (23)	620 (77)	805	309 (38.4)	496 (61.6)	805
p-value	0.781			0.378		
Income						
<5,000	93 (26.3)	261 (73.7)	354	146 (41.2)	208 (58.8)	638
5,000-10,000	270 (22.4)	936 (77.6)	1206	492 (40.8)	714 (59.2)	922
p-value	0.128			0.880		

and the association between acute stress and gender was found to be statistically significant (*p*=0.017). Coming to PTSD scores, more than half of the participants having symptoms of PTSD were females (59.2%). But while calculating the percentages among individual genders, about of all male participants (60.54%) had high scores on PTSD compared to of females (58.15%). No statistically significant association between gender and stress levels was found in the sample (*p*=0.345) (Table III).

There was no significant association between the K10 score and IES score and nationality of the sample (*p*=0.256 and *p*=0.647, respectively). No statistically significant difference was found between acute and long-term stress levels in people across the five country regions, with *p*-values of 0.560 and 0.947, respectively (Figure 1).

The results showed that acute stress was comparatively highest in the single category. 77.80 % of singles in the sample suffered from acute stress. Whereas PTSD symptoms were more pronounced in most separated individuals, where 72.73% in the sample suffered from them. No statistically significant stress, acute or chronic, was found between the categories, with a *p*-value of 0.88 and 0.43, respectively. There was no

significant association between age category and acute or chronic stress symptoms (*p*=0.682 and *p*=0.838, respectively).

The highest percentage of people between 55-64 years suffered from acute stress (86.20), whereas a greater percentage (60.54%) of younger people ranging between 35-44 reported PTSD symptoms during COVID-19. An interesting finding was that people with higher income suffered from more stress, acute and chronic (77.6% and 59.2%) than the ones in the lower-income category (73.7% and 58.8%), though it was statistically not significant (*p*=0.128 and *p*=0.880, respectively).

The percentage of non-employed participants who were acutely stressed was slightly higher (77.0%) than the ones who were employed (76.4%), though it was not statistically significant (*p*=0.781). However, the association between employment status and PTSD symptoms was statistically significant in our population with a *p*=0.037, where 61% of unemployed suffered from them, compared to 56.4% of employed subjects.

There was no significant association (*p*=0.293 and *p*=0.702) between education status and level of stress as reported by both K10 and IES scores, respectively. Interestingly, the mean stress scores
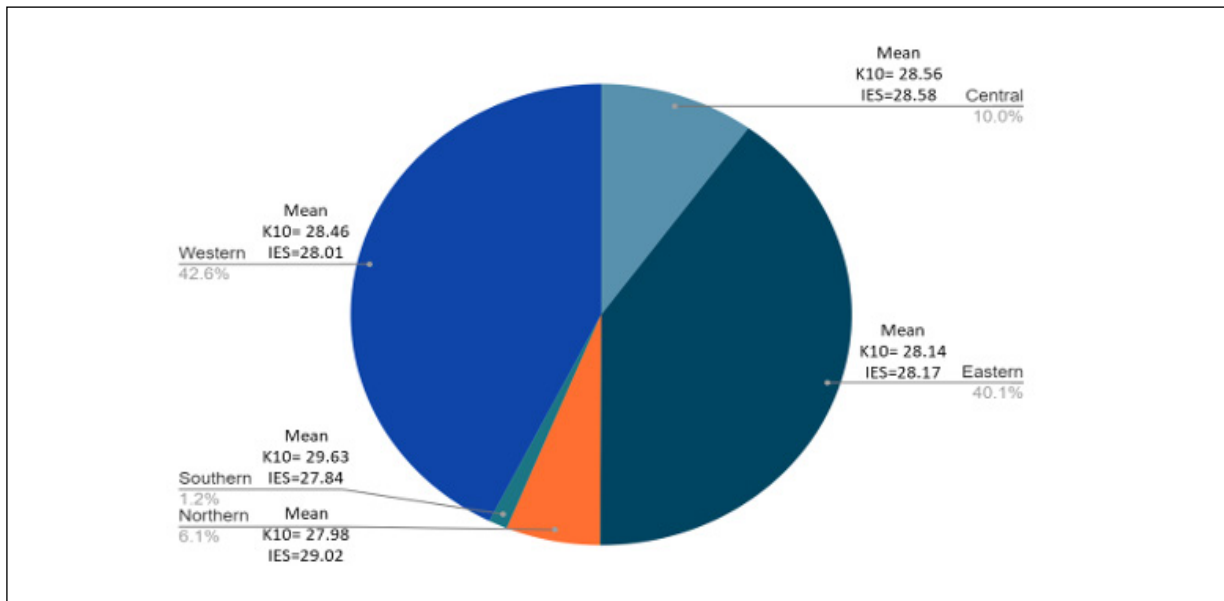
Figure 1. Regions, K10 and IES Scores.

were highest in middle pass participants when assessed through both the scales (28.70 and 29.33, respectively) (Table III).

Discussion

The nearly two years of the Pandemic have left many kinds of effects on the human population and the world. This study looked into the adverse psychological effects it has brought on the Saudi population. Three-quarters of the sample population were found to have experienced elevated levels of acute stress; this is a huge proportion by any standards. A lot of literature has come out during COVID-19, with many studies[18-20] looking at psychological impacts on the population; these studies have reported various rates for acute stress 24.4% in China[18], 57.4% in a multi-national sample[19], and a recent meta-analysis[20] of 5 studies reports pooled percentage of elevated-stress as 29.6%. This unusually high proportion (76.7%) of the population reporting acute stress mimics a war-like scenario at the population level.

A closer look at the study population characteristics and the lockdown type enforced in Saudi Arabia gives meaningful insights into this very high rate of acute stress. Most of the study sample were females. Over sixty percent of the study population reporting acute stress was also women, which is a factor associated with higher

levels of stress perception both in this study and in published literature[21,22]. A little over half of the study population reported to be unemployed (51.6%), and financial constraints and unemployment are associated with elevated levels of perceived stress in a number of studies[18,19]. Most of the study population was under 34 years of age (77.8%) and students, and both of these factors are linked to higher levels of acute stress[18,19] although not found to be statistically significant in this analysis.

The measures taken by the government of Saudi Arabia to tackle the COVID-19 spread are noted to be fast and unprecedented[23], in the sense that they had been imposed even before the first official case was reported in the Kingdom. The study sample also shows that only 6% of the participants had never been quarantined, while 68.2% had been quarantined at least once in a designated facility. These strict steps and resulting control of infection spread came at a cost, since the population was subjected to prolonged travel bans, strict social distancing, and extended curfews in major cities[5]. The intended outcome of curbing the spread of the pandemic was achieved, but the results of this study show, it did create a sense of heightened stress in the population. This disproportionately high stress is not found in literature from other countries, most likely due to their less severe lockdown measures or, in the case of China, due to the social milieu of being used to following the government's intrusive instructions.

Nearly sixty percent of the study sample also suffered from symptoms of post-traumatic stress. Participants who consider pandemic as a crisis are likely to experience symptoms of post-traumatic stress as reported by raised levels of these symptoms in the Greek Population during COVID-19 lockdown[24]. Female gender, loss of income, living through quarantine alone, and being exposed to COVID-19 were factors found to be associated with developing symptoms of post-traumatic stress in French university students[25]; all these factors were prevalent in this study sample and might be the reason why most of the participants have been experiencing PTSD-like symptoms. It is of note that being unemployed was also found to be significantly associated with high scores on the PTSD scale in this analysis.

Limitations

Despite being a large sample size from across the country, lack of randomization makes it not very appropriate for generalization; thus, further studies with better recruitment designs may be more insightful.

Implications

The results from this valuable nationwide survey give us ample baseline data to establish the fact that the majority of the Saudi population was burdened by psychological trauma and stress of varying degrees during the COVID-19 era. Findings can be employed effectively by designing specific services for the vulnerable population in order to address and treat these prevalent conditions effectively.

Furthermore, by identifying the at-risk population and distinct variables contributing to the stress burden in the Saudi population during this unexpected trauma, the study provides an opportunity for the various stakeholders to design and invest in primary prevention strategies to minimize the psychological illness risk in case of any future unexpected traumatic event.

Conclusions

The nationwide study emphasizes that the Saudi population has been extremely stressed and traumatized during the COVID-19 pandemic era and has called for effective and specific national strategies to address and manage these conditions in the short and long term.

Conflict of Interest

The authors declare that they have no conflict of interest.

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