Assessing depression, anxiety, stress and psychological impact of Covid-19 on general population of Karachi; A web survey based cross-sectional study

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Abstract

**Introduction:** An outbreak of pneumonia was observed in December, 2019 China which was named as Covid-19 (Corona virus disease 19) by WHO. The first case of Covid-19 appeared in Pakistan on Feb 26, 2020. Pakistan has responded well to the cause and had taken timely decisions. During Covid-19 depression, anxiety, sleep disturbances have been revealed among population of various countries. This study was carried out to determine the mental health status of general population in Karachi during Covid-19 pandemic.

**Materials and Methods:** This was a web survey based cross sectional study. The data was collected through a self-administrated questionnaire which was developed on Google forms. The questionnaire collected information regarding participants demographics, their knowledge about Covid-19, their attitude and practices towards it and the last part was used to assess psychological impact and mental health status of the participants using IES-R (Impact of event revised) score and DASS-21 (Depression, anxiety and stress score). Multivariate analysis of variance (MANOVA) and independent t-test were used as tests of significance.

**Results:** Majority 229(76.3%) of the participants were aged between 15-25 years. Social media was the main medium through which people 124(41.3%) learned about Covid-19. Evaluation of knowledge regarding Covid-19 infection showed that majority correctly knew about transmission sources and sign/symptoms of Covid-19 infection. Analysis revealed that majority of the people 167(55.7%) had normal depression subscale score (0-9), 196(65.3%) had anxiety scores within normal range and 198(66%) did not report stress and had normal scores. While assessing the psychological impact of Covid-19 we found that 221(73.7%) had normal IES-R score and had mild impact of Covid-19.

**Conclusion:** Our study showed that people of Karachi were well aware about Covid-19. Majority of respondents did not report depression, anxiety, stress and serious impact of Covid-19 on their lives showing their optimism and great will to fight against the pandemic.

**Keywords:** COVID-19, Psychological impact; Mental health.
Assessing depression, anxiety, stress and psychological impact of Covid-19 on general population of Karachi; A web survey based cross-sectional study


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Introduction

An outbreak of pneumonia having unknown etiology was observed in December, 2019 China with its center being Hubei province. This unknown virus caused an alarming situation both locally and internationally [1,2]. Scientist then isolated novel corona virus from the infected patients of Wuhan which belonged to the same lineage of SARS (severe acute respiratory syndrome) causing corona virus [1,3]. The Chinese scientists named this virus as “2019-nCoV”. Later it was named as Corona virus disease 19 (Covid-19) by WHO [4]. Due to its exponential increase in China, WHO declared it as a PHEIC (Public health emergency of international concern) on Jan 30, 2020. Later on Mar 11, 2020 Covid-19 was declared as “Pandemic” by WHO which had affected 113 countries with 118,162 cases by then [5,6]. As of now at the time of writing this article on May 7, 2020 the total cases worldwide are 3.78 million with death toll of 265,000 people [6]. Initially the virus was considered as zoonotic infection as majority of cases which were being reported had an exposure to seafood market. Later on, with detection of virus in health care workers and people with no exposure to sea-food market gave a clue of its human-to-human transmission via respiratory droplets containing virus [1,3]. The mean incubation period of Covid-19 reported is 5 days with wide variability among patients [7]. Majority of the patients have fever and cough as the presenting symptom while other symptoms include sore throat, headache, fatigue, diarrhea and chest tightness [7-9]. Patients with co-morbidities and old age have been observed to have severe form of disease [8]. Covid-19 first appeared in Pakistan on Feb 26, 2020 in a young pilgrim who returned from Iran. Due to its geographical location having China in its north the main center of pandemic, Iran in east with highest number of cases among Muslim countries and expanding tally of cases Pakistan required adequate management and promptly implementable plan [4]. Pakistan has responded well to the cause starting from rigorous screening of travelers from abroad, setting up new quarantine centers through-out the country and starting awareness campaigns for general public through different platforms [10]. On the writing of this article on May 7, 2020 Pakistan has 24,073 cases and 564 people have lost lives to it [6]. post-traumatic and psychiatric morbidities have been observed in community in previous SARS-outbreak. They were more associated with younger age and increased self-blame [11]. Fear of falling sick or dying themselves and feeling of helplessness have been experienced by individuals in previous infection outbreaks [1]. During Covid-19 depression, anxiety, sleep disturbances have been revealed among population. These symptoms were more prevalent in females and younger people [12]. Non-health care workers have reported more anxiety and depression than health care workers [13]. Therefore, it was really important to assess the mental health and psychological status of general population during this period of crisis and take measures to help people to cope these issues. To our knowledge no study has been done locally to address this important issue. Therefore, this study was carried out to determine the mental health status of general population in Karachi during Covid-19 pandemic.
Materials and Methodology

As a country wide lockdown was imposed therefore, we conducted a web survey based cross-sectional study on the residents of Karachi, Pakistan. We used non-probability convenience sampling technique for the study. All people of age above 15 years, who can read and understand English and are residents of Karachi irrespective of age, gender, ethnicity, profession, area of residence were included. People not willing to participate, having any psychiatric illness or taking any psychiatric medication and corona patients were excluded from the study. The data was collected through a self-administered questionnaire made after careful review of the previous literature available. The questionnaire was developed on Google forms and was shared by the investigators through WhatsApp groups, Facebook and email. The responses were gathered in a period of 5 days from 10th May, 2020 to 15th May, 2020. Prior to sharing the link, a message was shared on all the above-mentioned forums containing all the necessary information about the research its purpose, inclusion and exclusion criteria and ethical issues such as anonymity and confidentiality of the participants. Along with it the questionnaire also contained a consent form at the beginning containing all necessary information about study and ethical issues. All ethical considerations were observed and the study was conducted in accord with the declaration of Helsinki. The questionnaire comprised of three sections. In the first section demographics of the participant were be collected. The variable regarding demographics included age, sex, education, occupation, type of living, monthly income and marital status. The second part had variables assessing the knowledge of the participant regarding corona virus disease. It contained question asking about the source of information about Covid-19, sign and symptoms of the disease and routes of its transmission. In the third part participants were asked about their attitudes towards Covid-19 and different practices they were practicing to save themselves from it. They were asked whether they avoided gatherings, avoided using public transport, used hand sanitizers, disinfected their houses, did they avoid contact with corona virus infected patients. In the last part the mental health and psychological impact of Covid-19 on the respondents was assessed. We used Depression, Anxiety and Stress Scale (DASS-21) and Impact of Event Scale-Revised (IES-R) scales for this purpose respectively. DASS-21 has been previously used effectively both locally and internationally to assess mental health of the people. It has also shown good consistency and high validity [14-16]. DASS-21 has also been used to assess mental health of people during Covid-19 [1]. DASS-21 is a 21 item self-reported questionnaire divided in three sub-scales for depression, anxiety and stress respectively. Each sub-set comprises of 7 questions and each can be scored on a scale of 0 (did not apply to at all) to 3 (applied to be very much). The total score is summed and multiplied by a factor of 2. A score of 0-9 for depression, 0-7 for anxiety and 0-14 for stress was considered normal. The depression sub-scale was further categorized as mild (10-13), moderate (14-20), severe (21-27) and extremely severe (28+) depression. Similarly, anxiety sub-set was divided as mild (8-9), moderate (10-14), severe (15-19) and extremely severe (20+) anxiety. The stress part was also divided as mild (15-18), moderate (19-25), severe (26-33) and extremely severe (34+) stress. IES-R has been previously used on Pakistani population and has demonstrated good validity and reliability (Cronbach’s alphas of 0.91 and 0.94) [17-19]. Also, this has been used to evaluate psychological impact during SARS and Covid-19 [1,20]. IES-R is a 22-item scale, cleaved into 3 sub-scales reflecting intrusion, avoidance and hyperarousal. Each item is rated on a scale of 0 (Not at all) to 4 (extremely). Data was analyzed using IBM SPSS.V20. Quantitative data is expressed in mean and standard deviation while qualitative data is expressed in frequencies and percentages. Independent t-test and MANOVA (Multivariate analysis of variance) were used as
test of significance and a p value of <0.05 was considered significant.

Result

In this online survey a total of 300 respondents completed the survey. Majority of them were females 202(67.3%) and rest were males 98(32.7%). Large number of participants were aged between 15-25 years 229(76.3%), 50(16.7%) had ages between 26-40 years and rest 21(7%) were between 41-60 years. Talking about education, majority 173(57.7%) were graduates. Among the rest 76(25.3%) had studied till intermediate, 43(14.3%) had completed post-graduation and 8(2.7%) received secondary education. Greater number of respondents 235(78%) were unmarried and 65(22%) were married. Students made the greater part of our study population 185(61.7%). Among rest 63(21%) had private jobs, 17(5.7%) had government jobs, 11(3.7%) were self-employed, 11(3.7%) were unemployed. 9(2.9%) were house-wives and 4(1.3%) were teachers. Maximum participants 183(61%) were from single family, 113(37.7%) participants were living in joint family system and only 4(1.3%) were living independently. People with family earnings between 10,000-25,000 and 26,000-50,000 rupees per month had equal number of participants 99(33%) respectively. Among participants 70(23.3%) had family earning between 50,001-100,000 rupees per month while the rest 32(10.7%) reported a family earning of >100,000 rupees per month. Contact with corona patient was claimed by 51(17%) respondents while rest 249(83%) answered in negative. Vast number of answerers 197(65.7%) didn’t have any one in their friends, family or close contacts with Covid-19 infection, others 103(34.3%) had someone in their friends, family or close contacts with Covid-19 infection. Social media was the main medium through which people learned about Covid-19 included television 111(37%), internet 64(21.3%) and newspaper 1(0.3%).

Evaluation of knowledge regarding Covid-19 infection showed that majority correctly knew about transmission sources and sign/symptoms of Covid-19 infection. Hand-shakes/hugs (228), cough droplets (219), nasal secretions (154), using same utensils (128) and eating together (85) were all considered as sources of Covid-19 transmission. Shortness of breath (242), fever (227), cough (221), sore throat (160), headache (136), new loss of smell (120) and taste, muscle pain (111) and chills (50) were chosen by the participants as symptoms of Covid-19. Most of the people 252(84%) believed that Covid-19 transmission can be prevented by avoiding contact with infected people while among the others 24(8%) were against this thought and 24(8%) said they didn’t know. A large number people 221(73.3%) were hopeful and believed that we could win this war against Covid-19 virus. Majority of the participants 259(86.3%) avoided going out of their houses unnecessarily. Travelling in public transport was avoided by 268(89.3%) of respondents. Responses to various practices for protecting themselves from contracting covid-19 during pandemic are summarized in table 1. The sample mean and standard deviation for depression, anxiety and stress subscales among general population using DASS-21 scale were found to be 9.9(±9.2), 6.9(±8.4) and 12.3(±9.6) respectively. Depression subscale analysis revealed that majority of the people 167(55.7%) had normal score (0-9), 66(22%) had moderate depression, mild depression was observed in 34(11.3%), severe and extremely severe depression was seen in 16(5.3%) and 17(5.7%) participants respectively. For anxiety sub-scale, most of the participants 196(65.3%) had scores within normal range, moderate anxiety was reported by 41(13.7%) participants, extremely severe anxiety was seen in 29(9.7%) people, mild anxiety was seen 20(6.7%) and severe anxiety was present in 14(4.7%) respondents. Greater number of participants 198(66%) did not report stress and had normal score, 41(13.7%) suffered from mild stress, 30(10%) partakers had moderate stress, 18(6%) had severe stress and extremely severe stress was
observed in 13(4.3%) participants. While assessing the psychological impact of Covid-19 on general population using IES-R a sample mean of 17.03(S. D ±15.9) was obtained. Overwhelming number of participants 221(73.7%) had normal IES-R score. Severe impact was reported by 43(14.3%) people, 30(10%) had mild impact and 6(2%) suffered moderate psychological impact. There was no significant difference between different age groups when jointly compared with variables of depression, anxiety, stress and psychological impact estimated by IES-R scale (Wilk’s λ =0.960, F=1.521, p=0.147, η²=0.020). An overall difference was noted between people living independently and those living in different types of families when considered jointly on variables of depression, anxiety, stress and psychological impact evaluated by IES-R score (Wilk’s λ =0.947, F=2.018, p=0.042, η²=0.027). Post Hoc testing revealed a greater anxiety level in individuals living independently (Mean=14) than participant’s living in a single family (Mean=6.9, p=0.042) or joint family (Mean=6.7, p=0.039). It also showed that people living independently (Mean=30.8) experienced a greater psychological impact due to Covid-19 when compared with those who were living in a single family (Mean=17.5, p=0.044) or in a joint family system (Mean=15.5, p=0.021). An overall association of occupation was not established for depression, anxiety, stress levels and psychological impact (Wilk’s λ =0.904, F=1.495, p=0.075, η²=0.025). Level of education (Wilk’s λ =0.962, F=0.953, p=0.493, η²=0.013), marital status (Wilk’s λ =0.972, F =1.037, p=0.406, η²=0.014) and monthly income (Wilk’s λ =0.943, F=1.449, p=0.139, η²=0.019) had no significant difference on the levels of depression, anxiety, stress and psychological impact see table 2. Depression, anxiety, stress levels and psychological impact were not affected by gender, contact of participants with corona patient and corona patient in family or friends of respondents. A significant difference in stress levels was found between people who taught that we could win the war against corona compared to those who didn’t think same (p=0.048) see table 3.

<table>
<thead>
<tr>
<th>Table 1: Frequencies of different practices to avoid acquiring Covid-19 infection.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practices</td>
</tr>
<tr>
<td>Avoided public transport</td>
</tr>
<tr>
<td>Frequently washed hands</td>
</tr>
<tr>
<td>Used of face mask while going out</td>
</tr>
<tr>
<td>Used of disinfectant to disinfect house and surfaces</td>
</tr>
<tr>
<td>Avoided shaking hands/hugging</td>
</tr>
<tr>
<td>Disinfecting personal gadgets on returning home</td>
</tr>
</tbody>
</table>
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Table 2: Effect of age, marital status, income, type of family, occupation and education on DASS-21 and IESR score.

<table>
<thead>
<tr>
<th></th>
<th>Wilm’s Lambda Λ</th>
<th>F</th>
<th>Partial Eta Square η²</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.96</td>
<td>1.521</td>
<td>0.02</td>
<td>0.147</td>
</tr>
<tr>
<td>Marital status</td>
<td>0.962</td>
<td>0.953</td>
<td>0.013</td>
<td>0.493</td>
</tr>
<tr>
<td>Income</td>
<td>0.943</td>
<td>1.449</td>
<td>0.019</td>
<td>0.139</td>
</tr>
<tr>
<td>Type of family</td>
<td>0.947</td>
<td>2.018</td>
<td>0.027</td>
<td>0.042</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.904</td>
<td>1.495</td>
<td>0.025</td>
<td>0.075</td>
</tr>
<tr>
<td>Education</td>
<td>0.962</td>
<td>0.953</td>
<td>0.013</td>
<td>0.493</td>
</tr>
</tbody>
</table>

*=MANOVA has been used and p value of 0.05 is considered as significant.

Table 3: Association of gender, contact with Covid-19 patient, affected family member with Covid-19 with DASS-21 and IES-R score.

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
<th>Depression Mean ±SD</th>
<th>Anxiety Mean ±SD</th>
<th>Stress Mean ±SD</th>
<th>IESR Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>98 (32.6%)</td>
<td>8.59±7.84</td>
<td>6.02 ±7.74</td>
<td>10.76 ±8.53</td>
<td>16.67 ±15.5</td>
</tr>
<tr>
<td>Female</td>
<td>202 (67.3%)</td>
<td>10.60±9.72</td>
<td>7.40±8.72</td>
<td>13.04±10.07</td>
<td>17.2±16.37</td>
</tr>
<tr>
<td>P value*</td>
<td>0.056</td>
<td>0.168</td>
<td>0.042</td>
<td>0.783</td>
<td></td>
</tr>
<tr>
<td>Contact with corona virus infected patient</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51 (17%)</td>
<td>10.3±9.4</td>
<td>7.61±8.94</td>
<td>14.39±10.90</td>
<td>18.80±17.07</td>
</tr>
<tr>
<td>No</td>
<td>249 (83%)</td>
<td>9.87±9.15</td>
<td>6.81±8.33</td>
<td>11.86±9.46</td>
<td>16.67±15.69</td>
</tr>
<tr>
<td>P value*</td>
<td>0.755</td>
<td>0.54</td>
<td>0.088</td>
<td>0.385</td>
<td></td>
</tr>
<tr>
<td>Any one in family or friends with corona virus infection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>103 (34.3%)</td>
<td>10.37±9.09</td>
<td>7.42±8.60</td>
<td>13.18±9.80</td>
<td>17.38±16.56</td>
</tr>
<tr>
<td>No</td>
<td>197 (65.6%)</td>
<td>9.73±9.24</td>
<td>6.70±8.34</td>
<td>11.83±9.75</td>
<td>16.84±15.63</td>
</tr>
<tr>
<td>P value*</td>
<td>0.566</td>
<td>0.485</td>
<td>0.248</td>
<td>0.781</td>
<td></td>
</tr>
<tr>
<td>Will we win war against corona</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>221 (73.6%)</td>
<td>9.99±9.06</td>
<td>7.03±8.48</td>
<td>12.55±9.80</td>
<td>17.04±16.11</td>
</tr>
<tr>
<td>No</td>
<td>79 (26.3%)</td>
<td>9.67±5.41</td>
<td>5.89±5.59</td>
<td>7.89±5.92</td>
<td>16.27±12.93</td>
</tr>
<tr>
<td>P value*</td>
<td>0.881</td>
<td>0.575</td>
<td>0.048</td>
<td>0.843</td>
<td></td>
</tr>
</tbody>
</table>

*=Independent t-test.

Discussion

The 2019 Covid-19 pandemic is the largest atypical pneumonia outbreak since the severe acute respiratory syndrome (SARS) outbreak in 2003. The SARS outbreak had a profound impact on mental and psychological health of the people. During this pandemic the world has faced many challenges. On one hand people faced difficulties in earning their livelihood as many had to lose their jobs, others have to close their businesses due to lockdown and one other
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hand people faced sorrow by losing their loved ones. Therefore, in these pandemic researchers have investigated the effect of Covid-19 on mental health of the people. In our study majority of the respondents were females (67.3%) and most of them had bachelor’s degree (57.7%), other studies also had similar population characteristics [1,22-24]. This study showed that 34.3% of the participants had someone in their friends or family with Covid-19 infection which is higher than the studies conducted in Iran and Saudi Arabia where 19% and 5% of participants had someone in friends or family with Covid-19 infection [21,23]. Overall, 84% of individuals thought that avoiding contact with infected people may prevent Covid-19 transmission. A study conducted by Ahmad et al has considered that it is a very contagious disease, although transmission may be possible before symptoms appear in the patient, it is more likely when persons are infected [25]. Our survey showed that 86% of general public avoided leaving their homes unnecessarily and 89.3% of people stated they would not use public transport to avoid contracting Covid-19. This finding shows that people were aware of the risk and prepared to take precautionary measures to avoid that risk. The evaluation of mental health status of our study population revealed than more than 50% of the population did not report depression, anxiety or stress and normal scores for depression, anxiety and stress sub-scales were reported by them. These results are similar to studies conducted by Wang C et al [1], Mansouri AM [21], Tee ML et a [22] and Alkhamees AA [23] which also showed that more than 50% of their study populations had normal scores for DASS-21 subscales. Only 5.3% reported severe depression, 4.7% people reported severe anxiety and 6% reported severe depression. Our findings are consistent with prior findings from a study conducted on general population of Saudi Arabia [23]. We also investigated the psychological impact of Covid-19 pandemic on general population, which revealed that majority 73.3% had minimal impact of this pandemic. This finding corresponds to previous studies conducted in Saudi Arabia and Indian [23-25]. Contrary to the findings of our study, a recently published study on Chinese population revealed that Covid-19 had moderate to severe psychological impact on 53.8% of the study population. This contradiction might be due to the fact that China was the center of pandemic and also because initially the spread of Covid-19 was much more in China then in any other country of the world. While the similarity of result between our results and studies conducted in India and Saudi Arabia were because of lesser spread and lesser restrictions in those countries. Our study showed that gender and age had no significant effect on depression, anxiety, stress and psychological impact of the study population. This result of our is different from previous studies where male gender was found to be associated with decreased psychological impact and younger people (<35 years) were found to have greater anxiety than others [1,5,21,22]. One of the limitations of the study was smaller sample size. A study on larger scale will provide more insight on the magnitude of the problem. Another limitation of the study is the fact that the study was conducted in the early phases of the pandemic in Pakistan so the psychological impact determined could be underrated. Despite all these constraints, our study provides an initial assessment of the mental health and psychological impact on general population of Karachi.

Conclusion

Our study showed that people of Karachi were well aware about Covid-19. Majority of respondents did not report depression, anxiety, stress and serious impact of Covid-19 on their lives showing their optimism and great will to fight against the pandemic. However, this is very early phase of the crisis, as we will move along the total number of cases and deaths will rise which will definitely have its impact on people mental health therefore further studies needs to be conducted to evaluate Covid-19 impact on people in future.
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