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Psychiatry Research 295 (2021) 113598

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Stress and coping during COVID-19 pandemic: Result of an online survey

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ARTICLE INFO

Keywords:
Anxiety
COVID-19
Coping
Depression
Public health
Psychological stress

ABSTRACT

We intended to assess stress, anxiety, depression and coping strategies during COVID-19 pandemic. Through an online survey, we used primary care posttraumatic stress disorder (PTSD) screen for DSM 5 (PC-PTSD-5), Generalised Anxiety Disorder (GAD)-7 and Patient Health Questionnaire (PHQ)-9, along with coping methods. Of the respondents (n=733), a considerable proportion had moderate to severe anxiety (21.2%) and depression (15%). Stress symptoms, above the cut-off point of 3 in PC-PTSD-5 suggestive of probable PTSD, were present in 34.1%. Mental health problems were significantly associated with students, 20 to 30 year olds, those who are single, and university educated. Considerable proportions of healthcare workers presented with stress symptoms (21.4%), anxiety (5.6%) and depression (5.6%), however, the proportions were significantly less in comparison with others. Various coping strategies were reported; respondents who avoided thinking about the pandemic or seemed unsure of coping strategies and those struggling to cope had significantly greater anxiety and depression. As large proportions of people have anxiety, depression, and stress symptoms in relation to COVID-19, there is a need to establish a mental health support system that can address the need of the general population. Public education on coping strategies and stress management may be helpful.

1. Introduction

Coronavirus disease (COVID-19) is a global health catastrophe that has occurred in living memory. Considering the magnitude and the speed of spread of the pandemic, the increased worry and anxiety in the general population and health care workers (HCW) are understandable (Lai et al., 2020; Montemurro, 2020; Usher et al., 2020b). There are various factors: lack of effective treatment and preventive methods, a large number of deaths in various countries including those with excellent health services, the vulnerability of HCW, and massive impacts on economies are some of them (Auerbach and Miller, 2020). On the personal front, many have lost family members before their time (Sani et al., 2020), and have a persistent, genuine fear of losing more. There are additional mental health issues related to isolation and loneliness (Galea et al., 2020; Usher et al., 2020a), secondary to the current measures to control the spread. In this context, we intended to find out the current level of stress, anxiety, and depression symptoms and how people are coping, through an online survey.

2. Method

The online survey was conducted using a questionnaire covering anxiety, depression, stress, and coping strategies along with socio-demographic variables. The survey link was available in open forums for general public and was shared on various platforms, including, social media and in various professional/social groups requesting them to share the link amongst their contacts. The survey data was collected from 29.3.2020 to 7.4.2020.

Anxiety symptoms were assessed by the Generalised Anxiety Disorder (GAD)-7 questionnaire. It is a self-rated, validated screening instrument for anxiety and measures its severity (Spitzer et al., 2006). It has 7 items which are evaluated as 0 being not at all, to 3, nearly every day. Based on the total score of the individual, anxiety is categorised as none (0-4), mild (5-9), moderate (10-14), and severe (15-21) reflecting the degree of anxiety.

Depressive symptoms and their severity were assessed using the Patient Health Questionnaire (PHQ)-9 scale. PHQ-9 is a validated, self-rated scale, which has been used as a screening instrument for depression and its severity (Kroenke et al., 2001). It has 9 items which are

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https://doi.org/10.1016/j.psychres.2020.113598
Received 24 July 2020; Accepted 23 November 2020
Available online 26 November 2020

responded as 0 being not at all, to 3, nearly every day. Based on the total score, depression can be categorised as none (0-4), mild (5-9), moderate (10-14), moderately severe (15-19) and severe (20-27).

Stress related symptoms were assessed by the primary care post-traumatic stress disorder (PTSD) screen for DSM 5 (PC-PTSD-5). It is a 5-item screening questionnaire, which has been designed for use in primary care settings, and a cut-off score of 3 is optimally sensitive to suggest probable PTSD (Prins et al., 2016).

Coping was assessed by providing few common coping strategies, along with an open option for respondents to indicate in free text about the specific other strategies they were using. The common coping strategies included were, sharing emotions, activities, humour, turning to faith, having hope, avoiding to think, problem solving, etc. Socio-demographic variables of the area of residence, age, gender, education, occupation, marital, and economic status were collected as well.

The project was approved by the institutional ethics committee of the Quality of Life Research and Development Foundation as a non-interventional, public health survey. Voluntariness and anonymity of the responses were highlighted.

The data was analysed with SPSS version 25. Statistical associations of categorical variables were assessed by chi-square tests; means were compared using t-tests. Missing values were not included in the analysis. The level of significance was considered at the standard 0.05 level.

3. Result

There were 733 responses within 10 days of the survey from 20 countries. There were 429 males (Mean age = 37.2, SD = 13.7, range: 18-76 years) and 304 females (Mean age = 30.7, SD = 11.6, range: 13-71 years). The sample characteristics are given in Table 1. Most people in the sample were aged between 20-64 years, had college and above education, middle socioeconomic status (SES). The representation from the unemployed and self-employed was lower.

Proportions of the respondents having anxiety, depression, and (post-traumatic stress symptoms) PTSS are given in Table 2. Anxiety symptoms predominate, and almost one in five (21.2%) had moderate to severe anxiety symptoms. Moderate and moderately severe depressive symptoms were present in 15% of the respondents. Post-traumatic stress symptoms were prevalent as well, and almost one third could be considered for probable PTSD based on the scores in PC-PTSD-5.

Table 1
Sample characteristics.

	Categories	Male %	Female %	Total %
Age categories	19 or less	0.4	0.8	1.2
	20-39	32.6	33.2	65.8
	40-64	24.4	6.8	31.2
	65 and above	1.1	0.7	1.8
Education	School	0.3	0.4	0.7
	College	4.8	6.4	11.2
	University	30.8	21.8	52.7
	Professional	22.6	12.8	35.5
Economic status	Poor	1.1	0.3	1.4
	Lower middle	16.6	9.8	26.5
	Upper middle	36.6	29.1	65.6
	Upper	4.2	2.3	6.5
Marital status	Single	24.8	23.9	48.7
	Married	31.1	15.4	46.5
	Widowed/separated	0.7	0.7	1.4
	In a relationship	1.9	1.5	3.4
Occupation	Student	19.4	19.5	38.9
	Housewife/husband	0.0	1.4	1.4
	Retired	0.7	1.0	1.6
	Unemployed	0.5	0.5	1.1
	Self-employed	3.5	1.0	4.5
	Salaried	14.7	4.2	19.0
	Professional	6.7	4.1	10.8
	Health care professional	8.0	9.1	17.2
	Business/employer	4.9	0.5	5.5

Table 2
Categories of anxiety, depression, and stress.

Scales	Categories	Male %	Female %	Total %
Anxiety	None	32.3	20.2	52.5
	Mild	14.2	12.1	26.3
	Moderate	9.0	5.2	14.2
	Severe	3.0	4.0	7.0
Depression	None	35.7	24.8	60.6
	Mild	12.3	9.7	22.0
	Moderate	5.9	3.0	8.9
	Moderately Severe	3.4	2.7	6.1
	Severe	0.0	0.0	0.0
PTSS*	No PTSD	40.8	25.1	65.9
	Probable PTSD	17.7	16.4	34.1

* $p<0.05$; PTSS: Posttraumatic stress symptoms.

3.1. Comparison with sociodemographic variables

Considering the general increase of anxiety and depressive symptoms in the current situation, we grouped moderate or above degree of anxiety (GAD-7 score 9 or above) and depression (PHQ-9 score 9 or above) as of clinical significance. Comparing between lower-middle SES with those in upper-middle and upper SES categories, there were no significant differences in anxiety, depression, and PTSS.

Many demographic groups had significantly ($p<0.001$) higher proportion of moderate or higher level of anxiety; e.g. students (32.9%) vs employed (12.7%), single (29.9%) vs married (11.4%); college-educated (12.2%) vs university-educated (28.2%) or professionals (13.5%), and 20-30 year olds (28.0%) vs 40-64 year olds (8.3%).

Similarly, moderate or higher level of depression was significantly ($p<0.001$) associated with 20-30 year olds (23.7%) vs 40-64 year olds (5.7%), students (28.8%) vs employed (10.1%), college-educated (9.8%) vs university-educated (23.8%) or professional education (10.8%), and single (26.9%) vs married (6.7%).

Considering PTSS, the probable PTSD was present significantly ($p<0.001$) more proportions of students (44.9%) vs employed (26.9%), single (41.5%) vs married (24.3%); college-educated (23.2%) vs university-educated (41.9%) or professionals (26.5%), and 20-30 year olds (41.9%) vs 40-64 year olds (18.8%).

3.2. Comparison with health care workers

In comparison to HCW, a significantly more proportion of other individuals (those who were not HCW) in this study had probable PTSD (21.4% HCW vs 36.7% others, $p<0.01$). The proportions with moderate or above anxiety were significantly less for HCW (5.6% HCW vs 24.4% others, $p<0.001$). Similarly, moderate and above degree of depression was significantly less in HCW (5.6% HCW vs 19.9% others, $p<0.001$).

Table 3
Coping strategies.

Categories	Male %	Female %	Total %
Hope for the best	39.6	29.3	68.9
Remain busy*	29.3	23.9	53.2
Having faith in God or religion	21.6	15.3	36.8
Solve issues at my end	18.7	14.7	33.4
Share feelings with others*	17.3	15.6	32.9
Talk to others	16.9	13.5	30.4
Avoid thinking about it	15.0	11.7	26.7
Thinking different things	13.6	10.6	24.3
Humour	11.3	7.9	19.2
Struggling to cope	4.1	2.9	7.0
Other	1.9	1.0	2.9
Not sure	1.4	0.8	2.2

* $p<0.05$.

3.3. Coping strategies

Various coping strategies used by the respondents are given in Table 3. Most people hoped for the best; some other frequent strategies were: remaining busy in activities, problem solving, sharing feelings, and talking to others.

We compared the association of coping strategies with mental health issues: probable PTSD, anxiety, and depression with moderate or higher severity. There was no association for probable PTSD with the reported coping strategies. However, moderate to severe anxiety was associated with: avoiding to think about the issue (27.6% vs 18.8%, $p<0.05$), being not sure about coping strategy (43.8% vs 20.6%. $p<0.05$), and those who reported struggling to cope (41.2% vs 19.6%, $p<0.01$). In addition, persons with moderate to severe anxiety used humour less frequently (12.9% vs 20.9%, $p<0.05$). Similarly, moderate to severe depression was associated with avoidance to think (27.0% vs 13.9%, $p<0.01$), being not sure about coping strategies (43.8% vs 16.9%, $p<0.01$), and struggling to cope (35.3% vs 16.1%, $p<0.01$).

4. Discussion

The study evaluated proportions of people having mental health problems, possible risk factors and the coping strategies people used during the initial phase of the COVID-19 pandemic. As evident, considerable proportions of people have anxiety, depression, and stress symptoms with probable PTSD. Similar observations have been reported in a few studies (Vindegaard and Benros, 2020) although the prevalence figures have varied widely. A systematic review reported high rates of symptoms of anxiety (6.33% to 50.9%), depression (14.6% to 48.3%), post-traumatic stress disorder (7% to 53.8%), psychological distress (34.43% to 38%), and stress (8.1% to 81.9%) in general population studies (Xiong et al., 2020). Further variations were observed probably depending upon sample and regions. Various studies within China reported 21.3% with mild and 0.9% with severe anxiety (Cao et al., 2020); 40.4% having psychological problems and 14.4% having PTSD symptoms (Liang et al., 2020); and moderate-to-severe stress, anxiety and depression were noted in 8.1%, 28.8% and 16.5% respectively (Wang et al., 2020) in different populations. In USA high level of depression (43.3%), anxiety (45.4%) and PTSD symptoms (31.8%) were reported in young adults (Liu et al., 2020). A study in Spain reported 18.7% depressive, 21.6% anxiety and 15.8% PTSD symptoms (González-Sanguino et al., 2020). An Italian study observed that 32.1% had high anxiety, 41.8% high distress and 7.6% had PTSS (Casagrande et al., 2020). Regional variations are possible, probably due to cultural variations in the expression of distress, support available and also the methodology of the studies. This may be an area for future studies.

In our study, considerable proportions of HCW presented with stress symptoms, anxiety, and depression which were comparable with the findings at other places (Vindegaard and Benros, 2020). Psychiatric consequences of various pandemics (i.e., Severe Acute Respiratory Syndrome, Middle East Respiratory Syndrome, COVID-19, Ebola, and influenza A) on HCW suggested a range of prevalence figures; depression (27.5-50.7%), PTSD symptoms (11-73%), anxiety (45%) and high levels of stress (18.1-80.1%) (Preti et al., 2020). A multicentre study on HCW during COVID-19 reported moderate to very severe depression in 5.3%, moderate to extremely severe anxiety in 8.7% and 2.2% having moderate to extremely severe stress (Chew et al., 2020). A study in Spain reported 56.6% had PTSD symptoms, 58.6% had anxiety disorder and 46% depressive disorder (Luceño-Moreno et al., 2020). Initial findings among doctors and nurses in Wuhan suggested that 6.2% had severe and 22.4% had a moderate degree of depressive symptoms during COVID-19 (Kang et al., 2020); while another study highlighted that HCW had higher anxiety, depression, OCD symptoms, somatisation, insomnia compared with non-medical health workers (Zhang et al., 2020).

Compared to non-clinicians, HCW in our study had comparatively less anxiety, depression, and stress symptoms. This is probably due to various reasons, such as having more information, better preparedness and confidence in preventing the infection; however there was the contrasting point of frontline HCW having higher risk of contracting the virus (Nguyen et al., 2020). These factors may be explored in future studies.

It has been reported that psychological distress increases following pandemics; a study in Taiwan after Severe Acute Respiratory Syndrome pandemic, found 9.2% reporting life being more pessimistic and psychiatric morbidity being 11.7% (Peng et al., 2010). In our study the observed proportions of respondents having anxiety, depression, and PTSS are at the higher end of the reported prevalence of these disorders in the community. For illustration, recent global prevalence of anxiety disorders was 7.3% (ranging from 4.8 to 10.9%) (Baxter et al., 2013). The point prevalence of depression when using self-reporting instruments has been reported to be 17.3% in a systematic review (Lim et al., 2018). The point prevalence of PTSS in questionnaire-based studies has ranged from 2.9% to 39.1% (Spottswood et al., 2017). However, it is difficult to directly compare the observed figures in this study with the reported prevalence figures of these disorders considering methodological limitations.

In summary, this pilot study suggests that the prevalence of mental health concerns is high, requires in-depth studies, and more so to address the mental health issues through proper planning and structured approaches. The mental health problems may continue to linger as the pandemic progresses and secondary stress from bereavements and economic hardships build up. There may be more varied issues like increased substance use and suicides as has been observed following disasters (Kar, 2010).

4.1. Risk factors

In this study, mental health problems were significantly associated with students, 20-30 year-olds, those single, and university educated. It appears that besides the general concern regarding COVID-19, these groups were particularly worried about career and job prospects. In other studies, living in urban areas, with parents, with a stable family income were protective factors. Having relatives or acquaintances infected with COVID-19 were risk factors for anxiety (Cao et al., 2020). Another study reported that the risk factors for mental health problems were rural dwelling, female, and being at risk of contact with COVID-19 (Zhang et al., 2020).

4.2. Coping

Having effective coping strategies for stressful situations is important as these may prevent experiences leading to stress related psychiatric disorders. Although individual vulnerability to stress and specific situations would contribute, utilising coping strategies is expected to help. It is known that people use various coping methods in crisis or disaster situations (Sharma and Kar, 2018) as observed in this study. The results suggested that 'hoping for the best' was the most frequent way of coping, followed by 'remaining busy'. Around one third coped through religious faith, trying to deal with the issues as they face them, sharing feelings and talking to others. Our study also suggested that avoiding thinking about the current stressful situation, being unaware of coping strategies, and struggling to cope had significant associations with anxiety and depression. Similarly, humour as a coping strategy was significantly less likely to be associated with anxiety. However, as none of the coping strategies were associated with probable PTSD or lack of it, it is difficult to reflect which ones would be supportive in dealing with PTSD.

Nonetheless, as the study results suggest, providing information about how to cope and effective coping strategies may be useful. The weight of concerns may increase as the secondary stresses set in, related to economic hardships, job losses, bereavements. There is a need to inform people about available resources and practical methods to deal and cope with these emergent issues along with the continuing stress of

COVID-19.

4.3. Intervention

It is well known that humanitarian crises and disasters affect the mental health of the population and these require planning and implementation of short and long term interventions. It is understandable that along with COVID-19, a major mental health crisis has started and is expected to continue globally for a period of time.

During the acute phase of the pandemic, in the background of an increased level of stress and anxiety in the society due to COVID-19, it is essential that any emergency response should consider the component of mental health crisis management (Assari and Habibzadeh, 2020). This is relevant not only for patients showing COVID-19 symptoms, but also for their families. In the event of hospital admission, it is unlikely that family members will be allowed to meet the patients with COVID-19, which makes the stress worse.

As large numbers of people are affected by mental health concerns, interventions should address the need of the masses, rather than through clinics of usual mental health services. This is more important considering that existing mental health services may become overstretched for the clinical process of diagnosing and treating these mental health issues.

These need to be addressed through a public health approach; psychological support to the masses may be attempted through the internet. The internet as a medium of support has already been available for a long period. Accurate information-sharing, myth-busting, and up to date data on the pandemic could be easily supplied via the internet. Support such as counselling, resilience training, and psychotherapy can also be provided online. The scope and effectiveness of specific therapies such as mindfulness, cognitive behavioural therapy, bibliotherapy, etc. for this specific scenario may be considered. The key would be to have support in different languages. Information in the form of written and video material is already available, however, their usage, effectiveness, and, above all, authenticity need to be checked.

There would be a specific need for HCW, especially mental health support, resilience training, and online support. Computer-assisted resilience training in HCW appears to be of significant benefit and merits further study under pandemic conditions (Maunder et al., 2010).

4.4. Limitations

The usual limitations of online surveys apply to this study as well. The sample did not have many respondents from adolescents and elderly, school-educated, poor socio-economic status, unemployed, or employers. It may not be representative of the general population; however, it may represent people who normally have access to the internet. Larger samples may increase the accuracies of the findings; and may help to explore regional/cultural variation in the presentation; which may be considered in the future studies. There may be a larger and more varied impact on mental health, exacerbation of existing psychiatric illnesses, substance use, etc. so the findings here do not represent the potential holistic impact on mental health. As it is a self-report study, people may have provided what they are comfortable with, in spite of the assurance related to the anonymity of data.

4.5. Conclusion

Large proportions of people in the community have anxiety, depression, and stress symptoms during the COVID-19 pandemic. The proportions may increase as the secondary stresses due to the pandemic affect the population and become more pronounced. There is a need to put strategies in place to manage the scale of mental health morbidities. Public education about coping strategies, utilisation of effective methods of coping, and resources of practical help are expected to be useful. This is likely to be a long-term process that needs to be started during and be continued following the pandemic.

CRediT authorship contribution statement

Nilamadhab Kar: Conceptualization, Methodology, Formal analysis, Writing - original draft, Writing - review & editing. **Brajaballav Kar:** Methodology, Data curation, Formal analysis, Writing - review & editing. **Shreyan Kar:** Methodology, Formal analysis, Writing - review & editing.

Declarations of Competing Interest

None

Acknowledgement

Authors wish to thank Dr Maju Mathew Koola, USA; Dr Subas Pradhan, Dubai; Dr Susmit Roy, UK and Asmita Sharma, Nepal for support related to data collection; Quality of Life Research and Development Foundation (QoLReF) and The Institute of Insight, UK.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2020.113598.

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