Original Article

The psychological impact of COVID-19 among newly diagnosed patients: COVID Impact study

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ABSTRACT

Background: COVID-19 has had adverse psychological impact on the general population. Most surveys published till date are online questionnaires targeting general population/health care providers. There is lack of data on the psychological impact of disease on newly diagnosed COVID-19 patients.

Methods: The study was conducted at a tertiary care hospital, actively involved in the management of COVID patients. Newly diagnosed COVID-19 patients who had presented to the outpatient COVID care clinic were interviewed face to face by an interviewer using ‘Impact of Event Scale-Revised (IES-R)’, a validated and universally accepted research questionnaire.

Results: Most of the respondents were males (83.2%), mean age: 40.8 years. 31.7% were graduates and 58.5% were actively employed. Fever (57.4%), cough (37.6%), and progressive breathlessness (08.9%) were the three most common clinical symptoms. The mean score on ‘IES-R’ was 31.8. 30.7% respondents had suffered ‘severe’ psychological impact, 30.7% had ‘minimal’ impact. 19.8% and 1.8% had ‘mild’ and ‘moderate’ psychological impact respectively. On linear regression analysis, increasing age had statistically significant corelation with increasing scores on ‘IES-R scale’ ($p = 0.004$). Educational qualifications of the patient had negative corelation (Pearson correlation = $– 0.117$) while none of the clinical parameters had any statistically significant correlation with the patients’ psychological impact scores.

Conclusion: COVID-19 patients are at an increased risk of suffering from disease-related adverse psychological impact. Certain risk groups especially like the elderly need close
Introduction

The COVID-19 pandemic has affected the lives of millions of people across the globe. India at present is precariously poised. It is second in order among all the countries with highest number of cases the world over.1 It is a disease unlike any other in recent past which has affected all aspects of human life be it economic, social, or personal life. While a strict countrywide lockdown tried to control the spread of the infection, the economic, social, and psychological costs are still to be ascertained. A few studies done now have reported with panic behavior, desperation, hopelessness, and even adverse outcomes such as self-harm.2

Another aspect of the disease is the stigma attached to the disease.3–4 Psychological manifestations include fear, stress, frustration, anxiety, or even depression. Individuals have reported with panic behavior, desperation, hopelessness, and even adverse outcomes such as self-harm.5

Majority of the surveys published till date are online questionnaires and were done when the disease was in its initial stages. This study was done during the height of the first peak of the disease in the country to assess the psychological impact of the raging pandemic among those who have been newly diagnosed with the disease.

Materials and methods

This study was conducted at a tertiary care hospital actively involved in the management of COVID-19 patients. Newly diagnosed COVID-19 patients with mild—moderate disease who presented to the hospital for initial evaluation (after their test results were declared) at the outpatient COVID care clinic were inquired whether they wish to be part of the study, being carried out at the hospital. This study involved only patients with mild-moderate disease severity who were being managed on domiciliary care, as those with ‘severe disease/ oxygen requiring’ were directly admitted to intensive care unit/high dependency unit and hence were not clinically stable to be a part of this study. A written informed consent was taken from the respondents. It was conducted by a ‘face-to-face’ interview by staff trained in carrying out psychological assessment. The questions were read out to the respondents in their mother tongue (Marathi/Hindi). Those who could understand English language were provided with the written questionnaire and the responses marked by the respondents were assessed. The study was conducted after the approval of the institutes’ ethical committee.

Inclusion and exclusion criteria

All newly diagnosed COVID-19 patients more than 18 years of age presenting to the outpatient COVID care clinic who wished to be part of the study were included. Individuals with underlying psychiatric illness, those less than 18 years, patients who were oxygen requiring/severe disease/clinically unstable to answer the questionnaire and those unwilling to be a part of the study were excluded. Health care providers were excluded.

The following scheme was followed: Individuals included in the study were asked about their demographic characteristics: age, gender, educational qualifications, and their job profile. All were inquired about their presenting clinical features, e.g., fever, cough, breathlessness, loss of smell, or taste. They were also asked if they had had any history of contact with a COVID-19—positive patient or if they performed any travel to and from the ‘hotspot’ areas within fourteen days of symptom onset. Based on their reply to the 22 questionnaire based ‘IES-R’, the individuals were categorized into ‘mild’, ‘moderate’, and ‘severe’ degree of psychological impact. The scores were as follows: ‘minimal’: 0—23, ‘mild’: 24—32, ‘moderate’: 33—36, and ‘severe’: more than 36.7 The responses to ‘IES-R’ were further sub classified into the following subscales. The ‘intrusion subscale’ (mean response of items 1, 2, 3, 6, 9, 14, 16, 20), ‘avoidance subscale’ (mean response of items 5, 7, 8, 11, 12, 13, 17, 22), and ‘hyper arousal subscale’ (mean response of items 4, 10, 15, 18, 19, 21). The patients were also asked to identify the day-to-day factors in the current pandemic situation that in their opinion caused them the most distress: risk to other family members/loss of job/children’s education/inability to fulfill family commitments/economic loss (Fig. 1).

Statistical analysis

The data were initially entered into ‘Excel sheet’ format. ‘SPSS Statistic 22.0’ (IBM SPSS Statistics, New York, United States) was used for statistical analysis. Descriptive statistics (demography, clinical features at presentation, history of contact with COVID-positive patient) were calculated. The scores of the ‘IES-R’ were categorized into ‘minimal’, ‘mild’, ‘moderate,’ and ‘severe’ and expressed as percentage. ‘Intrusion’, ‘hyperarousal,’ and ‘avoidance’ subscales were expressed as mean and standard deviation. The descriptive statistics were analyzed using ‘linear regression’ to establish correlation between ‘IES-R’ severity scores. All tests were 2 tailed. $p < 0.05$ was considered as significant.
Results

A total of 101 respondents were included (150 patients were interviewed over 1-month period, 40 declined to be part of the study, 09 had missing entries).

Sociodemographic characteristics

Mean age: 40.4 years (minimum: 18 years and maximum 86 years). Majority (58.4%) were between 18 and 40 years age group. Majority of respondents were males (n = 84, 83.2%) while females (n = 16) constituted 16.8% of the respondents. 65.3% (n = 66) were high school graduates, 31.7% (n = 32) were college graduates, 58.5% (n = 59) were actively employed (government job/self-employed), 05.9% (n = 6) were presently studying while 25.7% (n = 26) had retired from their jobs.

Clinical characteristics

Fever was the most common presenting symptom (57.4%, n = 58). Cough and progressive breathlessness were the other two common clinical symptoms (37.6%, n = 38 and 08.9%, n = 9, respectively). The mean duration from the onset of symptoms to hospital visit (when the study was carried out) was 2.5 days (range: 0–6 days). 30.7% (n = 31) respondents had underlying comorbid illnesses. 23.8% (n = 24) among these respondents had been in contact with a confirmed COVID-19 patient prior to the onset of symptoms while only 05.9% (n = 6) gave h/o travel in or out of the city over last 14 days. None had h/o international travel (Table 1).

Psychological impact of COVID illness

Based on IES-R, the mean score was 31.38, median 30.0. The analysis of responses revealed that 30.7% (n = 31) respondents had suffered ‘severe’ psychological impact to

| Table 1 – Sociodemographic and clinical characteristics of COVID-19 patients. | Characteristics | Number (n) | Percentage (%) |
|---|---|---|---|
| 1 | Age group (years) | 18–40 | 59 | 58.4 |
| | | 41–60 | 30 | 29.7 |
| | | 61–75 | 09 | 08.9 |
| | | >75 | 03 | 03 |
| 2 | Gender | Male | 84 | 83.2 |
| | | Female | 17 | 16.8 |
| 3 | Educational status | Literate | 03 | 03 |
| | | High school Graduate | 66 | 65.3 |
| | | Postgraduate | 32 | 31.7 |
| 4 | Employment status | Service/self-employed Retired | 59 | 58.5 |
| | | Retired | 26 | 25.7 |
| | | Studying | 06 | 05.9 |
| | | Homemaker | 10 | 09.9 |
| 5 | Clinical presentation | Fever | 58 | 57.4 |
| | | Cough | 38 | 37.6 |
| | | Breathlessness | 09 | 08.9 |
| 6 | Underlying medical illness | Present | 31 | 30.7 |
| 7 | H/O contact with COVID +ve | 24 | 23.8 |
| 8 | H/O recent travel | 06 | 05.9 |
COVID-19 outbreak. Interestingly, an equal number (30.75, n = 31) had ‘minimal impact’. 19.8%, n = 20 and 1.8%, n = 19 had ‘mild’ and ‘moderate’ psychological impact, respectively (Table 2).

The mean score of the subscales were as follows: ‘Intrusion’: 9.70, ‘Avoidance’: 10.89, and ‘Hyper arousal’: 7.28 (Table 3).

An overwhelming majority of patients (71.3%, n = 72) felt that the risk of the disease affecting the other family members was their biggest worry at present. 08.9% (n = 9) feared that they would be unable to fulfill their family commitments because of the disease. 05% (n = 5) had apprehensions about economic loss while 04% (n = 4) felt that biggest apprehension was concerning their children’s education.

**Association of psychological impact with demographic variables**

Linear regression analysis showed that increasing age had positive correlation with increasing scores on ‘IES-R’ scale (Pearson correlation = 0.281) and this association was statistically significant (p = 0.004). Educational qualifications of the patients had negative correlation with psychological scores (Pearson correlation = –0.117), although it was not statistically significant (p = 0.246). None of the clinical parameters had any statistically significant correlation with the patients’ psychological impact scores. H/o contact with a COVID-positive patient and h/o travel also had no significant correlation with the patients’ psychological status (Table 4, Graph 1).

**Discussion**

Multiple online studies both from India and abroad have highlighted the psychological impact of COVID-19 on patients, health professionals and general population at large.2–4

We have conducted this study on recently diagnosed mild-moderate COVID-19 patients. Most respondents in our study are young males, educated, and employed. They were aware of the disease and its symptoms. Our study has brought about the fact that many of the respondents have had ‘severe’ psychological impact. This contrasts with online survey published from our country when the pandemic was in its initial stages. Ever-increasing number of patients, period of nationwide lockdown, and continuous media coverage about the disease and its complications could have a role to play. Another peculiar feature of our research is that an equally large number are ‘mildly affected’. These are the individuals who will probably adapt, provided they have a good psychosocial support.

Our study could identify the fact that elderly patients are at increased risk of adverse psychological impact. Underlying chronic illnesses such as stroke and neurodegenerative disorders predispose to psychological maladaptation.5 Prolonged period of isolation/quarantine and inadequate information from health authorities may reduce psychological resilience and amplify the impact of any disease in the elderly.6

The clinical symptoms in our study did not correlate with adverse psychological scores on ‘IES-R’. The respondents in our study had mild-moderate illness. This could possibly explain the dissociation of clinical symptomatology with psychological scores. Future studies may separately investigate the psychological impact on patients who have survived ‘severe’ COVID illness.

We have consciously tried not to include health care providers in our study as this can bias the results. Besides a number of online surveys have already highlighted the impact of COVID-19 illness on health care professionals.10–11

In the future, as the number of cases subside, the primary concern of psychologists would probably be to deal with the aftermath of illness. Just like other natural calamities, post-traumatic stress disorder would be of particular concern apart from depression and anxiety disorders.12 During periods of crisis management, psychosocial delivery support systems are often compromised. However, research on emotional aspects of previous SARS epidemics in 2000s highlights that emotional distress may in fact be counterproductive.13,14 Thus, we would be well advised to be prepared about the psychological aftermaths of the pandemic.

Our study has following advantages: To the best of our knowledge, this is the first study where face-to-face psychological assessment of newly diagnosed COVID patients was done by an interviewer using a validated and universally accepted research questionnaire. Majority of surveys done on this topic previously are web-based surveys. We have thus ensured respondent availability and integrity of the responses. All the responders were diagnosed ‘COVID positive’. Thus, we have reliable data on the stressors affecting the patients themselves.

### Table 2 – Responses as per impact of event scale revised.

| Category   | Total score on IEC-R | Frequency (n) | Percentage (%) |
|------------|----------------------|---------------|----------------|
| Minimal    | 0–23                 | 31            | 30.7           |
| Mild       | 24–32                | 20            | 19.8           |
| Moderate   | 33–36                | 19            | 18.8           |
| Severe     | >36                  | 31            | 30.7           |

### Table 3 – Subscale response as per Impact of Event Scale – Revised.

| Subscale                  | Frequency (n) | Mean   | Std. deviation |
|---------------------------|---------------|--------|----------------|
| Intrusion scale (0–32)    | 101           | 9.70   | 7.67           |
| Avoidance scale (0–32)    | 101           | 10.89  | 7.70           |
| Hyper arousal scale (0–24)| 101           | 7.28   | 5.51           |

(Q:1,2,3,6,9,14,16,20)
(Q:5,7,8,11,12,13,17,22)
(Q:4,10,15,18,19,21)
There are certain limitations of our study. The major disadvantage of this hospital-based study is the limited sample size. Majority of the participants were young (mean age: 40.4 years) and males (83.2%). Those admitted with severe disease were not included. Therefore, the results may not represent the true psychological impact in the community. Because the respondents were interviewed in the outpatient COVID clinic, we do not have data to collaborate the psychological impact of the disease with laboratory and radiological parameters such as C-reactive protein, Ferritin, X-ray (chest), and high-resolution computerized tomography scan chest.

To conclude, we have been able to prove that COVID-19 patients definitely have increased adverse psychological impact. Certain risk groups like the elderly need close follow-up. We also propose that mental health services be integrated to the existing health services managing COVID-19 patients. Those patients who have demonstrated ‘severe’ or ‘moderate’ response to COVID-19 infections may warrant monitoring so that intervention can be initiated at an early stage. Future studies may be required to assess and manage PTSD that may arise due to the pandemic.

Table 4 – Logistic regression analysis between severity on IEC-R scores and clinicosociodemographic characteristics of COVID-19 patients.

| Independent variables          | Pearson correlation | Significance (2-tailed) | Frequency (n) |
|-------------------------------|---------------------|-------------------------|---------------|
| Age                           | 0.281               | 0.004                   | 101           |
| Gender                        | 0.078               | 0.438                   | 101           |
| Educational status            | - 0.117             | 0.246                   | 101           |
| Employment status             | 0.242               | 0.015                   | 101           |
| Clinical presentation         | Fever               | 0.169                   | 101           |
|                              | Cough               | 0.104                   | 101           |
|                              | Breathlessness      | 0.187                   | 101           |
| H/o contact with COVID+ve pt. | 0.251               | 0.011                   | 101           |
| H/o recent travel             | 0.137               | 0.171                   | 101           |

Correlation is significant at 0.05 levels (2-tailed).

Graph 1 – Scatter plot showing association of age with psychological impact of COVID-19 disease.

Acknowledgment

Authors acknowledge the Department of Medicine, Command Hospital (Southern Command), Pune, India.

REFERENCES

1. WHO Coronavirus Disease (COVID-19) Dashboard | WHO Coronavirus Disease (COVID-19) Dashboard [Internet].
2. Wang Cuiyan, Pan Riyu, Wan Xiaoyang, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. Int J Environ Res Publ Health. 2020 Mar;17(5):1729.
3. Rajkumar RP. COVID-19 and mental health: a review of the existing literature. Asian J Psychiatr. 2020 Aug;52:102066.
4. Senderskov KM, Dinesen PT, Santini ZI, et al. The depressive state of Denmark during the COVID-19 pandemic. Acta Neuropsychiatr. 2020:1–3.
5. Sahoo S, Rani S, Parveen S, et al. Self-harm and COVID-19 Pandemic: an emerging concern – a report of 2 cases from India. Asian J Psychiatr. 2020 Jun;51:102104.
6. Bhattacharya P, Banerjee D, Rao TS. The “untold” side of COVID-19: social stigma and its consequences in India. Indian J Psychol Med. 2020 Jul;42(4):382–386.
7. Beck J Gayle, Grant Demond M, Read Jennifer P, et al. The impact of event scale-revised: psychometric properties in a sample of motor vehicle accident survivors. J Anxiety Disord. 2008;22(2):187–198.
8. Esch T, Stefano GB, Fricchione GL, et al. The role of stress in neurodegenerative diseases and mental disorders. Neuroendocrinol Lett. 2002 Jun;23(3):199–208.
9. Turner J, Kelly B. Emotional dimensions of chronic disease. West J Med. 2000 Feb;172(2):124–128.
10. Shreffler J, Petrey J, Huecker M. The impact of COVID-19 on healthcare worker wellness: a scoping review. West J Emerg Med. 2020 Sep;21(5):1059–1066.
11. Stories N. Impact of the COVID-19 Pandemic on Mental Health Care Workers in Argentina [Internet]. WPA; 2020.
12. Neria Y, Nandi A, Galea S. Post-traumatic stress disorder following disasters: a systematic review. J Anxiety. 2008 Apr;22(2):382–386.
13. Sim K, Chua HC. The psychological impact of SARS: a matter of heart and mind. CMAJ Can Med Assoc J. 2004 Mar 2;170(5):811–812.
14. Wu P, Fang Y, Guan Z, et al. The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk. Can J Psychiatry Rev Can Psychiatr. 2009 May;54(5):302–311.

Disclosure of competing interest

The authors have none to declare.