Impact of COVID-19 pandemic on mental health among Indians: A posttraumatic stress disorder

ABSTRACT

Background: Post Traumatic stress disorder usually occurs after a traumatic event and nowadays we are all facing the pandemic – the COVID-19 which has effected our mental health to a great extent. So this study was taken up to assess the risk of Post traumatic stress disorder symptoms using impact of event scale-revised (IES-R), their main stressors and coping measurements. Materials and Methods: A telephonic interview schedule was adopted to fill the online questionnaire among general population of age group 20-55 years covering different states using snow ball technique. Results: depicted 8.2% at risk of post traumatic stress disorder symptoms and 32.5% at risk of suppressed immune system functioning which is presumed to have its effect for the next 10 years. The main stressors of Covid -19 with increased score were worry about economic influences, effect of social media on daily life, lack of social support and poor knowledge. Coping measurements with brief resilient coping scale found 40.5% as low resilient copers who had higher mean scores of IES-R. Conclusions: This needs to be addressed earlier to bring up preventive strategies to ameliorate by including counselling services in the routine health care services of India.

Keywords: At risk, brief coping scale score, general population, impact of event scale-revised, mental health, posttraumatic stress disorder, stressors

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COVID-19 (severe acute respiratory syndrome-corona virus-2) has been declared as a Public Health Emergency of International concern on January 30, 2020 by the World Health Organization.[1] In India, the first case was confirmed on the same day, with the first death being reported on March 12, 2020.[2] The government of India implemented a Nationwide lockdown for 21 days from March 24 as a preventive strategy to contain the pandemic and flattening the curve to reduce the peak number of cases and related demands on health infrastructure. This in a phased manner, was extended till May 29, 2020.[3]

This has affected the Global and Indian Economy with loss of job for many, Educational uncertainty with the postponement of examinations, and financial disadvantages with Work from Home affecting physically, mentally, and socially the different strata of the community. This novel Coronavirus caused fear and stigma among people which...
prevented them from approaching Health Care services. Various forms of social media are loaded with information about pandemic, which most of the time may not be a trusted real source of information leading to rumors, myths, and misinformation creating stress, which people are unable to cope up with and feel exhausted. Their knowledge, attitude, and practices about the disease also influence their ability to follow the protective measures and thereby affecting the clinical outcome. These factors are the main stressors affecting the mental health of the people after the event (i.e. COVID-19), leading to posttraumatic stress disorder (PTSD). Under DSM-5, (PTSD) is an anxiety disorder that develops in relation to an event which creates psychological trauma in response to actual or threatened death, serious injury, or sexual violation; symptoms include nightmares, flashbacks, sleep disturbance, mood disorders, suicidal ideation, avoidance, and hyper-arousal in response to trauma-related stimuli.[9]

There are various self-reported instruments to measure the preliminary diagnosis of PTSD such as Davidson trauma scale, impact of event scale-revised (IES-R), Mississippi scale for combat-related PTSD for veterans, PTSD checklist for DSM-5, PTSD symptom scale self-reported version, and short PTSD rating interview, etc.[8]

Very few studies across the world concentrated on these issues of its impact on the mental health of the general population.[6,8] In the Indian set up, these type of studies were not concentrated much to our knowledge so this study has been taken up to assess the risk of PTSD symptoms using IES-R and to correlate the COVID-19 stressors with IES-R scoring along with their coping strategies measurement using the brief resilient coping scale.

**METHODOLOGY**

**Study design and settings**
A cross-sectional, multicentric study was conducted among the general population in selected states of India, which included Maharashtra, Madhya Pradesh, Uttar Pradesh, Bihar, Rajasthan, Delhi, Punjab, Haryana, Telangana, Andhra Pradesh, Karnataka, Tamil Nadu, and Kerala by trained NSS volunteers of ESIC Medical College, Sanathnagar who were located in different states at the time of the study.

**Inclusion and exclusion criteria**
Participants included were adults belonging to the age group of 20–55 years who were free from COVID-19 infection, residing in India only. All the Health Care Workers - the frontline warriors, background workers related to medicine such as lab supporting staff, psychology, nutrition, supporting staff working in any of the hospital and with already diagnosed or on treatment for any of the psychiatric disorders were excluded from the study.

**Sample size and sampling method**
The total sample size of 440 participants was calculated, taking 50% as prevalence using \( n = \frac{Z^2 \cdot P \cdot (1-P)}{d^2} \) along with 10% nonresponse rate, as this is a novel epidemic affecting people all over the world. Interview questionnaire schedule was taken up as telephonic interview, communicating it to the known contact details by adopting snowball sampling method.

**Data collection tools**
Data were collected during the lockdown period in the month of May 2020 for 25 days. Questionnaire consisted of consent form, four parts divided as Socio-Demographic Variables (Part 1), IES-R as part-2 was used to measure the risk of PTSD symptoms. The IES-R is a self-reported tool to measure the preliminary diagnosis of posttraumatic stress disorder.[9] This consists of 22 questions rated on a 5 item-Likert scale from 0 (Not at all) – 4 (extremely) during the past 7 days. These were subdivided to 3 subscales-intrusion, avoidance, and hyperarousal. The Intrusion subscale is the mean item response of items 1, 2, 3, 6, 9, 14, 16, 20; Avoidance subscale is the mean item response of items 5, 7, 8, 11, 12, 13, 17, 22; Hyperarousal subscale is the mean item response of items 4, 10, 15, 18, 19, 21. The hyper-arousal subscale has good predictive validity with regard to trauma (Briere, 1997), while the intrusion and avoidance subscales detect relevant differences in the clinical response to traumatic events of varying severity. The total score of 24 or more indicates partial PTSD or some symptoms of it, score of 33 and more represents the best cut off score for the diagnosis of PTSD and score of 37 and above depresses the immune system functioning, which would leave an impact for the next 10 years ahead. The internal consistency between the items in the scale was calculated using reliability analysis, and Cronbach’s alpha value was 0.896.

Part-3 consisted of information regarding COVID-19 stressors, which included individual and organizational factors such as sociodemographic characteristics, their knowledge, attitude and practices, influence of social media on daily life and social support, Worry about economic influences, and Worry about academic delays. The questions related to knowledge on COVID-19 were 8 in number consisting of questions on Causation, Symptoms and Signs, modes of transmission, preventive strategies, fatality, importance of social distancing/face mask, and hand wash and treatment. Each question was assigned one mark, and question with multiple answer was assigned two marks. Total 12 marks where cut off was designated as score <6 as poor knowledge and score >6 as good knowledge.
Practices consisted of 6 questions related to preventive strategies each assigned one mark with total score of 6 marks where cut off was designated as a score of <3 as poor and >3 as good practices, attitude consisted of 4 questions related to abuse, and social stigma where each assigned a score of one mark and total score of 4 where cutoff was laid as negative attitude with score of <2 and positive attitude as >2. Part-4 included coping strategies which were quantitatively measured using brief resilient scoring scale having four questions rated on 5-item Likert scale from 0 (Does not describe me at all) - 5 (describes me very well). These were interpreted as Low resilient copers with 4–13 as score, Medium resilient copers with the score of 14–16 and high resilient copers with the score of 17–20. The Cronbach’s alpha test value was found to be 0.794 with mean inter-item correlation value of 0.284.

**Ethical considerations**
Ethical clearance approval has been obtained from the Institutional Ethical Clearance Committee (ESICMC/ SNR/IEC-F0176/04/2020) before the study. Online consent forms were obtained from all the participants on voluntary basis, which was appended with the questionnaire. Privacy and confidentiality have been maintained.

**Statistical analysis**
Descriptive statistics such as number, percentage, mean ± standard deviation is to be used. One-way ANOVA was used to calculate and compare the mean scores of subscales in the categorized classification of PTSD. Correlation between COVID Stressors and PTSD score were also assessed. Chi-square was used to illustrate the association between knowledge, attitude, practices about COVID-19 as categorical (Good/Poor), and PTSD classification.

**RESULTS**
Our study consisted of the study participants from different states of India covering North, South, West, and Eastern parts of India. Our NSS volunteers located in their native places (Rural and Urban) contacted about 556 participants and the required sample of 440 was obtained after fulfilling the inclusion criteria. To include the general population, our volunteers made an attempt to cover people from different working sectors ranging from Fishermen, Washer men, Electricians, Business personnel, Sales personnel, Teachers, Students, and Professionals such as Engineers/Advocates working in both government and private.

**Socio demographic characteristics**
India consists of 28 States and 8 Union Territories of varying languages and cultures. Data were collected from 13 States and 3 Union Territories as per the convenience sampling detailed in Table 1.

**Table 1: Gives the details of data collected from various states of India**

| States              | n (%) |
|---------------------|-------|
| Northern            |       |
| Uttar Pradesh       | 25 (5.7) |
| Delhi               | 22 (5) |
| Punjab and Haryana  | 16 (3.6) |
| Bihar               | 5 (1.1) |
| Southern            |       |
| Telangana           | 72 (16.5) |
| Andhra Pradesh      | 27 (6.1) |
| Karnataka           | 34 (7.7) |
| Kerala              | 66 (15) |
| Tamil Nadu          | 45 (9.3) |
| Puducherry          | 1 (0.2) |
| Central             |       |
| Madhya Pradesh      | 55 (12.5) |
| Eastern             |       |
| West Bengal         | 9 (2) |
| Odisha              | 1 (0.2) |
| Western             |       |
| Maharashtra         | 61 (14) |
| Rajasthan           | 4 (0.9) |
| Gujarat             | 1 (0.2) |

Mean age was 29.74 ± 10.92 years; males were 214 (48.6%) and females were 225 (51.1%), others – 1 (0.2%); urban area residents were 304 (69%), rural area were 75 (17%) and rural-urban were 61 (14%). Educational status included illiterates 14 (3.3%), primary school 7 (1.5%), middle school 7 (1.5%), high school 14 (3%), intermediate/diploma courses 34 (7.7), graduates 245 (56%) and postgraduates 119 (27%); the lowest level of education was observed to be first standard and highest postgraduation in our study. Occupational status included Bank Managers 3 (0.7%), Professionals 50 (11.3%) which included Engineers and Advocates, Technicians and Associated Professionals like cable operators, technical workers, auto drivers 30 (6.8%), clerks 35 (8%), skilled workers and shop and market sales workers 80 (18.2%), skilled agricultural and fishery workers 4 (0.9%), plant and machine operators and assemblers 3 (0.7%), elementary occupation included cleaners, washer men, caretakers, housemaids, beauticians, kitchen assistants, manual laborer and watchmen jobs constituting 29 (6.6%) and unemployed were 206 (46.8%) which included students who were 150 in number. Among those employed, only 10 (4.2%) were government employees and the remaining were all from the private sector 224 (95.8%).

**Assessment of risk of posttraumatic stress disorder symptoms using impact of event scale-revised**
Score of 24 or more is a clinical concern at the risk of partial PTSD or some symptoms of it, which constituted...
86 (19.5%), score of 33 or more as risk of posttraumatic stress disorder 36 (8.2%), score of 37 or more as the risk of suppressed immune system functioning accounting to 143 (32.5%). On one-way ANOVA, we found mean item scores of intrusion subscale to be higher, followed by avoidance and hyperarousal, which was found to be statistically significant.

Total mean scores of intrusion subscale were 11.59 ± 6.56 [Table 2], avoidance subscale was 10.53 ± 5.98 and hyperarousal subscale was 7.18 ± 4.99 as depicted in Figure 1.

**Table 2: Mean item scores of subscales and impact of event scale-revised**

| Subscales         | Mean item scores | P    |
|-------------------|------------------|------|
| Intrusion         |                  |      |
| IES score <24 (normal) | 5.53±3.22       | 0.0002 |
| 24 or more       | 11.45±3.22      |      |
| 33 or more       | 13.77±2.90      |      |
| 37 or more       | 18.55±4.14      |      |
| Avoidance        |                  |      |
| IES score <24    | 5.50±3.12       | 0.001 |
| 24 or more       | 10.32±2.86      |      |
| 33 or more       | 12.08±3.69      |      |
| 37 or more       | 16.4±24.86      |      |
| Hyper arousal    |                  |      |
| IES Score <24    | 3.10±2.31       |      |
| 24 or more       | 6.20±2.53       |      |
| 33 or more       | 8.69±2.68       |      |
| 37 or more       | 12.38±4.01      |      |

**Correlation between COVID-19 stressors and posttraumatic stress disorder screening tool (impact of event scale-revised)**

Correlation analysis depicted a significant positive association of stressors such as worry about economy, effect of social media on daily life and negative correlation of lack of social support with increased IES-R scoring, which was found to be statistically significant [Table 3].

We also observed that there was no statistically significant association between socio demographic variables and PTSD. The knowledge, practices, and attitude also act as one of the COVID-19 stressor. The maximum score for the knowledge was 12, therefore, the cut off value of ≤6 was considered as having poor knowledge. Practices were considered to be poor with cut-off value of ≤3 and attitude was considered as negative with cut-off value of ≤2. Statistically significant association was found between poor knowledge and PTSD severity. There was no statistical significance with poor practices even though there was an increase in the score [Table 4].

**Quantitative measurement of coping strategies using brief resilient coping scale**

Coping strategies during this lockdown period were assessed using brief resilient coping scale and it was detailed in Figure 2. On further analysis of IES-R score with copers as per BRCS, we found increased mean score among low resilient copers (30.45 ± 16.42), followed by medium (28.96 ± 4.58) and high resilient copers (28.17 ± 15.13) but was not statistically significant (P = 0.415).

**DISCUSSION**

Our study included 440 study participants from different states of India having 51% of females and 49% of males with a mean age of 29.74 ± 10.92 years. Majority of them about 69%, were urban residents with the lowest level of education as the first standard and most of them (56%) were either pursuing or completed graduation. More than 95% were working in the private sector.
Using the self-reported scale of IES-R to detect PTSD symptoms, we found at risk of partial PTSD among 19.5%, at risk of PTSD among 8.2% and at risk of suppressed immune system functioning among 32.5%. Intrusion subscale mean score (11.59 ± 6.56) was found to be the highest, followed by avoidance (10.53 ± 5.98) and hyperarousal (7.18 ± 4.99). This indicates that following COVID-19 study, subjects were found to be scoring high on the chances to develop preoccupation with thoughts related to the event, which were as intrusive as compared to the chance of developing hyperarousal symptoms and avoidance behavior. We observed a significant positive association of COVID-19 stressors such as worry about economy, effect of social media on daily life, poor knowledge, and negative correlation of lack of social support with increased IES-R scoring in our study. The mean score of IES-R was found to be at an upper end among low resilient copers.

Zhang and Ma in the Liaoning province of China in the beginning of the Pandemic before the lockdown was declared, found 7.6% of participants having an IES-R score of >26 with total IES-R mean score of 13.6 ± 7.7 indicating mild stressful event. Intrusion subscale had a mean score of 12.7 ± 2.6, and the avoidance subscale mean score of 13.4 ± 2.9. This difference could be attributed to the timeline during which period it was studied and reported, especially as this study was done during their Chinese festival holiday time, where they were all getting good family support.

Tan Benjamin BY et al. conducted their study among medical and nonmedical trained hospital personnel from the National University of Singapore and found PTSD among 5.7% and 10.9%, respectively, with intrusion subscale mean score to be highest among nonmedical hospital staff.

Wenjuncao, in their study among Changzhi Medical College students, found 0.9% experiencing severe anxiety, 2.7% moderate anxiety, and 21.3% mild anxiety. Significant protective factors against anxiety were living in urban areas, with family income stability and living with parents. Having relatives or acquaintances infected with COVID-19 was a risk factor for increasing the anxiety of college students. Economic effects and effects on daily life, as well as delays in academic activities, were positively associated with anxiety symptoms, and social support was negatively correlated with the level of anxiety.

Liang et al. used PTSD Checklist Civilian version among the youth of China to measure PTSD symptoms with cut-off score of 38 and above and reported 40.4% having tendency to develop psychological problems and 14.4% youth groups with PTSD symptoms. Low education level, enterprise employee, having PTSD symptom, and using negative coping styles were the influence factors of youth mental health. Wang et al. had conducted study among 1210 respondents, of whom 53.8% rated the psychological impact as moderate or severe: 16.5% reported moderate-to-severe depressive symptoms; 28.8% reported moderate-to-severe anxiety symptoms, and 8.1% reported moderate-to-severe stress levels. All these variations are mainly due to different target groups involved and different scales used for measurement.

In India, Roy et al. in their study of knowledge, attitude, anxiety and perceived mental health care during COVID-19 pandemic noted >80% pre occupied with thoughts of COVID-19, 72% need to use gloves and sanitizer. Sleep

Table 4: Association of knowledge, practices and attitude about COVID‑19 and impact of event scale-revised Score

| IES-R categories | Poor knowledge (n=42), n (%) | Good knowledge (n=398), n (%) | χ², df | P |
|------------------|-----------------------------|-----------------------------|--------|---|
| IES score <24    | 12 (28.6)                   | 163 (41)                    | 12.22, 3 | 0.007 |
| 24 or more       | 6 (14.3)                    | 80 (20)                     |        |    |
| 33 or more       | 9 (21.4)                    | 27 (7)                      |        |    |
| 37 or more       | 15 (35.7)                   | 128 (32)                    |        |    |

| IES-R categories | Poor practices (n=11), n (%) | Good practices (n=429), n (%) | χ², df | P |
|------------------|-----------------------------|-----------------------------|--------|---|
| IES score <24    | 3 (27.3)                    | 172 (40.1)                  | 1.886, 3 | 0.597 |
| 24 or more       | 2 (18.2)                    | 84 (19.6)                   |        |    |
| 33 or more       | 4 (36.4)                    | 29 (12.4)                   |        |    |

| IES-R categories | Negative attitude (n=369), n (%) | Positive attitude (n=71), n (%) | χ², df | P |
|------------------|----------------------------------|---------------------------------|--------|---|
| IES score <24    | 149 (40.4)                      | 26 (36.6)                      | 2.452, 3 | 0.484 |
| 24 or more       | 68 (18.4)                      | 18 (25.4)                      |        |    |
| 33 or more       | 29 (7.9)                       | 7 (9.9)                        |        |    |
| 37 or more       | 123 (33.3)                     | 20 (28.2)                      |        |    |

IES-R - Impact of event scale-revised
differences, Paranoid about acquiring infection, distress related to social media were 12.5%, 37.8%, and 36.4%, respectively among the study participants. Majority of them had moderate knowledge about COVID-19 and adequate knowledge about preventive strategies and attitude to follow quarantine and social distancing.[15] This was mainly because majority of the respondents were related to health-care professionals.

**Limitation of our study**
We cannot generalize the results as it could not cover All States and Union Territories of our country. These type of studies require further follow-up with particular interventions to cope up in the near future.

Our study included the general population of India during the lockdown period trying to cover different working sections and found 8.2% at risk of PTSD Symptoms and 32.5% at risk of suppressing immune function, which has a long-term impact on mental health. Moreover, the intrusive thoughts were overtaking as a subscale influenced by economy, effect of social media on daily activities, lack of social support, and poor knowledge about COVID-19 with nearly 40% of low resilient copers. This signifies the importance of interventions such as awareness and counseling to cope up with the existing situation in life.

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**Conflicts of interest**
There are no conflicts of interest.

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