Development of the Indian scale of the fear of COVID-19

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The incidence pattern of coronavirus disease 2019, popularly known as COVID-19, having its epicenter in Wuhan, China, soon started spreading across countries, forming a nationwide pandemic, essentially transmitting through air and close contact.[1] With a catastrophic increment in the number of patients being infected and high death rates increasing exponentially each day, COVID-19 was being declared as a Public Health Emergency of International Concern by the WHO.[2]

In India, on January 31, 2020, the first case of COVID-19 was reported.[3] Since then, various alarming as well as miscreant videos featuring COVID-19 are being circulated all across social media filled with myths and misconceptions creating excessive havoc and anxiety among the masses. Owing to the lack of proper precautionary and safeguarding methods against this resistant strain, along with absence of vaccine, a large number of people are posing as high-risk individuals at the forefront.

The psychological manifestations of coronavirus are widespread. As on May 15, 2020, the Indian Government had registered a total number of positive cases of 81,970, 2649 deaths, and 27,920 cured due to COVID-19 infection.[4] With the high rise in infection and mortality rate, individuals began to worry about contagiousness, and with the increasing fear, the rational thinking of individuals seems to be heavily clouded by its crippling effects. Since the onset of pandemic, there has been an increase in the usage and hoarding of masks and sanitizers, resulting in exhaustion of resources in the global market.[5] Especially in a country like India, which is densely populated without a robust health-care infrastructure, it is a recent cause of worry.

Background: The first human case of COVID-19, the disease caused by the novel coronavirus causing COVID-19, subsequently named SARS-CoV-2 was reported by the officials in Wuhan City, China, in December 2019. In India, on January 31, 2020, the first case of COVID-19 was reported. Materials and Methods: The Indian scale of fear related to COVID-19 (ISF-C19) Scale was developed in Hindi and was rated by two raters. Then, it was applied on twenty individuals (ten males and ten females) as a pilot study. The study had been conducted in Eastern India, in the state of Jharkhand. ISF-C19 was completed by 118 participants (females – 75; males – 43), aged 18 years or older from the community, and the subjective well-being was assessed. The psychometric properties of this instrument were investigated. Safety measures (i.e., mask, maintaining distance, gloves, and sanitizers) were taken throughout the data collection period.

Results: Findings suggested that this scale has adequate sampling, adequate interitem reliability coefficient, and higher overall scores on the ISF-C19 indicated more severe fear related to COVID-19. Conclusion: In light of the current scenario of the emerging cases in India, there is an urgent need to develop a scale related to COVID-19 as there is no published Indian standardized scale before this recent outbreak of pandemic. Considering the current scenario, this scale is useful to assess the fear related to COVID-19.

Keywords: Community sample, COVID-19, fear, Jharkhand, subjective well-being

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However, current studies on COVID-19 worldwide have mainly focused on infection control, epidemiology, pathophysiology, target vaccine, and increasing cure rates due to treatment. The psychological and social aspects of the coronavirus are yet to be explored by researchers. India, along with other countries, is working on reducing the transmission rate of COVID-19, through enforcing lockdowns and minimal social contacts. However, they should also consider working on individual fears and lack of resources for effective control during stressful situations along with awareness in the society related to COVID 2019. Till recent events, we have no instruments to assess the psychological fear related to such virus strains of global pandemic. Therefore, developing a brief and valid instrument in India to assess an individual's fear due to coronavirus is very essential.

**MATERIALS AND METHODS**

**Aim**
The aim was to develop the Indian standardized scale related to COVID-19.

**Objectives**
- To assess the reliability of COVID-19 scale
- To assess the association between fear related to COVID-19 and subjective well-being

**Sample**
Participants in the current study included all Indians, aged 18 years or older and who could understand spoken Hindi. The team visited the community to collect the data for this current study. A total of 118 samples (n = 118; females – 75; males – 43) were collected just before the lockdown started. The study period was 14 days.

**Tools**
- Sociodemographic data: A background information sheet consisting of information of age, sex, place of living, and any travel history was used to obtain the information of the participants
- Personal Well-being Index-Adult: Subjective well-being was assessed by the Personal Well-being Index-Adult-English-5 edition, 2013, where a single item “How satisfied are you with your life as a whole” using a ten-point scale where 0 indicates highly satisfied and 10 indicates least satisfied was used
- Indian scale of fear related to COVID-19 (ISF-C19): The Indian scale for fear related to COVID-19 was used to assess the fear among the participants

**Selection and description of participants**
The study had been conducted in the Eastern India, in the state of Jharkhand. The team visited the community to collect the data for this current study. During the study period, a total of 118 samples were collected and included in this study (n = 118; females – 75; males – 43).

**Procedure**
For the development of this scale, several steps were taken.

### Table 1: Pilot study (n=20)

| Variables       | Mean±SD   | t      | P    |
|-----------------|-----------|--------|------|
| SWB             | 4.65±3.64 | 5.75   | 0.001|
| C1              | 2.60±0.940| 12.365 | 0.001|
| C2              | 1.75±0.89 | 7.000  | 0.001|
| C3              | 2.70±0.979| 12.337 | 0.001|
| C4              | 3.15±0.745| 18.390 | 0.001|
| C5              | 2.75±1.070| 11.489 | 0.001|
| C6              | 2.95±0.887| 14.873 | 0.001|
| C7              | 3.35±1.08 | 13.752 | 0.001|
| C8              | 2.70±1.17 | 10.283 | 0.001|
| C9              | 2.15±1.08 | 8.8826 | 0.001|

One sample t-test. SWB – Subjective well-being; C1–C9 – Items in ISF-C19, SD – Standard deviation; ISF-C19 – Indian scale of fear related to COVID-19

### Table 2: Psychometric properties of the Indian scale for fear related to COVID-19

| Psychometric evaluation (n=118) | Value | Adequacy |
|---------------------------------|-------|----------|
| KMO                             | 0.848 | Adequate |
| Chi-square                      | 485.1 | Adequate |
| Composite reliability           | -0.881| Adequate |

* Bartlett’s test for sphericity; Chronbach’s alpha. KMO – Kaiser-Meyer-Olkin measure of sampling adequacy

### Table 3: Item categorization in the Indian scale for fear of related to COVID-19

First, a detailed extensive literature review was done. The literature review was related to general fear scales and scale related to other pandemics of the world, as there were no scales related to COVID-19 specifically.

Next, the phase of question development or item generation was completed by the first two authors of the study using logical partitioning. The draft of the scale was developed in Hindi with 14 items to assess the fear. This scale was assessed by a panel of experts (three registered clinical psychologists who have M.Phil. degree and registered under the Rehabilitation Council of India). Expert judges evaluate each of the items to determine whether they represent the domain of interest. As per their suggestion, four items were removed from the scale. The nine items were retained as only one item was removed due to the repetition of the content. These expert judges were independent of those who developed the item pool. The expert judges rated the scale based on the parameter of acceptable meaning, defined unambiguously, and relevant to the purposes of measurement.
This nine-item scale was applied on twenty individuals (ten males and ten females) as a pilot study [Table 1]. Participants reported that they could understand the items of the scale. No further changes were done as per the recommendations based on the pilot sample. Henceforth, the nine items were finalized for the current scale.

The clinicians took safety measures (i.e., they used masks, gloves, and sanitizers) throughout the data collection period. They maintained 6 feet distance. Only verbal consent was obtained, and sociodemographic data along with other scales were administered. Responses were noted verbally in order to reduce the chances of transmission of coronavirus through surfaces as paper, pen, and other surfaces. All participants were asked, “whether they know about covid-19.” If the participants answered “yes,” the Indian scale for fear of COVID-19 was used to assess the fear.

**Statistics**

Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) (SPSS version 25.0) International Business Machines (IBM), Chicago, Illinois, U.S.A. Initially, the pilot study had been conducted. One sample $t$-test was used for the pilot study. Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was used to measure sample adequacy. Chi-square test was done. Cronbach’s alpha was used to measure the reliability coefficient. Next, factor analysis was done, and varimax rotation was calculated among each factor. Interitem correlation in the ISF-C19 scale was investigated using Pearson’s product-moment correlation analysis. The level of statistical significance ($\alpha$) was kept at 0.01 level.

**RESULTS**

Graph represents the factor analysis generated two factors one is concern and influence and the other is belief regarding infections. Cronbach’s alpha for concern and influence is 0.815, and Cronbach’s alpha for belief regarding infection is 0.841. Composite reliability is 0.881 [Tables 1-3].

Table 4 also shows the correlation between ISF-C19 and subjective well-being. There is a significant negative correlation found between subjective well-being and ISF-C19 (C2, C3, C5, C6, and C7) at 0.01 level.

Table 5 shows the interitem correlation in ISF-C19 in the general population. This Pearson product-moment correlation shows that there is a significant interitem positive correlation found at 0.01 level.

**DISCUSSION**

The origin of this pandemic has always been disputed and may never been resolved. A decision to announce a disease as deadly and pandemic in nature has a consequence beyond the physical health domain. Every nation has been affected by the spread of pandemic not only faces economic and political challenges but also witnesses a severe impact on the mental health component on the general public. Research has shown that different threats give rise to different psychological conditions. The pandemic, which is characterized as an unrestricted form of disease spread, has a potential to have a psychosocial impact on the society. Studies have shown that the outbreak of SARS and Ebola virus disease in the years 2003 and 2014 had caused widespread public fear and fear-induced emotional reactions that went to an extent of impeding infection control.

The current study presented the development of a new scale, the ISF-C19 Scale. Findings demonstrated that the ISF-C19 has a stable unidimensional structure with robust psychometric properties. Initial psychometric results indicated that the ISF-C19 had good properties as evident from different types of statistical data analysis as KMO, Cronbach’s alpha, and Chi-square. Moreover, the overall score of the summed-up item scores indicated the severity of the fear due to COVID-19. More specifically, the higher the score on the ISF-C19 indicated the lower scores on the subjective well-being. Similar studies have shown that negative effects of psychological reactions affect individuals’ health and well-being during the times of infectious epidemic crisis. In ISF-C19, each item is correlated with other items of this scale. Significant correlations have been found within items, and it assessed the concern and belief related to the ongoing pandemic. Henceforth, higher overall scores on the ISF-C19 indicated more severe fear related to COVID-19.

The study had certain contributory factors in the field of health, research, and psychology. This newly developed ISF-C19 has well-built psychometric properties, and the administration of this scale requires a very short period of time. This scale would be the first Indian standardized published scale. We can administer this scale on the general populations as well as health professionals to measure the distress among them. Based on
this scale, we can plan psychotherapeutic management in future. However, this study is not free from limitations.

First, sample size estimation was not calculated based on the population to claim the proper representation. Second, the sample was collected only from one state of India, Jharkhand. Therefore, particular strata could only be included in this current study.

Future research may include a population-based study with a greater sample size from other states of India to increase the power of the study, and it also highlights the cross-sectional findings. The administration of this scale in future can also highlight some important findings that can help in the understanding of their distress related to the outbreak of COVID-19 and its planning for intervention.

Table 5: Interitem correlation and correlation between items of the Indian scale for fear of related to COVID-19 and subjective well-being in the general population (n=118)

| n=118 | C1 | C8 | C9 | C2 | C3 | C6 | C7 | C4 | C5 | SWB |
|-------|----|----|----|----|----|----|----|----|----|-----|
| C1    | 1.000 | 0.332*** | 0.375*** | 0.254*** | 0.278** | 0.379** | 0.270** | 0.313** | 0.372** | -0.159 |
| C8    | 0.332*** | 1.000 | 0.648** | 0.459** | 0.638** | 0.529** | 0.378** | 0.482** | 0.433** | -0.216 |
| C9    | 0.375*** | 0.648** | 1.000 | 0.537*** | 0.589** | 0.590** | 0.472** | 0.410** | 0.444** | -0.313 |
| C2    | 0.254*** | 0.459** | 0.537*** | 1.000 | 0.499** | 0.358** | 0.264** | 0.296** | 0.431** | -0.312** |
| C3    | 0.278** | 0.638** | 0.589** | 0.499** | 1.000 | 0.475** | 0.456** | 0.429** | 0.460** | -0.296** |
| C6    | 0.379** | 0.539** | 0.590** | 0.358** | 0.475** | 1.000 | 0.556** | 0.485** | 0.493** | -0.341** |
| C7    | 0.270** | 0.378** | 0.472** | 0.246** | 0.456** | 0.554** | 1.000 | 0.497** | 0.594** | -0.247** |
| C4    | 0.313** | 0.482** | 0.410** | 0.296** | 0.429** | 0.485** | 0.497** | 1.000 | 0.703** | -0.160 |
| C5    | 0.371** | 0.433** | 0.444** | 0.431** | 0.460** | 0.493** | 0.594** | 0.703** | 1.000 | -0.430** |
| SWB   | -0.159 | -0.116 | -0.113 | -0.312** | -0.296** | -0.341** | -0.247** | -0.160 | -0.430** | 1.000 |

**Correlation is statistically significant at 0.01 level (two-tailed). SWB – Subjective well-being; C1–C9: Items from ISF-C19 scale; ISF-C19 – Indian scale of fear related to COVID-19

CONCLUSION

This newly constructed ISF-C19 is reliable and valid, and it is the first Indian standardized scale during this recent outbreak of the pandemic.

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Conflicts of interest

There are no conflicts of interest.

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