Development and Validation of an Indigenous Scale of the Fear Contracting COVID-19

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Abstract

Objective: COVID-19 pandemic has negative psychological impact on people and led to fear, anxiety, stress and depression among general population. So, the present study is aimed to develop and validate a scale for assessing fear related to COVID-19 pandemic.

Methods: Items of the scale were constructed from existing literature of COVID-19 and evaluation from experts. Descriptive study was conducted on 980 participants using convenient sampling technique.

Results: Sample was collected from general population of age 18 years and above. Demographic questionnaire and Fear contracting COVID-19 scale was administered to measure the intensity of fear experienced by people under COVID-19 pandemic situation. A principal axis factor analysis was conducted on 4 items with Varimax rotation to check the factor structure of the Fear construct. One factor had eigenvalue over Kaiser's criterion of 1 and explained a cumulative variance of 63.77%. Factor loading of all items was strong (0.76 to 0.83). Cronbach alpha of the scale was 0.82.

Conclusion: Thus, it can be concluded that Fear contracting COVID-19 is a reliable and valid scale to assess fear of COVID-19 among general population.

Keywords: COVID-19, Fear, Pakistan, Reliability and Validity, Tool development

Introduction

The Novel Coronavirus (COVID-19) epidemic, which began in December 2019, has now become a global pandemic, affecting countries on all seven continents and resulting in over two million human cases.[1] COVID-19 is an infectious disease which is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[2] The clinical presentation is often that of a respiratory infection, with symptoms ranging from a mild common cold-like illness to a severe viral pneumonia that can result in potentially fatal acute respiratory distress syndrome. Fever, cough, and dyspnoea are common symptoms, while some people may be asymptomatic.[3] Like other pandemics and emerging disease outbreaks, COVID-19 is creating immense psychological disturbances such as stress,[4] anxiety, depression and fear[5] in all age groups such as employees[6], students[5], and older adults.[7]

Fear is a natural, powerful and primitive human emotion. It is an automatic reaction of the body in response to any stimulus that is perceived as threatful or harmful to oneself.[8] If fear is disproportionate to the actual threat then it could be maladaptive. Too much or too little fear has detrimental effects on both individual and societal level.[9] Reasons for stress and fear abound in this current pandemic or lockdown are: there is risk of infection, human-to-human transmission of COVID-19, fear of becoming sick or of losing loved ones, extensive media coverage, how long the pandemic will last and what the future will bring, altered daily routines, social isolation, the prospect of financial hardship as well as the strict quarantine for 14 days.[7,10]

There are different perspectives that describe the process of fear, such as psychoanalytical, learning, cognitive and biological perspectives. According to Psychoanalytic view, the fear is a response of unresolved

conflicts between id and superego. The psychoanalysts believed that continued fear of an object or stimulus converts into phobias later on depending upon the proportion of fear experienced. If the fear is disproportionate to the threatful object then it is converted into phobia later on.[11] According to learning theory, fear is a conditioned response to pain. It describes that if any individual experiences pain in a certain situation, then the stimulus linked with that situation gains the ability to elicit same reaction that the pain formerly evoked.[12] The biological perspective describes that fear is elicited by three different processes which are overstimulation, cognitive incongruity and response unavailability.[13] According to the cognitive perspective, main causes for the motivation of fear response are loss of control and perceived inability to cope with the situation.[14]

Recently different tools were designed to assess fear related constructs of COVID-19 pandemic. COVID stress scale was recently developed by Taylor eta al. (2020) in which five factors of anxiety and stress related to corona virus were identified.[15] Similarly, four different domains of fear were identified by Schimmeti et al. based on conceptual analysis.[16] The documented literature provides information about the overview of negative emotions (anxiety, stress and fear) experienced by the individuals due to COVID-19 pandemic but least information is available to assess fear by using indigenous measure that will provide the reliable information about the people's fear response towards COVID-19 pandemic. So, the present study aimed to design a brief and valid measure to assess individual's fear related to COVID-19. This would help health professionals (psychologists) in designing effective treatment plan to address fear caused by coronavirus and improve psychological well-being of general population. Objective of this study is to develop and validate a scale for assessing fear related to COVID-19 pandemic

Methods

Development of the scale

This descriptive study is a multistage study, conducted in four steps.[17] In initial stage, construct of fear was identified, operationalized and an item pool of 10 questions was generated representing different domains of fear based on previous literature and theories by two experiences researchers for further evaluation.

In intermediary stage, 10 formulated questions were then evaluated from 5 mental health professionals (who have treated patients of COVID-19 and have full concept of Fear) or Psychology scholars (who had PhD degree in Clinical/ Applied Psychology or a practicing psychology scholar associated with any institute of Psychology). Feedback was taken from each professional for thorough understanding of the critical review of the questions and to reformulate and delete certain questions. Four questions were evaluated being not relevant to the construct of fear by the expert panel and were then removed from item pool.

At third step, the final obtained item pool of 6 questions was then given to five different mental health professionals or Psychology scholars for review related to item clarity and its utility in the clinical settings. They were asked to score the items for its understandability and the questions' relevance to the domain in which they were placed as a fear indicator. They were asked to rate it on a 0-10 points scale, where 0 means not appropriate/ understandable and 10 means highly appropriate/ understandable. A score of 7 and above were taken as a qualifying score for retaining the item. This was done to establish face validity of the questionnaire. Out of 6 question, 2 questions were considered as not relevant to the construct of fear which were removed from item pool.

Finally, pilot study was done on 30 participants (15 males and 15 females) from general population to obtain initial assessment of the scale. The questionnaire came with a feedback form that asked on the clarity and appropriateness of the items. The participants were asked to respond to 4 items questionnaire and rate how much fear they experience because of COVID-19 on 5 points Likert scale (never to always). A feedback form was also attached on which participants were asked on the clarity and appropriateness of the items. Further changes were not made as participants of pilot study reported no changes.

Participants & Procedure

After a pilot study, main study was conducted on a sample of 980 participants of age 18 years and above, both male and female, with different occupation. Data was collected using convenient sampling technique through web using Google form from April 2020 to July 2020. Participants facing COVID-19 pandemic and understand Urdu Language were include in the study. Participants who reported any psychological illness were excluded. The sample was taken from general population of Pakistan such as doctors, teachers, bankers, psychologists, fashion designers, content writers, information technologists, engineers (chemical, civil, electrical, mechanical), architecture, call centre agents, army officers, real estate agents, sportsman, software developers, security forces, telemarketing, civil servants, section officers, procurement officer, assistant managers, managers, freelancers, accountants, actresses, businessmen, assistant directors, deputy

directors, directors, clerks, computer operators, lawyers, research assistants, constructors, customer service representatives, sub-inspectors, zoologists, etc.

Measures

Fear Contracting COVID-19 Questionnaire

The questionnaire was developed during the present study to measure the intensity of fear experienced by people under COVID-19 pandemic situation and was administered on the sample. The 4 items include: how much you are fearful that you might get this disease from others, how much you are fearful that you will transfer this disease to your family members or other people around, do you fear dying of COVID-19, and do you fear loss of family members with this disease. Items were scored on 5 points Likert scale ranging from 0 (never) to 4 (always). A total score was calculated by summing up score of all questions (ranged from 0 to 16). The researcher considered the scoring of questionnaire as; greater the score, the greater will be the anticipated fear of contracting COVID-19.

Demographic Proforma

Demographic proforma included age, gender, education, occupation and income.

After taking informed consent, participants were asked to fill the final version of the fear contracting COVID-19 questionnaire along with demographic proforma and forward to others. They were debriefed about nature of the study and assured about confidentiality of their responses and identity. Time of administering the questionnaire was approximately 5 minutes.

Statistical Analysis

Means and frequencies for demographic variables were calculated using descriptive statistics. As a data reduction technique and to examine the factor structure of the Fear construct, Item and Factor Analysis was used. Reliability analysis was used to calculate the Cronbach alpha of the scale.

Results

Out of 980 participants, 302 were males and 678 were females. Mean age of the participants was 29 years (SD = 8.10). Mean education was 16 years and income was around 70000 (see Table 1). In order to assess psychometric properties of the scale, the validity of fear contracting COVID-19 and reliability of the scale were estimated.

Table 2 shows factor structure of fear contracting COVD-19 scale. A principal axis factor analysis was carried out on 4 items with Varimax rotation. The Kaiser-Meyer-Olkin measure verified the analysis' sampling adequacy, with KMO= .75, which is considerably above the acceptable limit of .5. To obtain

eigenvalues for each factor in the data, an initial analysis was performed. One factor had eigenvalue over Kaiser's criterion of 1 and explained 63.77% of cumulative variance. Table 2 shows factor loading of items after rotation. All items were retained as factor loadings were significant and strong (0.76 to 0.83). For Principal Component Analysis (PCA), Bartlett's test of sphericity χ^2 (6) = 1311.54, p < .001, indicated a significant large correlation between items. The items that clustered on the same components were thematically related and based on existing theoretical framework of Fear of COVID-19. Table 3 shows Cronbach alpha of Fear contracting COVID-19. It was revealed that the scale had high internal reliability.

Discussion

The present study aimed to develop and validate an

Table 1: *Demographic Characteristics of Sample (N = 980)*

	M	SD	Min	Max	f	%
Age	29.64	8.10	18	89		
Education	15.88	1.97	10	18+		
Income	71154.64	68860.43	5000	700000		
Gender						
Male					302	30.8
Female					678	69.2

Table 2: *Exploratory Factor Analysis Showing Factor Structure of Fear Contracting COVID-19*

Item No.	Items	Factor Loading
1	Fear of getting disease from others	.83
2	Fear of transfer disease to others	.81
3	Fear dying of COVID-19	.79
4	Fear of loss of family members with this disease	.76
	Eigenvalues	2.55
	% of variance	63.77

Note. N = 980. Factor loadings < .30 are suppressed

Table 3: *Mean, Standard Deviations and Cronbach Alpha of Fear Contracting COVID-19 Scale (N=980)*

	K	M	SD	Minimum	Maximum	α
Fear	4	8.49	4.12	1.70	2.41	.82

indigenous scale of fear of contracting COVID-19. The scale was administered on a sample of 980 general population with mean age of 29 years. Majority of the participants were females. It was found that scale has unidimensional structure. With respect of psychometric properties, fear contracting covid-19 is valid and reliable scale and can be used in assessing fear as

people's response to COVID-19. It will help in desig- ning effective treatment plan while considering fear caused by COVID-19 pandemic. This can be related with another study in which fear of covid-19 scale (FCS) was developed on 717 Iranian population with mean age of 31 years and it also has good reliability of 0.82 and factor loading of 0.66 to 0.74 but it was reported that sensitivity and specificity of FCS could not be examined. As fear is subjective so social desir- ability factor could not be excluded.[18] Another study reported four different domains of fear to understand model of fear related to COVID-19 pandemic. Those domains were fear of body, significant others, knowing/ not knowing and action/inaction.[16] Contrary to this, other tools are developed that measures anxiety, stress and depression related to COVID-19 pandemic such as COVID stress scale (CSS) was developed and validated to measure distress caused by COVID-19. It was consisted of 36 items that measures five factors of anxiety and stress. CSS has good reliability and validity.[15] A modified version of perceived stress scale related to COVID-19 was also developed to measure perceived stress of COVID-19 pandemic. It comprised of 10 items. PSS scale of COVID-19 was reported to has good reliability and validity.19 Another tool was developed named as COVID-19 peritraumatic distress index to measure peri-traumatic distress among people during COVID-19 pandemic. It was comprised of 24 questions of anxiety, depression, compulsion, phobias etc. This tool has good reliability and validity.[20] So, the present study focuses on the development and validation of the first indigenous tool of fear contrac- ting COVID-19 that measures intensity of fear related to COVID-19 pandemic.

Limitation of the present study is that the studied parti- cipants were from the general population and no clinical observation or client report was obtained related to his emotions to rule out psychological disorders as fear could be manifestation of some mood disorder. The scale was administered on general population; it has to be administered on different populations such as employees, health professionals, students etc. to assess the intensity of experienced fear due to COVID- 19. The one factor structure of the scale was based on exploratory factor analysis, so further verification is needed on factor structure of the scale by doing confir- matory factor analysis on different population.

Conclusion

Fear contracting COVID-19 scale is four-item unidi- mensional scale with robust psychometric properties. It is a valid and reliable scale to measure fear related to COVID-19 among general population of all age groups and both gender.

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