Validation of the Fear of COVID-19 Scale and its relationship with preventive behavior and anxiety disorders in Pakistan

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Abstract

Background: COVID-19 has caused a huge wave of fear across many nations around the globe. From a theoretical point of view, it is argued that fear induced by an imminent threat leads people to take defensive measures and at the same time creates psychiatric disorders. We conducted this study to validate the Urdu (national language in Pakistan) version of the Fear of COVID-19 Scale in the Pakistani context. We also examined the relationship between fear and 1) preventive behavior and 2) anxiety disorders among the general population.

Methods: We collected data from 2005 respondents across the country and confirmed the validity of the Urdu version of this scale. Structural analysis uncovered that fear of COVID-19 significantly predicts preventive behavior and anxiety disorder among respondents.

Results: This study confirms that fear of COVID-19 has aroused mixed feelings among the population in Pakistan. Fear of contracting COVID-19 has induced the masses to take preventive measures, while at the same time, it has also produced feelings of anxiety.

Conclusions: Previous research in this field also reported that fear of COVID-19 contributed significantly to mental health problems. Therefore, health authorities and governments must take measures to ensure mental health through psychosocial interventions.

Background

Fear is an imminent emotional response to dangerous situations. Neuroscientists have long been studying the mechanisms behind fear, which arises after detecting and responding to threats [1]. If the threat is perceived as uncertain and continuous, like in pandemics, then the fear can become chronic and worry may lead to serious mental health problems [2]. Fear of illness is a kind of fear that includes uncomfortable thinking and feelings of worry about the possibility of having a disease [3]. Similarly, anxiety can be part of any illness experience, but increased irrational fear of a disease needs to be addressed because it can seriously impair the functioning of a person [4]. Understandably, fear is an adaptive defense mechanism that is fundamental for survival and involves several biological processes of preparation for a response to potentially threatening events. However, when it is chronic or disproportionate, it becomes harmful and can be a key component in the development of various psychiatric disorders. Emergencies that occur during natural disasters, such as avalanches, earthquakes, and floods, tend to be sudden, unexpected, ephemeral, and recruit defensive responses. Defensive behaviors are triggered by activity in survival circuits that detect imminent threats, and fear is the conscious emotion that follows immediately. However, the specific threat of COVID-19 is unstable and mysterious, eliciting anxieties rather than fear [5]. In a pandemic, fear increases anxiety and stress levels in healthy individuals and intensifies the symptoms of those with pre-existing psychiatric disorders [6].

Recently, the COVID-19 pandemic has stirred a massive wave of fear in the population globally. In Pakistan, the first case of COVID-19 was reported in February 2020 [7]. The numbers of infected cases

fluctuated over time. The government of Pakistan employed an intermittent lockdown policy, which they called "smart lockdown". It advised people to stay at home during a lockdown, which ranged 2–6 weeks. The mental health consequences of COVID-19 itself and the repercussions of measures taken to avoid this contagion have been drastic [8]. Growing concerns about the mental health consequences of COVID-19 suggest that this crisis requires behavior changes following its significant psychological burden on individuals [9]. COVID-19 has affected people's attitudes and perceptions about the disease over time [10]. Mental health concerns related to COVID-19 have risen as a consequence of measures taken to handle the pandemic such as physical distancing [11]. Other than fear of contamination, fears about economic consequences, compulsive checking, and traumatic stress symptoms have been found [12]. Schimmenti et al. [13] found other dimensions of fear, including fear of the body, fear of not knowing, and fear of inaction. Previous studies have reported on fear related to COVID-19 in many parts of the world such as United States [14], Italy [15], Turkey [16], Israel [17], Eastern Europe [18], Bangladesh [19], Saudi Arabia [20], and New Zealand [21].

Fear involves the engagement of preventive behavior. However, previous research on the relationship between fear appeals in health promotions and preventive behavior suggest heterogeneous findings. For example, frequent fear appeals communicated by health authorities are not effective with respect to preventive behavior. People's coping appraisals are more powerful predictors as compared to perceptions of risk, and fear arousal is less important in activating precautionary measures [22]. A study conducted by Claassen et al. [23] describes the relationship between representation of cardiovascular disease and preventive behavior. According to this, family history was closely associated with preventive behaviors such as healthy lifestyle, selective diet, and physical activity. In the case of COVID-19, people were highly involved in preventive behavior such as frequently washing their hands and avoiding public transport [24]. Infectious diseases arouse fear among the majority of the population. Person-to-person transmission of such diseases create panic and uncertainty among the masses and force human beings to change their behavior quickly [25].

Fear of infectious diseases increases the risk for anxiety disorders among individuals. Previous research has shown a positive relationship between fears related to COVID-19 and anxiety [5, 26]. A cross-country study conducted by Fitzpatrick et al. [27] uncovered that fear of COVID-19 induces depression and anxiety in more than 25% of the population. COVID-19 has evoked different types of fears and anxieties, such as fear of the unknown, social isolation, and illness anxiety disorder [5]. COVID-19 induced anxiety was related to coronavirus fear, use of drugs, and suicidal ideation [28]. A wide body of experimental and epidemiological literature highlights that psychological stress, social isolation, and loneliness have a detrimental effect on multiple health-related outcomes, including comorbidity, multimorbidity, and mortality [29].

Several studies have used the Fear of COVID-19 Scale (FCV-19S) to assess the fear of COVID-19 and to check its validity in different contexts [14–21, 30, 31]. However, only limited evidence is available on the relationship of this scale with different psychosocial variables related to the onset of the COVID-19 pandemic, such as preventive behaviors and anxiety disorders. We extended the literature by examining

the association between fear induced by COVID-19 and preventive behaviors as well es psychosocial consequences (anxiety disorders) among the Pakistani population. The current study reports on the reliability qualities, concurrent validity, and construct (confirmatory) validity of the Urdu version of the FCV-19S.

Methods

Participants and data collection

Participants of this study were social media users in the general Pakistani population who were at least 18 years old and spoke Urdu as their first language. Data from 2,005 participants was gathered through a cross-sectional survey developed online using Google Form and circulated electronically among participants when lockdown restrictions were imposed by the government across the country and the chances of face-to-face data collection were limited. The research instrument was disseminated online through emails and famous social networking apps like Facebook, WhatsApp, LinkedIn, and Twitter. The participants were briefed about the purpose of the research study, and their informed consent was taken electronically. Similarly, it was also communicated to the respondents that their participation in this study is voluntary and the data will only be used for research purposes by ensuring their anonymity and confidentiality. There were no missing values, because all questions were mandatory.

Adaptation of FCV-19S into Urdu

To get a reliable and valid measure of the Urdu version of FCV-19S, we employed a forward-backward translation technique [32] as recommended by the World Health Organization for the translation and adaptation of research instruments [33].

Measures

Sociodemographic characteristics

Gender, age, marital status, employment status, area of residence, education, and participants' information about COVID-19 infected persons among their close contacts/surroundings were collected.

Fear of COVID-19 Scale

FCV-19S has recently been developed to assess the level of fear of COVID-19 [26]. The instrument consists of seven items and participants were supposed to indicate their level of agreement with each item (e.g. "I am afraid of losing my life because of COVID-19"). Responses were assessed on a 5-point Likert-scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). This scale has also been validated in many languages including Arabic, Bangla, Chinese, English, French, Hebrew, Italian, Japanese, Portuguese, Spanish, and Turkish.

Preventive behavior related to COVID-19

According to available knowledge regarding COVID-19 and the recommendations provided by the World Health Organization (WHO) [33], Mahmood et al. [34] developed seven statements to measure preventive behavior related to COVID-19 (e.g. "I regularly wash my hands for twenty seconds" and "I maintain social/physical distancing while meeting others"). These items were measured on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Generalized anxiety disorder

The Generalized Anxiety Disorder (GAD) questionnaire was developed to measure anxiety disorders [35]. This scale consists of seven items which describe a number of the most salient diagnostic features of GAD (i.e., feeling nervous, anxious, or on edge, and worrying too much about various things). Items are rated on a 4-point Likert-type scale (1 = not at all to 4 = almost every day).

Statistical analysis

The reliability and validity of the scale was checked by Cronbach's alpha and inter-item correlations. Confirmatory factor analysis was used to check how well the measured variables described the constructs. Structure Equation Modeling has been applied to cross-check the constructs' concurrent validity of the Urdu version of FCV-19S. SPSS version 25 was used to perform all statistical analysis. A p-value < 0.05 was deemed significant.

Results

Among 2,005 respondents, the majority (55.4%) were aged up to 25 years. More than half of the respondents (55.8%) were unemployed and approximately 61% lived in urban areas. Overall, more males (55.6%) than females (44.4%) participated in this study. Most respondents were either postgraduates (53.2%) or graduates (39.6%). The study population had almost equal representation of people who knew or did not knew about people who got infected with COVID-19 (Table 1).

Table 1
Sociodemographic characteristics of the sample (n = 2,005)

Variables	Frequency	Percentage
Gender		
Male	1114	55.6
Female	891	44.4
Age		
Up to 25 years	1110	55.4
26–50 years	824	41.1
51 years and above	71	3.5
Marital status		
Not married	1296	64.6
Married	709	35.4
Employment status		
Employed	887	44.2
Unemployed	1118	55.8
Area of living		
Rural	782	39.01
Urban	1223	60.99
Education		
PhD	116	5.8
MSc/M. Phil	951	47.4
BSc/BSc/BA	793	39.6
HSSC and below	145	7.2
Knowledge of anyone infected with COVID-19		
Yes	977	48.7
No	1028	51.3

Measures of central tendency and distributions

Table 2 shows the results of measures of central tendency and distributions for each item of FCV-19S. Likewise, earlier findings (Mahmood et al., 2020) showed that people had agreement with items 1, 2, and 5, whereas they disagreed with items 3, 4, 6, and 7. For measures of distribution, Byrne and Campbell (1999) consider items as normally distributed if their values of skewness and kurtosis range between + 1.5. Results demonstrate that not a single item had a higher or lesser value than + 1.00 for skewness and kurtosis. These findings are also aligned with the results of a previous study (Mahmood et al., 2020).

Table 2
Item properties of FCV-19S

	Mean	Std. Deviation	Skewness	Kurtosis
1. I am most afraid of Corona	3.10	1.100	-0.253	-0.603
2. It makes me uncomfortable to think about Corona	3.17	1.113	-0.398	-0.772
3. My hands become clammy when I think about Corona	2.05	0.941	0.927	0.697
4. I am afraid of losing my life because of Corona	2.54	1.152	0.353	-0.796
5. When I am watching news and stories about Corona on social media, I become nervous or anxious	3.43	1.116	-0.689	-0.356
6. I cannot sleep because I worry about getting Corona	2.02	0.964	0.950	0.579
7. My heart races or palpitates when I think about getting Corona	2.29	1.101	0.611	-0.487

Internal Consistency

Inter-item correlations ranged from 0.674 to 0.366, showing good internal consistency of the Urdu version of FCV-19S (Table 3). The reliability statistic (Cronbach's alpha = 0.873) for the Urdu version of the FCV-19S was higher than the threshold value (> 0.70). Corrected item-total correlations were also reported between 0.579 and 0.711. In addition, the value of Cronbach's alpha for the Urdu version of the FCV-19S does not go down if any item is deleted from the scale (Table 4). To check the construct reliability, the researchers calculated the average variance extracted (AVE) and composite reliability (CR) for the Urdu version of the FCV-19S. The values of AVE = 0.501 and CR = 0.875 indicate evidence of construct reliability. Based upon these findings, it can be concluded that the Urdu version of the FCV-19S has good internal consistency.

Table 3
Inter-item correlations

	FCV1	FCV2	FCV3	FCV4	FCV5	FCV6	FCV7
FCV1	1.000	-	-	-	-	-	-
FCV2	0.625	1.000	-	-	-	-	-
FCV3	0.452	0.464	1.000	-	-	-	-
FCV4	0.500	0.498	0.544	1.000	-	-	-
FCV5	0.467	0.531	0.366	0.459	1.000	-	-
FCV6	0.397	0.401	0.605	0.539	0.380	1.000	-
FCV7	0.448	0.484	0.603	0.573	0.466	0.674	1.000

Table 4
Factor loadings, Cronbach's alpha and corrected total correlation for FCV-19S in Urdu

	Factor loadings	Cronbach's alpha if item deleted	Corrected-item total correlation
FCV1	0.622	0.858	0.632
FCV2	0.670	0.854	0.661
FCV3	0.767	0.855	0.660
FCV4	0.727	0.851	0.682
FCV5	0.664	0.865	0.579
FCV6	0.736	0.856	0.650
FCV7	0.755	0.847	0.711

Confirmatory Factor Analysis

For the confirmation of single factor structure of the Urdu version of the FCV-19S scale, a confirmatory factor analysis was run. Fit indices (Table 5) are all within the acceptable limit (RMSR = 0.036; RMSEA = 0.080; GFI = 0.981; AGFI = 0.940; TLI = 0.953; CFI = 0.980). The factor loadings of the Urdu version of the FCV-19S were found to be statistically significant, ranging from 0.622 to 0.767 (Fig. 1).

Table 5
Psychometric testing

	Value	Suggested Cutoff
Confirmatory factor analysis		
χ2 (df)	136.27(9)*	Non-significant
Goodness of Fit (GFI)	0.981	≥ 0.95
Adjusted Goodness of Fit (AGFI)	0.940	≥ 0.90
Comparative Fit Index (CFI)	0.980	≥ 0.90
Tucker-Lewis Index (TLI)	0.953	≥ 0.90
Root Mean Square Error of Approximation (RMSEA)	0.080	≤ 0.08
Root Mean Square Residual (RMSR)	0.036	≤ 0.08
Average Variance Extracted (AVE)	0.501	≥ 0.50
Composite Reliability (CR)	0.875	≥ 0.60

Concurrent validity

The researchers performed structural equational modeling (SEM) to assess concurrent validity of the Urdu version of the FCV-19S. Findings indicate that fit indices (Fig. 2) were within the acceptable limit (RMSR = 0.049; RMSEA = 0.053; GFI = 0.941; CFI = 0.948). Fear of coronavirus significantly predicted general anxiety disorder ($\beta = 0.45$, $R^2 = 0.21$, $p < 0.001$). Similarly, the FCV-19S also explained preventive behavior related to COVID-19 ($\beta = 0.31$, $R^2 = 0.10$, $p < 0.001$).

Discussions

The present study was conducted to evaluate the validity of FCV-19S in the Pakistani context. The study also examined the association between fear of COVID-19, anxiety disorder, and preventive behavior. Pakistan has been struggling to fight against COVID-19 since February 2019. Statistical data analysis confirmed the validity of FCV-19S in Pakistan. The findings of this study corroborate with many studies conducted across the globe to check the validity of FCV-19S in different contexts [14–21, 30]. The results depict the universality of FCV-19. The study also demonstrated that fear of coronavirus significantly predicted general anxiety disorder. Similarly, the FCV-19S also explains preventive behavior related to COVID-19. As the onset of this viral disease has crippled life across the globe, people have adequate information about the risks associated with this disease. That is why the FCV-19S has demonstrated its validity in the developing as well as the developed world.

In addition to confirming the validity of the Urdu version of FCV-19S, we investigated the outcome of the COVID-19-induced fear. Existing literature has stressed the importance of assessing the socio-psychological consequences of fear triggered by infectious diseases in general and coronavirus in particular [6, 24, 25]. Health authorities and the state governments have always been curious regarding the prevention of behaviour during the spread of infectious diseases. Our study shows a positive trend among the Pakistani masses. Fear of coronavirus has made people aware of the dangers of coronavirus. The preventive measures taken the government and ordinary citizen have proved fruitful. The study's findings also reflect the ground reality in Pakistan, where the spread of coronavirus has remained under control, unlike in its neighboring country, India.

The findings of this study insinuate the complexity of human behavior. The fear of COVID-19 has been found to be associated with anxiety disorder and, at the same time, it is also related to preventive behavior. The anxiety disorder can be partly explained by the fear of coronavirus and, at the same time, it may be attributed to other factors associated with the spread of COVID-19 such as social isolation, physical constraints, one's level of self-efficacy, and coping strategies [5]. Regarding prevention behavior, as human beings, we are motivated to protect ourselves when we perceive that measures taken by us are adequate and efficacious [36]. Nevertheless, given that in the present work, fear of COVID-19 was also associated with anxiety disorder, at the same time, it is unclear whether fear of coronavirus directly caused anxiety disorder and preventive behavior. Descriptive analysis revealed that the majority (48.7%) had known the individual who had been infected by COVID-19. This might be one of the reasons to take preventive measures. Furthermore, the coronavirus has aroused a serious level of hypochondria among the masses. COVID-19 hypochondria exacerbates mental health issues and reduces productivity [37].

Limitations

Future research may focus on anxiety as a mediating factor between fear of COVID-19 and preventive behavior and vice versa. This is a major limitation of the study. Another limitation of this study is that it did not explain the fear of coronavirus, anxiety disorder, and protective behavior at a disaggregated level with respect to socio-demographic factors. Other potential causal factors of preventive behaviour and anxiety disorders, such as risk perceptions, personal or vicarious experience with the disease, perceived severity of the disease, and perceived vulnerability, may be investigated in future studies, particularly in the Pakistani context.

Conclusions

Keeping in view the findings of the study, we can conclude that FCV-19S has demonstrated validity in the Pakistani context. Also, a positive relationship has been observed between corona-induced fear, anxiety disorder, and protective behavior. This statistical relationship has also been observed in the real world, where protective behavior adopted by people has proved fruitful for the country. Based upon such findings, we can conclude that fear serves as a positive force that compel the people to take precautionary measures.

Abbreviations

AGFI   Adjusted Goodness of Fit Index

AVE   Average variance extracted

CFI   Comparative Fit Index

CR   Composite reliability

FCV-19S   Fear of COVID-19 Scale

GAD   Generalized anxiety disorder

GFI   Goodness of Fit Index

RMSEA   Root Mean Square Error of Approximation

RMSR   Root Mean Square Residual

TLI   Tucker-Lewis Index

WHO   World Health Organization

Declarations

Ethics approval and consent to participate

We received an ethical waiver for this study from the Ethical Review Board of the Department of Sociology, International Islamic University, Islamabad. The data was collected with informed consent from the participants. The study has been conducted in accordance with the Declaration of Helsinki.

Consent for publication

Not applicable

Availability of data and materials

Data is available from corresponding author upon reasonable request.

Competing interests

The authors declare no conflict of interest. RZ and FF serve on the Editorial Board of BMC Public Health as Associate Editors.

Authors' contributions

QKM and RZ conceptualized the study. QKM led the analysis, interpretation of the study findings, and manuscript writing. MMS, MSA, WAQ, RZ and FF contributed to data analysis and revised the manuscript critically for important intellectual content. All authors read and approved the final version of the manuscript.

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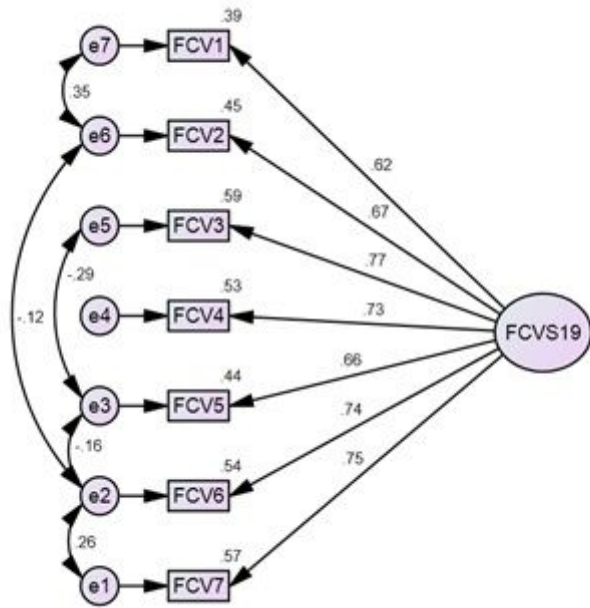
Figures

Figure 1
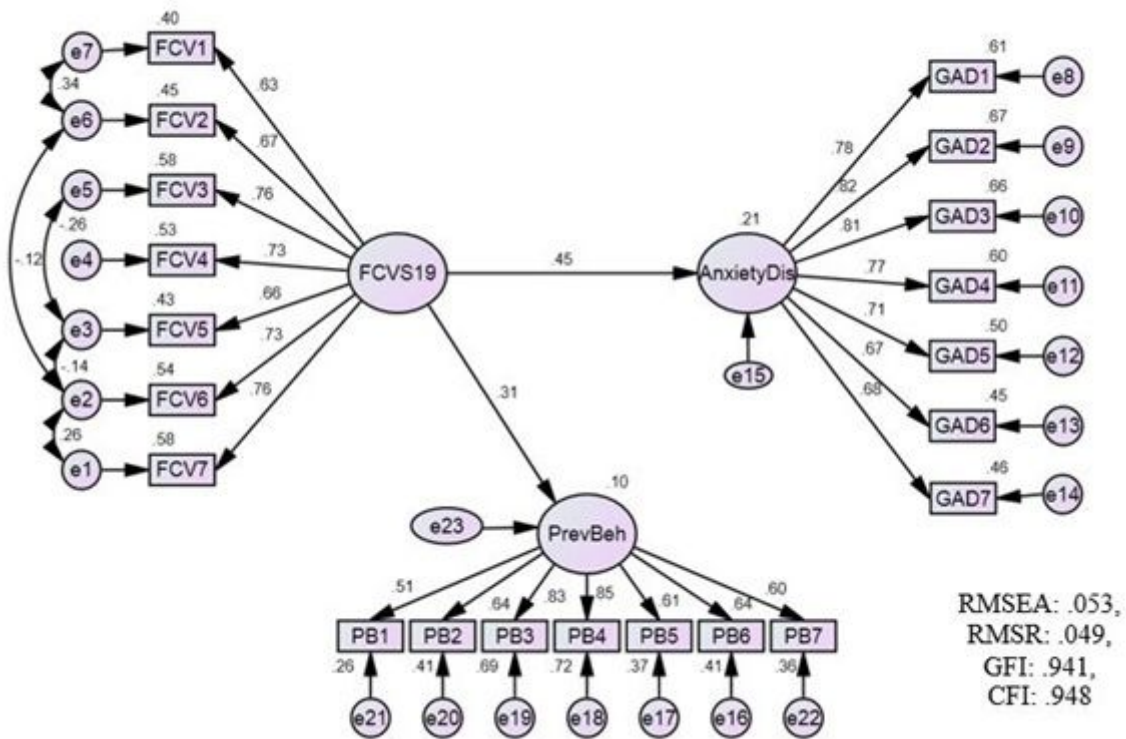
Factor loadings of the Urdu version of the FCV-19S

Figure 2

Structural equational modeling to assess validity of the Urdu version of the FCV-19S