

Psychometric Properties of the Fear of COVID-19 Scale (FCV-19S) in a Palestinian Context

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This study translated and validated the Fear of COVID-19 Scale (FCV-19S) in a Palestinian context. The FCV-19S is a newly emerging internationally standardized measure of anxiety related to being exposed to or contracting COVID-19. This research begins to identify factors that affect this phenomenon including gender (with females having more fear than males), education (individuals without college degrees demonstrating higher levels of fear) and smoking status (with smokers demonstrating higher levels of fear than non-smokers). The FCV-19 confirmed a one-factor structure in assessing fear of COVID-19 in the Palestinian context. Moreover, the measure demonstrated high levels of validity and reliability in a Palestinian context and therefore can be considered for future studies as the COVID-19 pandemic persists. Further investigations using the Arabic Language of FCV-19S may have far-reaching implications for measuring and combating the fear of COVID-19 at a personal and societal level for uniquely at-risk populations such as in the occupied territories of Palestine.


Keywords


COVID-19 • fear of disease • Palestine • test validation • FCV-19S

Background

An outbreak of novel coronavirus (COVID-19), a disease which began in Wuhan, China has spread internationally at rates previously not experienced (Gao et al., 2020). The most terrifying characteristic of the COVID-19 virus is that it is highly contagious and rapidly spreading.

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As of 10 August 2021, the confirmed infected cases around the world were 202,146,929 while the deaths were 4,285,421 (WHO, 2021a). Of total world cases, 349,485 were identified in the occupied territories of Palestine with 3,892 deaths (WHO, 2021b).

In general, COVID-19 results in a wide range of patient presentations from minimal symptoms to acute respiratory distress leading to death with a variable fatality rate. More severe cases result in death due to massive alveolar damage and progressive respiratory failure (Xu et al., 2020) and appears to be highly dependent on patient age and premorbid health status.

Despite best efforts of scientists to discover a drug treatment for the COVID-19 virus, at the time of writing there were few chemical compounds found to be effective in healing patients from this disease completely or significantly increasing survival rates (Gao, Tian, & Yang, 2020). As the rate of COVID-19 grew to an international pandemic, fear and emotional deregulation related to the threat of COVID-19 contamination increased in corresponding levels (Pakpour & Griffiths, 2020). Fear of COVID-19 is augmented by its characteristics of being highly transmissible, imminent, and invisible resulting in a public health crisis that is challenging to control and predict, leaving individuals with feelings of health insecurity for themselves and their loved ones (Mahamid, Veronese, & Bdier, 2021; Ornell, Schuch, Sordi, & Kessler, 2020).

From a cognitive behavioral perspective the individuals' emotional reaction (fear) results from interpretations of the threat of the disease. These thoughts can be triggered by external sources (e.g., watching the news, scanning the internet for information, listening to others talk about the virus), and also can be initiated by the interpretation of internal cues (e.g., perceived physical symptoms). Fear symptoms would be mitigated by personal characteristics (e.g., coping strategies, experiences with health issues) but in many cases could lead to behavioral symptoms (e.g., body checking, avoidance of leaving home, etc.), emotional reactions (e.g., fear, depression, etc.) and physiological responses (e.g., increased heart rate, insomnia, increased galvanic skin response (GSR), etc.) which are all considered part of the anxiety/fear reaction (Simard et al., 2013).

For those actually infected, in addition to the physiological consequences of COVID-19 such as fever, coughing, and respiratory distress, there are also negative psychological consequences such as (anxiety, depression, panic, stress, somatization, emotional exhaustion, acute psychological trauma symptoms, and fear, which in turn may negatively affect immune response (Greenberg, Docherty, Gnanapragasam, & Wessely, 2020; Lin, 2020; Wang et al., 2020; Wu & McGoogan, 2020).

Palestinians, as all people globally, would be expected to be afraid of COVID-19 infection. However in Palestine this fear is augmented due to the lack of confidence in the medical information received, uncoordinated societal response, and limited access to quality, trusted, affordable health care for the entire population. For those already ill, heightened fear also includes worry about the lack of ventilators and sequestered services for COVID-19 patients in the occupied territories (Mahamid, Berte, & Bdier, 2021; Guo, Zhou, Liu, & Tan, 2020).

In a recent study, it was found that asymptomatic Palestinian adults demonstrated depressive symptoms and increased self-reported stress when information about COVID-19 first emerged (Mahamid & Bdier, 2021). In a parallel regional study, uninfected individuals in Saudi Arabia also reported mild to moderate anxiety during the initial outbreak of COVID-19 (Alkwiase et al., 2020), and, globally, fear and anxiety were common in patients with COVID-19 as well (Xu et al., 2020).

Ren, Gao, and Chen (2020) reported that both fear and stigma are growing socially related to the COVID-19 virus which has resulted in attacks on Asian individuals and immigrant communities, discrimination against recovered COVID-19 patients, and political policies aimed at

China itself. The newly emerging literature is noting the great need to have a valid and reliable scale to test fear of COVID-19 and its related psychological distress among individuals, while this virus is spreading, in order to be able to assess and treat individuals with symptoms related to fear and anxiety of COVID-19.

Ahorsu and colleagues (2020) developed and validated a scale to measure and quantify fear of COVID-19 in the Iranian population, the Fear of COVID-19 Scale (FCV-19S). Several studies validated this scale in different contexts; among them, Alyami, Henning, Krägeloh, and Alyami (2020) adapted FCV-19S into Arabic and the results showed it to be psychometrically robust and useful in research assessing the psychological impact of COVID-19 among the Saudi adult population. FCV-19S was found to have strong psychometric properties in a Turkish-language version (Satici et al., 2021). Reznik et al. (2021) examined the validity of FCV-19S among an Eastern European population, with the instrument appearing to be valuable, valid and reliable. Soraci and colleagues (2020) analyzed the psychometric properties of an Italian version FCV-19S, with valid and reliable results in assessing fear of COVID-19 among a general Italian population. Sakib and colleagues (2020) validated a Bengali version of FCV-19S, and a Hebrew version was found to be valid in the Israeli context (Bitan et al., 2020).

Despite its being validated in Arabic in a Saudi context, there is a need to test the psychometric properties of this scale in special circumstances, like within the Palestinian context. This evaluation takes into account the specific and increased distress unique to Palestinians residing in occupied territories, an environment which includes high levels of environmental stress (e.g., militarization, poverty, lack of employment opportunities, cultural pressures, etc.) and the reality of the disease being spread in Palestine due to shortage and delay of vaccinations (Mahamid & Berte, 2019; Mahamid & Berte, 2020).

The Current Study

The current study was designed to examine the psychometric properties of the Fear of COVID-19 (FCV-19S) Scale in the Palestinian context. This scale can be utilized to allow mental health care providers in Palestine to effectively assess fear related to Covid-19 and potential future pandemics. The psychometric properties of the FCV-19S were analyzed in order to (a) explore the dimensionality of the scale through an exploratory factor analysis (EFA) and confirmatory factor analysis (CFA); (b) test its temporal and internal reliability; (c) calculate its concurrent validity with respect to other constructs (Health Anxiety Questionnaire (K-HAQ) and Injury/Illness Sensitivity scale (ISI)); and (d) determine its sensitivity to different demographic variables.

Methodology

Participants

Participants were recruited from online advertisements, e-mail campaigns, blogs, social media, and SMS campaigns. The aims and procedures of this study were presented online. In response to study guidelines, interested participants sent an email indicating their willingness to participate. Each participant then received a letter briefly explaining the subject of the study and its purpose, mentioning all ethical issues of confidentiality and voluntary participation. Upon reading and accepting the conditions outlined in the email, participants replied with their informed consent. Participants comprised 644 Palestinians (216 males and 448 females). Participants' ages ranged from 19 to 46 years old ($M = 33.8$, $SD = 12.35$). Most participants (88.1 percent)

had a college degree and 11.9 percent were without college degree. About one-fifth of the sample (21.7 percent) were smokers, and 88.1 percent were nonsmokers; this data felt important due to heightened risk of respiratory diseases. Inclusion in the study required participants to be: 1) Palestinian, 2) Native Arabic speakers, and 3) Living in the West Bank of Palestine during the initial spread of COVID-19. The study was submitted for review by An-Najah Institutional Review Board (IRB) and received approval before data collection was initiated. Informed consent was obtained electronically before data were collected from the participants.

Instruments and Procedures

To test the concurrent validity of CSS, the Fear of Coronavirus-19 Scale (FCV-19S), the Health Anxiety Questionnaire (K-HAQ), and Injury/Illness Sensitivity scale (ISI) were administered.

The Fear of Coronavirus-19 Scale (FCV-19S): The FCV-19S is a self-report measure aimed at assessing fear of COVID-19 in general asymptomatic populations. The scale consists of seven items pertaining to fear reactions toward being exposed or contaminated by COVID-19. Participants respond using a five-item Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale contained items such as, "I am afraid of losing my life because of Corona". The total score ranges between 7 and 35, with a higher sum score indicating a higher fear of COVID-19. The measure showed appropriate internal validity (Cronbach's alpha of 0.82; Ahorsu et al., 2020).

Health Anxiety Questionnaire (K-HAQ): The HAQ evaluates the severity and structure of generalized health anxiety. The HAQ consists of 21 items describing health anxiety related symptoms, and it uses a four-point Likert scale. The four points 'not at all or rarely', 'sometimes', 'often,' and 'most of the time' are scored from 0 to 3, respectively. The scale contained items such as, "When you notice an unpleasant feeling in your body, do you ever worry about it?". The total score is calculated by adding up each item score (ranging from 0 to 63). The higher the score, the greater the health anxiety. Cronbach's alpha was .92 and r value of test-retest reliability was .84 (Hwang, Jang, Lee, & Lee, 2018). In this study, the reliability coefficients of the scale was found to be $\alpha = .93$.

Injury/Illness Sensitivity scale (ISI): The (ISI) is a measure authored by Taylor (1993). It consists of 11 items designed to measure the fear of illness and injury; six items pertain to the fear of illness (e.g., "I get scared when I think I'm coming down with an illness") and five items refer to the fear of injury (e.g., "The thought of injury terrifies me"). Items are rated on a 5-point Likert scale ranging from 1 (agree very little) to 5 (agree very much). The higher total overall score, the greater the Injury/Illness Sensitivity. Taylor reported the internal consistency for the ISI to be acceptable ($\alpha > .80$). In this study, the reliability coefficients of the scale was found to be $\alpha = .90$.

Research Procedures

This study was conducted in March of 2020 and targeted Palestinian adults during the initial spread of COVID-19. The sample was recruited online using convenience sampling techniques. All participants were provided with information that enabled them to make an informed decision as to whether or not they wanted to participate in the research. Participants were provided with descriptions of the scales and the purpose of the research. Palestinian adults who agreed to participate in the research signed a formed consent. The research was conducted in line with the ethical guidelines of the American Psychological Association (APA, 2010) and the Declaration of Helsinki (2013) and had been approved by the An-Najah National University IRB.

Research Tools

The FCV-19S was translated from English into Arabic and the translation version evaluated by five Arab professional experts in the areas of psychology, counseling, Arabic language, and education. The expert team evaluated the clarity and relevance of the questions and the translation which was done by the researchers. After completion, the translated draft of the questionnaire was back-translated into English by an independent professional translator, per APA recommendations (American Psychological Association, 2010). The translated version was then pilot tested among 70 participants and refined further for clarity according to their comments. The final version of the Palestinian FCV-19S can be found in appendix.

Data Analysis

Descriptive statistics were used to test the characteristics of FCV-19S in Arabic for a Palestinian context. Means, standard deviations, and independent sample *t*-test were used to examine the differences in the scale by study demographic variables including gender, educational background, and smoking status. Moreover, a confirmatory factor analysis (CFA) model was conducted to test the factorial structure of FCV-19S in Arabic for a Palestinian context. An inter-item correlation was conducted to test the relationship between items of the scale, and concurrent validity was administered to test the correlation between the FCV-19S, K-HAQ, and ISI scales. In addition, a test of construct validity was conducted to evaluate the correlation between all items and the total score of FCV-19S. Cronbach's alpha and Guttman Split-Half were conducted to test the internal consistency of the scale, and test-retest reliability was used to ensure that the measurements obtained by the scale in one sitting are both representative and stable over time.

Findings

Confirmatory Factor Analysis

A confirmatory factor analysis (CFA) model was conducted to test the factorial structure of FCV-19S in Arabic for a Palestinian context (see Table 1). Maximum Likelihood Estimation was performed to determine the standard errors for the parameter estimates. A calculation of Mahalanobis' distance ($p < .001$) was performed on all items to detect and omit multivariate outliers; no extreme multivariate values were found. A two fit-index was adopted, both absolute and relative. The selected absolute indexes were χ^2 and normed- χ^2 (NC) as non-statistically significant χ^2 value and NC values of fewer than 2.0 indicate good fit (Hair et al., 2010). Accordingly, root mean square error of approximation (RMSEA), normed fit index (NFI), non-normed fit index (NNFI), comparative fit index (CFI), and standardized root mean square (SRMR) were calculated. The thresholds for good fit were as follow: RMSEA < .08 and SRMR < .07 (Schermelele-Engel, Moosbrugger, and Müller 2003), NFI > .95, NNFI > .95 (Marsh, Hau, and Wen 2004), and CFI > .95 (Hu & Bentler, 1999). Finally, a P value at .01 was set. The CFA model (see Figure 1) has been tested using AMOS 25 software for data analysis.

Inter-Item Correlations

Inter-item correlations for all seven items were administered for the 664 participants who answered all items (see Table 2). Results revealed that all items had acceptably inter-item correlations ($|r|s > .3$; Tabachnick & Fidell, 2001).

Table 1. CFA model of FCV-19S (n=664)

Estimate	Standardized	S.E.	C.R.	P	R ²
Item 1	.676	.046	16.044	.000	.457
Item 2	.678	.044	16.019	.000	.460
Item 3	.622	.023	16.588	.000	.387
Item 4	.761	.035	14.650	.000	.579
Item 5	.674	.051	16.066	.000	.455
Item 6	.725	.023	15.358	.000	.525
Item 7	.778	.028	14.249	.000	.605

$\chi^2(14) = 325.149, p < .001$

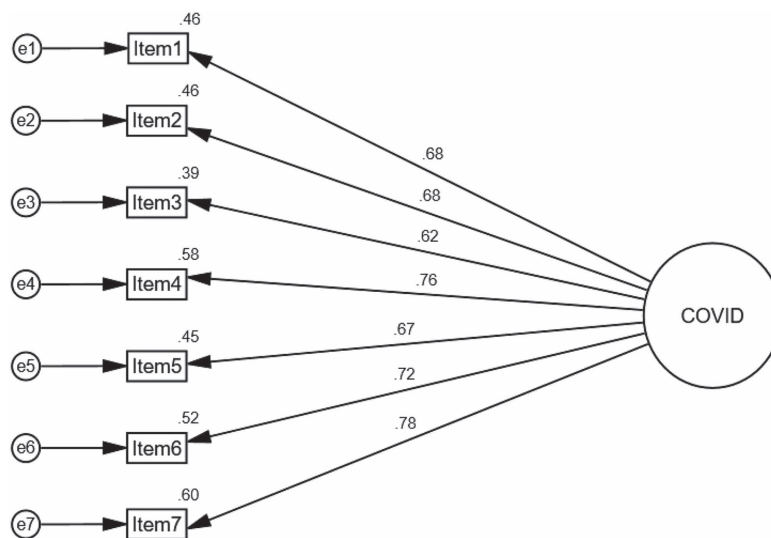


Figure 1. Confirmatory factor analysis established best-fitting single-factor model of FCV-196.

Results of Table 2 showed that all inter-item correlations are significant, and ranged between (.31 - .69), which indicates the acceptability for all items of the scale.

Construct Validity

The aim of construct validation is to embed a purported measure of a construct in a homological network, to establish its relation to other variables with which it should, theoretically, be associated positively and practically (Wasten & Rosenthal, 2003). In order to test construct validity of FCV-19S, the correlation between all items and the total score of the scale was calculated as shown in Table 3.

Results of Table 3 shows that correlations between total score of FCV-19S and all items of the scale were positive and significant, the correlations ranged between (.64-.78). This result confirms that each item contributed to Fear of COVID-19 total score.

Table 2. Inter-items correlation of FCV-19S (n = 664)

Item	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Item 2	.69**					
Item 3	.31**	.33**				
Item 4	.56**	.47**	.48**			
Item 5	.44**	.57**	.36**	.47**		
Item 6	.41**	.41**	.55**	.52**	.49**	
Item 7	.44**	.44**	.54**	.62**	.51**	.62**

** Correlation is significant at the 0.01 level (2-tailed).

Table 3. The correlations between total score of FCV-19S and all items (n= 664)

Item	Correlations with total score
Item 1	.76**
Item 2	.77**
Item 3	.64**
Item 4	.79**
Item 5	.75**
Item 6	.74**
Item 7	.78**

** Correlation is significant at the 0.01 level (2-tailed).

Concurrent Validity

Concurrent validity is an approach of criterion validity that estimates performance on different tests at approximately the same time (Cohen & Swerdlik, 2005). To determine if the scale really represents the fear of COVID-19, a Person Correlation Coefficient was conducted between the FCV-19S, the Health Anxiety Questionnaire (K-HAQ), and the Injury/Illness Sensitivity scale (ISI) as shown in Table 4.

FCV-19S correlated significantly and positively with K-HAQ ($r = .53$; $p < .01$), and positively correlated to ISI ($r = .55$; $p < .01$). K-HAQ correlated significantly and positively to ISI. This result indicates high level of concurrence of FCV-19S.

Reliability of FCV-19S

Reliability is the degree to which the measure of a construct is consistent or dependable (Varni, Seid, & Kurtin, 2001). In order to test the reliability of the scale, Cronbach's alpha, Guttman Split-Half, and test-retest methods were calculated as shown in Table 5.

The FCV-19S is reliable, as reflected by a standardized Cronbach's alpha of .868, Split – Half coefficient .832. Moreover, Cronbach's Alpha if Item Deleted confirms that all items of scales should not be deleted since no item whose Alpha if Item Deleted score was higher than the total scale's alpha, which confirms the acceptability of all items of FCV-19S. To assess test-retest reliability, the scale was readministered to 70 participants after its first administration, with three weeks between the two administrations. The correlation between FCV-19S scores at both instances was .826, which confirms that FCV-19S captures a stable construct.

Table 4. Pearson Correlation Coefficients between FCV-19S, K-HAQ and ISI scales (n=664)

Scale	1	2	3
1. FCV-19S	1	.53**	.55**
2. K-HAQ		1	.80**
3. ISI			1

**Correlation is significant at the 0.01 level (2-tailed).

Table 5. Reliability indicators of FCV-19S

Reliability	Cronbach's Alpha if Item Deleted	Corrected Item-Total Correlation	Test-retest	Guttman Split- Half	α
Item 1	.849	.646	.821		
Item 2	.846	.665	.813		
Item 3	.862	.551	.814		
Item 4	.842	.694	.824		
Item 5	.852	.631	.816		
Item 6	.849	.655	.834		
Item 7	.836	.615	.817		
Total			.826	.832	.868

Female respondents reported a higher degree of COVID-19 fear ($t = -5.54$; $p < .001$) than male respondents. In regard to academic background, those without college degree demonstrated a significantly higher degree of COVID-19 fear than those who had a college degree ($t = 3.20$; $p < .001$). Moreover, smoking respondents reported more fear than those who were nonsmokers ($t = -2.08$; $p < .043$). Table 6 shows the differences of the FCV-19S related to the three demographic variables.

Discussion

The present study translated and validated the FCV-19S to be used as viable measure for testing and examining fear of COVID-19 in a Palestinian context. In the tested sample, the FCV-19S was found to be internally reliable (by item and in entirety) and corresponded positively with scores on the related measures of Health Anxiety (HAS) and Injury/Illness (ISI). The study found that population characteristics such as gender (females demonstrating higher fear levels than males), education level (individuals without college degree experiencing higher levels of fear), and smoking status (smokers indicating higher levels of fear than nonsmokers) had a significant predictive effect on COVID-19 fear levels.

The study presents robust evidence that the FCV-19S in Arabic is a viable measure for examining fear of infection in a Palestinian population, in line with other Arab populations (Alyami et al., 2020) and international samples (Pang et al., 2020; Perz, Lang, & Harrington, 2020; Reznik et al., 2021), and related to generalized measures of health and injury anxiety.

Regarding the dimensionality of the scale, the FCV-19 confirmed a one-factor structure in assessing fear of COVID-19 in the Palestinian context, which is consistent with previous studies (Broche-Perez et al., 2020; Reznik et al., 2020; Pang et al., 2020; Satici et al., 2021;

Table 6. Differences in Fear of COVID-19 by gender, academic background, and smoking status (n=664)

Variable	Gender		Academic background		Smoking status	
	Male	Female	Without college degree	With college degree	Smokers	Nonsmokers
Mean (SD)	2.23(.71)***	2.55(.79)***	2.71(.84)***	2.41(.77)***	2.48(.80)*	2.34(.70)*

* $p < 0.05$; *** $p < 0.001$

Winter et al., 2020), and inconsistent with Bitan and colleagues (2020) who proposed a two-factor structure for the Hebrew FCV-19S. Pakpour, Griffiths, and Lin (2020) confirmed that a two-factor structure is not appropriate for the FCV-19S, as previous studies have shown a clear single-factor structure of the scale (Reznik et al., 2020; Pang et al., 2020; Perz, Lang, & Harrington, 2020), and proposed that the CFA should be used rather than Exploratory Factor Analysis (EFA) to examine the factor structure of the FCV-19S.

Having internationally standardized tools to examine, compare, and contrast COVID-19 will allow this newly emerging and critical field to grow and develop as our knowledge about the disease and its impact increase over time and experience. There has not been a global pandemic in over 100 years (Veronese et al., 2021; Mahamid et al., 2021). The psychological effects of the wide range of symptoms and potential deadly outcomes, the lack of clear information and directives about the disease and how to prevent/ treat it, differential demands of social isolation by population, economic and global health concerns, and repercussions of fear of exposure/infection on individuals of differing ages and situations will be valuable in assisting mental health professionals to train and educate medical professionals in both clinical populations and in planning future treatment models.

Well-known methodologies such as cognitive behavioral therapies have not yet been tested in circumstances of a global pandemic. It is imperative that the field have tools to measure not only levels of COVID-19 fear for diagnosis and identification but also to be able to demonstrate change after intervention to ensure the ethical standards for treatment selections can be upheld by the proven effectiveness of this outcome measure.

In some populations (like Palestinians), COVID-19 may accentuate the feelings of vulnerability, distrust, and hostility toward the political and sociological realities of occupation. Obstacles like the inability to protect your own population by enforcing border entry, severe limits in resources for creating effective testing programs, lack of accessible health care, and the risks posed daily by a hostile foreign occupier amplifies fear and creates an environment where rumor, conspiracy theories, and heightened arousal may interfere with public health measures. In these environments, understanding COVID-19 fear is as important as combatting the disease itself (Mahamid & Berte, 2019; Mahamid & Berte, 2020). Although the FCV-19S was validated in Arabic within a Saudi context, the unique conditions of Palestinian society make this study necessary, as Palestinians face particular challenges and struggles (including occupation, poverty, exposure to violence, restriction of movement, arrest, detention, relocation, lack of resources, etc.) that increase the risk of developing psychological stress (Mahamid, 2021). Validating international instruments within a Palestinian context, such as the FCV-19S, will be useful in providing valuable information on fears of COVID-19.

As with any study there are limitations to the data presented. This study was conducted in March of 2020 when knowledge about COVID-19 and its devastating effects to world health, society, and economics were not yet known. The sample was significantly skewed for an

educated population as recruitment occurred online and also comprised mostly of women. As the study was based on self-referral, one might imagine that the sample included individuals who were thinking about and worried about the topic and may not be representative of the general population. Lastly, as the survey was based on self-report and using stimulus questions that were straightforward in presentation, it is likely that scores reflected some amount of concern over self-presentation which may explain for example why men scored lower in fear than women.

It is hopeful that this newly validated measure will assist in increasing the knowledge about COVID-19 fears and create programs to manage such fear in the population so that effective disease control measures can be implemented and the disease itself reduce the threat to vulnerable populations as well as reducing further negative impact of the population that a long-lasting, wide range fear itself can cause.

Compliance with Ethical Standards

Conflict of Interest

The authors declare that they have no conflict of interest. No funding was received for this study.

Ethical Approval

All procedures performed in this study involving human participants were in accordance with the ethical standards of University's Research Ethics Board, the American Psychological Association (APA, 2010), and with the 2013 Helsinki Declaration.

Informed Consent

Informed consent was obtained from all participants.

Appendix

FCV-19S in a Palestinian Context

1. أنا خائف للغاية من فايروس كورونا
2. أشعر بعدم الراحة عندما أفكر بفايروس كورونا
3. تتعرق يدي عندما أفكر بفايروس كورونا
4. أنا خائف من أن أفقد حياتي بسبب فايروس كورونا
5. أصبح عصيباً وقلقاً عندما أشاهد الأخبار والقصص المنتشرة على وسائل التواصل الاجتماعي حول فايروس كورونا
6. لا أستطيع النوم بسبب قلقي من الإصابة بفايروس كورونا
7. يدق قلبي بسرعة عندما أفكر بالإصابة بفايروس كورونا

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