ORIGINAL RESEARCH

Re-testing the psychometric properties of the Fear of COVID-19 Scale (FCV-19s)

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Received: June 21, 2022 **Accepted:** August 25, 2022 **Online Published:** September 26, 2022
DOI: 10.5430/jnep.v13n1p55 **URL:** https://doi.org/10.5430/jnep.v13n1p55

ABSTRACT

The COVID-19 pandemic has brought about multi-faceted effects, including deleterious physical and mental health concerns. Fear of COVID-19 appears to result in varying mental and psychological symptoms among those in contact to patients with the disease. The study aimed to test the psychometric properties of the Fear of COVID-19 Scale (FCV-19s) in accurately measuring fear brought by the pandemic. One-hundred nineteen (119) hospital staff who were nurses currently working in private and/or public hospitals in Pampanga, who has had previous and/or current contact with COVID-19 patients, and are in optimal mental health state, were purposefully selected to participate in this study. Methodological research was employed to statistically test the psychometric properties of FCV-19s using exploratory factor analysis to test factor structure; Cronbach's alpha to test internal reliability; and Pearson r with the Depression, Anxiety, and Stress Scale (DASS-21) to test concurrent validity. Statistical tests of the FCV-19s showed a single-factor structure, a Cronbach's alpha score of 0.884, and a moderate correlation with DASS-21 (0.428). The present study was able to confirm the unidimensional construct, reliability, and concurrent validity of FCV-19s. Results contribute to the body of knowledge in terms of the accurate assessment of fear brought by the COVID-19.

Key Words: COVID-19, Fear of COVID-19 Scale, FCV-19s, Psychometric properties, Validity, Reliability, Filipino nurses

1. INTRODUCTION

In December 2019, an unknown virus, which originated in Wuhan Province of China, was discovered to have afflicted humans.[1] Further investigation showed that a novel coronavirus has been spreading rapidly in China and across its borders. Not long after, the WHO has declared a pandemic called the SARS-nCOV-2 virus, commonly known as COVID-19.

In the Philippines, the Department of Health (DOH)[2] has identified a total of 1,332,832 Filipinos who were afflicted with the virus, with more than 5,000 cases surging daily. The burden of the pandemic has brought not only physical manifestations, but also mental and emotional crises as well.[3] Everyone, including healthcare workers was affected by the pandemic.

Healthcare workers, specifically nurses, remain as one of the frontline workers in the battle against the pandemic. They, however, are not spared of the ill-effects of the pandemic. Because of their daily exposure, many healthcare providers have acquired the virus.[4] Their situation became more complicated with the recent surge of the number of cases, resulting in most hospitals reaching their maximum capacity.[2] Consequently, many nurses found it a daily struggle to go to work and became anxious of what might happen to them if they contracted COVID-19.[3]

To accurately measure the fear of COVID-19, Ahorsu et al.[5]

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have constructed the Fear of COVID-19 Scale (FCV-19s). The tool consists of 7 seven questions which is answered using a 5-point Likert scale and it measures the perception of fear brought by COVID-19.

The development of the tool was aimed at accurately measuring fear of COVID-19. However, Ahorsu et al.[5] identified limitations of the instrument. The selected participants of their study were from a general population having no clinical diagnosis of mood disorders obtained thus, affecting the examination of the sensitivity and specificity of the scales. The subjectivity of fear along with the use of a self-report method in data collection posited that responses shed by the participants may have been affected by factors such as social desirability. The use of convenience sampling, a non-probability sampling technique was found to have affected the generalizability of their findings as well. Finally, the need to use other forms of statistical analyses aside from using exploratory factor analysis and Rasch analysis where the single factor structure of the tool was based were noted.[5]

Undoubtedly, research has been dedicated to shed light to the fear brought about by the pandemic. Authors have translated and tested the psychometric properties of FCV-19s. Midorikawa et al.[6] and Wakashima et al.[7] translated the tool into Japanese versions and tested the psychometric properties, all of which found adequate internal reliability (0.83 and 0.87, respectively) and concurrent validity ($0.30< r <0.60$ and $r =.29$ to $r =.56$, respectively). Bitan et al.,[8] in the Hebrew version, found that the tool resulted in a unidimensional factor structure. The Italian version found significant factor loadings and very good internal consistency ($\alpha = .871$).[9]

Gap in the literature, however, is the need to establish further validity and reliability of the tool in measuring the fear of COVID-19 while addressing the limitations noted by the principal authors.

2. Review of related literature

2.1 Statistical perspectives on COVID-19

On December 31, 2019, the WHO Country Office revealed the outbreak of a "viral pneumonia of unknown cause" in Wuhan, People's Republic of China.[10] From the first case documented until September 22, 2020, there has been an exponential increase worldwide in the number of positive cases, with more than 176,693,988 total confirmed cases and 382,341 cases daily.[1]

In the Philippines, there are 1,332,832 COVID-19 cases,[2] with the National Capital Region (NCR) having the highest number of active cases (8,056), followed by regions IV-A, VI, III, and IX. Furthermore, 14,285,745 cumulative RT-PCR tests were done, with a 10.56% positivity rate. This exponential increase in the number of cases in the Philippines provides a concern towards provision of quality healthcare. As of September 2020, the bed occupancy percentage has spiked to 48% already, with ICU Beds occupied at 57% followed by Isolation Beds (47%) and Ward Beds (46%).[2]

Data imply that with the increase in the number of COVID-19 positive cases, there rises a need for additional support to the healthcare workforce to provide adequate care for these patients.[11] However, reports show that healthcare workers in the Philippines also experience various concerns which affect their service.

Nurses and midwives also voiced out mental health concerns such as anxiety. In Montemayor,[12] healthcare workers who contracted COVID-19 in the country has reached 2,067, with nurses on the top with 759 positive cases as of September 2020; the risk of contracting the disease becomes prevalent among healthcare workers.

Epidemiological studies show that the COVID-19 is a non-fatal and self-limiting virus which results from droplet exposure to a carrier of the virus. Signs and symptoms of COVID-19 suspects include flu-like symptoms such as sore throat, fever, dry cough, colds, anosmia.[13] Other non-respiratory symptoms include diarrhea and headache. Management of the disease primarily focuses on the treatment of the aforementioned signs and symptoms, leaving mental and psychological problems, specifically fear, in the background.[14]

2.2 Fear as a mental health concern during the COVID-19 pandemic

In Labar,[15] fear is described as "a negative emotional reaction to threatening stimulus, leading to defensive responses". Fear, like many other mental and psychological concerns, was given little importance during the pandemic. They should be treated with the same urgency as they are experienced concurrently with the disease and pose further threats.[16]

Several studies found that fear may exacerbate the physical symptoms of COVID-19.[17] This threat is not only experienced by patients suspected and diagnosed with the disease but also by healthcare workers who are in direct contact with these patients. Although there have been studies pertaining to the physical symptoms of COVID-19, its effects and consequences on the mental wellbeing of patients as well as frontline healthcare workers have not been studied with greater depth, particularly the resulting fear of the pandemic.[18] Infectious diseases, such as that of COVID-19, cause differing levels of fear and anxiety which in turn disrupt a person's functioning.[19]

COVID-19 appears to cause mental health concerns in vari-

ous groups of population. In Duran,[20] preschool children's drawings reflect their fear of COVID-19 through their drawings where levels of worry and nervousness about COVID-19 are implied. In Madan,[21] 30% of quarantined children experienced acute stress disorder, depression, and adjustment problems. In another study, there is a significant association between fear and anxiety among adolescents.[22] District schools in the United States could not reopen fully due to students' fear of contracting COVID-19.[23] Even college students are also anxious because of COVID-19.[24] More seriously, some even had suicidal thoughts.[21]

The pandemic has also resulted in other various mental health concerns, mainly negative psychological, psychiatric, and psychosocial symptoms. Various levels of negative emotions of anxiety, anger, loneliness, unhappiness, and life dissatisfaction were found in Solymosi et al.[25] In Madan,[21] the stigma associated with COVID-19 was found to be experienced by children as well. Moreover, a study found that COVID-19 appeared to contribute to the development of eating disorders.[26]

Most frontline healthcare workers were personally affected by COVID-19—physically, emotionally, and psychosocially. Several studies on healthcare workers identified their problems, concerns, and challenges related to COVID-19; fear,[27] Stigma which contributed to fatigue, anxiety, sleep disorders, emotional disturbances, anxiety, depression.[28–30] The lack of facilities to appropriately address mental health concerns related to COVID-19 aggravates the problems.[31] Several studies also reported mental health problems encountered by nurses who handle patients diagnosed with Coronavirus Disease (COVID-19). These problems include psychological and work-related distress,[3,32–34] and work dissatisfaction.[3,35] Among the studies of frontline nurses, the work stress due to COVID-19 is correlated to their intention to leave their jobs (turnover intention).[3]

2.3 Previous studies testing the FCV-19s

To accurately test the validity and reliability of the FCV-19s, several studies were done in a variety of populations and translations that statistically measured its psychometric properties. Midorikawa et al.[6] and Wakashima et al.[7] translated the FCV-19s to Japanese and found adequate internal reliability (0.83 and 0.87, respectively) and moderate to high correlations ($0.30 < r < 0.60$ and $r = .29$ to $r = .56$, respectively). The Hebrew version confirms that all the seven items of FCV-19s accurately measures the perception of fear of COVID-19 (unidimensional), explaining a 53.71% variance.[8] The Italian version of the FCV-19s showed "promising" psychometric characteristics as well, with significant factor loadings, very good internal consistency ($\alpha = .871$), and significant and positive construct validity. There are high correlations between FCV-19s and Hospital Anxiety and Depression Scale (HADS) ($r = .649$), and with the Severity Measure for Specific Phobia–Adult ($r = .703$).[9] Statistical analyses of the FCV-19s with different tools measuring Fear and other psychological and psychiatric conditions were also tested to measure correlations. Correlations of the FCV-19s to the Hospital Anxiety and Depression Scale (HADS) are tested and found significant and positive correlation with HADS.[5,7,9,36] In Midorikawa et al.,[6] FCV-19s was found to be positively correlated with Kessler Screening Scale (K6) which screens mood and anxiety disorders; Generalized Anxiety Disorder-7 (GAD-7) which assesses severity of Generalized Anxiety Disorder; and Impact of Event Scale- Revised (IES-R) which investigates traumatic events. FCV-19s was also found to be positively correlated with Perceived Vulnerability to Disease (PVD).[7] Magano et al.,[37] found a positive correlation ($r = 0.53$; $p < .001$) of FCV-19s with the new measurement tool, Coronavirus Assessment Scale (CAS) which screens, and measures severity of dysfunctional anxiety associated with COVID-19. Relationships of the FCV-19s to other instruments found positive correlation with Intolerance of Uncertainty Scale (IUS),[38] criterion validity with the Revised Child Anxiety and Depression Scale-Child (RCADS-C),[39] direct relationship with Hospital Anxiety and Depression Scale (HADS) and Perceived Vulnerability to Disease (PVD),[7] positive correlates with Preventive Behaviors related to COVID-19 Scale (PBCV-19S), and negative correlates with Wardwick-Edinburgh Mental Wellbeing Scale (WEMWBS).[40]

The other versions of the FCV-19s—Amharic (Ethiopian),[41] Portuguese,[37,42] and Malay[43] versions of the FCV-19s—also confirmed the unidimensionality of the tool, as well as its strong psychometric properties (Amharic $\alpha = 0.71$; Portuguese, $\alpha = 0.88$; and Malay, $\alpha = 0.893$).

2.4 The gap in the literature

In the process of testing the validity and reliability of the FCV-19s in the assessment of the perception of fear of COVID-19, studies found several limitations with the applicability of the tool. Ahorsu et al.,[5] the proponent of the FCV-19s has delineated limitations of the study, which are (1) the selected participants of their study were from a general population, having no clinical diagnosis of mood disorders obtained, affecting the examination of the sensitivity and specificity of the scales, (2) the subjectivity of fear along with the use of a self-report method in data collection posited that responses shed by the participants may have been affected by factors such as social desirability (3) the use of convenience sampling, a non-probability sampling

technique was found to have affected the generalizability of their findings as well, and (4) the need to use confirmatory factor analysis aside from using exploratory factor analysis and Rasch analysis where the single factor structure of the tool was based. These limitations are consistent in other studies made to test the validity of the tool. Convenience sampling appears to pose limitation in the generalizability of the tool as well.[39] Translated versions of the tool were also tested while few studies measured the validity of the original English version of FCV-19s.

2.5 Aim of the Study

The study was aimed at filling the gap in the literature by testing the validity, reliability, and other psychometric properties of the original English version of the FCV-19s using exploratory factor analysis, by employing a probability sampling technique, and including specific criteria in the selection of the respondents to in measuring the psychometric properties of the tool.

2.6 Research questions

The present study was aimed at testing the validity and reliability of Ahorsu, et al.'s[5] Fear of COVID-19 Scale. It specifically seeks to answer the following research questions:
1) What is the measure of the factor structure of the FCV-19s?
2) What is the internal consistency of FCV-19s?
3) What is the concurrent validity of FCV-19s?

3. METHODS

3.1 Design

The study utilized a quantitative approach, more specifically, methodological research design in testing the validity of FCV-19s to "provide information on the design, conduct, analysis or reporting of primary and secondary research and can be used to appraise quality, quantity, completeness, accuracy and consistency of health research".[44] Because the study occurred at the specific time of the pandemic, the use of a cross-sectional design to measure validity of the FCV-19s was essential and appropriate.

3.2 Participants and setting

Hospital staff from public and private hospitals in Pampanga were asked to participate in the study. G*Power was used to determine the sample size in which a minimum of 89 respondents were identified to be necessary for the study. Input parameters in the calculation of sample size using G*Power included 0.15 effect size, 0.05 α error of probability, 0.95 Power (1-β error probability), and 7 number of predictors. Output parameters included 3.65 non-centrality parameter δ, 1.98 critical t, 81 degree of freedom, an actual power of 0.95 and a sample size of 89 was required after G*Power computation. 134 nurses were purposefully selected to participate, and in the process, 119 nurses were able to complete the study.

Purposive sampling was used to select the prospective respondents. The criteria set for the respondents of the study were nurses who: (1) are currently employed in either a public or private hospital in Pampanga, (2) has had contact with COVID-19 positive patients, and (3) were evaluated to be in an optimal mental health state, meaning, having no stress, anxiety, and/or depression at the time of the study as assessed using the Depression, Anxiety, and Stress Scale (DASS-21).

3.3 Instrument

To initially assess mental wellbeing of the respondents, they were asked to answer the Depression, Anxiety, and Stress Scale (DASS-21).[45] The tool consists of 21 questions to assess levels of depression, anxiety, and stress, with 7 questions allotted to each aspect. Cronbach's alpha scores of the DASS-21 are 0.81, 0.89, and 0.78 for depression, anxiety, and stress, respectively.[46] The instrument instructs the participants to respond to the 21 items using the 4-point Likert scale: 0 = did not apply to me at all, 1 = applied to me to some degree, or some of the time, 2 = applied to me to a considerable degree or a good part of time, and 3 = applied to me very much or most of the time. A score of more than 9 in the Depression sub-scale, more than 7 in the Anxiety sub-scale, and more than 14 in the Stress sub-scale were interpreted as "other than normal" based on DASS-21 scoring and interpretation. The tool is available in the public domain and was transcribed to Google forms.

The tool Fear of COVID-19 Scale (FCV-19s) of Ahorsu et al.[5] was used after permission was granted by the author. The instrument includes a 7-item scale with the following scores: good internal consistency (α = .82), 0.88 composite reliability and acceptable average variance extracted (AVE) of 0.51. The standard error of measurement was also low (1.89). The instrument was written in Google forms where participants were asked to answer a Likert score with the following measures: 1 = strongly disagree, 2 = disagree, 3 =neutral, 4 = agree, and 5 = strongly agree. Additionally, general information, such as age, gender, occupation, marital status, area of assignment in the hospital, years in practice, and working hours, were gathered, and analyzed.

3.4 Data collection

In the recruitment of respondents, the author employed a snowball sampling technique: after the first identified respondents have accomplished the questionnaires, they were asked to assist the author in identifying other potential participants

who met the set criteria. Recruitment of participants and data collection were stopped when the computed sample size was met.

The consent form and tools which were used in the study were transcribed in Google forms. Links to access the consent form and tools were generated and sent via social media platforms: Facebook Messenger, Twitter, and Instagram. Further, prospective respondents received these forms and tools through their e-mail addresses. Respondents were able to access both the informed consent and the questionnaires used in the study in the same link provided.

Respondents were asked to accomplish the two instruments transcribed in a Google Form. In the first section of the form, the respondents answered the DASS-21 instrument. Afterwards, in the next section of the form, the respondents answered the FCV-19s. Respondents took 15 to 20 minutes to accomplish both instruments. When the target sample was reached, data collection was put on hold and all access to the Google form was taken down. Data collection was accomplished from September 15, 2021 until September 21, 2021. After raw data was extracted, DASS-21 scores were calculated and interpreted. Fifteen (15) respondents with scores other than "normal" in any of the three constructs (depression, anxiety, and stress) were removed from the dataset and given referral to a list of offices and services addressing mental health concerns. 119 out of the 134 respondents had "normal" DASS-21 scores in which their FCV-19s scores were then analyzed.

3.5 Data analysis

Exploratory factor analysis was tested to examine the factor structure of the scale. Dataset were subjected to Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity to test dataset appropriateness. Afterwards, principal component analysis (PCA) was computed to identify factor structure. Cronbach's alpha score was analyzed to test internal consistency of the tool. Furthermore, Pearson R was calculated to test concurrent validity of FCV-19s with DASS-21.

3.6 Ethical considerations

An informed consent was given at the beginning of the study. Respondents were assured of confidentiality and anonymity; all data gathered from this study were only accessed by the author and were stored in an encrypted and locked computer. Furthermore, raw data will only be stored for 3 years, and will be subsequently deleted.

Participation in the study was voluntary. There was no coercion of any form to the respondents. The respondents were assured that they can, at any time, withdraw from the study and have the right to have their information removed from the database. Data acquired from the respondents included socio-demographic data. To maintain anonymity, no information identifying the respondents were used in the presentation of the results. The respondents, however, were instructed that they may request a copy of their response to the questionnaire.

The author declares no conflict of interest as well as sponsorship of any form for the current study. No compensation of any form to the respondents were provided. The potential risk identified in the study was the possible disclosure of sensitive and identifying information of the respondents which have been prevented with the use of strong passwords and encryption in storing data using a computer. Another risk identified was the possible discomfort to the respondent's psychological well-being experienced while answering the questionnaires. To address this concern, the following were employed: (1) the author conducted a prior disclosure of all the possible risks in the study, (2) the respondents were assured that they may opt not to continue with the study, (3) all access to the Google Form were taken down after the target number of sample was achieved, and (4) a list of offices and services addressing mental health concern were included in the Google form.

Finally, the paper was read, reviewed, and approved by the Institutional Review Board of Holy Angel University prior to the start of the study.

4. RESULTS

4.1 Exploratory factor analysis (EFA)

EFA includes a series of steps including measuring appropriateness of data set to undergo factor analysis, extraction of factors, and lastly, rotation of extracted factors. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity was used to test appropriateness. Principal component analysis (PCA) was employed to extract factors.

KMO test shows a computed score of 0.850, which shows appropriateness to conduct factor analysis, while Bartlett's Test of Sphericity shows a significant value of $p<0.001$, showing homogeneity of variances among the data in the matrix.

The seven FCV-19 items were factor analyzed with a sample of 119 nurses using principal component analysis for factor extraction. Preliminary analysis indicated moderately high factorability – Bartlett's test was significant at $p <.001$ and the overall value of the Kaiser-Meyer-Olkin test was .85.

Table 1. Principal component analysis of the 7-item FCV-19s (N = 119)

FCV-19 items	Factor Loadings	Communality
1. I am most afraid of COVID-19	.816	.666
2. It makes me uncomfortable to think about COVID-19	.818	.669
3. My hands become clammy when I think about COVID-19	.631	.398
4. I am afraid of losing my life because of COVID-19	.743	.552
5. When I watch news and stories about COVID-19 on social media, I become nervous or anxious	.825	.680
6. I cannot sleep because I'm worrying about getting COVID-19	.788	.622
7. My hear races or palpitates when I think about getting COVID-19	.779	.608
Eigenvalue	4.194	
Percent of Variance Explained	59.917	

Table 2. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.884	.887	7

Using a minimum eigenvalue of 1.0 as the extraction criterion for factors, one factor (component) that accounted for a total of 59.917% of the variance was extracted (see Table 1). Communalities were fairly high ranging from .552 to .690 except for one (.398). Overall, the factor structure that emerged was reasonably clear and interpretable and pointed to the seminal works on FCV as a unidimensional construct.

Another way to identify the factors which should be generated is through Scree Plotting. In a Scree Plot, the point where the slope of the curve starts to obviously slope down, or "elbow" shows the number of factors that should be extracted and generated (see Figure 1).

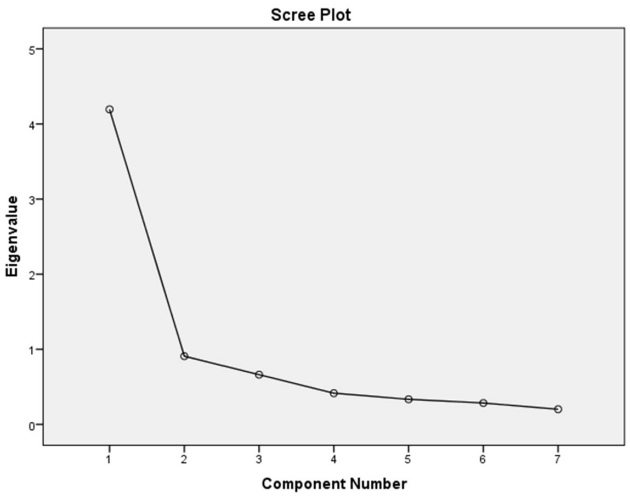

Figure 1. Scree Plot of the Eigenvalues

The Scree Plot is used to provide a visual aid of the extracted factor. A sharp elbow is shown after the first component. Inter-correlations, verified through their corresponding Eigenvalues, are weaker after the first component. The Scree Plot further verifies the unidimensional construct of FCV-19s.

4.2 Reliability and validity

To test the reliability of the Fear of COVID-19 Scale, test for Cronbach's alpha score was employed (see Table 3). The Cronbach's alpha score of the seven items of FCV-19s is a=0.884, which shows that the tool has good internal consistency, indicating close inter-item relationships of the tool.

Table 3. Pearson correlation with DASS-21

		DASS	FCC
DASS	Pearson Correlation	1	.428**
	Sig. (2-tailed)		.000
	N	119	119
FCC	Pearson Correlation	.428**	1
	Sig. (2-tailed)	.000	
	N	119	119

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

Concurrent validity of the tool was tested using Pearson correlation between FCV-19s and DASS-21. Results show moderate degree of correlation (0.428) between FCV-19s and DASS-21 (see Table 3).

5. Discussion

The goal of the current study is to test the psychometric properties of the FCV-19s. As the multifaceted effects of the COVID-19 pandemic affect not only the physical but also the mental aspects of human life, it has a significance for the accurate assessment of the perceived fear of COVID-19. The FCV-19 have a unidimensional construct, significant inter-item relationships, good reliability, and moderate correlation with DASS-21 in measuring fear of COVID-19

among individuals without concurrent mental condition. The present study was able to address the limitations mentioned by Ahorsu, et al.[5] by screening the participants for concurrent mental condition, selecting participants based on set criteria, and verifying its psychometric properties using EFA.

The present study tested the psychometric properties of FCV-19s while having criteria for the respondents who participated. Nurses who have handled COVID-19 patients working in Pampanga who did not present any concurrent mental concern during the study were chosen. The sample of the study differentiates it from other researches whose respondents were derived from the general population.[6,7,9,37–39,41,43,47–52] Although a wider range of sample may be a good representative of the population, respondents with concurrent mental conditions may have higher scores in FCV-19s and therefore could have affected FCV-19s scores accurately.[53,54]

Further, studies tested specific groups in measuring the psychometric properties of FCV-19s similar with the present study. Medical front liners, pediatric patients, medical doctors, and elder respondents, respectively, were asked to participate in similar studies.[55–58] Green et al.[49] expressed the need to test FCV-19s to a specific group (medical professionals in their study). Nurses, together with other medical professionals, are frontline workers during the pandemic and have first-hand experience of the fear of COVID-19 and may have different scores compared with the general population.

The average FCV-19s score of the respondents in the present study is 18.14 which is consistent with non-Asian countries who scored 15-19.[39,59–64] Conversely, it is notable that Asian countries scored higher FCV-19s.[5,6,65–67] This inconsistency of average scores may be due to higher levels of resilience adapted from being continually exposed to the virus in their workplace. One study even noted that frontline workers "reported medium to high levels of resilient coping".[58]

Testing of the factor structure found KMO and Bartlett's test scores 0.850 and $p < 0.001$, respectively, which are consistent with several studies,[37,48,50,56] thus suggesting substantial correlation in the dataset. KMO tests sample adequacy while Bartlett's test of sphericity tests if redundancy is present among variables. A KMO value between 0.8 and 1.0 indicates the sampling is adequate while a Bartlett's score of $p <$ .001 indicates correlation in the data.

To further test factor structure, exploratory factor analysis using principal component analysis was performed and confirmed that FCV-19s is unidimensional; all items measure the concept of fear of COVID-19. This is in congruence to previous studies done to test the tool's psychometric properties.[7,9,41,43,48,49,52,56,57,63,68] Conversely, the results are inconsistent to that of other studies where 2 factor models, emotional and physical response, were found to be better fit in the bifactorial structure than that of the unidimensional structure found in the current study.[6,37,47,51,55,62,63,69,70] It is also important to note that in other studies, FCV-19s was found to have 1 factor and 2 factor models.[37,55,70]

Cronbach's alpha score tested the reliability of FCV-19s and found good reliability (α = 0.884). This is consistent to many research testing the reliability of FCV-19s as well with α scores ranging from 0.83 to 0.92.[6,7,9,37,41,43,47–52,56,65,68,70,71]

Pearson correlation was also performed to test concurrent validity. Findings show moderate correlation with DASS-21 (r = 0.428). This is in congruence with several studies where low to moderate correlations ranging r = 0.389 to r = 0.481 with DASS-21 was found.[43,50]

In the Philippines, several authors used FCV-19s in descriptive, cross-sectional, and correlational studies[72–75] but none have yet tested the psychometric properties of the tool. Thus, based on extensive search, the present study is the first to test the validity of the tool.

6. Conclusion

Overall, the present study was able to confirm that all items of FCV-19s measure the construct of fear of COVID-19, are reliable, and correlates with DASS-21. With the statistical significance noting the psychometric properties of the tool, the present study contributes to the accurate measurement of the perception of fear brought about by COVID-19 especially among nurses who are continuously in the front line against the pandemic.

Recommendations and directions for future research

The present study showed strong psychometric properties of FCV-19s in measuring fear of COVID-19 among nurses. Results may help administrators and nurses manage levels of fear, depression, anxiety and stress due to COVID-19.

Because the situation of the COVID-19 pandemic may vary from one region to the other, a larger sample size is recommended to provide a wider range of representation of the population. Furthermore, because cross sectional studies could not rule out causality, it is also recommended that longitudinal studies be conducted to further test the tool's psychometric properties. Data collection was also done in one-time administration. In this case, participants may experience emotional discomfort and hence, it is recommended that future studies conduct the collection in a manner where

sequential collection of data be conducted.

Another concern encountered during the study is the unavailability of internet connection to respondents in far-flung areas in Pampanga. Because the tool was transcribed in Google forms, those with unstable internet connection are unable to participate. It is recommended that another data gathering method be used.

Furthermore, the second limitation stated by Ahorsu, et al.[5] which is the subjectivity of fear was not addressed in the present study. The subjectivity of fear and the use of self-report method may have affected the results of the present study. It is recommended that future studies conduct, in-person collection of data.

Finally, a Filipino language translation of FCV-19s is recommended for future research to encapsulate idiosyncrasies of Filipino nurses towards fear of COVID-19.

Conflicts of Interest Disclosure

The author declares that there is no conflict of interest.

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