Konselor
Volume 9 Number 2 2020, pp 75-80
ISSN: Print 1412-9760 – Online 2541-5948
DOI: https://doi.org/10.24036/0202092109075-0-00
Received January 06, 2020; Revised February 14, 2020; Accepted March 02, 2020

The fear of coronavirus scale: exploratory and confirmatory factor analysis

Yoga Setyo Wibowo[1*)], Rizki Karya Utami[1], Yunita Nadia[1], Emmanuel Nizeyumukiza[1], Farida Agus Setiawati[1]
[1]Universitas Negeri Yogyakarta, Indonesia
*Corresponding author, e-mail: yogasetyo.2018@student.uny.ac.id

Abstract
Although the problem of anxiety and fear has not been a priority in the treatment of coronavirus, the results of studies show that there is an increase in people's fear of coronavirus. This study aims to analyze the Fear of COVID-19 Scale (FCV-19S in the Indonesian population. Exploratory Factor Analysis and Confirmation Factor analysis were used for this purpose. A total of 117 participants responded to the scale. The results of the EFA showed that the scale has two dimensions. Furthermore, the results of the CFA revealed that the Indonesian version of FCV-19S exhibited very good construct validity (factorial and convergent), and acceptable reliability. These findings suggest that the Indonesian version of FCV-19S is a developmentally appropriate instrument that can be used to examine fears of coronavirus in Indonesia.

Keywords: Fear, coronavirus, Indonesia

How to Cite: Wibowo, Y., Utami, R., Nadia, Y., Nizeyumukiza, E., & Setiawati, F. (2020). The fear of coronavirus scale: exploratory and confirmatory factor analysis. *Konselor,* 9(2), 75-80. DOI:10.24036/0202092109075-0-00

Introduction

Although the problem of has not been a priority in the treatment of coronavirus, results of prior studies show that there is an increase in people's fear of coronavirus (Asmundson & Taylor, 2020; Goyal, Chauhan, Chhikara, Gupta, & Singh, 2020; Liang, Chen, Zheng, & Liu, 2020; N. Liu et al., 2020; S. Liu et al., 2020). This increase of fear is almost twice the one of the Severe Acute Respiratory Syndrome (SARS) which occurred in China in 2003 (S. Liu, et al., 2020).

(Ahorsu et al., 2020; Chakraborty & Karmakar, 2020; Harper, Satchell, Fido, & Latzman, 2020) explained that fear of coronavirus is caused by uncertainty about how bad coronavirus impacts. There so many impact in psychological that cause by covid19 include fear, stress, anxiety and depression (Amin, 2020; Fitzpatrick, Harris, & Drawve, 2020; Harper, et al., 2020; Khan, Mamun, Griffiths, & Ullah, 2020; Kontoangelos, Economou, & Papageorgiou, 2020; Menzies & Menzies, 2020; Pakpour & Griffiths, 2020; Zolotov, Reznik, Bender, & Isralowitz, 2020). In general, individuals who have high fears will not be able to think clearly and rationally when reacting to covid19 (Mamun, Bodrud-Doza, & Griffiths, 2020; Sher, 2020). However, the psychological impact of covid19 increase the suicide rates (Dsouza, Quadros, Hyderabadwala, & Mamun, 2020; Sher, 2020; Standish, 2020; Weems, Carrion, Mccurdy, & Scozzafava, 2020). For example, (Goyal, et al., 2020) reported that one person in India committed suicide due to coronavirus.

According to (Ren, Gao, & Chen, 2020; Xiang et al., 2020) fears that occur can worsen their condition. (Ahorsu, et al., 2020; Satici, Gocet-Tekin, Deniz, & Satici, 2020) explain one of the reasons why psychological aspects such as the current fear of coronaviruses are lacking due to the lack of proper psychometric instruments. Therefore, developing a short and valid instrument to capture the fear of coronavirus is appropriate and important. With information about how someone is afraid of coronavirus, the government can design further appropriate programs to overcome fear.

Currently, several scales have been developed to measure the fear of coronavirus, one of which is the COVID-19 Scale (FCV-19S). (Ahorsu, et al., 2020) explained that FCV-19S can be used to complement clinical efforts in preventing the spread and treatment of COVID-19 cases. To be used in Indonesia, a strategic step needed is the adaptation of the FCV-19S to provide a scale that fits and can be used for the initial screening of fear of coronavirus.

Although the FCV-19S has demonstrated a good model fit in Iran's population (Ahorsu, et al., 2020), no evidence supports that the FCV-19S can be used in Indonesia. The main objective of this study is to evaluate and confirm FCV-19S in the Indonesian population. The Exploratory Factor Analysis and Confirmation Factor analysis were used in this study (Thompson, 2004; Watkins, 2018). Therefore, this research intends to analyze the Fear of COVID-19 Scale (FCV-19S in the Indonesian population.

Method

A total of 117 (M =…; age average =…) participants participated in this study. The scale is shared online with the help of Google forms. Inclusion criteria included the following: Indonesian citizens who were willing to participate in this study and completed the whole questionnaire.

The instrument used was FCV-19S developed by (Ahorsu, et al., 2020). The participants indicated their level of agreement with the statements using a five-item Likert-type scale. Answers included "strongly disagree," "disagree," "neither agree nor disagree," "agree," and "strongly agree". The minimum score possible for each question is 1, and the maximum is 5. A total score is calculated by summing up the items scores (ranging from 7 to 35). The higher the scores the greater the fear of coronavirus. The FCV-19S has reliability values as follows: internal consistency (α = .82); test-retest reliability (ICC = .72) The concurrent validity was supported by the Hospital Anxiety and Depression Scale (with depression, r = 0.425 and anxiety, r = 0.511) and the Perceived Vulnerability to Disease Scale (with perceived infectability, r = 0.483 and germ aversion, r = 0.459).

Several steps were taken in this research. First, the translation of the scale is done by experts in the field of psychology keeping the meaning of the content (Tabel. 1). Second, scale was shared with participants using google forms. Third, Exploration Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed in this study. (J. F. Hair, Anderson, Babin, & Black, 2010; Watkins, 2018) explain that EFA can be a very useful and powerful multivariate statistical technique for extracting information effectively from large data sets that are interrelated, whereas CFA is aimed at testing hypotheses or conceptual frameworks that have been previously formulated. Data were compiled and analyzed using two softwares; the Statistical Package for Social Sciences (SPSS) version 22.0 for EFA and the linear structural relations (LISREL) version 8.80 for CFA. Two model fit indices were used: Cut off fit index for EFA (J. F. Hair, W.C., B., Babin, B.J., Anderson, R. E., & Tatham, R. L., 2014) and goodness of fit (GOF) for CFA according to (Brown, 2015).

Table 1. Translated Item *FCV-19S* with English Version to Indonesian Version

No	English Version	Indonesian Version
1	I am most afraid of coronavirus-19.	*Saya merasa sangat takut dengan coronavirus-19.*
2	It makes me uncomfortable to think about coronavirus-19.	*Berpikir tentang coronavirus-19 membuat perasaan saya tidak nyaman.*
3	My hands become clammy when I think about coronavirus-19.	*Tangan saya menjadi basah ketika saya berpikir tentang coronavirus-19*
4	I am afraid of losing my life because of coronavirus-19.	*Saya takut kehilangan nyawa saya karena coronavirus-19.*
5	When watching news and stories about coronavirus-19 on social media, I become nervous or anxious.	*Saat menonton berita dan cerita tentang coronavirus-19 di media sosial, saya menjadi gugup atau cemas.*
6	I cannot sleep because I'm worrying about getting coronavirus-19.	*Saya tidak bisa tidur karena saya khawatir terkena coronavirus-19.*
7	My heart races or palpitates when I think about getting coronavirus-19.	*Jantung saya berdetak kencang atau berdebar ketika saya berpikir terpapar coronavirus-19.*

Translated Item *FCV-19S* with English Version to Indonesian Version.

Results and Discussion

The purpose of this study was to evaluate and confirm the Fear of COVID-19 Scale in the Indonesian population. Following (Thompson, 2004; Watkins, 2018), the results of this study were obtained with the help of two analyses, namely Exploratory Factor Analysis and Comfirmatory Factor Analysis.

The results of EFA shows a Barlett Test of Sphericity of 335.270 ($p<0.05$) which means that there is a significant correlation between observed variables. The KMO calculation result of 0.779 indicate that the sample adequacy resides in the middle category (J. F. Hair, et al., 2010). The table 2 shows that the FCV-19S consists of two dimensions that include psychological and physiological reactions. In this study, the naming of factors is determined by the factor loading that is explained by the factors for each variable. The first factor has the biggest loading in explaining variables. This shows that the first factor is a common factor on the fear scale. Based on the content of the statement (eg, I cannot sleep because I am worried about getting coronavirus-19), the first factor is called a physiological reaction, while the second factor is called a psychological reaction (Steimer, 2002).

Table 2. EFA with FCV-19S varimax rotation

Item	psychological reaction	physiological reaction
Item 1		.842
Item 2		.827
Item 3	.807	
Item 4		.702
Item 5		.630
Item 6	.848	
Item 7	.797	
Variance explained	3.590	1.244
Variance in%	51.279	17.767
Cumulative variance in%	51.279	69.046

EFA with FCV-19S varimax rotation

The results of this EFA showed that the FCV-19S has two components which is inconsistent with previous studies. For example, (Ahorsu, et al., 2020) found that the FCV-19S is unidimensional. According to (Thompson, 2004; Watkins, 2018), EFA might find a new model that is more suitable for certain populations. However, to ensure the robustness of the results, a CFA analysis is needed for both models because two different models may fit in the same population.

The results of the analysis show that not all the two models fit, where model.1 ($\chi2 = 96.17$, $\chi2/df = 2.134$, RMR = 0.13, RMSEA = 0.22, TLI = 0.77 and CFI = 0.84) and model.2 ($\chi2 = 42.73$, $\chi2/df = 2.134$, RMR = 0.096, RMSEA = 0.14, TLI = 0.88 and CFI = 0.93). Model 2 exhibits a better goodness of fit than model.1. Modifications can be done by considering the "modification index" of LISREL v 8.80. According to (Wammerl, Jaunig, Mairunteregger, & Streit, 2019) "modification index" can be done, however, it must consider the existing theory.

Table 3 shows the model fit for the Single-Factor Model and two-Factor Model. The results showed that model.2 ($\chi2 = 14.30$, $\chi2/df = 2.134$, RMR = 0.054, RMSEA = 0.051, TLI = 0.99 and CFI = 0.97) has better fit indices then model.1 ($\chi2 = 23.19$, $\chi2/df = 2.134$, RMR = 0.093, RMSEA = 0.098, TLI = 0.95 and CFI = 0.98).

Table 3. Goodness of fit after modification

Model	Chi-Square	RMSEA	GFI	RMR	TLI	CFI
Model.1 Single-factor model	23.19	0.098	0.95	0.093	0.95	0.98
Item.2 correlated two-factor model	14.30	0.051	0.91	0.054	0.99	0.97

Goodness of fit

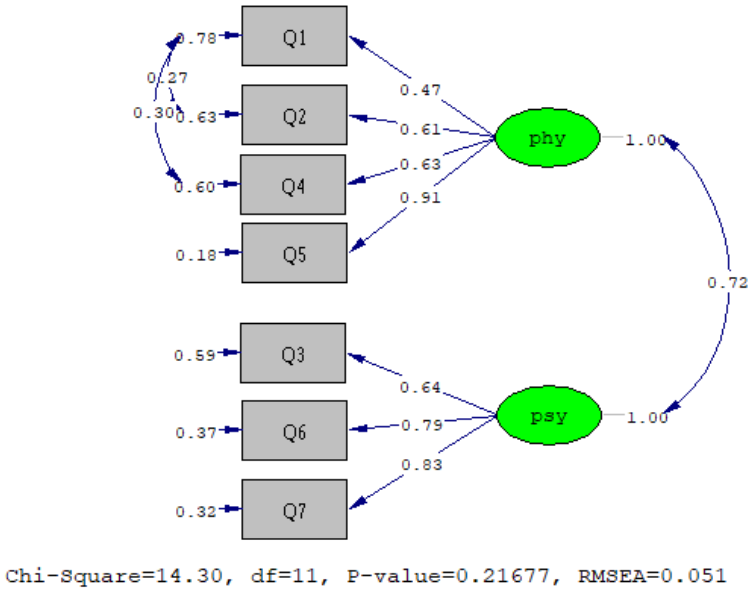

Figure 1 shows the final factor structure of FCV-19S in Indonesian version. The result of the modified model shows acceptable loading factor. The FCV-19S in Indonesian version also shows acceptable discriminant validity (Brown, 2015; J. F. Hair, W.C., B., Babin, B.J., Anderson, R. E., & Tatham, R. L., 2014). Furthermore, the results of reliability test, using composite reliability, show that physiology reaction dimension have good reliability α = 0.8 and psychology reaction also have good reliability α = 0.74 (Raykov, Dimitrov, & Asparouhov, 2010).

The findings show that the scale of fear after being adapted to Indonesia has good measurement significance. The original version explained that the FCV-19S is unidimensional, however, the EFA test of this study showed that in the Indonesian context the scale has two dimensions, namely psychological and physiological reactions.

The testing of this instrument in the Indonesian context is needed to understand the emotional impact of the pandemic given the phenomena found in previous studies that fear of COVID-19 increased compared to previous pandemics. Disclosure of the condition of fear requires an instrument that has good validity and reliability and is consistent with the culture of Indonesia. The results are proposed to assist the government in implementing programs for the COVID-19 pandemic.

Conclusion

The main objective of this study is to evaluate the validity of the theory of fear by adopting and testing FCV-19S that is culturally translated and adapted in the Indonesian sample. Because there is no previous research that considers empirical data relating to the theory of fear, this study aims to find out whether the FCV-19S is suitable for use in Indonesia. The Indonesian version of FCV-19S reveals high convergent and discriminant validity. The EFA results showed that FCV-19S has two factors. Furthermore, CFA analysis confirms that the two-factor model exhibited a better model fit than the Single-Factor model. We reject the

Single-Factor Model because it does not meet the cut-off criteria and show a model-fit that is much lower than the twodimensional model. The Indonesian version of FCV-19S shows a fairly good reliability coefficient for the overall fear scale. In addition, we reject the Single-Factor Model because of some weak statistical assumptions, and explicitly, the FCV-19S has two different measurement domains " physiological reactions " and " psychological reactions ". These findings indicate that the Indonesian version of FCV-19S is a developmentally appropriate instrument that can be used to examine the fear of COVID-19 in Indonesia . Thus, future research needs to carry out an analysis of the validity of other contracts such as MTMM, considering that Indonesia has a variety of cultures that might lead to different results.

References

Ahorsu, D. K., Lin, C.-Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The fear of COVID-19 scale: development and initial validation. *International journal of mental health and addiction*.

Amin, S. (2020). The psychology of coronavirus fear: Are healthcare professionals suffering from corona-phobia? *International Journal of Healthcare Management*, 1-8.

Asmundson, G. J., & Taylor, S. (2020). How health anxiety influences responses to viral outbreaks like COVID-19: What all decision-makers, health authorities, and health care professionals need to know. *Journal of Anxiety Disorders, 71*, 102211.

Brown, T. A. (2015). *Confirmatory factor analysis for applied research*: Guilford publications.

Chakraborty, A., & Karmakar, S. (2020). Impact of COVID-19 on Obsessive Compulsive Disorder (OCD). *Iranian Journal of Psychiatry, 15*(3), 256-259.

Dsouza, D. D., Quadros, S., Hyderabadwala, Z. J., & Mamun, M. A. (2020). Aggregated COVID-19 suicide incidences in India: Fear of COVID-19 infection is the prominent causative factor. *Psychiatry research*, 113145.

Fitzpatrick, K. M., Harris, C., & Drawve, G. (2020). Fear of COVID-19 and the mental health consequences in America. *Psychological trauma: theory, research, practice, and policy*.

Goyal, K., Chauhan, P., Chhikara, K., Gupta, P., & Singh, M. P. (2020). Fear of COVID 2019: First suicidal case in India! *Asian journal of psychiatry, 49*, 101989.

Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). Multivariate data analysis: A global perspective (Vol. 7): Upper Saddle River, NJ: Pearson.

Hair, J. F., W.C., B., Babin, B.J., Anderson, R. E., & Tatham, R. L. (2014). *Multivariate Data Analysis. Prentice hall*. West Sussex, United Kingdom: Upper Saddle River.

Harper, C. A., Satchell, L. P., Fido, D., & Latzman, R. D. (2020). Functional fear predicts public health compliance in the COVID-19 pandemic. *International journal of mental health and addiction*.

Khan, K. S., Mamun, M. A., Griffiths, M. D., & Ullah, I. (2020). The mental health impact of the COVID-19 pandemic across different cohorts. *International journal of mental health and addiction*, 1-7.

Kontoangelos, K., Economou, M., & Papageorgiou, C. (2020). Mental health effects of COVID-19 pandemia: a review of clinical and psychological traits. *Psychiatry investigation, 17*(6), 491.

Liang, Y., Chen, M., Zheng, X., & Liu, J. (2020). Screening for Chinese medical staff mental health by SDS and SAS during the outbreak of COVID-19. *Journal of psychosomatic research, 133*, 110102.

Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., . . . Wang, Y. (2020). Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. *Psychiatry research*, 112921.

Liu, S., Yang, L., Zhang, C., Xiang, Y.-T., Liu, Z., Hu, S., & Zhang, B. (2020). Online mental health services in China during the COVID-19 outbreak. *The Lancet Psychiatry, 7*(4), e17-e18.

Mamun, M. A., Bodrud-Doza, M., & Griffiths, M. D. (2020). Hospital suicide due to non-treatment by healthcare staff fearing COVID-19 infection in Bangladesh? *Asian journal of psychiatry, 54*, 102295.

Menzies, R. E., & Menzies, R. G. (2020). Death anxiety in the time of COVID-19: Theoretical explanations and clinical implications. *The Cognitive Behaviour Therapist, 13*.

Pakpour, A. H., & Griffiths, M. D. (2020). The fear of COVID-19 and its role in preventive behaviors. *Journal of Concurrent Disorders*.

Raykov, T., Dimitrov, D. M., & Asparouhov, T. (2010). Evaluation of scale reliability with binary measures using latent variable modeling. *Structural Equation Modeling, 17*(2), 265-279.

Ren, S.-Y., Gao, R.-D., & Chen, Y.-L. (2020). Fear can be more harmful than the severe acute respiratory syndrome coronavirus 2 in controlling the corona virus disease 2019 epidemic. *World journal of clinical cases, 8*(4), 652.

Satici, B., Gocet-Tekin, E., Deniz, M. E., & Satici, S. A. (2020). Adaptation of the Fear of COVID-19 Scale: Its association with psychological distress and life satisfaction in Turkey. *International journal of mental health and addiction*, 1.

Sher, L. (2020). The impact of the COVID-19 pandemic on suicide rates. *QJM: An International Journal of Medicine, 113*(10), 707-712.

Standish, K. (2020). A coming wave: suicide and gender after COVID-19. *Journal of Gender Studies*, 1-5.

Steimer, T. (2002). The biology of fear-and anxiety-related behaviors. *Dialogues in clinical neuroscience, 4*(3), 231.

Thompson, B. (2004). *Exploratory and confirmatory factor analysis*: American Psychological Association.

Wammerl, M., Jaunig, J., Mairunteregger, T., & Streit, P. (2019). The German Version of the PERMA-Profiler: Evidence for Construct and Convergent Validity of the PERMA Theory of Well-Being in German Speaking Countries. *Journal of Well-Being Assessment, 3*(2-3), 75-96.

Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology, 44*(3), 219-246.

Weems, C. F., Carrion, V., Mccurdy, B., & Scozzafava, M. D. (2020). Increased risk of suicide due to economic and social impacts of social distancing measures to address the Covid-19 pandemic: A forecast. *Res Prepr*, 0-9.

Xiang, Y.-T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., & Ng, C. H. (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The Lancet Psychiatry, 7*(3), 228-229.

Zolotov, Y., Reznik, A., Bender, S., & Isralowitz, R. (2020). COVID-19 fear, mental health, and substance use among Israeli university students. *International journal of mental health and addiction*, 1-7.