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Amir H. Pakpour, Mark D. Griffiths, Kun-Chia Chang, Yu-Pin Chen, Yi-Jie Kuo, Chung-Ying Lin

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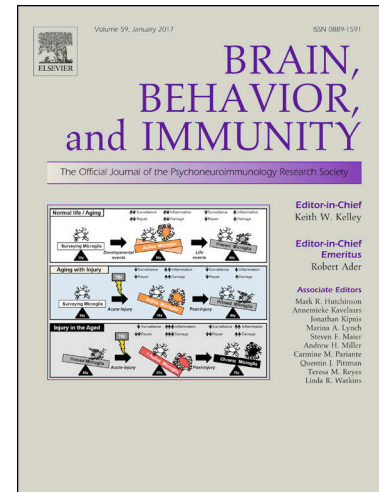
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Assessing the fear of COVID-19 among different populations: A response to Ransing et al. (2020)

Amir H. Pakpour^{1,2}, Mark D. Griffiths³, Kun-Chia Chang^{4,5}, Yu-Pin Chen^{6,7}, Yi-Jie Kuo^{6,7},
Chung-Ying Lin⁸

¹ Social Determinants of Health Research Center, Research Institute for prevention of Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin 3419759811, Iran

² Department of Nursing, School of Health and Welfare, Jönköping University, Jönköping, Sweden

³ International Gaming Research Unit, Psychology Department, Nottingham Trent University, Nottingham, UK

⁴ Jianan Psychiatric Center, Ministry of Health and Welfare, Tainan, Taiwan

⁵ Department of Natural Biotechnology, NanHua University, Chiayi 622, Taiwan

⁶ Department of Orthopedic Surgery, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan

⁷ Department of Orthopedic Surgery, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan

⁸ Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hung Hom, Hong Kong

Correspondence: C.-Y. Lin, PhD, Department of Rehabilitation Sciences, Faculty of Health and Social Sciences, The Hong Kong Polytechnic University, 11 Yuk Choi Rd, Hung Hom, Hong Kong. **E-mail:** cylin36933@gmail.com; cy.lin@polyu.edu.hk; **Tel:** 852-2766-6755; **Fax:** 852-2330-8656

Drs. Amir H. Pakpour and Mark D. Griffiths equally contributed to the paper.

Dear editors,

Ransing et al.¹ recently summarized the current available instruments for assessing mental health issues relating to the COVID-19 pandemic in *Brain, Behavior, and Immunity*. Among the four instruments reviewed by Ransing et al.¹ was the Fear of COVID-19 Scale (FCV-19S) that we co-developed and rated as having the most evidence in relation to its psychometric properties. While the Coronavirus Anxiety Scale (CAS)² and the Obsession with COVID-19 Scale (OCS)³ both have versions in other languages, only their English version has been psychometrically validated. Moreover, the COVID Stress Scale (CSS)⁴ has only been validated in English. However, the FCV-19S, as reviewed by Ransing et al.¹, has been translated into different language versions and tested in different country populations. Ransing et al.¹ recommend there is a need to translate, validate, and cultural-adapt the existing instruments. We would like to point out that the FCV-19S has already been validated in many languages with good psychometric properties including English⁵, Persian⁶, Bangla⁷, Italian⁸, Hebrew⁹, Arabic¹⁰, Russian¹¹, and Turkish¹²). We are also aware that there are other versions currently under review including versions in Spanish, Japanese, Hindi, Malaysian, and Polish. To the best of our knowledge, these research teams have also found good psychometric properties for the FCV-19S. Therefore, we are confident that the FCV-19S has already fulfilled the recommendation made by Ransing et al.¹ Moreover, the FCV-19S is arguably more theoretically grounded than other COVID-19-related instruments in that it was developed using the Protection Motivation Theory¹³, while the other three instruments do not report any theoretical framework to support their development.

However, we would like to clarify the remarks made by Ransing et al.¹ regarding the unstable factor structure of the FCV-19S (i.e., a two-factor structure found in the Russian FCV-19S¹¹). In addition to the Russian version, the Hebrew FCV-19S⁹ also reported a two-factor structure. However, we are of the opinion that the two-factor structure proposed by

both the Russian and Hebrew versions are a consequence of their inappropriate use of principal component analysis (PCA) or exploratory factor analysis (EFA). Given that many language versions of the FCV-19S^{6-8,10,12} confirmed its unidimensional structure, the use of PCA or EFA is not justified because a confirmatory factor analysis (CFA) should have been performed.¹⁴ Only if the researchers have strong reasons to doubt the theoretical framework, should they have considered applying EFA for further understanding in an instrument's factor structure.

Ransing et al.¹ also recommend validating the instruments among vulnerable populations, including elderly, children, adolescents, young adults, and people with pre-existing physical and mental illness. We totally agree with the recommendation and would like to respond that we have already collected FCV-19S among individuals with mental illness, elderly people who have visited an outpatient department in a medical center, and adolescents. The collections were all face-to-face interviews and administered by several research assistants and online surveys. Those with mental illness (n=516; 294 males; mean age=47.5 years) were interviewed between March 23 and May 15, 2020 from the Jianan Psychiatric Center, Taiwan. Elderly individuals (n=139; 42 males; mean age=71.7) were interviewed between May 1 and 15, 2020 from the Wan Fang Hospital, Taiwan. The adolescents (n=582; 274 males; mean age=18.02 years) completed an online survey between March and April 2020 from a Bangla community⁷. Utilizing CFA with the estimator of diagonally weighted least squares, we found that the FCV-19S also supported the unidimensional structure in the three vulnerable samples (Table 1). Therefore, we believe that the FCV-19S can assess fear of COVID-19 among clinical and vulnerable samples. Nevertheless, we agree with the other future directions proposed by Ransing et al.¹ regarding the need for the development of both clinically administered instruments and instruments assessing stigma¹⁵.

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Table 1. Factor structure of the Fear of COVID-19 Scale (FCV-19S) in three vulnerable samples

Item #	Mental illness	Elderly	Adolescent
	Factor loading		
F1	0.66	0.72	0.72
F2	0.81	0.54	0.66
F3	0.82	0.29	0.73
F4	0.82	0.65	0.77
F5	0.85	0.77	0.69
F6	0.82	0.46	0.64
F7	0.86	0.38	0.65
Fit statistics			
χ^2 (df)/ p	44.97 (14)/ <0.001	24.10 (14)/ 0.045	21.53 (14)/ 0.09
CFI	0.992	0.960	0.997
TLI	0.989	0.941	0.995
RMSEA	0.066	0.072	0.030
90% CI of RMSEA	0.045, 0.087	0.011, 0.120	0.000, 0.055

CFI=comparable fit index; TLI=Tucker-Lewis index; RMSEA=root mean square error of approximation.