

## Science of Nursing and Health Practices Science infirmière et pratiques en santé



# Translation of the Fear of COVID-19 Scale into French-Canadian and English-Canadian and Validation in the Nursing Staff of Quebec

## Traduction de l'échelle de la peur de la COVID-19 en langues franco et anglo-canadiennes et validation auprès du personnel infirmier du Québec

Céline Gélinas, Christine Maheu, Mélanie Lavoie-Tremblay, Mélissa Richard-Lalonde, Maria Cecilia Gallani, Émilie Gosselin, Maude Hébert, Eric Tchouaket Nguemeleu et José Côté

Volume 4, numéro 1, juin 2021

COVID-19

URI : <https://id.erudit.org/iderudit/1077985ar>

DOI : <https://doi.org/10.7202/1077985ar>

[Aller au sommaire du numéro](#)

Éditeur(s)

Réseau de recherche en interventions en sciences infirmières du Québec (RRISIQ)

ISSN

2561-7516 (numérique)

[Découvrir la revue](#)

Citer cet article

Gélinas, C., Maheu, C., Lavoie-Tremblay, M., Richard-Lalonde, M., Gallani, M. C., Gosselin, É., Hébert, M., Tchouaket Nguemeleu, E. & Côté, J. (2021). Translation of the Fear of COVID-19 Scale into French-Canadian and English-Canadian and Validation in the Nursing Staff of Quebec. *Science of Nursing and Health Practices / Science infirmière et pratiques en santé*, 4(1), 1–23. <https://doi.org/10.7202/1077985ar>

Résumé de l'article

**Introduction** : Le Québec est une province grandement affectée par la COVID-19 au Canada. La peur de la COVID-19 est inévitable chez les travailleurs de la santé. Une échelle de la peur de la COVID-19 a été développée pour mesurer ce type de peur. **Buts** : Traduire l'échelle en versions franco- et anglo-canadiennes, et valider son utilisation auprès du personnel infirmier du Québec. **Méthodes** : Une enquête électronique a été réalisée auprès d'environ 15 000 membres du personnel infirmier incluant des infirmières et des infirmières auxiliaires qui ont consenti à être contactées via leur ordre professionnel respectif. Une méthode de double traduction inverse a été utilisée. Des questionnaires mesurant des variables associées au stress et au travail ont été utilisés dans le processus de validation. **Résultats** : Un total de 1708 membres du personnel infirmier, majoritairement des femmes, ont complété l'enquête (1517 et 191 pour les versions franco- et anglo-canadiennes). Une échelle unidimensionnelle a été confirmée pour les deux versions (alphas de Cronbach de 0,90 et 0,88). Des scores plus élevés de peur ont été obtenus chez les femmes et dans la génération X (40-56 ans). Une peur plus élevée a aussi été rapportée chez le personnel infirmier en soins de longue durée, ayant soigné des patients COVID-19 qui sont décédés, et ayant rapporté un faible niveau de préparation. Des associations de convergence ont été obtenues entre la peur de la COVID-19 et les mesures de stress et du travail. **Discussion et conclusion** : Une approche rigoureuse a été utilisée pour la traduction de cette échelle. Les versions franco et anglo-canadiennes ont démontré une échelle unidimensionnelle valide chez des membres du personnel infirmier du Québec.

© Céline Gélinas, Christine Maheu, Mélanie Lavoie-Tremblay, Mélissa Richard-Lalonde, Maria Cecilia Gallani, Émilie Gosselin, Maude Hébert, Eric Tchouaket Nguemeleu and José Côté, 2021



Ce document est protégé par la loi sur le droit d'auteur. L'utilisation des services d'Érudit (y compris la reproduction) est assujettie à sa politique d'utilisation que vous pouvez consulter en ligne.

<https://apropos.erudit.org/fr/usagers/politique-dutilisation/>

Érudit

Cet article est diffusé et préservé par Érudit.

Érudit est un consortium interuniversitaire sans but lucratif composé de l'Université de Montréal, l'Université Laval et l'Université du Québec à Montréal. Il a pour mission la promotion et la valorisation de la recherche.

<https://www.erudit.org/fr/>

## Translation of the Fear of COVID-19 Scale into French-Canadian and English-Canadian and Validation in the Nursing Staff of Quebec

### Traduction de l'échelle de la peur de la COVID-19 en langues franco et anglo-canadiennes et validation auprès du personnel infirmier du Québec

**Céline Gélinas**, inf., Ph. D., Professeure titulaire, École des sciences infirmières Ingram, Université McGill, Chercheuse, Centre de recherche en sciences infirmières et Institut Lady Davis, CIUSSS Centre-Ouest-de-l'Île-de-Montréal, Hôpital général juif

**Christine Maheu**, inf., Ph. D., Professeure agrégée, École des sciences infirmières Ingram, Université McGill, Chercheuse, Centre universitaire de santé de McGill

**Mélanie Lavoie-Tremblay**, inf., Ph. D., Professeure agrégée, École des sciences infirmières Ingram, Université McGill

**Mélissa Richard-Lalonde**, inf., M. Sc., Ph. D.(c), École des sciences infirmières Ingram, Université McGill, Coordinatrice de recherche clinique, Centre de recherche en sciences infirmières, CIUSSS Centre-Ouest-de l'Île-de-Montréal, Hôpital général juif

**Maria Cecilia Gallani**, inf., Ph. D., Professeure titulaire, Faculté des sciences infirmières, Université Laval, Chercheuse, Centre de recherche de l'Institut universitaire de cardiologie et de pneumologie de Québec

**Émilie Gosselin**, inf., Ph. D., Professeure adjointe, École des sciences infirmières, Université de Sherbrooke

**Maude Hébert**, inf., Ph. D., Professeure agrégée, Département des sciences infirmières, Université du Québec à Trois-Rivières

**Eric Tchouaket Nguemeleu**, Ph. D., Professeur agrégé, Département des sciences infirmières, Université du Québec en Outaouais

**José Côté**, inf., Ph. D., Professeure titulaire, Faculté des sciences infirmières, Université de Montréal, titulaire de la Chaire de recherche sur les nouvelles pratiques de soins infirmiers, Chercheuse, Centre de recherche du Centre Hospitalier de l'Université de Montréal

#### Correspondance | Correspondence:

Céline Gélinas, inf., Ph. D.

Professeure titulaire

École des sciences infirmières Ingram, Université McGill

680, rue Sherbrooke Ouest, 18<sup>e</sup> étage, suite 1800, Montréal, QC, Canada, H3A 2M7

[celine.gelinas@mcgill.ca](mailto:celine.gelinas@mcgill.ca)

## Keywords

Fear of COVID-19 Scale; translation; validation; nurses; licensed practical nurses; French-Canadian; English-Canadian

## Abstract

**Introduction:** During the COVID-19 pandemic, Quebec has been one of the most affected provinces in Canada. Rising fear of COVID-19 is inevitable among healthcare workers, and a new scale was developed to measure this type of fear, the Fear of COVID-19 Scale (FCV-19S). **Aims:** To translate the FCV-19S into French-Canadian and English-Canadian, and to validate both versions in the nursing staff from Quebec. **Methods:** A cross-sectional online survey was sent to approximately 15 000 nursing staff including nurses and licensed practical nurses among those who had consented to their respective Order to be contacted for research. The forward-backward method was used to translate the FCV-19S into French-Canadian and English-Canadian. Both versions along with stress and work-related questionnaires, were used to establish validity. **Results:** A total of 1708 nursing staff, with a majority of women, completed the survey (1517 and 191 completed the French-Canadian and English-Canadian versions). A unidimensional scale was confirmed for both versions with Cronbach alphas of 0.90 and 0.88. Discriminative values showed higher fear levels in women, and in generation X (40-56 years old). Higher fear levels were also found in nursing staff working in long-term care facilities, provided care to COVID-19 patients who died, and those who felt less prepared to provide safe care. Convergent associations were found between fear levels, stress, work satisfaction, and turnover intention. **Discussion and conclusion:** A rigorous approach was used to translate the fear of COVID-19 scale into French-Canadian and English-Canadian. Both Canadian versions of the FCV-19S supported a valid unidimensional scale in Quebec nursing staff.

## Résumé

**Introduction :** Le Québec est une province grandement affectée par la COVID-19 au Canada. La peur de la COVID-19 est inévitable chez les travailleurs de la santé. Une échelle de la peur de la COVID-19 a été développée pour mesurer ce type de peur. **Buts :** Traduire l'échelle en versions franco- et anglo-canadiennes, et valider son utilisation auprès du personnel infirmier du Québec. **Méthodes :** Une enquête électronique a été réalisée auprès d'environ 15 000 membres du personnel infirmier incluant des infirmières et des infirmières auxiliaires qui ont consenti à être contactées via leur ordre professionnel respectif. Une méthode de double traduction inverse a été utilisée. Des questionnaires mesurant des variables associées au stress et au travail ont été utilisés dans le processus de validation. **Résultats :** Un total de 1708 membres du personnel infirmier, majoritairement des femmes, ont complété l'enquête (1517 et 191 pour les versions franco- et anglo-canadiennes). Une échelle unidimensionnelle a été confirmée pour les deux versions (alphas de Cronbach de 0,90 et 0,88). Des scores plus élevés de peur ont été obtenus chez les femmes et dans la génération X (40-56 ans). Une peur plus élevée a aussi été rapportée chez le personnel infirmier en soins de longue durée, ayant soigné des patients COVID-19 qui sont décédés, et ayant rapporté un faible niveau de préparation. Des associations de convergence ont été obtenues entre la peur de la COVID-19 et les mesures de stress et du travail. **Discussion et conclusion :** Une approche rigoureuse a été utilisée pour la traduction de cette échelle. Les versions franco et anglo-canadiennes ont démontré une échelle unidimensionnelle valide chez des membres du personnel infirmier du Québec.

## Mots-clés

Échelle de la peur de la COVID-19; traduction; validation; infirmières; infirmières-auxiliaires; langue canadienne-française; langue canadienne-anglaise

## INTRODUCTION

---

As of April 27, 2021, the province of Quebec registered more than 345 000 people infected with, and over 10 000 deaths from, the coronavirus disease (COVID-19), being one of the most affected provinces in Canada (Gouvernement du Québec, 2021; Public Health Agency of Canada, 2021a). During the first wave of the pandemic in Quebec in the spring of 2020, 3890 out of 5629 deaths (69.1%) were from older adults of residential and long-term care centres (Protecteur du citoyen, 2020). The province of Quebec went through a second wave of the pandemic in the fall of 2020 and the winter of 2021, and a third wave has started at the end of March 2021 (Gouvernement du Québec).

Nursing staff, such as nurses and licensed practical nurses (LPNs), are at the frontline of the effort to prevent and treat the spread of the SARS-CoV-2, having to work over twice the required overtime compared to the previous year (Carrière et al., 2020). Of the confirmed positive COVID-19 cases reported by the Public Health Agency of Canada for Quebec as of March 2021, 15% were healthcare workers, with 3 reported deaths (Public Health Agency of Canada, 2021b).

Fear is a core emotional response to the perceived threat of COVID-19 during the current pandemic (Van Bavel et al., 2020). Fear of COVID-19 was associated with symptoms of stress in frontline nurses (Labrague et al., 2020) and healthcare workers (Khanal et al., 2020). The Fear of COVID-19 Scale (FCV-19S) was developed to measure the level of fear that people might experience toward COVID-19 (Ahorsu et al., 2020). The original version is in Iranian, but it was also made available in English by the authors. So far, the FCV-19S has been translated, adapted and validated in over 35 countries and in at least 20 languages, sometimes by more than one research group for the same language (see Table 1 and Table 2 in Appendix A). Studies have reported good internal consistency, with Cronbach alphas ranging from 0.68 (Reizer et al., 2020) to 0.93 (Bharatharaj et al., 2020; Chang et al., 2020). FCV-19S mean scores varied across populations, from 13 for the general population in Norway (Iversen et al., 2021)

to 27 in a general population in Iran (Ahorsu et al.). Moderate fear levels (mean=19.92, SD=6.15) were reported in 261 frontline nurses from the Philippines (Labrague et al., 2020). Similar fear levels were also found in other studies with healthcare workers, including nurses from Mexico (Garcia-Reyna et al., 2020) and Turkey (Saracoglu et al., 2020).

Most studies (n=26) have concluded that the FCV-19S is a unidimensional scale (Ahorsu et al., 2020; Alyami et al., 2020; Bakioglu et al., 2020; Cavalheiro & Sticca, 2020; Chang et al., 2020; Elemo et al., 2020; Faro et al., 2020; Garcia-Reyna et al., 2020; Giordani et al., 2020; Haktanir et al., 2020; Kaya et al., 2020; Korukcu et al., 2021; Mahmood et al., 2020; Mailliez et al., 2020; Martinez-Lorca et al., 2020; Mercado-Lara et al., 2021; Nguyen et al., 2020; Pang et al., 2020; Perz et al., 2020; Piqueras et al., 2020; Sakib et al., 2020; Satici et al., 2020; Soraci et al., 2020; Stanculescu, 2021; Tsiropoulou et al., 2020; Wakashima et al., 2020; Winter et al., 2020). The unidimensional structure of the scale was also confirmed in a large study with data from eleven countries (Lin et al., 2021). However, some studies (n=9) have reported a two-dimensional scale with four items loading on the emotional/psychological factor (items 1, 2, 4, and 5), and three items loading on the physiological/physical/somatic factor (items 3, 6, and 7) (Andrade et al., 2020; Barrios et al., 2020; Bharatharaj et al., 2020; Caycho-Rodriguez et al., 2020; Chi et al., 2020; Huarcaya-Victoria et al., 2020; Masuyama et al., 2020; Reznik et al., 2020; Tzur Bitan et al., 2020). One study reported a different two-dimensional scale with items 1, 2 and 4 loading on the psychological factor and items 3, 5, 6 and 7 loading on the somatic factor (Iversen et al., 2021).

Socio-demographic characteristics were identified to influence fear of COVID-19. Gender differences in FCV-19S mean scores were identified among healthcare workers, students and the general population in several studies (Alomo et al., 2020; Andrade et al., 2020; Broche-Perez et al., 2020; Caci et al., 2020; Doshi et al., 2020; Garcia-Reyna et al., 2020; Haktanir et al., 2020; Hossain et al., 2020; Iversen et al., 2021; Korukcu et al., 2021; Mahmood et al., 2020; Nguyen et al., 2020; Nikopoulou et al., 2020; Parlapani et al., 2020;

Prazeres et al., 2020; Piqueras et al., 2020; Rahman et al., 2020; Reznik et al., 2020; Sakib et al., 2020; Slijivo et al., 2020; Stanculescu, 2021; Tsipropoulou et al., 2020; Tzur Bitan et al., 2020; Zolotov et al., 2020), but not in others (Ahorsu et al., 2020; Mohammadpour et al., 2020; Perz et al., 2020; Saracoglu et al., 2020; Wakashima et al., 2020). In studies reporting gender differences, women reported higher FCV-19S scores than men. Younger age was also associated with higher fear levels in some studies, including those with nurses (Doshi et al., 2020; Saracoglu et al., 2020).

According to nurses' work characteristics, the study by Labrague and colleagues (2020) reported higher fear scores in part-time nurses compared to those working full-time, and in nurses who did not attend a COVID-19 training. In the same study, a negative association was found between fear of COVID-19 and job satisfaction, and a positive association was found with turnover intention (Labrague et al.).

At the time we proceeded with the translation of the scale (May-June, 2020), no other French version was available. In July 2020, a French version from France was made available in a preprint manuscript (Mailliez et al., 2020). French-Canadian is noticeably different from French spoken in France in addition to the cultural differences. Therefore, validating a French-Canadian version was warranted in light of previous French-translated tools from French-Canadian to French-France (Lonjon et al., 2014).

## PURPOSE AND OBJECTIVES

This study aimed to translate the FCV-19S into French-Canadian (French-CA) and English-Canadian (English-CA), and to validate both versions in the nursing staff population from the province of Quebec, Canada. Specific objectives were to evaluate the:

1. Internal consistency and structure of the French-CA and English-CA versions of the FCV-19S.
2. Discriminative validation of the French-CA version of the scale among nursing staff according to their perceived level of preparedness, those who provided care to COVID-19 patients and those who did not,

professional role, healthcare setting, gender and age.

3. Convergent validation of the French-CA version of the scale with stress-related symptoms, work satisfaction and turnover intention.

## METHODS

---

### DESIGN AND SAMPLE

This methodological study was part of a larger cross-sectional survey. An anonymous online survey was sent to nursing staff in the province of Quebec. Members of the Quebec Order of Nurses (*Ordre des infirmières et infirmiers du Québec - OIIQ*) and the Quebec Order of Licensed Practical Nurses (*Ordre des infirmières et infirmiers auxiliaires du Québec – OIIAQ*) were eligible if they had consented to be contacted for research projects. As established practices in these professional orders, an approximate proportion of 25-30% of these consenting nursing members were randomly selected through their specific order to not overburden members with multiple project invitations within the same period. Out of 28 500 nurses and 24 000 licensed practical nurses (LPN), the invitation to complete the survey was sent to an estimated total of 15 000 members across the province, and we expected a minimum participation rate of 10%.

### PROCEDURES

Ethics approval was obtained from the Medical/Biomedical Research Ethics Committee of the *Centre intégré universitaire de santé et services sociaux (CIUSSS) du Centre-Ouest-Montréal* to conduct this study (2021-2451). OIIQ and OIIAQ members received an email inviting them to complete an anonymous survey online via Qualtrics (2020), a secure web-based electronic data capture system. A link was provided and led them to an introduction letter and consent. If they agreed to participate, they were granted access to the survey. The survey was available from July 22 to November 16, 2020, and could only be completed once per participant. Two reminders at a minimum of two-week interval were sent.

Considering that nurses and LPNs are French or English-Canadian speakers, participants could choose their preferred language (French- or English-Canadian) to complete the survey.

## INSTRUMENTS

For discriminative and convergent validation of the French-CA version of the FCV-19S, selected variables were used including the psychological distress K6 scale, the Patient Health Questionnaire on depression symptoms, work satisfaction and turnover intention as well as socio-demographic and work-related characteristics during the pandemic.

**The Fear of COVID-19 Scale.** The FCV-19S was developed using several steps, including an extensive literature review on general fear scales and item pooling, content evaluation with experts from various disciplines (i.e., health education, psychology, medicine, nursing, and sociology), cognitive interviews and pilot testing with 46 individuals from the general population (Ahorsu et al., 2020). The FCV-19S includes 7 items, each rated on a Likert scale from 1 (strongly disagree) to 5 (strongly agree), for a total score from 7 to 35. Higher scores represent greater fear of COVID-19 (Ahorsu et al.). The original Iranian version of FCV-19S was found to include one main factor with a Cronbach alpha of 0.82. After obtaining permission from the primary author of the scale (Ahorsu), we translated the English version of the FCV-19S into French-CA and English-CA using a double forward-backward method inspired by Sousa and Rojjanasrirat (2011). Two bilingual French-Canadian speakers (one with experience in health care terminology and one with colloquial phrases) independently translated the English version into French-CA. Any discrepancies were resolved via discussion as part of a committee including the bilingual French-Canadian speakers and two research team members with expertise in tool translation and development to produce a preliminary French-CA version of the FCV-19S. For most items, the exact same wording in French-Canadian was used by both individuals who did the translation. Minor edits were made to some words (e.g., “réseaux sociaux” to “médias sociaux”, “mal à l’aise” to “inconfortable”). The translation of

“losing my life” (item 4) led to further discussion as it was translated as “perdre ma vie” and “mourir” by each individual. We made the decision to keep “perdre ma vie” as it was felt that the meaning was related to broader aspects of life. This preliminary French-CA version then underwent blind backward translation into English-Canadian by two other bilingual speakers (one familiar with health care terminology, and one with the use of colloquial phrases) blind to the scale. The preliminary French-CA and the two back-translated English-CA versions were compared to the English version of the scale (Ahorsu et al.) and discussed within a larger committee involving all four individuals who translated the scale and three research team members with expertise in tool translation and development. Most items were back-translated with the exact same wording as the English version except for “scared” (item 1 – afraid) and “moist” and “sweaty” (item 3 – my hands become clammy). The committee agreed that the meaning was preserved as terms were synonyms. Again, “perdre ma vie” was back-translated into “losing my life” and “dying.” In order to be consistent with our decision and the English version (Ahorsu et al.), it was decided to keep “losing my life.” To better fit with the English-Canadian language, minor edits were made to the English version of the scale (item 1: “most afraid” was changed for “very afraid”, item 5: “I become nervous or anxious” was moved at the beginning of the sentence). Finally, “coronavirus” was changed for “COVID-19” in both the French-CA and English-CA versions. Both versions of the FCV-19S can be found in Table 4.

**Stress-Related Measures.** The K6 psychological distress questionnaire includes 6 items rated on a 5-level descriptive scale (0= none of the time to 4= all of the time) (Kessler et al., 2002). Areas Under the Curve (AUC) >0.80 for the K6 were obtained with DSM-IV, or World Health Organization structured interviews as reference criteria in the general population (Kessler et al., 2002, 2003, 2010). A cut-off score of 13 or higher has been established to identify individuals with nonspecific serious psychological distress (Kessler et al., 2003). In this study sample, internal consistency was supported with Cronbach alphas of 0.87 and 0.88 for the French and English versions of K6.

The 9-item Patient Health Questionnaire (PHQ-9: Kroenke & Spitzer, 2002) is rated on a 4-level descriptive scale (0=Not at all to 3=Nearly everyday) with a total score ranging from 0 to 27. The PHQ-9 is a depression screening tool with scores from 0 to 4 indicating no to minimal symptoms, 5 to 9 mild symptoms, 10 to 14 moderate depression symptoms, and scores  $\geq 15$  severe symptoms. In this study sample, internal consistency was supported with Cronbach alphas of 0.89 and 0.88 for the French and English versions of PHQ-9. Both the K6 and the PHQ-9 are recommended measures by the *Institut national de santé publique du Québec* (Canuel et al., 2019).

#### **Work Satisfaction and Turnover Intention.**

Work satisfaction was measured using a self-reported single-item (I am satisfied with my work) on a 7-level descriptive scale (do not agree at all to very strongly agree). This single-item measure of work satisfaction has shown to have high correlations with other work satisfaction scales (Wanous et al., 1997). Using the same response scale, turnover intention was assessed with 2 items: professional turnover intention and organisational turnover intention (O'Driscoll & Beehr, 1994). In this study sample, acceptable Cronbach alphas of 0.79 and 0.74 for turnover intention were obtained for the French and English versions.

**Socio-Demographic and Work-Related Characteristics.** Socio-demographic included self-identified gender, age and generation. Work-related characteristics included professional role (nurses or LPN), years of experience (current setting and profession), healthcare setting (acute care, long-term care, and other), perception of preparedness to offer safe care during the COVID-19 pandemic (very well prepared to very poorly prepared), provided care to COVID-19 patients or not, and had provided care to COVID-19 patients who died.

#### **DATA ANALYSIS**

Descriptive statistics were obtained for all variables. According to the level of measurement of each variable, frequencies (%), means and standard deviations (SD) or medians and interquartile ranges (IQR) were reported. The FCV-19S items of the French-CA and English-CA versions

appeared normally distributed with SDs < means, and kurtosis and skewness indices <  $\pm 2$  (Kim, 2013). Cronbach alphas were calculated for internal consistency of the French-CA and English-CA versions of the FCV-19S. Cronbach alpha values >0.70 are considered acceptable (Streiner et al., 2015). Exploratory Factor Analysis (EFA) was performed for both versions of the scale to examine its internal structure as a strategy of construct validity. We expected to find one dominant factor with a high eigenvalue (>1) (Tabachnick & Fidell, 2019) and explaining more than 50% of the COVID-19 fear variance. Confirmatory Factor Analysis (CFA) was also performed using IBM SPSS Amos, Version 26.0 (Arbuckle, 2014) to confirm each version's unidimensional structure, and model fit indices were reported. We expected a ratio of  $\chi^2$  to  $df$  <3, comparative fit index (CFI) >0.95, and root mean square error of approximation (RMSEA) <0.06 for good model fit (Schreiber et al., 2006). As a common rule, 10 to 20 participants per item with a minimum sample size of 100 to 200 is required to run factor analysis for scales with well-determined factors (Tabachnick & Fidell). Therefore, our samples of 1517 and 191 nursing staff participants for each version were appropriate to run our factor analyses. We had no missing data for the FCV-19S.

Further analyses included t-tests and one-way analyses of variance (ANOVA) using relevant socio-demographic and work characteristics. Power analysis was done using G\*Power 3.1 (Faul et al., 2007). Considering ratios of 0.2 and 0.3 as compared groups were not of equal size, a sample size > 1000 participants was required to perform t-tests ( $\alpha=.01$ ; 80% power; effect size=0.25). A minimum of 275 participants was also required to perform one-way ANOVAs ( $\alpha=.01$ ; 80% power; effect size=0.25) with up to 5 compared groups. Therefore, other validation objectives were achieved using the French-CA version of the scale. More specifically, t-tests or ANOVAs were performed to examine discriminative validation between groups according to socio-demographic (gender, generation) and work (professional role, healthcare setting, job status, preparedness and exposure to COVID-19) characteristics. Post-hoc tests (Fisher LSD or Tukey HSD) were done to allow for subgroup comparisons. A Pearson or Spearman

correlation was calculated between the FCV-19S, psychological distress, depression symptoms, work satisfaction and turnover intention. Subgroup analyses (t-tests, one-way ANOVA) were performed with cut-off scores of psychological distress and depression symptoms. The alpha was set at .01 with Bonferroni correction for multiple tests. We used IBM SPSS Statistics for Windows, Version 24.0. (IBM Corp., 2016). We had less than 3% missing data in independent variables used for discriminative and convergent validation objectives which were not replaced in data analysis.

## RESULTS

---

### SAMPLE DESCRIPTION

A total of 1708 nursing staff respondents, for an estimated participation rate of 11%, completed the FCV-19S i.e., 1517 and 191 completed the French-CA and the English-CA versions, respectively. As expected for nursing staff, the majority were women. Participants were in the middle ages, and all administrative areas of the province of Quebec were represented with a proportion of 60% from Montréal, the south shore (Montérégie and Estrie) and the North Shore (Laval and Laurentides). Participants were experienced nursing staff working in acute care, long-term care and other settings (e.g., community care, mental health, public health). Almost half of the participants reported that they provided care to COVID-19 patients, and among them 60% had provided care to COVID-19 patients who died. All sample characteristics are described in Table 3. The level of fear of COVID-19 for the total sample (n=1708) was moderate (mean=17.03, SD=6.18).

### INTERNAL CONSISTENCY AND STRUCTURE OF THE FEAR OF COVID-19 SCALE: FRENCH-CA AND ENGLISH-CA VERSIONS

Internal consistency was supported with Cronbach alphas of 0.90 and 0.88 for the French-CA and English-CA versions of the scale (Table 4). In the French-CA version, moderate inter-item correlations ranged from 0.47 to 0.74 ( $p<.001$ ). In the English-CA version, moderate inter-item

correlations were also found and ranged from 0.39 to 0.64 ( $p<.001$ ). The Kaiser measure of sampling adequacy was  $>.60$  and the Bartlett's test of sphericity was significant supporting EFA assumptions. Multicollinearity was absent as all inter-item correlations were lower than  $.85$ . EFA revealed one large factor with a high eigenvalue ( $>4$ ), explaining 63.5% and 59.4% of the fear of COVID-19 variance for the French-CA and English-CA versions. Factor loadings were all above 0.65 in both versions of the scale (Table 4). CFA of both versions supported the scale's unidimensionality when taking into account covariances between items' error terms. The French-CA one-factor scale showed good model fit with a ratio of  $\chi^2$  to  $df=2.67$  with CFI=1.00 and RMSEA=0.03. Also, the English-CA one-factor scale showed a good model fit with a ratio  $\chi^2$  to  $df=1.38$ , CFI=0.99, and RMSEA=0.05.

### DISCRIMINATIVE VALIDATION OF THE FRENCH-CANADIAN VERSION OF THE FEAR OF COVID-19 SCALE

Fear of COVID-19 mean scores differed according to various socio-demographic and work characteristics (Table 5). Fear levels tended to be higher in women than men. No correlation was found with age. However, we found differences between generations. Levels of fear were higher in generation X (40-56 years old) compared to generation Y (20-39 years old) (Fisher LSD,  $p=.002$ ) and Baby Boomers (57-74 years old) (Fisher LSD,  $p=.004$ ).

Many differences were associated with work characteristics. Fear levels were higher in LPNs compared to nurses, and in long-term care facilities compared to acute care and other settings (Fisher LSD,  $p<.001$ ). A tendency towards significance was identified for job status (F test,  $p>.01$ ) with higher fear in part-time nursing staff. Higher fear levels were found in nursing staff who reported being poorly prepared to offer safe care during the COVID-19 pandemic. Most group pairs showed different fear levels (Tuckey HSD,  $p<.01$ ) except between groups who reported somewhat poorly and very poorly prepared ( $p=.105$ ). No statistically significant differences in fear levels were found between nursing staff who provided care to COVID-19 patients and those who did not. However, higher fear levels were found in those caring for COVID-19 patients who died.



**Table 3***Sociodemographic and Work Characteristics of the Nursing Staff Participants<sup>a</sup>*

	French-CA (n=1517)	English-CA (n=191)
<b>Gender: n (%)</b>		
Woman	1309 (86.3)	178 (93.2)
Man	175 (11.5)	11 (5.6)
Other or Prefer not to answer	31 (2.0)	2 (1.0)
<b>Age: mean (SD)</b>	41.11 (10.57)	41.03 (12.71)
<b>Profession: n (%)</b>		
LPN	841 (55.4)	75 (39.3)
Nurses	676 (44.6)	116 (60.7)
<b>Years of experience: mean (SD)</b>	14.10 (10.08)	13.34 (11.65)
<b>Years of experience in current establishment: mean (SD)</b>	9.23 (8.23)	8.43 (8.31)
<b>Healthcare Setting: n (%)</b>		
Acute care	454 (29.9)	57 (29.8)
Long-term care	505 (33.3)	56 (29.3)
Other <sup>b</sup>	558 (36.8)	78 (40.8)
<b>Provided care to COVID-19 patients: n (%)</b>	679 (44.8)	103 (53.9)
<b>Provided care to COVID-19 patients (n=782) who died: n (%)</b>	408 (60.1)	60 (58.3)
<b>Fear of COVID-19 total score: mean (SD)</b>	16.88 (6.18)	18.25 (6.08)

Note. SD = standard deviation

<sup>a</sup> Totals differ due to few missing data (1-25) for these variables: Gender, Age, Years of experience, Years of experience in current establishment, Provided care to COVID-19 patients, Provided care to COVID-19 patients who died.

<sup>b</sup> Other healthcare settings include community care, mental health, public health, COVID screening clinic, *Info-Santé*, Info-Social, rehabilitation.

### CONVERGENT VALIDATION OF THE FRENCH-CANADIAN VERSION OF THE FEAR OF COVID-19 SCALE

A moderate level of psychological distress was found in this sample with a mean of 8.17 (SD=5.05), and it was positively correlated with fear of COVID-19 ( $r=0.38$ ,  $p<.001$ ). Nursing staff who reached the cut-off score  $\geq 13$  had a greater level of fear compared to those who did not (Table 5). Mild depression symptoms were found in this sample with a PHQ-9 mean of 6.44 (SD=5.61) which were positively correlated with fear of COVID-19 ( $r=0.31$ ,  $p<.001$ ). Significant differences in fear scores were found between the four categories of depression symptoms (Table 5). Post-hoc tests demonstrated significantly higher fear scores in

most group pairs (Tukey HSD,  $p<.001$ ) except between nurses with mild and moderate symptoms ( $p=.116$ ) and between nurses with moderate and severe symptoms ( $p=.090$ ). Nursing staff with no or minimal depression symptoms had lower fear scores compared to all other groups ( $p<.001$ ).

Work satisfaction was moderate to high with a median of 5 (IQR=3-6) and was negatively associated with fear of COVID-19 (Spearman rho correlation =  $-0.18$ ,  $p<.001$ ). Professional (median=2, IQR=1-4) and organisational (median=3, IQR=1-5) turnover intention were both positively associated with fear of COVID-19 (Spearman rho correlations of 0.17 and 0.15,  $p<.001$ ).

**Table 4***Exploratory Factor Analysis of the French-CA and English-CA Versions of the Fear of COVID-19 Scale*

Item	French-CA (n=1517)		English-CA (n=191)	
	Mean (SD)	Factor loading	Mean (SD)	Factor loading
1. <i>J'ai très peur de la COVID-19 / I am very afraid of COVID-19</i>	2.88 (1.10)	0.72	3.14 (1.06)	0.70
2. <i>Ça me rend inconfortable de penser à la COVID-19 / It makes me uncomfortable to think about COVID-19</i>	2.88 (1.12)	0.71	2.99 (1.11)	0.66
3. <i>Mes mains deviennent moites lorsque je pense à la COVID -19 / My hands become clammy when I think about COVID-19</i>	1.90 (0.97)	0.76	2.03 (1.11)	0.74
4. <i>J'ai peur de perdre ma vie à cause de la COVID-19 / I am afraid of losing my life because of COVID-19</i>	2.41 (1.25)	0.78	2.68 (1.26)	0.68
5. <i>Je deviens nerveux-se ou anxieux-se lorsque je regarde les nouvelles et les histoires sur la COVID-19 dans les médias sociaux / I become nervous or anxious when watching news and stories about COVID-19 on social media</i>	2.82 (1.24)	0.74	3.04 (1.23)	0.75
6. <i>Je ne peux pas dormir car je m'inquiète d'attraper la COVID-19 / I cannot sleep because I'm worrying about getting COVID-19</i>	1.85 (0.96)	0.77	2.14 (1.07)	0.73
7. <i>Mon coeur bat très rapidement ou palpite lorsque je pense à la possibilité d'attraper la COVID-19 / My heart races or palpitates when I think about getting COVID-19</i>	2.13 (1.12)	0.82	2.23 (1.16)	0.81
Kaiser measure of sampling adequacy		0.90	0.88	
Bartlett's test of sphericity		p<.001	p<.001	
Eigenvalue		4.44	4.16	
% of explained variance		63.5%	59.4%	
Cronbach alpha		0.90	0.88	

Note. Each item was rated on a Likert scale from 1=strongly disagree to 5=strongly agree.

**Table 5**

*Associations between socio-demographic, work-related characteristics and Fear of COVID-19 scores (French-CA version, N=1517)<sup>a</sup>*

Variable	Description (n)	Fear of COVID-19: mean (SD)	Statistical Test	p value
Gender	Woman (n=1309)	16.98 (6.17)	t= 2.15	.032
	Man (n=175)	15.92 (6.04)		
Generation	Y (n=715)	16.49 (5.99)	F= 7.07	.001
	X (n=674)	17.51 (6.42)		
	Baby Boomers (n=122)	15.76 (5.58)		
Professional role	Nurse (n=676)	15.78 (5.51)	t= 6.41	<.001
	Licensed Practical Nurse (n=841)	17.76 (6.54)		
Healthcare Setting	Acute Care (n=454)	16.39 (5.88)	F= 22.25	<.001
	Long-Term Care (n=505)	18.33 (6.58)		
	Other (n=558)	15.96 (5.81)		
Job Status	Full-time (n=1024)	16.61 (6.05)	F= 3.25	.039
	Part-time (n=455)	17.49 (6.41)		
	Other (n=38)	16.82 (6.45)		
Preparedness to offer safe care during the COVID-19 pandemic	Very well prepared (n=220)	14.69 (5.95)	F=18.89	<.001
	Somewhat well prepared (n=825)	16.70 (5.82)		
	Somewhat poorly prepared (n=369)	17.87 (6.56)		
	Very poorly prepared (n=97)	19.44 (6.40)		
Provided care to COVID-19 patients	Yes (n=679)	17.03 (6.43)	t= 0.86	.393
	No (n=836)	16.76 (5.97)		
Provided care to COVID-19 patients (n=679) who died	Yes (n=408)	17.66 (6.60)	t= 3.17	.002
	No (n=270)	16.07 (6.07)		
Psychological Distress (K6)	<13 (n=1202)	16.04 (5.83)	t= -10.20	<.001
	≥13 (n=305)	19.94 (6.45)		
Depression Symptoms (PHQ-9)	0-4 (n=668)	14.95 (5.29)	F= 48.32	<.001
	5-9 (n=448)	17.58 (5.90)		
	10-14 (n=231)	18.67 (6.40)		
	≥15 (n=150)	20.14 (7.40)		

*Note.* Generation Y: born 1981-2000; Generation X: born 1964-1980; Baby Boomers: born 1946-1963.

<sup>a</sup> Totals differ due to few missing data (1-31) for these variables: Gender, Generation, Preparedness, Provided care to COVID-19 patients, Provided care to COVID-19 patients who died, Psychological Distress and Depression Symptoms.

## DISCUSSION

---

We translated the Fear of COVID-19 scale into French-Canadian and English-Canadian using a rigorous translation approach. At the time we did the translation, only the English version provided by Ahorsu and colleagues (2020) was available. Soon after, on June 25<sup>th</sup>, the English-US version (Perz et al., 2020) was published, and on July 22<sup>nd</sup>, the French-France version was made available (Mailliez et al., 2020). Some differences were noted between our French-CA version and the French version from France. More specifically, the terminology from France included the use of “mourir” in item 4, “réseaux sociaux” in item 5, “mon rythme cardiaque accélère” in item 7 as well as the use of “le” instead of “la” COVID-19 in all items. Our English-CA version was very close to the English-US version. The only difference was related to item 4 in which the term “dying” is included in the English-US version.

A unidimensional scale was found in this nursing staff population of Quebec. Indeed, internal consistency and one main factor of fear behaviors related to COVID-19 were supported for both versions. Findings were consistent with those of previous validation studies of the Iranian version (n=717; Ahorsu et al. 2020), the French-France version (n=316; Mailliez et al., 2020), and the English-US version (n=237; Perz et al., 2020) with Cronbach alpha coefficients >0.80, and unidimensional scale (Lin et al., 2021).

In terms of discriminative validation of the French-CA version of the scale using socio-demographic characteristics, we found a tendency towards higher levels of COVID-19 fear by an average of one point on the FCV-19S in women compared to men. Previous studies from other countries among healthcare workers (n=2930, Mexico; Garcia-Reyna et al., 2020) and students in health disciplines (n=5423, Vietnam; Nguyen et al., 2020; n=370, Israel; Zolotov et al., 2020) such as medicine and nursing reported higher fear levels in women than men. Although age did not influence fear levels in our nursing sample, levels of COVID-19 fear were higher in generation X compared to generation Y and Baby Boomers. Generation X is born from 1964 to 1980 (40 to 56 years old).

Considering that the average maternity age is 30 years old in Quebec, individuals from this generation may have children who live with them (La Presse Canadienne, 2010). Also, they may fulfill caregiver roles for their parents. Kumar et al. (2020) identified infecting family members as the most important factor associated with fear faced by healthcare workers (n=329) in Pakistan during the COVID-19 pandemic. Transmission of COVID-19 to their family was the top source of distress in healthcare workers (n=657 with almost half were nurses) from a large medical centre in New York (Schechter et al., 2020). Therefore, nurses from generation X may have been concerned about getting COVID-19 and infecting their family members.

Regarding discriminative validation related to work characteristics, fear levels were higher in nursing staff who work in long-term care facilities, who provided care to COVID-19 patients who died, and were LPN. High fear level in long-term care facilities is consistent in our provincial context, considering that more than half of COVID-19 deaths were reported in these healthcare settings during the first wave of the pandemic in Quebec (Institut national de santé publique du Québec, 2021). Testimonies of healthcare workers' fear were also stated in the Quebec Ombudsman's Progress Report on the first wave of COVID-19 in long-term care facilities (Protecteur du citoyen, 2020). In alignment with this, higher fear levels were found in nursing staff who provided care to COVID-19 patients who died than those who survived. Higher fear was also found in nursing staff who reported being poorly prepared to offer safe care including appropriate nosocomial infection prevention and control interventions during the COVID-19 pandemic (Observations sur les centres d'hébergement de soins longue durée de Montréal, 2020). Interestingly, in a study by Labrague et al. (2020) with a sample of 261 nurses working in COVID-19 designated hospitals in the Philippines, a lower fear level related to COVID-19 was found in nurses who received a COVID-19 training compared to those who did not. Such a finding supports the importance of providing COVID-19 training to nursing staff. Other studies with healthcare workers have shown greater odds of COVID-19 fear or higher fear levels in nurses

compared to other health professionals and support staff (Garcia-Reyna et al., 2020; Khanal et al., 2020). In this methodological study, only nursing staff was included not allowing us to make comparisons with other health disciplines. Moreover, to our knowledge, we are the first research team to include LPN. It must be noted that a higher proportion of LPN (46.4%) worked in long-term care facilities compared to nurses (17.0%) in this study sample. Therefore, higher fear in LPN is coherent in our provincial context, where the highest rate of mortality related to COVID-19 was found in long-term care facilities during the first wave of the pandemic.

According to convergent validation of the French-CA version, positive mild associations ( $r=0.30-0.38$ ) were found between fear of COVID-19, psychological distress and depression symptoms. We must mention that we were the only research team to use the K6 scale, not allowing us to compare our findings with previous studies. These previous studies used the Hospital Anxiety Depression Scale (HADS) or the Job Stress Scale (JSS). Correlations in the range of 0.40-0.50 with these stress measures were found in nurses (JSS in Labrague et al., 2020) and healthcare workers (HADS in Khanal et al., 2020). Similar correlations were found in the general population for the original Iranian version and the French-France versions of FCV-19S with HADS anxiety and depression scores (Ahorsu et al., 2020; Mailliez et al., 2020). Anxiety was also found to be associated with higher fear scores (English-US version) in a student sample (Perz et al., 2020). The PHQ-9 was used by Saracoglu and colleagues (2020), but they did not report associations between depression and fear of COVID-19. Although our correlations with stress-related measures were lower in comparison to these previous studies, they were positive as expected and almost reach a moderate magnitude (Agoklu, 2018). According to convergent validation with work characteristics, our mild correlations ( $<0.30$ ) between COVID-19 fear, work satisfaction, and turnover intention are similar to those found by Labrague et al. (2020) who used the same measure for turnover intention and a similar one for work satisfaction. A mild

negative correlation was found between COVID-19 fear and work satisfaction, and mild positive correlations were obtained with turnover intention. Turnover intention is an important predictor of nurses' actual turnover behaviour (Hayes et al., 2006).

## LIMITATIONS

The participation rate was low, but expected. A potential explanation for this is the timing of the invitation during the summer vacation period. Also, several surveys were launched during the pandemic, and nursing staff was a targeted group in these studies. Nursing staff may also have been solicited to participate in other studies through their healthcare institution. A smaller sample of nursing staff completed the English-CA and due to low power, we could not check for discriminative and convergent validation of the English-CA version of the scale. Our primary goal was to check if the scale structure was consistent and similar for both versions. Our selected stress-related measures differed from those used in other studies, not allowing us to compare our findings with previous studies. As this methodological study was part of a larger cross-sectional survey with broader objectives, we had to select measures with fewer items to minimize the participant's burden.

## IMPLICATIONS FOR NURSING

Fear of COVID-19 was high in Quebec nursing staff and was associated with stress-related symptoms. Training and appropriate resources are essential to provide nursing staff and healthcare workers with adequate preparation and protection from COVID-19. Screening for fear of COVID-19 could help identify nursing staff at higher risk of distress. It could guide the development of further interventions to modify or overcome factors that trigger the fear of COVID-19, such as stressors, lack of information, or low perceived control. In addition, the development of support interventions and safety measures at the workplace and at home are important to reassure nursing staff and healthcare workers.

## CONCLUSION

---

The French-CA and English-CA versions of the FCV-19S resulted in a unidimensional scale. Discriminative and convergent analyses of the French-CA version of the scale support its validity in Quebec nursing staff population. As fear of COVID-19 was associated with stress-related symptoms, it should be addressed in training and support programs. The FCV-19S was validated in a large sample of nursing staff, but further validation testing with other multidisciplinary team members is required to support its validity in the healthcare workforce of Quebec.

---

**Authors' contribution:** CG, MLT and JC designed the study. CG, CM, MH, and MRL participated in the translation process. CG and MRL collected and analyzed the data. CG organized the article. MRL drafted the introduction and CG drafted the objectives, methods, results, and discussion. All authors (CG, CM, MLT, MRL, MCG, EG, MH, ETN and JC) participated in the interpretation of findings, revised critically and approved the final version of the manuscript.

**Acknowledgments:** We wish to thank our collaborators, the OIIQ and OIIAQ, for their input in the survey development and their support with recruitment.

**Funding:** This study was funded by the RRISIQ.

**Statement of conflict of interest:** The authors declare no conflict of interest.

**Ethics certificate number:** Project 2021-2451 was approved by the Medical/Biomedical Research Ethics Committee of the CIUSSS Centre-West-Montréal.

**Reçu/Received:** 17 Jan 2021 **Publié/Published:** Juin 2021

## NOTE

Please contact the corresponding author if you wish to use the French-Canadian Version and English-Canadian Version of the Fear of COVID-19 Scale.

## REFERENCES

---

- Agoklu, H. (2018). User's guide to correlation coefficients. *Turkish Journal of Emergency Medicine*, 18(3), 91-93. <https://doi.org/10.1016/j.tjem.2018.08.001>
- 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*, 1-9. <https://doi.org/10.1007/s11469-020-00270-8>
- Alomo, M., Gagliardi, G., Pelocche, S., Somers, E., Alzina, P., & Prokopez, C. R. (2020). [Psychological effects during the COVID-19 outbreak in Argentina]. *Revista de la Facultad de Ciencias Médicas de Córdoba*, 77(3), 176-181. <https://doi.org/10.31053/1853.0605.v77.n3.28561>
- Alyami, M., Henning, M., Krageloh, C. U., & Alyami, H. (2020). Psychometric evaluation of the arabic version of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction*, 1-14. <https://doi.org/10.1007/s11469-020-00316-x>
- Andrade, E. F., Pereira, L. J., Oliveira, A. P. L., Orlando, D. R., Alves, D. A. G., Guilarducci, J. S., & Castelo, P. M. (2020). Perceived fear of COVID-19 infection according to sex, age and occupational risk using the Brazilian version of the Fear of COVID-19 Scale. *Death Studies*, 1-10. <https://doi.org/10.1080/07481187.2020.1809786>
- Arbuckle, J. L. (2014). Amos (Version 26.0) [Computer software]. IBM SPSS.
- Bakioglu, F., Korkmaz, O., & Ercan, H. (2020). Fear of COVID-19 and Positivity: Mediating Role of Intolerance of Uncertainty, Depression, Anxiety, and Stress. *International Journal of Mental Health and Addiction*, 1-14. <https://doi.org/10.1007/s11469-020-00331-y>
- Barrios, I., Ríos-González, C., O'Higgins, M., González, I., García, O., Ruiz Díaz, N., Castaldelli-Maia, J. M., Ventriglio, A., & Torales, J. (2020). *Psychometric properties of the Spanish version of the Fear of COVID-19 Scale (FCV-19S)*. Research square Preprints. <https://doi.org/10.21203/rs.3.rs-33345/v1>
- Bharatharaj, J., Alyami, M., Henning, M., Alyami, H., & Krägeloh, C. (2020). *Tamil version of the Fear of COVID-19 Scale*. Research square Preprints. <https://doi.org/10.21203/rs.3.rs-40914/v1>
- Broche-Perez, Y., Fernandez-Fleites, Z., Jimenez-Puig, E., Fernandez-Castillo, E., & Rodriguez-Martin, B. C. (2020). Gender and fear of COVID-19 in a Cuban population sample. *International Journal of Mental Health and Addiction*, 1-9. <https://doi.org/10.1007/s11469-020-00343-8>
- Caci, B., Miceli, S., Scrima, F., & Cardaci, M. (2020). Neuroticism and fear of COVID-19. The Interplay Between Boredom, Fantasy Engagement, and Perceived Control Over Time. *Frontiers in Psychology*, 11, 574393. <https://doi.org/10.3389/fpsyg.2020.574393>
- Canuel, M., Gosselin, P., Duhoux, A., Brunet, A., & Lesage, A. (2019). *Boîte à outils pour la surveillance post-sinistre des impacts sur la santé mentale*. Institut national de santé publique du Québec [Post-disaster mental health impacts surveillance toolkit]. <https://www.inspq.qc.ca/publications/2523>
- Carrière, G., Park, J., Deng, Z., & Kohen, D. (2020, September 1). *Overtime work among professional nurses during the COVID-19 pandemic*. Statistics Canada. <https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00074-eng.htm>
- Cavalheiro, F. R. S., & Sticca, M. G. (2020). Adaptation and Validation of the Brazilian version of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction*, 1-9. <https://doi.org/10.1007/s11469-020-00415-9>
- Caycho-Rodriguez, T., Vilca, L. W., Cervigni, M., Gallegos, M., Martino, P., Portillo, N., Bares, I., Calandra, M., & Burgos Videla, C. (2020). Fear of COVID-19 scale: Validity, reliability and factorial invariance in Argentina's general population. *Death Studies*, 1-10. <https://doi.org/10.1080/07481187.2020.1836071>
- Chang, K. C., Hou, W. L., Pakpour, A. H., Lin, C. Y., & Griffiths, M. D. (2020). Psychometric testing of three COVID-19-related scales among people with mental illness. *International Journal of Mental Health and Addiction*, 1-13. <https://doi.org/10.1007/s11469-020-00361-6>
- Chi, X., Chen, S., Chen, Y., Chen, D., Yu, Q., Guo, T., Cao, Q., Zheng, X., Huang, S., Hossain, M., Stubbs, B., & Yeung, A. Zou, L. (2020). *Psychometric evaluation of the Fear of COVID-19 Scale among Chinese population*. PsyArXiv Preprints. <https://doi.org/10.31234/osf.io/t5jne>
- Doshi, D., Karunakar, P., Sukhabogi, J. R., Prasanna, J. S., & Mahajan, S. V. (2020). Assessing coronavirus fear in Indian population using the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction*, 1-9. <https://doi.org/10.1007/s11469-020-00332-x>
- Elemo, A. S., Satici, S. A., & Griffiths, M. D. (2020). The Fear of COVID-19 Scale: Psychometric properties of the Ethiopian Amharic version. *International Journal of Mental Health and Addiction*, 1-12. <https://doi.org/10.1007/s11469-020-00448-0>
- Faro, A., Silva, L. S., Nunes, D. S., & Feitosa, A. L. B. (2020). *Adaptação e validação da Escala de Medo da COVID-19 [Adaptation and validation of the Fear of COVID-19 Scale]*. SciELO Preprints. <https://doi.org/10.1590/SciELOPreprints.898>

- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191. <https://doi.org/10.3758/BF03193146>
- Garcia-Reyna, B., Castillo-Garcia, G. D., Barbosa-Camacho, F. J., Cervantes-Cardona, G. A., Cervantes-Perez, E., Torres-Mendoza, B. M., Fuentes-Orozco, C., Pintor-Belmontes, K. J., Guzman-Ramirez, B. G., Hernandez-Bernal, A., Gonzalez-Ojeda, A., & Cervantes-Guevara, G. (2020). Fear of COVID-19 Scale for hospital staff in regional hospitals in Mexico: A brief report. *International Journal of Mental Health and Addiction*, 1-12. <https://doi.org/10.1007/s11469-020-00413-x>
- Giordani, R. C. F., Zanoni da Silva, M., Muhl, C., & Giolo, S. R. (2020). Fear of COVID-19 Scale: Assessing fear of the coronavirus pandemic in Brazil. *Journal of Health Psychology*, 1359105320982035. <https://doi.org/10.1177/1359105320982035>
- Gouvernement du Québec. (2021). *Data on COVID-19 in Québec*. <https://www.quebec.ca/en/health/health-issues/a-z/2019-coronavirus/situation-coronavirus-in-quebec/>
- Haktanir, A., Seki, T., & Dilmac, B. (2020). Adaptation and evaluation of Turkish version of the Fear of COVID-19 Scale. *Death Studies*, 1-9. <https://doi.org/10.1080/07481187.2020.1773026>
- Hayes, L.J., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., Spence Laschinger, H.K., North, N. and Stone, P.W. (2006). Nurse turnover: A literature review. *International Journal of Nursing Studies*, 43(2), 237-263. <https://doi.org/10.1016/j.ijnurstu.2005.02.007>
- Hossain, M. A., Jahid, M. I. K., Hossain, K. M. A., Walton, L. M., Uddin, Z., Haque, M. O., Kabir, M. F., Arafat, S. M. Y., Sakel, M., Faruqui, R., & Hossain, Z. (2020). Knowledge, attitudes, and fear of COVID-19 during the rapid rise period in Bangladesh. *PLoS One*, 15(9), e0239646. <https://doi.org/10.1371/journal.pone.0239646>
- Huarcaya-Victoria, J., Villarreal-Zegarra, D., Podesta, A., & Luna-Cuadros, M. A. (2020). Psychometric properties of a Spanish version of the Fear of COVID-19 Scale in general population of Lima, Peru. *International Journal of Mental Health and Addiction*, 1-14. <https://doi.org/10.1007/s11469-020-00354-5>
- IBM Corp. (2016). IBM SPSS Statistics for Windows, Version 24.0. IBM Corp.
- Institut national de santé publique du Québec. (2020). *Données COVID-19 au Québec*. <https://www.inspq.qc.ca/covid-19/donnees>
- Iversen, M. M., Norekval, T. M., Oterhals, K., Fadnes, L. T., Maeland, S., Pakpour, A. H., & Breivik, K. (2021). Psychometric Properties of the Norwegian Version of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction*, 1-19. <https://doi.org/10.1007/s11469-020-00454-2>
- Kaya, S., Dunder, E., Cakiroglu, F. P., & Uzdil, Z. (2020). Adaptation of the Fear of 2019 Coronavirus Disease (COVID-19) Scale to Turkish Culture: A Validity and Reliability Study. *Journal of Cognitive-Behavioral Psychotherapy and Research*, 10(1), 40-45. <https://doi.org/10.5455/JCBPR.104890>
- Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SLT, Walters, E. E., & Zaslavsky AM. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. (2002). *Psychological Medicine* 32(6):959-976. <https://doi.org/10.1017/s0033291702006074>
- Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of General Psychiatry*, 60(2), 184-189. <https://doi.org/10.1001/archpsyc.60.2.184>
- Kessler, R. C., Greif Green, J., Gruber, M. J., Sampson, N. A., Bromet, E., Cuitan, M., Furukawa, T. A., Gureje, O., Hinkov, H., Hu, C. Y., Lara, C., Lee, S., Mneimneh, Z., Myer, L., Oakley-Browne, M., Posada-Villa, J., Sagar, R., Viana, M. C., & Zaslavsky, A. M. (2010). Screening for serious mental illness in the general population with the K6 screening scale: Results from the WHO World Mental Health (WMH) survey initiative. *International Journal of Methods in Psychiatric Research*, 19(Suppl. 1), 4-22. <https://doi.org/10.1002/mpr.310>
- Khanal, P., Devkota, N., Dahal, M., Paudel, K., Mishra, S. R., & Joshi, D. (2020). Coronavirus fear among health workers during the early phase of pandemic response in Nepal: a web-based cross-sectional study. bioRxiv preprint. <https://doi.org/10.1101/2020.11.04.367912>
- Kim, H. Y. (2013). Statistical notes for clinical researchers : Assessing normal distribution using skewness and kurtosis. *Restorative Dentistry & Endodontics*, 38(1), 52-54. <https://dx.doi.org/10.5395/rde.2013.38.1.52>
- Korukcu, O., Ozkaya, M., Faruk Boran, O., & Boran, M. (2021). The effect of the COVID-19 pandemic on community mental health: A psychometric and prevalence study in Turkey. *Health & Social Care in the Community*, 1-10. <https://doi.org/10.1111/hsc.13270>
- Kroenke, K., & Spitzer, R. L. The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals*, 32(9), 1-7. <https://doi.org/10.3928/0048-5713-20020901-06>
- La Presse canadienne (2010, April 6). *Âge moyen de la maternité au Québec: près de 30 ans*. Le Devoir. <https://www.ledevoir.com/societe/actualites-en-societe/286450/age-moyen-de-la-maternite-au-quebec-pres-de-30-ans>
- Lin, C. Y., Hou, W. L., Mamum, M. A., da Silva, J. A., Broche-Pérez, Y., Ullah, I., Masayama, A., Wakashima, K., Mailliez, M., Carre, A., Chen, Y. P., Chang, K. C., Kuo, Y. J., Soraci, P., Scarf, D., Broström, A., Griffiths, M. D., & Pakpour, A. H. (2021). Fear



- of COVID-19 Scale (FCV-19S) across countries: Measurement of invariance issues. *Nursing Open*, 1-17. <https://doi.org/10.1002/nop2.855>
- Lonjon, G., Ilharreborde, B., Odent, T., Moreau, S., Glorion, C., & Mazda, K. (2014). Reliability and validity of the French-Canadian version of the scoliosis research society 22 questionnaire in France. *Spine*, 39(1), E26-34. <https://doi.org/10.1097/BRS.000000000000080>
- Mahmood, Q. K., Jafree, S. R., & Qureshi, W. A. (2020). The psychometric validation of FCV19S in Urdu and socio-demographic association with fear in the people of the Khyber Pakhtunkhwa (KPK) Province in Pakistan. *International Journal of Mental Health and Addiction*, 1-11. <https://doi.org/10.1007/s11469-020-00371-4>
- Mailliez, M., Griffiths, M. D., & Carre, A. (2020). *Validation of the French version of the Fear of COVID-19 Scale and its associations with depression, anxiety and differential emotions*. Research Square Preprints. <https://doi.org/10.21203/rs.3.rs-46616/v1>
- Martinez-Lorca, M., Martinez-Lorca, A., Criado-Alvarez, J. J., Armesilla, M. D. C., & Latorre, J. M. (2020). The Fear of COVID-19 Scale: Validation in Spanish university students. *Psychiatry Research*, 293, 113350. <https://doi.org/10.1016/j.psychres.2020.113350>
- Masuyama, A., Shinkawa, H., & Kubo, T. (2020). Validation and psychometric properties of the Japanese version of the Fear of COVID-19 Scale among adolescents. *International Journal of Mental Health and Addiction*, 1-11. <https://doi.org/10.1007/s11469-020-00368-z>
- Mercado-Lara, M., Campo-Arias, A., & Monterrosa-Castro, A. (2021). Validity and reliability of the Spanish version of Fear of COVID-19 Scale in Colombian physicians. *International Journal of Mental Health and Addiction*. <https://doi.org/10.1007/s11469-020-00430-w>
- Mohammadpour, M., Ghorbani, V., Khoramnia, S., Ahmadi, S. M., Ghvami, M., & Maleki, M. (2020). Anxiety, self-compassion, gender differences and COVID-19: Predicting self-care behaviors and fear of COVID-19 based on anxiety and self-compassion with an emphasis on gender differences. *Iranian Journal of Psychiatry*, 15(3), 213-219. <https://doi.org/10.18502/ijps.v15i3.3813>
- Nguyen, H. T., Do, B. N., Pham, K. M., Kim, G. B., Dam, H. T. B., Nguyen, T. T., Nguyen, T. T. P., Nguyen, Y. H., Sorensen, K., Pleasant, A., & Duong, T. V. (2020). Fear of COVID-19 Scale-Associations of its scores with health literacy and health-related behaviors among medical students. *International Journal of Environmental Research and Public Health*, 17(1) 4164. <https://doi.org/10.3390/ijerph17114164>
- Nikopoulou, V. A., Holeva, V., Parlapani, E., Karamouzi, P., Voitsidis, P., Porfyri, G. N., Blekas, A., Papigkioti, K., Patsiala, S., & Diakogiannis, I. (2020). Mental health screening for COVID-19: A proposed cutoff score for the Greek version of the Fear of COVID-19 Scale (FCV-19S). *International Journal of Mental Health and Addiction*, 1-14. <https://doi.org/10.1007/s11469-020-00414-w>
- Observations sur les centres d'hébergement de soins longues durées de Montréal [Observations on the longterm care facilities of Montreal]. (2020). [https://m1.quebecormedia.com/emp/tvanouvelles\\_prod/file/76873f0f-97da-4961-aa99-0d841a5c703f\\_Observation\\_FAC\\_CHSLD.pdf](https://m1.quebecormedia.com/emp/tvanouvelles_prod/file/76873f0f-97da-4961-aa99-0d841a5c703f_Observation_FAC_CHSLD.pdf)
- Ogrodniczuk, J. S., Rice, S. M., Kealy, D., Seidler, Z. E., Delara, M., & Oliffe, J. L. (2021). Psychosocial impact of the COVID-19 pandemic: A cross-sectional study of online help-seeking Canadian men. *Postgrad Med*. <https://doi.org/10.1080/00325481.2021.1873027>
- Pang, N. T. P., Kamu, A., Hambali, N. L. B., Mun, H. C., Kassim, M. A., Mohamed, N. H., Ayu, F., Rahim, S. S. S. A., Omar, A., & Jeffree, M. S. (2020). Malay version of the Fear of COVID-19 Scale: Validity and reliability. *International Journal of Mental Health and Addiction*, 1-10. <https://doi.org/10.1007/s11469-020-00355-4>
- Parlapani, E., Holeva, V., Nikopoulou, V. A., Sereslis, K., Athanasiadou, M., Godosidis, A., Stephanou, T., & Diakogiannis, I. (2020). Intolerance of uncertainty and loneliness in older adults during the COVID-19 pandemic. *Frontiers in Psychiatry*, 11, 842. <https://doi.org/10.3389/fpsy.2020.00842>
- Perz, C. A., Lang, B. A., & Harrington, R. (2020). Validation of the Fear of COVID-19 Scale in a US college sample. *International Journal of Mental Health and Addiction*, 1-11. <https://doi.org/10.1007/s11469-020-00356-3>
- Piqueras, J. A., Gomez-Gomez, M., Marzo, J. C., Gomez-Mir, P., Falco, R., & Valenzuela, B. (2020). *Validation of the Spanish version of Fear of COVID-19 Scale: Its association with acute stress and coping*. Research Square Preprints. <https://doi.org/10.21203/rs.3.rs-75063/v1>
- Prazeres, F., Passos, L., Simoes, J. A., Simoes, P., Martins, C., & Teixeira, A. (2020). COVID-19-related fear and anxiety: Spiritual-religious coping in healthcare workers in Portugal. *International Journal of Environmental Research and Public Health*, 18(1), 220. <https://doi.org/10.3390/ijerph18010220>
- Protecteur du citoyen. (2020). *COVID-19 in CHSLDs during the first wave of the pandemic: Learning from the crisis and moving to uphold the rights and dignity of CHSLD residents (The Quebec Ombudsman's Status Report)*. [https://protecteurducitoyen.qc.ca/sites/default/files/pdf/rapports\\_speciaux/progress-report-chslds-covid-19.pdf](https://protecteurducitoyen.qc.ca/sites/default/files/pdf/rapports_speciaux/progress-report-chslds-covid-19.pdf)
- Public Health Agency of Canada. (2021a) Interactive data visualizations of COVID-19. *Public Health Infobase*. <https://health-infobase.canada.ca/covid-19/>

- Public Health Agency of Canada. (2021b). *Preliminary dataset on confirmed cases of COVID-19*, Public Health Agency of Canada [csv]. COVID19-eng. <https://www150.statcan.gc.ca/n1/pub/13-26-0003/132600032020001-eng.htm>
- Qualtrics. (2020). *Qualtrics* [Computer software]. <https://www.qualtrics.com>
- Rahman, M. A., Hoque, N., Alif, S. M., Salehin, M., Islam, S. M. S., Banik, B., Sharif, A., Nazim, N. B., Sultana, F., & Cross, W. (2020). Factors associated with psychological distress, fear and coping strategies during the COVID-19 pandemic in Australia. *Global Health, 16*(1), 95. <https://doi.org/10.1186/s12992-020-00624-w>
- Reizer, A., Koslowsky, M., & Geffen, L. (2020). Living in fear: The relationship between fear of COVID-19, distress, health, and marital satisfaction among Israeli women. *Health Care for Women International, 1-21*. <https://doi.org/10.1080/07399332.2020.1829626>
- Reznik, A., Gritsenko, V., Konstantinov, V., Khamenka, N., & Isralowitz, R. (2020). COVID-19 fear in Eastern Europe: Validation of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction, 1-6*. <https://doi.org/10.1007/s11469-020-00283-3>
- Sakib, N., Bhuiyan, A., Hossain, S., Al Mamun, F., Hosen, I., Abdullah, A. H., Sarker, M. A., Mohiuddin, M. S., Rayhan, I., Hossain, M., Sikder, M. T., Gozal, D., Muhit, M., Islam, S. M. S., Griffiths, M. D., Pakpour, A. H., & Mamun, M. A. (2020). Psychometric validation of the Bangla Fear of COVID-19 Scale: Confirmatory factor analysis and Rasch analysis. *International Journal of Mental Health and Addiction, 1-12*. <https://doi.org/10.1007/s11469-020-00289-x>
- Saracoglu, K. T., Simsek, T., Kahraman, S., Bombaci, E., Sezen, O., Saracoglu, A., & Demirhan, R. (2020). The psychological impact of COVID-19 disease is more severe on intensive care unit healthcare providers: A cross-sectional study. *Clinical Psychopharmacology and Neuroscience, 18*(4), 607-615. <https://doi.org/10.9758/cpn.2020.18.4.607>
- 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, 1-9*. <https://doi.org/10.1007/s11469-020-00294-0>
- Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2010). Reporting Structural Equation Modeling and Confirmatory Factor Analysis results: A review. *Journal of Educational Research, 99*(6), 323-338. <https://doi.org/10.3200/JOER.99.6.323-338>
- Sljivo, A., Kacamakovic, M., Quraishi, I., & Dzubur Kulenovic, A. (2020). Fear and depression among residents of Bosnia and Herzegovina during COVID-19 outbreak – Internet survey. *Psychiatria Danubina, 32*(2), 266-272. <https://doi.org/doi:10.24869/psyd.2020.266>
- Soraci, P., Ferrari, A., Abbiati, F. A., Del Fante, E., De Pace, R., Urso, A., & Griffiths, M. D. (2020). Validation and psychometric evaluation of the Italian version of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction, 1-10*. <https://doi.org/10.1007/s11469-020-00277-1>
- Sousa, V. D., & Rojjanasrirat, W. (2011). Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. *Journal of Evaluation in Clinical Practice, 17*(2), 268-274. <https://doi.org/10.1111/j.1365-2753.2010.01434.x>
- Stanculescu, E. (2021). Fear of COVID-19 in Romania: Validation of the Romanian version of the Fear of COVID-19 Scale using graded response model analysis. *International Journal of Mental Health and Addiction, 1-16*. <https://doi.org/10.1007/s11469-020-00428-4>
- Streiner, D. L., Norman, G. R., & Cairney, J. (2015). *Health measurement scales: A practical guide to their development and use* (5<sup>th</sup> ed.), Appendix B, p.375-379. Oxford University Press.
- Tabachnick B. G., & Fidell L. S. (2019). Chapter 13: Principal Components and Factor Analysis. In *Using multivariate statistics* (7<sup>th</sup> ed., pp. 476-527). Pearson Education Inc.
- Tsipropoulou, V., Nikopoulou, V. A., Holeva, V., Nasika, Z., Diakogiannis, I., Sakka, S., Kostikidou, S., Varvara, C., Spyridopoulou, E., & Parlapani, E. (2020). Psychometric properties of the Greek version of FCV-19S. *International Journal of Mental Health and Addiction, 1-10*. <https://doi.org/10.1007/s11469-020-00319-8>
- Tzur Bitan, D., Grossman-Giron, A., Bloch, Y., Mayer, Y., Shiffman, N., & Mendlovic, S. (2020). Fear of COVID-19 Scale: Psychometric characteristics, reliability and validity in the Israeli population. *Psychiatry Research, 289*, 113100. <https://doi.org/10.1016/j.psychres.2020.113100>
- Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., Druckman, J. N., Drury, J., Dube, O., Ellemers, N., Finkel, E. J., Fowler, J. H., Gelfand, M., Han, S., Haslam, S. A., Jetten ... & Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour, 4*(5), 460-471. <https://doi.org/10.1038/s41562-020-0884-z>
- Wakashima, K., Asai, K., Kobayashi, D., Koiwa, K., Kamoshida, S., & Sakuraba, M. (2020). The Japanese version of the Fear of COVID-19 Scale: Reliability, validity, and relation to coping behavior. *PLoS One, 15*(11), e0241958. <https://doi.org/10.1371/journal.pone.0241958>
- Wanous, J.P., Reichers A.E., & Hudy M.J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology, 82*(2), 247-252. <https://doi.org/10.1037/0021-9010.82.2.247>

- Winter, T., Riordan, B. C., Pakpour, A. H., Griffiths, M. D., Mason, A., Poulgrain, J. W., & Scarf, D. (2020). Evaluation of the English version of the Fear of COVID-19 Scale and its relationship with behavior change and political beliefs. *International Journal of Mental Health and Addiction*, 1-11. <https://doi.org/10.1007/s11469-020-00342-9>
- 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. <https://doi.org/10.1007/s11469-020-00351-8>

Appendix A

**Table 1**

*Overview of translations and adaptations of the Fear of COVID-19 Scale*

Language of scale	Month and Year	First author	Country	Translation Method	N	Participants	Mean (SD)	Cronbach's alpha	Factor Analysis
English	March 2020	Ahorsu	Iran	original scale	717	General adult population	<b>27.39</b>	0.82	EFA: one factor
American English	June 2020	Perz	US	Items 1 and 7 modified	237	University students	18.10 (7.10)	0.91	EFA: one factor 66% explained variance
Italian	May 2020	Soraci	Italy	forward-backward	249	General adult population	<b>16.90</b>	0.87	CFA: one factor 65.7% explained variance
Turkish	May 2020	Satici, Gocet-Tekin	Turkey	NR	1304	General adult population	<b>20.03</b>	0.85	CFA: one factor <b>43.6%</b> explained variance
	May 2020	Haktanir	Turkey	forward-backward	668	General adult population	<b>18.48</b>	0.86	CFA: one factor <b>44.9%</b> explained variance
	May 2020	Bakioglu	Turkey	forward-backward	960	General adult population	19.44 (6.07)	0.88	CFA: one factor 58.9% explained variance
	July 2020	Kaya	Turkey	forward-backward	839	General adult population	median = <b>22</b>	0.87	EFA + CFA: one factor 65.6% explained variance
	December 2020	Korukcu	Turkey	forward-backward	431	General adult population	21.47 (6.28)	0.89	CFA: one factor
Bangla	May 2020	Sakib	Bangladesh	forward-backward	8550	General population	<b>21.38</b>	0.87	CFA: one factor <b>58.7%</b> explained variance
	September 2020	Hossain	Bangladesh	forward-backward	2157	General population	18.53 (5.01)	NR	NR

Language of scale	Month and Year	First author	Country	Translation Method	N	Participants	Mean (SD)	Cronbach's alpha	Factor Analysis
Russian	May 2020	Reznik	Russia and Belarus	forward-backward	850	General adult population	17.20 (4.70)	0.81	EFA: two factors
Hebrew	May 2020	Tzur Bitan	Israel	forward-backward	639	General population	<b>16.32</b>	0.86	EFA: two factors 65.8% explained variance
	June 2020	Zolotov	Israel	forward-backward	370	Health care students	14.95 (4.80)	0.84	CFA: inconclusive
	October 2020	Reizer	Israel	forward-backward	130	Women population	NR	0.68	CFA: one factor
Arabic	May 2020	Alyami	Saudi Arabia	forward-backward	639	General adult population	<b>16.95</b>	0.88	CFA: one factor
Bosnian-Croatian-Serbian (BCS)	May 2020	Sljivo	Bosnia & Herzegovina	forward	1201	General adult population not infected with COVID-19	NA	0.88	NR
Greek	May 2020	Tsiropoulou	Greece	forward-backward	3029	General adult population	<b>16.24</b>	0.84	CFA: one factor
Vietnamese	June 2020	Nguyen	Vietnam	forward	5423	Medical students	16.70 (5.30)	0.90	One factor 62.2% explained variance
Spanish	May 2020	Alamo	Argentina	forward-backward	759	General adult population	16.97 (5.70)	NR	NR
	June 2020	Barrios	Paraguay	forward-backward	1077	University population	15.84 (5.53)	0.86	EFA + CFA: two factors
	June 2020	Broche-Pérez	Cuba	forward-backward	772	General adult population	<b>20.85</b>	0.87	NR
	June 2020	Huarcaya-Victoria	Peru	forward	832	General adult population	<b>15.80</b>	0.88	EFA + CFA: two factors 72.5% explained variance

Language of scale	Month and Year	First author	Country	Translation Method	N	Participants	Mean (SD)	Cronbach's alpha	Factor Analysis
Spanish	August 2020	Martinez-Lorca	Spain	forward-backward	606	University students	16.79 (6.04)	0.86	EFA: one factor 49.1% explained variance
	September 2020	Piqueras	Spain and Dominican Republic	forward-backward	1146	General population	15.17 (5.88)	0.86	CFA: one factor
	January 2021	Mercado-Lara	Colombia	forward-backward	531	Physicians	NR	NR	CFA (unidimensional)
Malay	July 2020	Pang	Malaysia	forward-backward	228	University population	<b>18.36</b>	0.89	CFA: <b>41.1%</b> explained variance (unidimensional)
Chinese	July 2020	Chang	Taiwan	forward	400	Adults with mental illness	<b>18.46</b>	0.93	CFA: <b>65.0%</b> explained variance (unidimensional)
	October 2020	Chi	China	forward-backward	1700	General population	<b>17.18</b>	0.92	EFA in Sample 1 + CFA in Sample 2: two factors 79.3% explained variance
Urdu	July 2020	Mahmood	Pakistan	forward-backward	501	General adult population	<b>18.57</b>	0.85	CFA: one factor
Japanese	July 2020	Masuyama	Japan	forward-backward	629	Adolescent students	18.71 (5.65)	0.82	CFA: two factors
	November 2020	Wakashima	Japan	forward-backward	450	General adult population	21.25 (5.38)	0.87	CFA + EFA: one factor <b>49.6%</b> explained variance
Persian/Farsi	July 2020	Mohammadpour	Iran	NR	403	Adults exposed to COVID-19	<b>16.19</b>	NR	NR
	August 2020	Lin	Hong Kong	NR	1078	General adult population	NR	0.89	NR

Language of scale	Month and Year	First author	Country	Translation Method	N	Participants	Mean (SD)	Cronbach's alpha	Factor Analysis
Brazilian Portuguese	July 2020	Faro	Brazil	forward	1000	General adult population	22.20 (5.78)	0.86	CFA: one factor <b>47.6%</b> explained variance
	August 2020	Andrade	Brazil	forward-backward	1743	General adult population	<b>21.94</b>	0.86	EFA + CFA: two factors 53.0% explained variance
	November 2020	Cavalheiro	Brazil	forward-backward	354	General adult population	15.76 (6.22)	0.88	EFA + CFA: one factor 53.7% explained variance
	December 2020	Giordani	Brazil	forward	7430	General adult population	19.80 (5.30)	0.86	EFA: one factor 54.8% explained variance
Portuguese	December 2020	Prazeres	Portugal	forward-backward	222	Healthcare workers	median = 14	0.83	NR
Tamil	July 2020	Bharatharaj	India	forward-backward	95	General adult population	20.18 (8.13)	0.93	One factor
French	July 2020	Mailliez	France	forward-backward	316	General population	15.82 (6.19)	0.87	CFA: one factor <b>44.0%</b> explained variance
Polish	August 2020	Rusyan	Poland	forward	356	Dentist population	<b>11.65</b>	NR	NR
Amharic	December 2020	Elemo	Ethiopia	forward-backward	307	General adult population	<b>21.35</b>	0.87	CFA: one factor
Romanian	January 2021	Stanculescu	Romania	forward-backward	809	General adult population	14.11 (5.62)	0.88	CFA: one factor
Norwegian	January 2021	Iversen	Norway	forward-backward	1063	General adult population	<b>12.90</b>	0.88	EFA + CFA: two factors 69% explained variance

*Note.* Values calculated from published raw results are shown in bold. Total scale means were calculated from individual items' means. Explained variance calculation in factor analysis was based on the procedure described by Streiner et al. (2015). NR = Not Reported; EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis.

**Table 2**

*Other Studies That Reported Data on Validation for the Fear of COVID-19 Scale*

Language of scale	Month and Year	First author	Country	Translation Method	Sample (N)	Participants	Mean (SD)	Cronbach alpha	Factor Analysis
English	April 2020	Harper	UK	NR	324	General population	<b>18.03</b>	0.88	NR
	June 2020	Winter	New Zealand	version from Ahorsu et al, 2020	S1=1397; S2=1023	General adult population	S1=15.6(7.7); S2=18.3(7.9)	S1=0.89; S2=0.88	CFA: one factor S1= <b>53.4%</b> explained variance and S2= <b>51.5%</b> explained variance
	September 2020	Labrague	Philippines	version from Ahorsu et al, 2020	261	Frontline registered nurses	19.92 (6.15)	0.87	NR
	October 2020	Rahman	Australia	version from Ahorsu et al, 2020	549	General adult population	18.40 (6.50)	NR	NR
	October 2020	Li	Hong Kong	version from Ahorsu et al, 2020	110	Filipino domestic helpers	11.81 (2.97)	0.83	NR
	October 2020	Seyed Hashemi	Iran	version from Ahorsu et al, 2020	651	General adult population	18.72 (5.81)	0.87	NR
	October 2020	Mertens	International	version from Ahorsu et al, 2020	829	General population	NR	0.86	CFA + EFA: inconclusive
	October 2020	Caci	Italy	version from Ahorsu et al, 2020	301	General adult population	NR	0.86	NR
	November 2020	Khanal	Nepal	version from Ahorsu et al, 2020	475	Health care workers	<b>17.07</b>	NR	NR
	November 2020	Saracoglu	Turkey	version from Ahorsu et al, 2020	208	Health care workers	18.56 (7.73)	NR	NR



Language of scale	Month and Year	First author	Country	Translation Method	Sample (N)	Participants	Mean (SD)	Cronbach alpha	Factor Analysis
English	January 2021	Ogrodniczuk	Canada	version from Ahorsu et al, 2020	434	Adult men population	15.94 (5.80)	0.88	NR
Turkish	May 2020	Satici, Saricali	Turkey	version from Satici et al, 2020	1772	General adult population	18.83 (6.01)	0.87	NR
	June 2020	Evren	Turkey	version from Satici et al, 2020	1023	General population	NR	0.87	NR
Greek	August 2020	Parlapani	Greece	version from Tsipropoulou et al, 2020	103	Older adult population	18.48 (5.32)	NR	NR
	November 2020	Nikopoulou	Greece	version from Tsipropoulou et al, 2020	538	General adult population	<b>15.36</b>	NR	NR
Spanish	October 2020	Caycho-Rodriguez	Argentina	version from Huarcaya-Victoria et al. 2020	1291	General adult population	<b>13.34</b>	NR	CFA: two factors F1= <b>67.7%</b> and F2= <b>55%</b> explained variance
	November 2020	Garcia-Reyna	Mexico	version from Huarcaya-Victoria et al, 2020	2860	Health care workers	19.30 (6.90)	0.90	CFA: one factor <b>57.2%</b> explained variance

*Note.* Values calculated from published raw results are shown in bold. Total scale means were calculated from individual items' means. Explained variance calculation in factor analysis was based on the procedure described by Streiner et al. (2015). NR = Not Reported; F1 = Factor 1; F2 = Factor 2; S1 = Sample 1; S2 = Sample 2; EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis.