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Can COVID-19 related mental health issues be measured?

To the Editor,

The COVID-19 pandemic and mitigation efforts carry a mental health toll among health care workers, individuals infected and the general population (Li et al., 2020; Ransing et al., 2020). There is a lack of specific robust screening tools or diagnostic instruments that could promptly identify relevant symptoms and contribute to the attempts to study the epidemiology of COVID-19 related mental health problems. In fact, the use of traditional assessment tools (e.g. PHQ-9, GAD-7) may lead to under-diagnosis or over-diagnosis of the cases emerging in this current pandemic due to their poor psychometric properties (e.g. face validity). There are new scales tailored to identify COVID-19 related mental health issues (Lee, 2020a; Taylor et al., 2020), however, their clinical utility, methodological strengths and limitations have not yet been explored in the literature. In this article we provide a brief overview of these new assessment tools, with a focus on their multi-language availability.

Our search (till May 15, 2020) in PubMed, Scopus, and Google Scholar databases yielded five published new scales (Table 1) (Ahorsu et al., 2020; Lee, 2020a,b; Taylor et al., 2020): Coronavirus Anxiety Scale (CAS) (Lee, 2020b), the Obsession with COVID-19 Scale (OCS) (Lee, 2020a), the Fear of COVID-19 Scale (FCV-19S) (Ahorsu et al., 2020), the COVID Stress Scales (CSS) (Taylor et al., 2020), and the Questionnaire on Perception of Threat from COVID-19 (Pérez-Fuentes et al., 2020). Almost all of them were developed as self-report and Likert-type scales and validated using online surveys. To our surprise, there was no available clinician-administered scale to measure psychological distress or disorders in the context of COVID-19 infection.

The CAS and OCS, developed from the same data source, assess symptoms of anxiety and dysfunctional thinking as per the DSM-5 criteria. The OCS measures recurring symptoms of anxiety (i.e. cognitive and behavioral perpetuating factors). Both the OCS and CAS can assist with identifying the maintaining factors for COVID-19 anxiety and developing interventions to tackle them. Although translated versions of these scales are available in several languages, they are yet to be validated. The FCV-19S has been already translated and validated in different languages with evidence of good reliability (internal consistency) and validity (convergent and construct) (Reznik et al., 2020; Sakib et al., 2020; Satici et al., 2020; Soraci et al., 2020). The FCV-19S is a scale with a uni-dimensional structure, except for the Russian Version, which has a bi-dimensional structure. The CSS, CAS, and OCS have dimensional ratings for different yet interrelated underlying constructs or factors. Furthermore, some weaknesses [e.g. Italian FCV-19S was validated in an adequate but suboptimal sample (Table 1)], and inconsistencies in their underlying factor structures, as above mentioned, warrant further refinement with more robust and stable factor structures.

All scales were developed in the pre-peak period of the pandemic and may not be sensitive or specific enough to assess anxiety or dysfunctional thinking during peak or post-peak periods (Ransing et al., 2020). Of note that all scales have been validated in non-clinical samples consisting of middle-aged adults, a relatively less vulnerable group of people. Nevertheless, preliminary psychometric reports suggest that the CAS score was well correlated with distress, coping, and support, while the OCS score was associated with coronavirus anxiety, spiritual crisis, and alcohol/drug coping. All versions of FCV-19S and CSS were strongly correlated with depression and anxiety. Due to the unique discriminative ability and consistency with the DSM-5's cross-cutting symptom measures of CAS and OCS, these assessment tools may prove more useful for clinicians.

In the current scenario, self-report scales might prove useful as they are short, easy to administer (through paper or a digital platform), and feasible to be used when in self-isolation or quarantine. However, these scales may have limited potential to measure outcome parameters of interventions as the findings may not be aligned with objective assessment and be more prone to response bias. It is therefore crucial to develop clinician-administered assessment tools consistent with DSM-5 or ICD-10/11 criteria, with strong psychometric properties, and sensitive to interventions.

This brief overview of scales provides several key directions for future research. First, there is a need to refine existing screening instruments with translation, validation, and cross-cultural adaptation without detracting from their psychometric properties to boost clinical and epidemiological research across the world. In particular, future validation studies should include the elderly, children, adolescents, young adults, and people with pre-existing physical and mental illness in particular settings (e.g. self-isolation or quarantine), to determine the discriminative ability and widen their utility. Second, researchers need to compare the psychometric properties of these scales with each other or with the traditional scales (e.g. PHQ-9, GAD-7) to ascertain the op-

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Table 1
Empirically Validated Scales That Measures the COVID-19 Related Mental Health Issues.

Sr No	Authors	Scale	Sample Size, Age (Mean ± SD), Country, Duration of data collection	Available in Language	No.of Items	Psychometric properties of Validated Version	Dimensions/Factors, Additional points
1	(Lee, 2020b)	Coronavirus Anxiety Scale (CAS)[a]	**n** = 775, Age: 32.72 ± 9.35 years, United States of America, 11th to 13th March 2020	English[@], Brazilian Portuguese, Hebrew, Korean, Polish, Portuguese, Romanian, Spanish, Turkish, Urdu	5*	**English Version:** **Reliability:** Cronbach's alpha = 0.93 **Validity:** correlated with disability (LD = 0.82), distress (LD = 0.81), and coping (r = 0.80) **Discrimination ability**: AUC: 0.94 **Cut off scores**: ≥ 9 ; sensitivity: 90%; specificity: 85%; false-positive: 15%	Four Factors /dimensions: 1) Cognitive (e.g. repetitive thinking) 2) Emotional (e.g. fear, anger), 3) Behavioral (e.g. dysfunctional activities; avoidance), 4) Physiological (e.g. sleep disturbances)
2	(Lee, 2020a)	Obsession with COVID-19 Scale (OCS)[a]	**n** = 775; **n** = 398, Age: 32.72 ± 9.35 years, United States of America, 11th to 13th March 2020	English[@], Hebrew, Korean, Polish, Romanian, Turkish Urdu	4*	**English version:** **Reliability:**Cronbach's alpha = 0.84 to 0.85 **Construct validity**: suicidal ideation (r = 0.45–0.56), alcohol/drug coping (r = 0.42–0.50), coronavirus anxiety (r = 0.72–0.81), spiritual crisis (r = 0.53–0.64), extreme hopelessness (r = 0.66–0.70). **Discrimination ability**: AUC = 0.81 to 0.92 **Cut off scores**: ≥ 7, sensitivity: 81% to 93%; specificity: 73% to 76%	Secondary data analysis (Single-factor: Cognitive (e.g. repetitive thinking)
3	(Ahorsu et al., 2020)	Fear of COVID-19 Scale (FCV-19S)	**n** = 717, Age: 31.25 ± 12.68 years, Iran, Duration: NA	English/Persian[@]	7#	**Reliability:** Cronbach's alpha: 0.82 **Validity:** concurrent [with depression (r = 0.42), anxiety (r = 0.51), germ aversion (r = 0.45), perceived infectability (r = 0.48)] **Interpretation:** A total score (from 7 to 35). Higher score indicates the more fear of COVID-19	Single Factor (Uni-dimensional)
4	(Soraci et al., 2020)	The Italian version of FCV-19S	**n** = 249, Age: 34.50 ± 12.21 years, Italy, 18th March to 21st March 2020	Italian[@]	7#	**Reliability:** Cronbach's alpha: 0.87. **Validity**: HADS (r = 0.64) and SMSP-A (r = 0.70). **Other comments:** adequate but suboptimal sample, female (92%) vs male (8%)	Single Factor (Uni-dimensional)
5	(Sakib et al., 2020)	Bangla version of FCV-19S	**n** = 8550, Age: 26.5 ± 9.1 years, Bangladesh, 1st April to 10th April 2020	Bangla[@]	7#.	**Reliability:** Cronbach's alpha: 0.87 **Validity:** acceptable construct, good concurrent validity (positively correlated with the PHQ-9 (r = 0.41)	Single Factor (Uni-dimensional)
5	(Satici et al., 2020)	Turkish version of FCV-19S	**n** = 1304, Age: 29.47 ± 10.54 years, Turkey, Duration: NA	Turkish[@]	7#	**Reliability:** Cronbach's alpha: 0.85 **Validity:** Correlated with depression (r = 0.38), life satisfaction (r = − 0.20), anxiety (r = 0.55), stress (r = 0.47).	Single Factor (Uni-dimensional)
6	(Reznik et al., 2020)	Russian version of FCV-19S	**n** = 850, Age: 34.8 ± 13.0 years, Eastern Europe (Russia and Belarus) Duration: NA	Russian[@]	7#	**Reliability:** Cronbach's alpha: 0.81 **Validity:** Factorial validity was acceptable **Other comments:** Mixed population (Russia, Belarus)	Two factors (Bi-dimensional; Physiological, and emotional response)
7	(Taylor et al., 2020)	COVID Stress Scales (CSS): Five subscales	**n** = 6854, Age:49.8 ± 16.2 years, Canada and United States, 21st March to 1st April 1, 2020	English[@]	36[$]	**Reliability**: Cronbach's alpha for each subscale: > 0.80 **Validity**: **Convergent:** For each subscale (r ~ 0.29 to 0.48 for health anxiety, checking, and contamination) **Discriminant:** For each subscale: anxiety (r ~ 0.39 to 0.62), depression (r ~ 0.28 to 0.57) Other Other comments: Mixed population (Canada, United States)	Five subscales: Danger and contamination fears, xenophobia, fears about economic consequences, compulsive checking, and traumatic stress symptoms about COVID-19
8	(Pérez-Fuentes et al., 2020)	Questionnaire on Perception of Threat	**n** = 1014**, Age**: 42.92 ± 12.33 years, All Spanish Autonomous regions, 18th March to 23rd March 2020	Spanish[@]	Spanish [@]	**Reliability:** Cronbach's alpha = 0.66 **Validity**: Adequate (details not available) Other comments: low reliability	Single Factor (Uni-dimensional)

Abbreviations:
#: five levels from strongly disagree (1) to strongly agree (5); *: Five levels from not at all (0) to nearly every day (4) over the last 2 weeks; + Likert-type scale from 0 to 10, LD: Structure coefficients, r: Pearson's coefficient, $: Five levels from not at all (0) to extremely (4) over the last one weeks; HADS: Hospital Anxiety and Depression Scale, SMSP-A: Severity Measure for Specific Phobia–Adult; PHQ-9: Patient Health Questionnaire-9, @ Validated version (Psychometric properties are known or published); NA: Not available in the published manuscript.
Footnote: i) All scales except CSS, take 4–5 min to administer ii) CAS and OCS details are available at: https://sites.google.com/cnu.edu/coronavirusanxietyproject/home.

timal measure in different countries, settings, and populations. Still, these scales may be useful for epidemiological research, but perhaps less so for interventional studies that will need additional scales as outcome measures. For interventional research, the combination of scales or tools (e.g. traditional, self-report, and clinical-administered) either parallel or in a predefined sequence may be necessary to assess the change and to improve diagnostic coverage, psychometric properties, and comparative evaluation. In particular we would suggest the development of scales that can assist with the assessment of COVID-19 related psycho-social stigma, phobia, and post-traumatic stress disorder.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bbi.2020.05.049.

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