

CORONA DISEASE ANXIETY SCALE (CDAS): PSYCHOMETRIC PROPERTIES OF THE ALBANIAN VERSION

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ABSTRACT

Several studies have reported higher prevalence of psychological disorders as a result of the global pandemic of coronavirus disease 2019 (COVID-19), including symptoms of anxiety. The present study aims to determine the reliability, convergent validity and factor structure of the Corona Disease Anxiety Scale (CDAS) in a sample of 175 students from University of Shkoder, Albania. We found that CDAS showed good psychometric properties. Results indicated that the scale was highly reliable in terms of internal consistency measured using Chronbach's alfa test ($\alpha = .92$), as well with the Split-Half method ($r_{hh} = .92$). Two factors were identified through confirmatory factor analysis (psychological and physiological) and all items resulted to be significant in relation to one of these two factors. This scale had a good convergent validity indicated by significant correlation with Beck Anxiety Inventory (BAI) ($r = .43, p < .001$). The adaptation of questionnaires for different cultures it is important for researchers and mental health practitioners, mainly during global emergencies, including infectious diseases.

Keywords: COVID-19, CDAS, BAI, reliability, convergent validity.

INTRODUCTION

It has been more than a year and a half since the World Health Organization (WHO) declared the COVID-19 outbreak and highlighted the importance of precautionary measures, including physical distance, wearing mask, increasing handwashing, and reducing face touching, given that the virus spreads rapidly from person to person (Wang et al., 2020). Currently, the *number* of reported COVID-19 *cases worldwide has* passed 228 million and the *number* of deaths *had reached* 4.7 million (WHO, 2021). Beyond the impacts on physical health, employment, and income (OECD, 2020) evidence suggests that individuals may experience symptoms of psychosis, anxiety, trauma, suicidal ideation, and panic during outbreaks of communicable diseases (Taylor 2008; Tucci et al. 2017; World Health Organization 2020b). Hence, dealing with a new and unknown situations brought around by the pandemic, along with the immediate changes in mortality statistics, might affect the mental health of the individuals, leading to increased fear, stress and anxiety (OBSh, 2020b). Physiological and psychological symptoms of anxiety are present when an *alarming* event occurs. These symptoms might include: edginess or restlessness, tiring easily, more fatigue than usual, impaired concentration or feeling as though the mind goes blank, irritability, increased muscle aches or soreness, difficulty sleeping (DSM-5; APA, 2013).

Another problem that occurs in situations of experiencing anxiety and stress is that they might weaken the immunity system of a person and make them vulnerable to infection compared to others that do not experience these emotions (Stein, 1989). Anxiety can reduce a person's

quality of life, as a result, they should learn some strategies in order to cope with certain doses of it.

Keeping in mind the rapid spreading of the disease and the absence of scientific studies in this area, various authors and researchers worked together to create instruments and scales that aim to determine the level and extent of psychological symptoms during the pandemic. Among the first instruments designed is the Obsession with COVID-19 Scale (OCS; Lee, 2020a); Coronavirus Anxiety Scale (CAS; Lee, 2020b), COVID-19 Anxiety Scale (Silva et al., 2020), and also the Corona Disease Anxiety Scale (CDAS; Alipour et al., 2020).

CAS (Lee, 2020b) is a scale with 5 items about experiencing physiological symptoms of anxiety tested in various contexts, such as USA (Lee, 2020b), Peru (Caycho-Rodríguez et al., 2021), South Korea (Choi et al., 2020) showing a single-factorial design and good psychometric properties. COVID-19 Anxiety Scale of Silva et al.; (2020), is similar in formulation and psychometric properties with the CAS but it is tested only in a single cultural context. Meanwhile CDAS, designed by Iranian researchers, differs from the scales mentioned above because it presents a two-factor structure (physiological and psychological symptoms). It also has good psychometric properties, but it is validated from authors only in their own culture.

The purpose of this article is to present the analysis of the psychometric properties of the CDAS even in the Albanian context. The evaluation of the psychometric properties including reliability, validity and factor structure is realized in the population of university students of Shkoder, Albania from Bachelor degree.

METHODOLOGY

Participants

The sample of this study consists of 175 students selected in a purposive, non-probability sampling from three different faculties of University of Shkoder, respectively from faculty of Educational Sciences, Natural Sciences and Economics, ranged in age from 18 to over 26 years old. According to the demographic findings, 158 participants (90.3%) were female and 17 participants (9.7%) were male; in terms of age 59 participants (33.7%) were in the age range of 18-19 years old, 71 (40.6%) were aged 20-21 years old, 26 (14.9%) were aged 22-23 years old, 8 (4.6%) were aged 24-25 years old and 11 (6.3%) were in the age range over 26 years old; in terms of level of study, 68 participants (38.9%) were first year students, 52 participants (29.7%) were second year students, 24 (13.7%) third year students, 25 (14.3%) fourth year students and 6 students (3.4%) fifth year students; in terms of the field of study 44 participants (25.7%) were students of Psychology, 63 of them (35.4%) students of Social Work, 22 (12.6%) students of Nursery and 40 of them (22.9%) students of Economics.

Research Instruments

- A. *Demographic questions.* At the beginning of the questionnaire, to the participants were given demographic questions which included standard categories such as: gender, age, level and field of study.
- B. *Corona Disease Anxiety Scale (CDAS)* was created by Iranian researchers: Alipour, Ghadami, Farsham and Dorri (2020) and it included 18 items based on a Likert scale from 0 to 3 (0=never, 1=sometimes, 2=often, 3=always). The items from 1 to 9 measure the physical symptoms and items from 10 to 18 measure psychological symptoms of anxiety as a result of the pandemic situation (Alipour et al.,2020). The marking for this

questionnaire ranges from 0 to 54, the higher the marks are the greater the level of anxiety is.

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Table 1. Corona Disease Anxiety Scale (CDAS) in Albanian language

	Pohimet	Kurrë	Ndonjëherë	Shpesh	Gjithmonë
1. Më kap ankthi kur mendoj rreth koronavirusit.	0	1	2	3	
2. Tensionohem kur mendoj rreth pasojave negative të koronavirusit.	0	1	2	3	
3. Më shqetësojnë shumë shifrat e larta të koronavirusit.	0	1	2	3	
4. Kam frikë se mos infektohem nga koronavirusi.	0	1	2	3	
5. Frika se mos infektohem nga koronavirusi është e pranishme në çdo kohë.	0	1	2	3	
6. Edhe shenjat më të vogla më bëjnë të besoj që mund të jem prekur nga koronavirusi, kështu që filloj të kontrolloj veten.	0	1	2	3	
7. Shqetësohem se mos ua transmetoj koronavirusin atyre që më rrethojnë.	0	1	2	3	
8. Ankthi në lidhje me koronavirusin më shoqëron në çdo gjë që bëj.	0	1	2	3	
9. Më shqetëson fakti që lajmet perqëndrohen kryesisht mbi ngjarjet rreth koronavirusit.	0	1	2	3	
10. Duke menduar rreth koronavirusit tani flë më pak.	0	1	2	3	
11. Duke menduar rreth koronavirusit kam humbur oreksin.	0	1	2	3	
12. Më dhëmb koka kur mendoj rreth koronavirusit.	0	1	2	3	
13. Filloj të dridhem kur mendoj rreth koronavirusit.	0	1	2	3	
14. Më rrënqethet trupi kur mendoj rreth koronavirusit.	0	1	2	3	
15. Koronavirusi më është kthyer në makth.	0	1	2	3	
16. Për shkak të koronavirusit tani merrem më pak me aktivitet fizik.	0	1	2	3	
17. E kam të vështirë të flas me të tjerët në lidhje me koronavirusin.	0	1	2	3	
18. E ndjej zemrën të më rrahë shpejt kur mendoj rreth koronavirusit.	0	1	2	3	

D. *Beck Anxiety Inventory (BAI)* was developed by the American psychiatrist Aron T. Beck (1993) and includes 21 items based on a 4-point Likert scale that measures the severity of anxiety in adults and adolescents where they are asked to report the extent to which they have been bothered by symptoms in the week preceding (including the day that the questionnaire was completed). Each participant has four possible choices, from 0=never, 1=sometimes, 2=often, 3=always. The values for each item are summed yielding an overall or total score that can range between 0 and 63 points. BAI has been criticized for its main focus on the physical symptoms of anxiety (most of them similar with the reaction to a panic attack) and neglect of the psychological symptoms. The internal consistency of the *instrument* items, assessed by *Cronbach's alpha coefficient* was high ($\alpha = 0.94$).

Data Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS-23). The internal consistency of the scale was evaluated using the Cronbach's alpha coefficient and Split-Half method using the Spearman-Brown prophecy formula; to evaluate the structure validity, confirmatory factor analysis (for a model with two factors) with *varimax rotation* was utilized; Convergent validity of CDAS was examined by calculating the correlations coefficient (Pearson's r) between these measure with the Beck Anxiety Inventory (BAI).

Ethics

This study is in accordance with the standards of the Code of Ethics and Deontology (Order of Psychologist in the Republic of Albania, 2017). At the beginning of the questionnaires that were administered online using Google Forms, subjects had to read the informed consent which informed them about the study's purposes, its nature, the risks and benefits. In addition, participants were informed that their responses would be kept confidential and would be used for research purposes. They were also informed that their participation was voluntary and they could withdraw from the study at any time. To consent, participants could click "yes" (I agree) or "no" (I disagree) before looking at the content of the questionnaires.

RESULTS

Reliability analysis

Reliability is a measure used to evaluate the degree to which each measurement procedure yields the same results on repeated tests. However, every measurement have some degree of uncertainty that may come from a variety of sources.

But while repeated measurements of the same phenomenon never precisely duplicate each other, they do tend to be consistent from one measurement to another. This tendency toward consistency found in repeated measurements of the same phenomenon is referred to as reliability (Carmines & Zeller, 1979). One approach of assessing the internal consistency of the scale is the correlation between multiple items in a test that are intended to measure the same construct.

Reliability indicates the extent to which individual differences in test scores are attributable to true differences in the characteristics under consideration and the extent to which they are attributable to chance errors (Anastasi, 1988).

As can be seen from the results in Table 2, Cronbach's alpha for the total questionnaire and for the two particular factors also was higher than 0.7 indicating acceptable internal consistency.

Table 2. Internal reliability coefficients for CDAS and its factors

Factor name	Items of each factor	Number	Cronbach's alpha
Psychological symptoms	1-8	9	.89
Physiologic symptoms	10-18	9	.88
Full questionnaire		18	.92

CDAS in this study seems to be very reliable. Coefficient alpha for psychological symptoms resulted $\alpha = .89$, for physics symptoms $\alpha = .88$ and for the total questionnaire $\alpha = .92$.

Split-Half method

Another method that is used to evaluate the reliability of the scale measuring the consistency between two halves of a construct measure is Split-half reliability.

This method consists of dividing the whole set of test items into two equal halves and calculating the correlation between these *two total scores*. A fundamental assumption of reliability according to this method is that the two halves of the scale should give similar scores and therefore a high correlation. The split-half reliability coefficient is the correlation between the total scores of the two half-tests, corrected by the Spearman-Brown formula for the full test (Crocker & Algina, 1986).

In this case CDAS scale is divided in two parts with an equal number of 9 items. Table 3 shows the reliability coefficient of Split-Half for CDAS. As it can be seen from the data, the

coefficient in this study resulted to be high, $r_{hh} = .92$ (in general, .70 is considered an acceptable value, .80 a good one and .90 or higher is considered very good).

Table 3. Split-Half reliability

Cronbach's alpha				Spearman-Brown coefficient	
Part 1		Part 2		Equal length	Unequal length
Value	N of items	Value	N of items	.922	.922
.832	9 ^a	.880	9 ^b	Guttman Split-Half coefficient	
Correlation between forms				.921	
.855					

a. The items are: 1, 3, 5, 7, 9, 11, 13, 15, 17.

b. The items are: 2, 4, 6, 8, 10, 12, 14, 16, 18.

Confirmatory factor analysis

Confirmatory factor analysis aims to define if the respective number of factors and items confirms what is expected based on the pre-created theory. Items are chosen based on the previous theory and the factorial analysis is used to see if their weight is the same as it was predicted at the expected number of factors (Preedy & Watson, 2009).

CDAS designed by Alipour and his colleagues (2020), is expected to be a scale with two factors: the first, named “physiological symptoms” with 9 items (10-18) were extracted and the second factor, named “psychological symptoms” with 9 items (1-9).

In table 4 are presented the results of the factor analysis for the CDAS instrument, where it can be observed that, after the varimax rotation, the minimum factor weight of an item is .367 and the maximum .818.

These two factors account for 58% of the total variance, of which 29.3% was related to psychological symptoms where the item number 18 “I feel my heart beating when I think about coronavirus”, had the highest eigenvalue (.818). The second factor named “psychological symptoms” explained slightly lower variance, about 28.8%. Here the item number 10 “Thinking about coronavirus has interrupted my sleep”, had the highest eigenvalue (.815).

Table 4. The impact of each item on CDAS

N	N of item	Factor 1	Factor 2
1.	18	.818	
2.	13	.817	
3.	12	.788	
4.	14	.762	
5.	17	.754	
6.	10	.718	
7.	11	.657	
8.	15	.577	
9.	16	.367	
10.	5		.815
11.	2		.788
12.	1		.787
13.	3		.767
14.	4		.691
15.	6		.687
16.	7		.678
17.	8		.663
18.	9		.442

All items resulted to be significant in relation to one of these two factors.

Convergent validity

Convergent validity is a parameter often used in sociology, psychology and other behavioral sciences, refers to the degree to which two measures of constructs that theoretically should be related, are in fact related (Carlson & Herdman, 2012). This is considered a subscale of constructive validity. Convergent validity of CDAS was provided by the correlation with Beck Anxiety Inventory (BAI). From the results it can be observed that exist a moderate positive correlation between the two measurements $r_{(175)} = .429$, $p < .001$, which suggests that both scales was characterized by adequate reliability and concurrent validity. Table 5 shows the correlation between the two scales and their descriptive results.

Table 5. Mean, Standard Deviation and correlation between the scales

Scales	Mean	Standard deviation	BAI	CDAS
BAI	19.65	12.84.	-	.429**
CDAS	13.09	9.85	.429**	-

Note: BAI=Beck's Anxiety Inventory; CDAS=Coronavirus Disease Anxiety Scale; * $p < .001$

DISCUSSION

The purpose of this study was to evaluate the psychometric properties of the Corona Disease Anxiety Scale (CDAS) in the Albanian context. The results showed that CDAS is a reliable and a valid scale for measuring the anxiety caused by COVID-19 in the population of students from University of Shkoder, Albania.

One of the most common indicators of internal consistency of a measure is Cronbach's alpha coefficient. In this study, Cronbach's alpha was $a = .92$, almost the same of the original scale applied in Iranian population that has resulted $a = .91$ (Alipour et al., 2020). Also, these results are similar to those of Coronavirus Anxiety Scale (CAS) where $a = .93$ (Lee, 2020).

According to Split-Half analysis, the scale turns out to have high internal reliability ($r_{hh} = .92$). Confirmatory factor analysis made it possible to confirm two factors: physiological (items from 1 to 9) and psychological (items from 10 to 18). This finding is consistent with the recent studies including that of Alipour and his colleagues (2020). As demonstrated by previous research on anxiety in the pre-pandemic period that are focused on designing questionnaires for patients with anxiety disorders they had often emphasized the physical and psychological factors of these patients, which is in the same line with the present findings (Dong, 2017; Laureau et al., 2018; Ninot et al. 2013). The results of this study showed a good convergent validity of the CDAS, defined by the correlation with BAI ($r = .43$, $p > 0.01$). Also, the Iranian researches that hold the merit of the CDAS development, have defined the convergent validity from the correlation of this scale with GHQ-28 and they managed to produce similar results with those of our study ($r = .49$, $p > 0.01$). In conclusion, it can be said that CDAS is a suitable scale for measuring anxiety due to COVID-19 in the Albanian context.

However, several limitations of the study should be noted, to provide direction for future research. *Firstly*, subjects were chosen using non-probability sampling techniques. Although this approach is common in scientific researches during the pandemic situation, the study could be repeated using in this case probabilistic selection techniques.

Secondly, the sample of the study consisted of university students and may not be representative of the general adult population, because generalization of the results is

somewhat limited. *Thirdly*, the data were collected using an online self-administered questionnaire and there is a risk that participants did not take seriously the compilation. Despite these limitations, should be noticed that is the first study that evaluate the psychometric properties of the CDAS in Albanian context and would serve as a basis for other cross-sectional or longitudinal studies that aim to evaluate the distribution and severity of anxiety symptoms due to COVID-19 in the general population of our country.

ACKNOWLEDGEMENTS

The researchers express their gratitude to the students of University of Shkoder who participated in this study.

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