The validation of Corona Anxiety Questionnaire in Iranian Population

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Abstract

Background: Anxiety is an evolutionary mental status that alerts a person from possible dangers: inside or outside dangers. One of the external dangers that threaten global society these days is Corona's disease. It has reported since 2020 January in Iran and has killed more than 8000 people during 5 month. But someone are unaware of the importance and danger of Corona or they don't consider any reason to worry. The aim of this study was to design and standardize a special questionnaire for corona anxiety in the Iranian population. Because of it, with the help of 10 psychologists and psychiatrics found 8 scales and wrote 36 question. Questionnaire asked from 523 internet operators by porsline.ir all over Iran.

Method: To assess the reliability, kappa statistic was calculated and for construct validity, exploratory factor analysis (EFA) with Varimax rotation and confirmatory factor analysis (CFA) were used. Convergent and discriminant validity was checked using Spearman correlation and for content validity index (CVR) was used. Result: Reliability for the most items was high. Questionnaire showed excellent convergent and discriminant validity except for social support subscale. The results of categorical confirmatory factor analysis supported the fit of the eight-factor model of the Corona Anxiety Scales-36. Furthermore, the average of CVR was higher than acceptance level (0.62).

Conclusion: The findings showed that the corona anxiety questionnaire is a questionnaire with appropriate validity and reliability for use in anxiety related to the unknown corona disease.

Background

Anxiety is an evolutionary mental status that alerts a person from possible dangers(1). These dangers may be internal (psychological threats) or external (social threats), but anxiety does not have a specific root and cause obviously, so it always manifests itself as anxiety and restlessness. While being rootless, it can be caused by environmental factors such as health and life risks, and the nervous pressure is often so deep and persistent that it can lead to the physical pains and physical disorders such as migraine headaches and stomach pain in addition to using the endocrine system (2, 3). One of the external dangers that threaten global society these days is Corona's disease. Corona is the family of lung viruses that can kill a patient with flu-like symptoms within a few days (4). By the advent of corona, all medical and governmental systems around the world have tried to control and prevent it.

However, hundreds of people suffer from the disease almost every day. At the same time, it has been determined that the level of predicting risk by individuals in different provinces is very different despite the numerous trips of the Iranian people to recreational and tourism areas. This means that some people are unaware of the importance and danger of Corona or they don't consider any reason to be worry. Currently, approximately 8.3% of Iranian people suffer from a variety of anxiety disorders(5), and this disorder is observed more among women and single people with poorer social support (6). Current anxiety questionnaires such as the Depression Anxiety Stress Scales (DASS) (7) and the Beck Anxiety Inventory (BAI) (8) and the General Health Questionnaire (GHQ) (9) measure the general anxieties and do not target the specific anxiety of an acute and infectious disease. Therefore, the need for a questionnaire that can assess the psychological sensitivity of individuals in the general society about an acute and fatal infectious disease such as Covid19 can be useful in research that seeks to influence the media and the truthfulness of individuals.

In addition to psychoanalysis of corona anxiety, this questionnaire can examine the anxiety of those diseases by replacing a few words and naming acute diseases instead of corona.

Methods

To determine the necessary scales for corona anxiety, 3 psychologists and psychiatrists were polled who have a background in the field of psychology of chronic diseases. Sufficient questions were designed for the available scales. Questions designed were evaluated by 10 psychologists and 10 normal individuals. After removing the repeated and less relevant questions, using the online random sampling method in the general population for each question, more than 10 people were considered for

answering, and thus questions were asked from 523 computer users. Due to the release of Corona and the protection of sanitary privates, the questionnaire was uploaded on the website porsline.ir so that eager people can complete the questionnaire online.

Inclusion criteria: All Iranian people could participate in the survey without considering demographic information. Exclusion criteria: Questionnaires that were not fully filled out or that the researcher made it possible to accidentally fill out were removed.

SPSS 16 and MedCalc 14 were employed to perform the exploratory factor analysis and discriminant and convergent analysis; also, the Amos 23 software was used to perform the CFA analyses.

The reliability of the Corona Anxiety subscales was tested using the Cronbach's alpha coefficient. The coefficient values of greater than 0.7 was considered as satisfactory internal consistency. The exploratory factor analysis (EFA) with varimax rotation and confirmatory factor analysis (CFA) were used to determine the construct validity of the Corona Anxiety Scale. According to Kline (10), the value of 0.40 was used as a factor loading criterion in the exploratory factor analysis in the correlation matrix between the Corona Anxiety items and the eight hypothesized subscales. CFA was utilized to assess the relationship between a set of continuous latent variables and a number of observed variables (the items of the Corona Anxiety-36). In this research, we studied whether or not the assumed eight-factor model is a good model for data. A number of goodness-of-fit indices were used for investigating the goodness of fit of the model, including Tucker–Lewis index (TLI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA). Values of $RMSEA \leq 0.08$, and CFI and $TLI \geq 0.90$ determined an adequate model fit (11).

Convergent and discriminant validity were assessed using Spearman correlation coefficient. The value of a coefficient should be at least 0.40 between a scale and its own item for convergent validity. Discriminant validity is supported whenever a correlation between an item and its hypothesized subscale is higher than its correlation with the other subscales. The correlation between an item and its own-subscale should be significantly higher than the correlations of that item to other subscales (12). Content validity index (CVR) was calculated based on the responses to the necessity of questions (n_e) and total number of people (N) with $CVR = (n_e - N/2) / (N/2)$. According to Msyamboza (2005), for 10 professionals, the minimum required CVR for each item is 0.62 (13).

Table 1
Corona Anxiety Questionnaire Key

number	Questions	Scales	Min	Max	Balance
1	1,2,3,4,18,19,26,33	Sensitivity to Cleaning	8/ abandon to Cleaning	32/Obsessive	16–18
2	5,6,7,8,9,23,28	New disorders in the corona effect.	7/ Lack of disorder	28/ suspicious in neurotic syndrome and delirium	14–17
3	10,11,12,14,24,25	Social sensitivity and touch	6/social imprudence.	24/ unsociability in the corona effect	12–14
4	17,20,31,40	Background of anxiety and psychological disorders	4/Mental health	16/ suspicious in neurotic syndrome and delirium	4–8
5	16,36,37,38,39	Social support	5/ lack of social support	20/ Saturation of social support	10–12
6	13,32	Sensitivity to individual responsibility	2/ Social irresponsibility	8/ Social obsession	4–8
7	27,34	Verbal Avoidance of Illness	2/ Welcome to talking about Corona	8/ Avoid talking about Corona	4–5
8	15,35	Sensitivity to religious beliefs	2/ Religious disbelief	8/ Superstitious belief	4–5
9	1–36	General score	36	144	66–85

The questions related to each of the questionnaire items are given in Table 1. A 36-item questionnaire and a 4-point Likert answer (1. Not at all; 2. Less; 3. To some extent; 4. Very much) examines the general understanding of the importance and degree of risk of Coron's disease, and it has 8 sub-scales 1) Sensitivity to cleaning; 2) New disorders in the Corona effect; Social sensitivity and touch; 4) Background of anxiety and psychological disorders; 5) Social support; 6) Sensitivity to provide individual responsibility; 7) Verbal avoidance of illness; 8) Sensitivity to religious beliefs and a total score of anxiety.

Results

Of all 523 responders, the median age was 36 (range 11 to 79 years) with a mean of 37.19 (SD = 12.7). The majority of responders were female (62.6%) with 35% having high school or less and 21% having obtained MD and PhD. They all lived in cities with only 3% having acquired symptoms of COVID-2019 and 5% having OCD history.

Table 2
Cronbach's alpha for the Corona Anxiety subscales in Iranian people

Scales	No. items	n	mean $\pm$ SD	Cronbach's alpha
Sensitivity to Cleaning	8	523	16.46 $\pm$ 5.56	0.84
New disorders in the corona effect	7	523	10.75 $\pm$ 4.36	0.82
Social sensitivity and touch	6	523	15.86 $\pm$ 4.21	0.75
Background of anxiety and psychological disorders	4	523	6.86 $\pm$ 2.11	0.42
Social support	5	523	11.07 $\pm$ 2.78	0.42
Sensitivity to individual responsibility	2	523	4.81 $\pm$ 1.95	0.64
Verbal Avoidance of Illness	2	523	3.62 $\pm$ 1.44	0.36
Sensitivity to religious beliefs	2	523	5.33 $\pm$ 1.59	0.52
Total anxiety	36	523	74.73 $\pm$ 15.8	0.89

Table 2 displays the Cronbach's alpha coefficients, means and SDs of the Corona Anxiety Scale for Iranian people with and without anxiety. It reveals that all of the domains have sufficient reliability which is greater than 0.7 except for 'Background of anxiety and psychological disorders', 'Social support', and 'Verbal Avoidance of Illness'.

Table 3
CVR and Factor loadings (rotated) ¹ of eight factor solution of the Corona Anxiety Scale

Scales	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇	F ₈	CVR
Sensitivity to Cleaning									
1. Sensitivity to behavioral symptoms	0.69	0.28	-0.04	-0.01	0.06	0.12	0.05	-0.13	1
2. Obsessive to wash	0.73	0.18	0.22	0.18	-0.03	0.10	0.02	0.00	1
3. Sensitivity to physical symptoms	0.74	0.19	0.14	-0.02	0.06	0.14	0.05	-0.02	1
4. Physically avoid of people	0.52	0.15	0.28	-0.14	0.02	0.22	0.02	0.14	1
18. Run away from people because of afraid of illness	0.55	0.21	0.21	0.16	0.16	0.03	0.01	0.02	1
19. Hesitance of Life priorities	0.52	0.16	0.15	0.07	0.13	0.16	-0.04	0.08	1
24. Obsession of exist Corona virus	0.54	0.29	0.37	0.25	-0.03	-0.10	0.08	-0.12	0.4
29. Obsessive symptom in effected of Corona	0.40	0.32	0.29	0.37	0.03	-0.01	0.15	0.10	1
New disorders in the corona effect									
5. Obsessive of sin	0.27	0.57	0.24	-0.04	0.09	0.03	0.01	0.05	0.2
6. Dream disorder in effected of Corona	0.28	0.66	0.19	0.04	0.06	-0.06	0.05	0.04	0.2
7. Psychosomatic in effected of Corona	0.35	0.62	0.07	0.31	-0.01	0.01	0.07	0.05	1
8. Thought of Suicide	0.08	0.68	0.02	0.02	0.14	0.07	-0.07	-0.07	0.2
9. Anxiety from environmental cues	0.14	0.61	0.13	0.01	0.08	0.16	0.12	0.01	0.8
21. Depression symptoms	0.21	0.69	0.11	0.26	0.05	0.01	0.17	-0.03	0.6
26. History of anxiety disorders	0.25	0.40	0.14	0.38	0.24	0.16	0.22	-0.16	1
Social sensitivity and touch									
10. Obsessive about awareness	0.15	0.22	0.69	0.03	-0.05	0.05	-0.31	-0.05	1
11. Obsessive about awareness	0.18	0.31	0.68	0.01	0.02	0.06	-0.19	-0.03	0.6
12. Distrust to people	0.08	0.22	0.54	-0.16	0.26	0.17	0.28	-0.03	1
14. Sensitivity about touch	0.35	0.23	0.56	0.18	0.09	0.04	0.16	0.03	0.6
22. Run away from people because of afraid of illness	0.29	-0.09	0.50	0.10	0.06	0.03	0.32	0.03	1
23. Obsessive to wash	0.39	0.04	0.50	0.23	-0.20	-0.02	0.05	-0.04	1
Background of anxiety and psychological disorders									
17. History of healthy obsessive	0.18	-0.04	0.20	0.31	0.05	-0.01	-0.16	0.46	1
20. History of mental disorders	0.05	0.07	-0.04	0.51	0.08	-0.05	-0.12	-0.10	1
27. History of Psychosomatic	-0.03	0.14	-0.04	0.58	0.01	0.33	0.31	-0.09	1
36. Disbelief about obsession	0.12	0.07	0.29	0.57	0.10	-0.04	0.14	0.23	1
Social support									
16. Social support for talk	0.11	0.16	-0.06	-0.08	0.67	-0.13	0.07	0.01	0.4

Scales	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇	F ₈	CVR
32. Rate of Social support	-0.15	0.12	0.12	-0.07	-0.55	0.24	0.06	0.22	1
33. Financially problem	-0.16	0.16	0.16	0.03	0.62	0.25	-0.04	0.03	1
34. History of anxiety disorders	0.13	0.25	0.18	0.30	0.48	0.28	0.10	-0.09	1
35. Rate of Social support	0.10	0.09	0.05	0.38	0.59	0.12	0.06	-0.08	1
Sensitivity to individual responsibility									
13. Distrust to people	0.25	-0.04	0.05	-0.03	0.03	0.78	-0.05	0.04	1
28. Obsessive about Feel guilty	0.35	0.25	0.07	0.15	0.01	0.64	0.07	-0.02	1
Verbal Avoidance of Illness									
25. Sensitivity to talk about Corona	0.26	0.20	0.18	0.17	-0.01	0.00	0.47	-0.09	0.6
30. Sensitivity to talk about Corona	-0.05	0.09	-0.11	-0.01	0.05	0.00	0.81	0.06	1
Sensitivity to religious beliefs									
15. Commitment to religion	0.05	-0.03	-0.06	-0.06	-0.06	-0.06	-0.06	0.74	0.2
31. Belief to supporting by God	-0.16	0.04	-0.09	-0.10	-0.16	0.11	0.19	0.73	0.6
<i>Note.</i> 1: Varimax rotation; F1: Sensitivity to Cleaning, F2: New disorders in the corona effect, F3: Social sensitivity and touch, F4: Background of anxiety and psychological disorders, F5: Social support, F6: Sensitivity to individual responsibility, F7: Verbal Avoidance of Illness, F8: Sensitivity to religious beliefs; Items belonging to the postulated scales are shown by bold numbers; Factor loadings under 0.4 have been underlined.									

The result of the factor analysis with Varimax rotation to test the construct validity of the Corona Anxiety Scale is presented in Table 3. The proportions of variance explained by the first eight factors are 53.75%. Only the items of 'History of obsessive disorder' in background of anxiety and psychological disorders subscale has a weak correlation (below 0.4) with its own domain. Nevertheless, the results of CFA supported the fit of the eight-factor model with RMSEA = 0.055, CFI = 0.83, TLI = 0.8 for the Corona Anxiety Scale. In this table, the result of CVR were calculated for each item. Minimum and maximum CVR were 0.6 and 1, except for 'Obsession of exist Corona virus', 'obsession for sin', "sleeping disorder affected by Corona", 'intentions of suicide', 'social support for talk', and "Commitment to religion". Total CVR for the entire questionnaire (average of CVRs of all items) was 0.82, so in average CVR was higher than the acceptance level (0.62).

Table 4
Item scaling tests: convergent and discriminant validity for the Corona Anxiety Scale

Scales	No. items	Convergent validity ^a		Discriminant validity ^b	
		Range of correlation	Scaling success (percent)	Range of correlation	Scaling success (percent)
Sensitivity to Cleaning	8	0.61–0.8	8/8(100)	0.01–0.56	56/56(100)
New disorders in the corona effect	7	0.61–0.8	7/7(100)	0.01–0.52	49/49(100)
Social sensitivity and touch	6	0.6–0.74	6/6(100)	0.04–0.64	42/42(100)
Background of anxiety and psychological disorders	4	0.44–0.7	4/4(100)	0.0004–0.33	28/28(100)
Social support	5	0.12–0.72	4/5(80)	0.01–0.42	31/35(89)
Sensitivity to individual responsibility	2	0.85–0.86	2/2(100)	0.004–0.45	14/14(100)
Verbal Avoidance of Illness	2	0.75–0.81	2/2(100)	0.005–0.38	14/14(100)
Sensitivity to religious beliefs	2	0.8–0.84	2/2(100)	0.01–0.13	14/14(100)
<i>Note.</i> a: Number of correlation between items and hypothesized scale corrected for overlap ≥ 0.4 /total number of convergent validity tests; b: Number of convergent correlations significantly higher than discriminant correlations/Total number of correlations.					

The result of the convergent and discriminant validity for the Corona Anxiety Scale is presented in Table 4. These findings show that the scaling success rates for convergent and discriminant validity are 100% for all domains except for social support subscale. In this subscale, the success rate for item convergent and discriminant validity of items are 80% (4/5) and 89% (31/35), respectively.

Discussion

The present study was conducted to construct Corona Anxiety Questionnaire and examining its validity and reliability. According to the results, this questionnaire is a valid tool among Iranian people with a desirable reliability number and excellent convergent and discriminant values. The results of exploratory factor analysis presents a document that this questionnaire has 8 dimensions: Sensitivity to Cleaning, New disorders in the corona effect, Social sensitivity and touch, Background of anxiety and psychological disorders, Social support, Sensitivity to provides individual responsibility, Verbal Avoidance of Illness, and Sensitivity to religious beliefs, which is also confirmed by CFA Factor Analysis (CFA). These 8 dimensions explain about half of the variance between variables.

According to the DSM-IV-TR classification, the category of anxiety disorders includes obsessive-compulsive disorder, panic attack, pervasive anxiety disorder, and post-traumatic stress disorder. This classification is based on the effect of anxiety on external behavior, such as hand washing or avoiding discussion about fear and anxiety (14). Relying on this type of classification, the present questionnaire also included obsessive-compulsive disorder as anxiety disorders, and in addition to past and new anxiety symptoms due to corona, it has paid attention to past and new obsessive-compulsive symptoms.

The components extracted in the Sensitivity to Cleaning dimension include Sensitivity to behavioral symptoms, Obsessive to wash, Sensitivity to physical symptoms, Physically avoid people, Run away from people because of fear of illness, Hesitance of Life priorities, Obsession of exist Corona virus and Obsessive symptom in effected of Corona.

In the Mazdali Obsession Questionnaire, which includes 4 subscales of Obsessive to wash and check, slowness, and doubt, the subclass of obsessive to wash asks questions similar to the Sensitivity to Cleaning scale of this questionnaire(15, 16). The components extracted in the New Disorders in the Corona effect dimension include Obsessive of sin, Dream disorder in

effected of Corona, Psychosomatic in effected of Corona, Thought of Suicide, Anxiety from environmental cues, Depression symptoms, and History of anxiety disorders.

The DSM-IV-TR refers to the classification of a variety of anxiety disorders as anxiety disorders caused by general medical illness. The sub-scale of new disorders in the corona effect is considered based on this division (14).

The components extracted in the Social sensitivity and touch dimension include Obsessive about awareness, Obsessive about awareness, Distrust to people, Sensitivity about touch, Run away from people because of the fear of poverty and Obsessive to wash. This scale in the classification of delusional disorders is a subset of the bite and injury delusion. DSM-IV-TR divides this disorder into belief in injury and conspiracy by strangers by others (14).

The components extracted in the Background dimension of anxiety and psychological disorders include History of healthy obsessive, History of mental disorders, History of Psychosomatic and Disbelief about obsession. In addition to the fact that DSM-IV-TR considers a significant amount of anxiety disorders as a result of people's pathology backgrounds (14), the MMPI questionnaire (17) also considers this issue under the topic of the causes of disorders.

The components extracted in Sensitivity to individual responsibility include Distrust to people, Obsessive about Feel guilty in the Verbal Avoidance of Illness dimension including Sensitivity to talk about Corona and Sensitivity to talk about Corona and Sensitivity to religious beliefs including Commitment to religion and Belief to support by God.

Research has shown that religious beliefs can be a powerful preventative against anxiety disorders and have a better prognosis for sufferers (18). Therefore, the level of trust in God and religious rites was included in this questionnaire. In this way, it can be found that the components of Corona Anxiety Questionnaire are in accordance with the components mentioned in the theoretical and experimental texts, and the findings of the present study confirm its validity and reliability. But it's important to note that Cronbach's alpha is less than 0.05 in three dimensions, Background of Anxiety and Psychological Disorders, Social Support, and Verbal Avoidance of Illness. Furthermore, Question 17, entitled History of healthy obsessive with a correlation of 0.31, which is less than the appropriate standard of 0.4, is in its dimension (Background of anxiety and psychological disorders). Finally, this questionnaire was conducted only on Iranian people, and therefore its generalization to individuals in other countries requires further study.

Conclusion

Although several questionnaires have been already presented in the field of anxiety in psychology, it is necessary to design a special questionnaire about Corona disease which is a new and unknown disease. In general, the findings show that the corona anxiety questionnaire is a questionnaire with appropriate validity and reliability for use in anxiety related to the unknown corona disease.

Abbreviations

exploratory factor analysis (EFA); confirmatory factor analysis (CFA); content validity index (CVR); General Health Questionnaire (GHQ); Depression Anxiety Stress Scales (DASS); Beck Anxiety Inventory (BAI).

Declarations

Ethics approval and consent to participate

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the Shiraz University of Medical Sciences (SUMS) ethics board committee, reference number: IR.SUMS.REC.1399.112. It is worth mentioning all participants filled out the summary form of informed consent of Shiraz University of Medical Sciences.

Consent for publication

"Not applicable" in this section.

Availability of data and materials

The datasets during and/or analysed during the current study available from the corresponding author on reasonable request.

Competing interests

There is no competing interests.

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Authors' contributions

MM have involved in the study concept and design, acquisition of data, drafting the manuscript, administrative, statistical analysis, technical and study supervision and final proof of the manuscript.

MRH have involved in the study concept and design, acquisition of data, drafting the manuscript, administrative, statistical analysis, technical and study supervision and final proof of the manuscript.

MF have involved in statistical analysis and interpretation of the data, critical revision of the manuscript for intellectual content and final proof of the manuscript.

HJ have involved in Conceptual Design and technical and study supervision, statically analysis and final proof of the manuscript.

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