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Adaptation Of The Covid-19 Fear Scale Method: Psychometric Characteristics Of The Russian Version

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Abstract. In scientific and practical terms, the comparison of methods based on different theoretical and methodological foundations is of particular relevance.It should be noted that most of the globally recognized methods do not have a reliable and valid Russian-language version, which sets the task of validating the corresponding tools.The work is devoted to the development and testing of the Russian-language version of the **Fear of COVID-19** Scale, which makes it possible to identify the severity of anxiety about coronavirus infection.

Testee: 463 people, including patients of medical institutions repurposed for the treatment of COVID-19 (66 people)

Methods : Fear of COVID-19 Scale (Ahorsu, Lin, Imani, et al., 2020), Impact of Event Scale by M. Horowitza, adapted in Russia in 1998 by M.Sh. Magomed-Eminov (Magomed-Eminov, 2008).

Results: internal consistency of the scale (Cronbach's alpha) is 0.81. The convergent validity of the method was analyzed (significant correlations between Fear of COVID-19 Scale and Impact of Event Scale were obtained.Revealed a 2-factor structure of the method.A significant relationship was found between the fear of coronavirus infection and socio-demographic characteristics (gender, age,).

Keywords: Fear of COVID-19 Scale, concern, anxiety, psychometric indicators, negative, neutral and positive consequences of an extreme situation.

Introduction

Since COVID-19 was reported in December 2019 to June 2021, there have been more than 177 million confirmed cases in over 200 countries and regions.The virus is new, rapidly spreading, with a death rate of about 2%.The number of cases of 2019-nCoV infection continues to rise, as does the number of deaths - about 4 million people.

This century, humans have experienced three coronavirus pandemics in 2003, 2012 and COVID-19 in 2019.Each pandemic not only posed serious threats to the lives of infected people, but also caused varying degrees of negative and profound psychological problems in both COVID-19 survivors and those who did

not have COVID-19 (Asmolov, Magomed-Eminov et al., 2020; Brook et al., 2020; Lee, 2020; Holmes et al., 2020); Lin et al., 2020) in the form of tension, fear, anxiety and psychological maladjustment, depression.Studies of previous pandemics have shown a link between viral infectious diseases and psychological distress, with negative consequences of psychological reactions such as hypochondria and anxiety affecting the health and well-being of people during an infectious epidemic crisis (Duncan et al. 2009; Pappas et al. 2009; Ropeik 2004; Hameretal., 2019).

Over the period of the pandemic, researchers around the world believe that it is necessary to more accurately find out whether people are really suffering from psychological problems associated with COVID-19.One of the central problems identified by most researchers is fear, even "coronavirus psychosis", all sorts of variations of anxiety before the threatCOVID-19 (Bo et al., 2020; Taylor, Asmundsen, 2020; Enikolopov et al., 2020;Gerasimova, Kholmogorova, 2020;Yan et al., 2021; Martin, 2020; Pervichko et al. 2020; Sokolova, L. P., M. Sh. Magomed-Eminov et al, 2020:Tkhostov, Rasskazova, 2020; Wang et al., 2020; Xie et al., 2020; Zhang et al., 2020). For example, it is believed that «people with high health anxiety tend to misinterpret harmless bodily sensations and changes as evidence that they are infected, which in turn increases their anxiety and affects their ability to make rational decisions and affects on their behavior» (Asmundson, Taylor, 2020).That is, it requires at least differentiation of ‘illness anxiety disorder’ [DSM-5; American Psychiatric Association (APA), 2013], from what today is commonly called fear or (anxiety) about a new coronavirus infection.

Various existing instruments are used for the initial screening or clinical diagnosis of anxiety, depression, and other mental symptoms, in particular the Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS), Generalized Anxiety Disorder (GAD-7), and the General Health Questionnaire (GHQ-9).Also, in the first months of the 2020 pandemic, specialized diagnostic tools were developed, for example, the peritraumatic distress scale (CORPD) (Qiu, Shen, Zhao et al., 2020), the COVID-19 threat scale (Kachanoff, 2020), COVID Stress Scales (Taylor et al., 2020), COVID-19-Related Psychological Distress Scale (CORPDS) (Feng, 2020), Coronavirus Anxiety Scale (CAS) (Lee, 2020), etc.

In connection with the methodological aspect to which this study is devoted, the focus is on the psychological tool - the COVID-19 Fear Scale (FCV-19S) (Ahorsu et al, 2020), developed in the first period of the pandemic and adapted in Israel (Bitan et al., 2020), Italy (Satici et al., 2020; Soraci et al., 2020), Turkey (Satici et al., 2020), Bangladesh (Sakib et al., 2020), in Arabic (Alyami et al., 2020)., in Brazil (Silva, 2021).Items FCV-19 were constructed based on a review of existing fear scales, peer review, and participant surveys.Several psychometric tests were performed to ensure the reliability and validity of the proposed instrument.After checking the overall correlation, seven items with a total score (from 0.47 to 0.56) were retained and additionally confirmed by significant and strong factor loadings (from 0.66 to 0.74).In addition,

the coefficients using both classical test theory and the Rush model were also satisfactory.The obtained values of reliability - internal consistency (α = .82) and reliability of retesting (ICC = .72) were acceptable.The Hospital Anxiety and Depression Scale (HADS) and Perceived Vulnerability to Disease (PVDS), the Persian version of the Disease Susceptibility Scale, were used for validation(Ahmadzadeh et al. 2013; Duncan et al. 2009). Validity, confirmed by correlation with the clinical scale of anxiety and depression, was: with depression, r = 0.425 and anxiety, r = 0.511 and the scale of perceived vulnerability to disease (r = 0.483 and aversion to microbes r = 0.459).

The development of the COVID-19 fear scale (FC-19S) showed that FCV-19S has a stable one-dimensional structure with stable psychometric properties, the overall FCV-19 scores are comparable for both sexes and all ages (Ahorsu et al., 2020). The researchers say it's a good psychometric tool to use to assess fears of COVID-19, with higher overall FCV-19 scores indicating a stronger fear of COVID-19.It was demonstrated that this tool can be used to assess and solve psychological problems associated with COVID-19 among men and women, as well as people of all ages (adults).

Materialandmethods

The Fear of COVID-19 Scale, developed by M.D. Griffiths, Pakpour A.H. et al. [2020], validated by Ahorsu, Lin, Imani, et al. [2020], to measure the severity of fear, anxiety and uncertainty about COVID-19 in order to minimize psychological reactions to the pandemic in the adult population and to personalize coronavirus treatment programs, taking into account the individual characteristics of the response to the disease.

Socio-demographic data, information about the past illness were identified using a passport questionnaire prior to the study.

The Impact of Event Scale test by M. Horowitz, adapted in Russia in 1998 by M.Sh. Magomed-EminovMagomed-Eminov, 2008) to measure the impact of a traumatic event; identifies both trauma and less intense forms of stress; is able to detect events that have caused post-traumatic stress disorder (PTSD); was used in the study of veterans of the war in Afghanistan, veterans of the war in Chechnya, servicemen of the Kantemirovsk division, etc.)

Creation of the Russian-language version of the COVID-19 Fear Scale

The adaptation procedure and the Russian-language version of the COVID-19 Fear Scale consisted of the following steps:

–the initial translation from English into Russian and the examination of the translation, the preparation of the text of the methodology in Russian was carried out by specialists in the field of extreme psychology, psychological assistance and resocialization; collection of data on a sample of 18 people and

examination of the results;

– reverse translation (from Russian into English) and assessment of the correspondence of the translation to the original;

– correction of statements, examination of the final version of the questionnaire.To identify and reformulate ambiguous and difficult to understand points, the Russian-language formulations were then discussed with 5 experts (professional psychologists, qualified specialists in the field of psychological assistance) and 10 testee (not psychologists);

- organization of a study among patients and medical staff of hospitals re-profiled for the treatment of COVID-19;

– collection of data to assess the psychometric indicators of the questionnaire;

–primary analysis of the distribution of items, reliability and internal structure of the methodology.At this stage, descriptive statistics indicators were calculated, the reliability-consistency of items was identified, correlation and factor analysis was carried out;

– identifying the relationship of socio-demographic characteristics (gender, age, education) with the fear of COVID-19;

– discussion of the results in comparison with foreign studies;

–assessment of the convergent validity of the method. The relationship between the scales of the technique and other techniques for measuring the trauma of the experienced situation (Impact of Event Scale) was revealed.

Collection and processing of data

Study participants. The study involved a total of 463 participants; of them men - 22.8% (n = 105) and women - 77.2% (n = 358).The age range was from 18 to 83 years old, with a mean age of 24.86 years (SD = 11.35).Educational status: 4.3% (n = 28) of respondents with secondary education, 15% (n = 69) with higher education, 79% (n = 364) with incomplete higher education (students and graduates of universities).Marital status: not married - 84.2% (n = 389); married - 15.7% (n = 74).

Data collection procedure.The methodology was tested in May-June 2020 on a sample of 66 subjects aged 19–83 years (Sokolova, Magomed-Eminov et al., 2020).The participants in this stage of the study were patients and medical staff of a clinical hospital in Moscow, among whom were people who had recovered or were sick with COVID-19.At this stage, the respondents filled out the questionnaire in writing.The study was continued in October - December 2020 in a distance format, since the main category of subjects in this series were students of universities, according to the requirements of distance learning, data were collected in electronic form.

Data processing procedure.The performed verification of the obtained data showed that the normal distribution (<1.0) is typical only for a few questions (3, 6, 7) (Table 1), therefore nonparametric statistics methods were used for processing.

Table №1

Testing COVID-19 Fear Scale questions for normal distribution

	COVID-19 FearScaleQuestions							
Normaldistribution	1	2	3	4	5	6	7	Totalscore
Position	1,00	1,94	,22	,96	1,25	,22	,46	5,79
Scales	,99	1,29	,57	1,21	1,19	,54	,82	4,74

To analyze the indicators of the COVID-19 Fear Scale methodology, the following were used: descriptive statistics; the identification of intercorrelations between the items of the questionnaire, the relationship with indicators of other methods, age and academic performance was carried out using Spearman's rank correlation coefficient;Mann-Whitney U-test was used for independent samples to identify differences in the COVID-19 Fear Scale scores between men and women.The reliability assessment was carried out on the basis of determining the internal consistency of the methodological issues (Cronbach's alpha coefficient).The data were processed using the SPSS Statistics 28.0.0.0 (190) software.To determine the factor structure of the questionnaire, exploratory factor analysis (EFA) was used.

Results Reliability-Consistency. The reliability-consistency of the method, determined using the Alpha-Cronbach criterion, is 0.81 in the total sample, which indicates its high reliability (Table 2).

TableN№2

Indicators on the COVID-19 Fear Scale

variables	min	Max	Average (M)	Standarddeviation (SD)	α Cronbach
Totalsample	7	33	13,03	4,683	0,81

The links between the items on the COVID-19 Fear Scale among themselves and the overall score are presented in Table 3.

Table №3

Intercorrelation Matrix (Ro Spearman) COVID-19 Fear Scales

items	1	2	3	4	5	6	7	Overallscore
1	1,000	,481**	,370**	,524**	,444**	,356**	,402**	,743**
2	,481**	1,000	,281**	,368**	,536**	,268**	,401**	,776**
3	,370**	,281**	1,000	,339**	,337**	,557**	,524**	,517**
4	,524**	,368**	,339**	1,000	,429**	,346**	,438**	,715**
5	,444**	,536**	,337**	,429**	1,000	,298**	,427**	,763**
6	,356**	,268**	,557**	,346**	,298**	1,000	,588**	,501**
7	,402**	,401**	,524**	,438**	,427**	,588**	1,000	,655**
Overallscore	,743**	,776**	,517**	,715**	,763**	,501**	,655**	1,000

** Correlation is significant at the 0.01 level (double-sided); * at 0.05 level (double-sided)

Analysis of the data indicates the presence of highly significant connections (at p-level <0.01) between individual items of the questionnaire with each other and with the overall score of the COVID-19 Fear Scale. The study analyzed data on the severity of fear of COVID-19 (Table 4).

Table №4

Means and standard deviations on the COVID-19 Fear Scale (n = 463)

items	**M (SD) (n=463)**
1. I am most afraid of COVID-19	2,00(,99)
2. It makes me uncomfortable to think about COVID-19	2,93(1,29)
3. My hands become clammy when I think about COVID-19	1,22(,57)
4. I am afraid of losing my life because of COVID-19	1,96(1,21)
5. When watching news and stories about COVID-19 on social media, I become nervous or anxious	2,25(1,19)
6. I cannot sleep because I'm worrying about	1,22(,53)

getting COVID-19	
7. My heart races or palpitates when I think about getting COVID-19	1,46(,82)
Overall score	13,00(4,72)

The severity of fear in relation to COVID-19 disease in the sample as a whole is closer to low rates, the average values for almost all items of the questionnaire are in the interval 1 (assessment of the statement about fear- «completely disagree»)-3 («it is difficult to determine whether I agree or disagree»).

Correlation of COVID-19 Fear Scale scores with gender and age characteristics of respondents. The study analyzed the association of COVID-19 Fear Scale scores with testee age. A significant correlation of the total score with age was revealed (Rs =, 132, p < ,01), which indicates a more pronounced fear in older subjects.Testing the hypothesis about the differences in the severity of fear in individuals of different sex using the Mann-Whitney U test for independent samples does not allow us to reject the null hypothesis that the distribution of Fear of coronavirus is the same for the «gender» category (p=, 235). Thus, gender differences in the severity of fear of coronavirus are generally not significant.

Factor analysis. On the basis of exploratory factor analysis (EFA), the primary meaningful grouping of the items of the questionnaire was carried out. the factors formed on the basis of EFA were presented for expert discussion.The general data of the study (n = 463) were subjected to EPA using the principal component method (rotation of the Varimax axes, Kaiser normalization) with the extraction of 2 factors (Table 5).

Table № 5

Factor analysis data. Rotated Component Matrix[a]

	Component	
	1	2
1. I am most afraid of COVID-19	,683	,331
2. It makes me uncomfortable to think about COVID-19	,830	,084
3. My hands become clammy when I think about COVID-19	,160	,799
4. I am afraid of losing my life because of COVID-19	,559	,418
5. When watching news and stories about COVID-19 on social media, I become nervous or anxious	,788	,193
6. I cannot sleep because I'm worrying about getting COVID-19	,159	,843
7. My heart races or palpitates when I think about getting COVID-19	,396	,709

Factor extraction method: principal component analysis. Rotation method: Varimax with Kaiser normalization.

a. Rotation converged in 3 iterations.

The highlighted factors explain 63.96% of the total variance. Factor 1 explains 49.49% of the total variance, it includes items 1, 2,4,5.These points on the Scale are associated with the awareness of their experiences, thoughts, information about the coronavirus.Factor 2 explains 14,47% of the total variance, it includes items 3,6,7 that relate to somatic manifestations of anxiety, concern, fear (hands shaking, heart palpitations, sleep disturbances).

The discussion of the results

Discussion of consistency of issues. The adapted method has good internal consistency - Cronbach's α coefficient = .81 (according to the standards for assessing consistency, the high level of consistency is considered to be α > .80.This indicator is comparable with the data of other researchers.The Cronbach alpha coefficient for our sample was 0.81, compared to 0.847 in the Turkish sample (Satici et al., 2020), 0.871 in the Italian sample (Soraci et al., 2020), 0.87 in the Bangladesh and Brazilian sample (Sacib et al., 2020; Silva et al., 2021).To identify the specifics of the Russian-language version of the Scale, we compared the data obtained with the results of the Iranian sample (Ahorsu et al., 2020) (Table 6).

Table №6

Comparison of data on the severity of fear, obtained using the Russian and English versions (Ahorsu et al., 2020)

Items	Ahorsu et al., 2020 M (SD) (n = 717)	Russian sample M (SD) (n = 463)
I am most afraid of COVID-19	3,48 (1,14)	2,00(,99)
It makes me uncomfortable to think about COVID-19	4,01 (0,84)	2,93(1,29)
My hands become clammy when I think about COVID-19	3,76 (0,88)	1,22(,57)
I am afraid of losing my life because of COVID-19	4,24 (0,90)	1,96(1,21)
When watching news and stories about COVID-19 on social media, I become nervous or anxious	3,53 (1,07)	2,25(1,19)

I cannot sleep because I'm worrying about getting COVID-19	4,11 (0,81)	1,22(,53)
My heart races or palpitates when I think about getting COVID-19	4,26 (0,75)	1,46(,82)

Comparison of the results shows that for all items of the Russian-language version of the Scale, the severity of fear is lower than in the English-language sample.The data obtained can be interpreted as follows.First, the studies (Ahorsu et al., 2020) were carried out in March 2020, at the initial stage of the pandemic, when there was little reliable information about the disease, there was high uncertainty about infection, treatment, etc.Our study was conducted later - in the summer and autumn periods of the 2020 pandemic, when the characteristic wave of panic and hysteria in the media, statements by politicians and «medical experts» gave way to more balanced approaches, and protocols for treating the disease were developed. An indirect confirmation of our interpretation can be found in the studies of Russian authors.So in April 2020, in the first period of the pandemic, it was recorded that the feeling of danger persists and grows, there is an increase in anxiety and phobic reactions in connection with the coronavirus (Enikolopov et al., 2020). A high level of anxiety among 48% of respondents under 40 years old was revealed in a study (Skotnicova et al., 2020) conducted in April 2020, but already in May, according to «Platforma» CSD and OMIcompany, only 11% (N = 1043) revealed alarming symptoms (Nestik et al., 2020).It should be noted that the data on anxiety of infection and COVID-19 disease in these studies can be compared with significant reservations, because they are obtained using different methods, they do not always clearly define whether it is about fear, anxiety, dismay and concern, anxious disorder.A number of researchers, arguing with the developers of scales specific for detecting anxiety about coronavirus, justify the need to take into account the factors accompanying the pandemic situation, which are associated with extremely relevant reasons for anxiety, for example, economic uncertainty, isolation conditions, etc.Thus, the study found that fear of infection is less relevant for respondents than more pronounced and dysfunctional anxiety about the economic consequences of the pandemic(Tkhostovetal, 2020).

Analysis of gender differences in the severity of fear of coronavirus in our study did not reveal significant differences, which is consistent with the results of the Iranian study (Ahorsu et al., 2020), but contradicts the data of some Russian studies.In particular, in the work (Tkhostov, Rasskazova, 2020), it is shown that women are more worried about the coronavirus than men, but this concerns the fear of contracting coronavirus due to concern for loved ones, while no gender differences are found with regard to the consequences of the pandemic.It should be pointed out that it is necessary to investigate this problem in more depth, since our results could be affected by an imbalance in the sample by gender (the predominance of females).No differences were found in the fear of coronavirus infection in such indicators as education, marital status, which is confirmed in other studies.

It seems important to discuss the discovered relationship between fear of coronavirus and the age of the respondents ($p < .01$).In our study, older subjects experience a more pronounced fear of coronavirus than younger subjects, which is consistent with data (Tkhostov, Rasskazova, 2020) on a stronger fear of infection in older people, but contradicts other results (Skotnicova et al., 2020) and at the same time, it is consistent with data from Chinese studies that people under the age of 18 had the lowest rates of psychological distress from COVID-19, while those between the ages of 18 and 30 or over 60 had the highest rates (Qiu et al. 2020).

The present study has some limitations: the study participants were from the general Russian Moscow population, without psychiatric diagnoses, but no data were obtained on the diagnosis of anxiety. Factor analysis of the Russian-language version of the COVID-19 Fear Scale questionnaire suggests two factor structures, in contrast to the one-factor structure of the English version (Ahorsu et al., 2020).Our data are consistent with the work of researchers from Israel, who also distinguish a two-factor structure - emotional fear responses and symptomatic expressions of fear (Bitan et al, 2020).A logical explanation is the differentiation of the cognitive and somatic aspects of the manifestation of fear of the coronavirus.It seems promising to us to further study the ratio of these aspects depending on the sociodemographic characteristics of the subjects, as well as the individual experience of the COVID-19 disease (Personal growth and covid-19 distress, 2021).

Conclusions

The purpose of this work was to develop and test the Russian-language version of the COVID-19 Fear Scale.The relevance of adaptation and the relevance of the methodology The COVID-19 fear scale is due, on the one hand, to the intensive growth of research in the field of psychology of the COVID-19 pandemic, on the other hand, to the predominant use in Russia of methods developed earlier without taking into account possible specific reactions to COVID-19, and also the lack of generally reliable compact diagnostic tools that allow us to compare the data obtained in the Russian sample with foreign studies.

The theoretical interest and practical significance of studying the psychological reactions of a person in an extreme situation, especially aggravated in the current pandemic situation, is faced with the problem of methodological elaboration and methodological equipment of the study.The need to take into account the specificity of the situation, the peculiarities of its dynamics, dictate the need for methods that take into account the specifics of the novel coronavirus pandemic.

Thus, the Russian-language version of the Questionnaire is characterized by high reliability and consistency.

All items had acceptable correlations between the total item count.It should be noted that

according to our data, the COVID-19 Fear Scale turned out to be «sensitive»to the age characteristics of the respondents, which was not shown by studies on the Iranian, Turkish, Italian, Brazilian sample.However, a sample from Bangladesh showed that gender, marital status, including having children and having chronic diseases were included by the authors as significant predictors of higher levels of fear of COVID-19.The severity of fear of a new coronavirus infection is generally lower than according to foreign studies.The use of the COVID-19 Fear Scale must be correlated with the specifics of the pandemic situation, namely the dynamics of the epidemic waves.Carrying out research using this tool will allow, firstly, in the scientific and psychological terms, to highlight and describe the specifics of concern and anxiety of people in connection with the new coronavirus infection; secondly, in the practice of doctors and medical personnel, to carry out a more individualized approach, identifying risk groups of patients by gender and age.At the same time, specialists in the field of psychological assistance and rehabilitation could use the scale for psychological work to prevent and overcome negative aspects, primary and secondary psychological trauma in people in a situation of the COVID-19 pandemic.The mapping and application of such data can then be used to develop targeted education and / or prevention programs that can help overcome fear of COVID - 19 and help these people engage in preventive behavior.

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