Indian Journal of Behavioural Sciences
An Official Journal of **Central Psychiatric Society**
(Indian Psychiatric Society-Central Zone)

RESEARCH ARTICLE
e-ISSN: 2455-6599 | p-ISSN: 2319-2062
doi: 10.55229/ijbs.v26i1.03

Utility of Brief Illness Perception Questionnaire for Assessing the Acute Impact of COVID-19 Infection: A Psychometric Study

Anuja Lahiri, Roshan Sutar*, Gaurav Singh

Department of CFM, All India Institute of Medical Sciences Bhopal, Madhya Pradesh, India
Department of Psychiatry, All India Institute of Medical Sciences Bhopal, Madhya Pradesh, India

Abstract

Background: The coronavirus disease-19 (COVID-19) pandemic has created mental health repercussions in the lives of many individuals. It is important to understand emergent perceptions of this illness among patients with a recent diagnosis of COVID-19. Due to its good psychometric properties, the brief illness perception questionnaire (BIPQ) has been widely used for various illnesses and in different languages. Its application in recently diagnosed COVID-19 patients is an area worth exploring in an Indian setting.

Aim: We aim to understand the patient's perception of COVID-19 illness using the hindi adaptation of BIPQ and validate for its further use in a similar type of acute setting.

Method: This tool was customized by three subject experts for its application in recently diagnosed COVID-19 patients. A customized tool was circulated to nine subject matter specialists for the computation of the content validity index. The tool link was shared with patients. A total of 112 patients responded. Factor analysis and reliability analysis were also conducted.

Result: Item content validity index for all items in the BIPQ scale was in the acceptable range (value above 70%). Scale-content validity index/universal agreement was 88.8%. Bartlett's test was significant ($p < 0.001$) and the Kaiser-Meier-Olkin measure of sampling adequacy was 0.777. The factor loading threshold was fixed at a value above 0.40. Eight Likert scale items of BIPQ based on factor analysis were regrouped in two. Items one, two, four, five, and eight were in group one, which depicted "concrete perception," and items three, six, and seven were in group two which depicted "gestalt perception" of recently diagnosed COVID-19 patients. Cronbach's alpha of the scale was found to be high at 0.808.

Conclusion: Results depicted a two-factor structure of BIPQ with satisfactory validity and reliability. We suggest regrouping of existing items of BIPQ into two domains, namely "concrete perception" and "gestalt perception" for recently diagnosed patients with COVID-19.

ARTICLE INFO

***Correspondence:**
Roshan Sutar
roshidoc@yahoo.co.in
Department of Psychiatry, All India Institute of Medical Sciences Bhopal, Madhya Pradesh, India

Dates:
Received: 05-10-2022
Accepted: 03-01-2023
Published: 25-03-2023

Keywords:
COVID-19, BIPQ, Validation, India, Factor analysis, Perception, Mental health

How to Cite:
Lahiri A, Sutar R, Singh G. Utility of Brief Illness Perception Questionnaire for Assessing the Acute Impact of COVID-19 Infection: A Psychometric Study. Indian Journal of Behavioural Sciences. 2023;26(1): 12-19. doi: 10.55229/ijbs.v26i1.03

Introduction

The worldwide pandemic of COVID-19 had a devastating impact on patient's mental health, causing many concerns such as depression, anxiety, and post-traumatic stress disorder.[1-3] Numerous studies have tried to understand the general health impact of COVID-19[4,5] however, very few studies looked at illness

perception from the perspective of patients. The fear of illness caused a state of panic and bewilderment, and therefore attempts to interview such patients in an empathetic and non-judgmental way have been reported. There is clear identification of distress related to shock, fear of stigmatization, anxiety, and depression,[6-8] in response to COVID-19. As per the Ministry of Health and Family Welfare (MoHFW), in India, the number of active cases as of 4th October 2022 is 34598 with 528716 deaths so far.[9] As per the latest WHO update, the new variant of COVID-19 including "Delta variant", and "Omicron" is prevalent in South Africa and it is expected to mutate into a new strain that has again created unrest and apprehension among individuals worldwide including India.[10,11] It is thus pertinent to understand the emergent perceptions of patients recently diagnosed with COVID-19 and their understanding of the course of illness to have better communication, rapport with healthcare workers, and rapid recovery from mental distress.[12] The illness perception is also affected by an individual's readiness, attitudes toward falling sick, the suffering associated with an illness, and knowledge about the course of an illness that can further influence the perceived stress related to health.[13]

One of the most widely used scales for promptly measuring illness's cognitive and emotional depictions is the brief illness perception questionnaire (BIPQ). A nine-item scale, BIPQ was developed by Broadbent *et al.* in 2006. Its eight items assess the eight domains of illness perceptions: consequences, timeline, personal control, treatment control, identity, concern, coherence, and emotional representation. The ninth item illustrates the causal aspect.[14] Owing to its good psychometric properties, BIPQ has been widely used for various illnesses and in various languages worldwide[15] country, language and study design. The questionnaire's concurrent validity, predictive validity, sensitivity to change, discriminant validity and mean scores for different populations were summarised. The review included 188 papers. The BIPQ has been administered to patients from age 8 to over 80, with a wide range of illnesses, in 26 languages from 36 countries. Pooled correlations between illness perceptions and depression, anxiety, blood glucose levels and quality of life were consistent with previous research and theory (range 25–49 for consequences, identity and emotional representations; -.12 to -.27 for personal control. However, the adaption and validation of BIPQ using factor structure is an interesting process for two reasons, firstly COVID-19 is an acute illness, and a viral pathogen causes it. BIPQ has mostly been applied in chronic medical illnesses to explore the ability of an individual to fight an illness and emotional responsiveness towards the perceptual experience. So far only one study has systematically tried to look at the facets of acute distress in COVID-19. The adaptation of BIPQ, especially in the Indian setting and in the hindi language, is a novel construct to map the spheres of mental health in a consequence of COVID-19. This study explains the execution of BIPQ in understanding the concerns of patients in a unique way providing a new understanding of the utility of BIPQ in acute illnesses.

Methodology

This study was approved by the Institutional Human Ethics Committee (Ref No.-IM0276). As part of personal communication, the authors contacted Elizabeth Broadbent *via* mail. She shared the hindi version of the tool for diabetic patients. The original scale comprises 8 items with Likert scoring 0 to 10. In addition to this, there is one question that deals with an enumeration of three causal factors for the disease as per the respondent. The broad domains of the items are cognitive illness (items 1 to 5), emotional illness perception (items 6 and 8), and illness coherence (item 7). When this scale is used the scores are computed by reversing the code of items three, four, and seven and adding the same to items one, two, five, six, and eight. A higher score depicts that a participant is more threatened by the illness.[14] We conducted a study on patients who were admitted due to positive results on reverse transcription polymerase chain reaction (RT-PCR) for COVID-19 in the past 48 hours. Subjects were recruited based on any gender, age of more than 18 years, mild to moderate severity of COVID-19 based on physician's assessment, and ability to use the smartphone. We excluded pregnant patients who required oxygen therapy and those on intensive

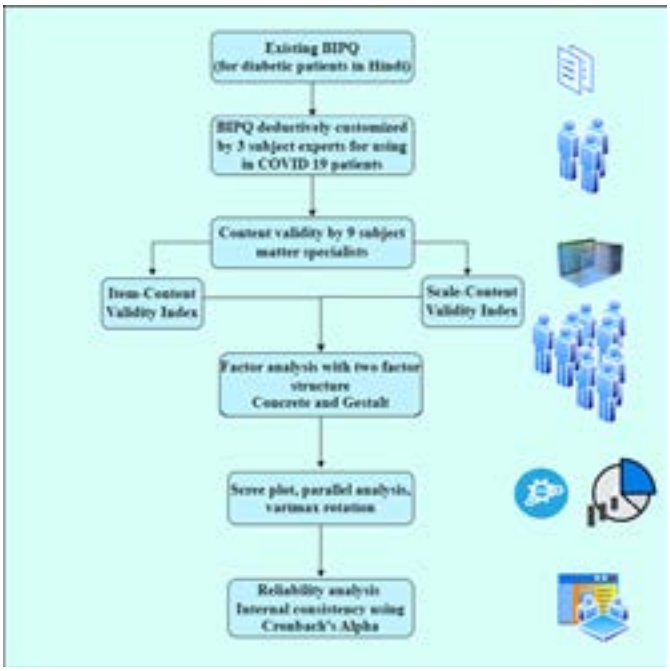

Figure 1: Workflow of the study

management such as inotropes. Written informed digital consent was obtained for participation in this study.

Based on the proven concepts of scientists like Tavsancil[16] and Nunnally,[17] the present study's authors decided to conduct a study on a minimum of 90 patients, which is ten times the number of items of BIPQ. Keeping into consideration the phenomena of attrition, the final number of patients enrolled in the study was 112.

This study aims to adapt and validate the existing Hindi version of BIPQ in recently diagnosed COVID-19 patients.

Data Collection Process and Tool

The tool was customized for its application in recently diagnosed COVID-19 patients by three subject specialists (Psychiatrists and physicians fluent in hindi) based on a deductive approach after an extensive literature search. For computing content validity, we informed nine clinical psychologists and psychiatrists and the tool was reviewed for application in acute COVID-19 patients. The final tool was shared with the study participants using a link developed from a KoboToolBox, free, open-source software (GNU License). The link was disseminated using smartphone devices via mail, whatsApp, and other platforms to a list of patients meeting the eligibility criteria.

Nine experts rated between one to four as one=Not relevant items; two items need major revision, three=Relevant but need minor revision and four=Very relevant. The Item-Content Validity Index (I-CVI) for each item was calculated by dividing the number of experts scoring an item as three or four by the total number of experts. The I-CVI below 70% was taken as the threshold for elimination. The items were back-translated into english by three experts who are fluent in both hindi and english language.

After calculating I-CVI*, Scale-Content Validity Index/Universal Agreement (S-CVI/UA)* was computed by dividing the number of items with an I-CVI value of 100% by the total number of items.

The licensed IBM SPSS version 21 was used. Sociodemographic variables were described using descriptive statistics. The tool was validated by computing the content validity index. Followed by which factor analysis was done. The reliability of the translated and adapted version was checked by Cronbach's alpha.

The methodology, in brief, is explained in Figure 1.

Results

Descriptive Statistics

A total of 291 subjects were approached for the study, of which 112 participants responded under the supervision of the research team. Out of 112 study participants, 70.5% were males, 33% were government employees and 85% were urban residents (Table 1). The mean age was 40.04 ± 15.24 years. The ninth item in BIPQ helps in understanding the cause of the illness. The important causes enumerated by the patients were lack of awareness related to social distancing, wearing the mask, hand washing/sanitization, and poor immunity.

Content Validity Index

The I-CVI of eight items out of nine was 100%. One item had an I-CVI of 88.9% (Table 2). The S-CVI/UA was found to be 88.8%.

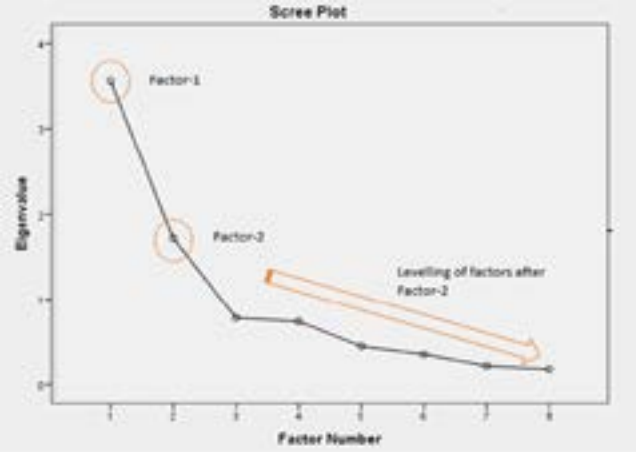

Figure 2: Screen plot

Factor Structure for Validity Assessment of BIPQ in Recently Diagnosed COVID-19 Patients

Understanding whether exploratory factor analysis (EFA) can be conducted in the given data set was done by Bartlett's Test and Kaiser-Meier-Olkin measure of sampling adequacy (KMO MSA). Bartlett's test was significant ($p < 0.001$) confirming that the factor matrix can be analyzed i.e. the correlation matrix and identity matrix were significantly different. KMO MSA was 0.777 (<0.50) indicating that the matrix is acceptable (between middling and meritorious) for factoring (Table 3). A two-factor solution was used based on scree plot (Figure 2), parallel analysis, and Eigen value cut-off. The extraction method used was the principal axis factoring with varimax as the rotation method. It was observed that factors one and two explained 60.6% of the variance. We considered a factor loading of 0.40. Followed by this, naming and categorization of factors based on the loadings were done. The eight items in the BIPQ scale were grouped into two categories. Category one had item number one (consequences), two (timeline), four (treatment control), five (identity) and eight (emotional representation). The factor loading in this category was between 0.595–0.926. Category two had item number three (personal control), six (illness concern), and seven (coherence). The factor loading in category two was between 0.508–0.79. Following this, the two categories were re-named by the authors as "Concrete perception" and "Gestalt perception" of the COVID-19 illness for factors one and two, respectively (Table 4). Cronbach's alpha checked the reliability of the hindi translated and adapted version. The Cronbach's alpha was found to be high with a value of 0.808 (Table 5).

Discussion

This study opens up the possibility of exploring the patient's perception of an acute COVID-19-like illness using BIPQ in the Indian context. Two broader constructs emerged after the factor analysis accounting for 60.6% of the variance. The factor analysis furthermore helped in regrouping the eight Likert scale items of the BIPQ into two groups "concrete perception of illness" and "gestalt perception of illness". As described by Leventhal *et al.,* individuals respond in a certain way when they perceive they have a health threat. These are broadly divided into

Table 1: Sociodemographic details of study participants

Category	*Sub-category*	*Number*	*Percentage*
Gender	Male	79	70.5
	Female	33	29.5
Area	Urban	95	84.8
	Rural	17	15.2
Occupation	Student	14	12.5
	Service	37	33
	Laborer	12	10.7
	Homemaker	18	16.1
	Other	31	27.7

Table 2: I-CVI calculation for each item

Item	*I-CVI (%)*	*Interpretation*
1	88.9	Relevant
2	100	Relevant
3	100	Relevant
4	100	Relevant
5	100	Relevant
6	100	Relevant
7	100	Relevant
8	100	Relevant
9	100	Relevant

Table 3: Bartlett's Test and KMO MSA

Kaiser-Meier-Olkin Measure of Sampling Adequacy	*0.777*
Chi-Square	403.724
Degree of freedom	28
Significance	0.000

cognitive and emotional representations.[18] COVID-19 is perceived as a definite health threat by patients, their keens, and health professionals. Therefore, the perception of illness in a short span appears more relevant than syndromal depression or anxiety disorder. The cognitive and emotional response of an individual toward a threat to health is not easy to measure. However, the original scale developed by Broadbent *et al.* can be adapted effectively to understand the cognitive aspects of illness from the first five items of BIPQ which include *consequence*

Table 4: Renaming factor categories based on loadings

Item	*Questions*	*Factor*	
		1 Concrete perception	*2 Gestalt perception*
Item one Consequence	कोवडि-19 आपका जीवन कतिना प्रभावति करता है? "COVID-19 aapka jeevan kitna prabhavit karta hai?" How much does COVID-19 affect your life?	.595	
Item two Timeline	आपके वचिार में आपकी कोवडि-19 की बीमारी कतिने समय तक रहेगी? "Aapke vichar mei aapki COVID-19 ki beemari kitne samay tak rahegi?" How long do you think your COVID-19 illness will continue?	.558	
Item eight Emotional representation	आपकी कोवडि-19 की बीमारी आपकी भावुकता को कतिना प्रभावति करती है? "Aapki COVID-19 ki beemari aapki bhavukta ko kitna prabhavit karti hai?" How much does your COVID-19 illness affect you emotionally?	.781	
Item four Treatment control	आपको क्या लगता है आपका इलाज आपके कोवडि-19 को ठीक करने में आपकी कतिनी मद्द कर सकता है? "Aapko kya lagta hai aapka ilaaj aapke COVID-19 ko theek karne mei aapki kitni madad kar sakta hai?" How much do you think your treatment can help you to cure your COVID-19 illness?	.798	
Item five Identity	आपको कोवडि-19 के लक्षण कसि हद्द तक महसूस होते है? "Aapko COVID-19 ke lakshan kis hadd tak mehsus hote hai?" How much do you experience symptoms from your COVID-19 illness?	.926	
Item six Illness concern	आप अपने कोवडि-19 को लेकर कतिने चतिति है? "Aap apne COVID-19 ko lekar kitne chintit hai?" How concerned are you about your COVID-19 illness?		.508
Item seven Coherence	आपको क्या लगता है आप अपने कोवडि-19 की बीमारी को कतिना समझ सकते हो? "Aapko kya lagta hai aap apne COVID-19 ki beemari ko kitna samajh sakte ho?" How well do you feel you understand your COVID-19 illness?		.734
Item three Personal control	आपको क्या लगता है आपका आपके इस कोवडि-19 के बीमारी पर कतिना काबू है? "Aapko kya lagta hai aapka aapke iss COVID-19 ke beemari par kitna kaabu hai?" How much control do you feel you have over your COVID-19 illness?		.791

Table 5: Reliability statistics

Cronbach's Alpha	*No. of items*
.808	8
Item	*Cronbach's alpha if item deleted*
Item one	.784
Item two	.800
Item three	.820
Item four	.770
Item five	.760
Item six	.796
Item seven	.802
Item eight	.745

(item one, as per the patient, what are the expected effects along with the outcomes of illness), *timeline* (item two, patient's belief related to how long will the illness persist), *personal control* (item three, how much the patient feels he has control over his illness), *treatment control* (item four, patient's belief that the given treatment can facilitate in his cure) and *identity* (item five, how a patient identifies illness and symptoms as part of disease). The emotional aspects of an illness include *concern* (item six, how concerned is the patient about his illness) and *emotions* (item eight, how much is the illness affecting the patient emotionally). *Coherence* (Item seven) assesses comprehensibility (how the patient comprehends/understands his illness).[14] The adaptation of the hindi version of BIPQ for COVID-19 patients makes it a smooth transition of items related to cognition and emotion associated with the illness. The regrouping of these items into two groups namely concrete and gestalt perception of an acute illness after factor analysis has greatly helped to measure the immediate experience of an illness perception by the patients. The sound internal consistency of the tool further makes it more acceptable in Indian context.[19] Moreover, the concrete and gestalt domains are aptly representing the natural course of an illness. With context to COVID-19, these questions answer the gestalt perceptions of the patients towards the illness that included personal control, coherence, and concern. These items tend to give us an idea about synchronous thinking and emotional representation related to an illness and its control, and therefore are classified into a gestalt perception. While concrete perceptions of an illness included identity, consequence, and timeline which represents the true human nature to perceive the average threat associated with an illness in terms of time to recover, the loss associated with an illness and its complications, the immediate grief reaction and expression of emotional distress which all fall in a concrete understanding or direct result of an illness. The reliability of the scale was high with Cronbach's alpha value of 0.808. More importantly, mental health professionals can get an objective assessment of the perception of an individual towards the illness, and therefore can greatly impact modifying their beliefs and behaviors through cognitive or behavior therapy. The understanding of different domains and working towards modifying a few of them to develop psychological flexibility could impact the quality of life of an individual with acute illnesses.[20] The relationship between stress, and illness perception is explored recently and BIPQ could play an important role in understanding this further in the Indian context in future research.[21]

The scale is adapted for the Indian population currently and can be applied to mild to moderate acute conditions simulating COVID-19 such as acute viral and bacterial infections or pyrexia of unknown origin. The scale is easy to administer for the age group 18 to 45 years, and easier for illiterate people as well if used offline. Robust reviews and studies have ascertained the worldwide utility of similar tools during COVID-19 pandemic,[22-25] therefore the study reinforces the utility of BIPQ as valid and reliable tool in Indian setting. We encourage researchers to use this scale in addition to an assessment of depression and anxiety measures to get a holistic understanding of human perception.[26,27]

Conclusion

The adapted and translated hindi version of the BIPQ for its specific usage in recently diagnosed COVID-19 patients, re-groups the eight items into two groups namely "concrete perception of illness" and "gestalt perception of illness". The ninth item in the adapted version also deals with the enumeration of the causal factors. The hindi version of the tool is validated and shows satisfactory reliability to use in acute COVID-19 like illnesses. The tool is handy and easy to use and

captures the acute mental representation of the patients who are recently diagnosed with COVID-19 in the Indian setting.

Funding

Nil

Conflict of interest

Nil

Acknowledgement

We are thankful to Dr. Vaibhav Ingale, Dr. Parneet kaur, Dr. Swanzil Chaudhary and Dr. Pooja Chaudhary for their contribution towards data collection.

References

1. Mental health and COVID-19 [Internet]. [cited 2021 Nov 9]. Available from: https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/publications-and-technical-guidance/mental-health-and-covid-19
2. Xiong J, Lipsitz O, Nasri F, Lui LMW, Gill H, Phan L, et al. Impact of COVID-19 pandemic on mental health in the general population: A systematic review. J Affect Disord [Internet]. 2020 Dec 1 [cited 2021 Nov 9];277:55–64. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7413844/
3. GuidelinesforDeliveryofMentalMentalHealthcareServicesduringtheCOVID19.pdf [Internet]. [cited 2021 Nov 9]. Available from: https://www.mohfw.gov.in/pdf/GuidelinesforDeliveryofMentalMentalHealthcareServicesduringtheCOVID19.pdf
4. Varghese GM, John R. COVID-19 in India: Moving from containment to mitigation. Indian J Med Res [Internet]. 2020 [cited 2021 Nov 9];151(2–3):136–9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7366532/
5. Ghosh A, Nundy S, Mallick TK. How India is dealing with COVID-19 pandemic. Sens Int [Internet]. 2020 [cited 2021 Nov 9];1:100021. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7376361/
6. Sahoo S, Mehra A, Dua D, Suri V, Malhotra P, Yaddanapudi LN, et al. Psychological experience of patients admitted with SARS-CoV-2 infection. Asian J Psychiatry [Internet]. 2020 Dec [cited 2021 Nov 9];54:102355. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7434329/
7. Wilson W, Raj JP, Rao S, Ghiya M, Nedungalaparambil NM, Mundra H, et al. Prevalence and Predictors of Stress, anxiety, and Depression among Healthcare Workers Managing COVID-19 Pandemic in India: A Nationwide Observational Study. Indian J Psychol Med [Internet]. 2020 Jul 6 [cited 2021 Nov 9];42(4):353–8. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7385435/
8. Rajkumar RP. COVID-19 and mental health: A review of the existing literature. Asian J Psychiatry [Internet]. 2020 Aug [cited 2021 Nov 9];52:102066. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7151415/
9. MoHFW | Home [Internet]. [cited 2022 Oct 4]. Available from: https://www.mohfw.gov.in/
10. Classification of Omicron (B.1.1.529): SARS-CoV-2 Variant of Concern [Internet]. [cited 2021 Nov 28]. Available from: https://www.who.int/news/item/26-11-2021-classification-of-omicron-(b.1.1.529)-sars-cov-2-variant-of-concern
11. "Omicron" May Be A Wake-Up Call: WHO's Dr Soumya Swaminathan [Internet]. NDTV.com. [cited 2021 Nov 28]. Available from: https://www.ndtv.com/india-news/omicron-may-be-a-wake-up-call-whos-dr-soumya-swaminathan-2627525
12. Pérez-Fuentes M del C, Molero Jurado M del M, Oropesa Ruiz NF, Martos Martínez Á, Simón Márquez M del M, Herrera-Peco I, et al. Questionnaire on Perception of Threat from COVID-19. J Clin Med [Internet]. 2020 Apr 22 [cited 2021 Nov 9];9(4):1196. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7230235/
13. Karataş T, Özen Ş, Kutlutürkan S. Factor Structure and Psychometric Properties of the Brief Illness Perception Questionnaire in Turkish Cancer Patients. Asia-Pac J Oncol Nurs [Internet]. 2017 [cited 2021 Nov 9];4(1):77–83. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5297237/
14. Broadbent E, Petrie KJ, Main J, Weinman J. The brief illness perception questionnaire. J Psychosom Res. 2006 Jun;60(6):631–7.
15. Broadbent E, Wilkes C, Koschwanez H, Weinman J, Norton S, Petrie KJ. A systematic review and meta-analysis of the Brief Illness Perception Questionnaire. Psychol Health. 2015;30(11):1361–85.
16. Tavşancıl E. Measuring attitudesand data analysis with SPSS. Ankara: Nobel Akademik Yayincilik; 2014.
17. Nunnally J, Bernstein I. Psychometric testing. New York: McGraw-Hill; 1978.
18. Leventhal H, Nerenz D, Steele D. Illness representations and coping with health threats. In: Handbook of Psychology and Health. 1984. p. 219–52.
19. Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ [Internet]. 2011 Jun 27 [cited 2022 Oct 4];2:53–5. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4205511/
20. Can psychological flexibility and prosociality mitigate illness perceptions toward COVID-19 on mental health? A cross-sectional study among Hong Kong adults | Globalization and Health | Full Text [Internet]. [cited 2022 Oct 4]. Available from: https://globalizationandhealth.biomedcentral.com/articles/10.1186/s12992-021-00692-6

21. Ting RSK, Aw Yong YY, Tan MM, Yap CK. Cultural Responses to Covid-19 Pandemic: Religions, Illness Perception, and Perceived Stress. Front Psychol [Internet]. 2021 [cited 2022 Oct 4];12. Available from: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.634863
22. Aqeel M, Abbas J, Shuja KH, Rehna T, Ziapour A, Yousaf I, et al. The influence of illness perception, anxiety and depression disorders on students mental health during COVID-19 outbreak in Pakistan: a Web-based cross-sectional survey. Int J Hum Rights Healthc [Internet]. 2021 Jan 1 [cited 2022 Oct 4];15(1):17–30. Available from: https://doi.org/10.1108/IJHRH-10-2020-0095
23. Sawyer AT, Harris SL, Koenig HG. Illness perception and high readmission health outcomes. Health Psychol Open [Internet]. 2019 Apr 23 [cited 2022 Oct 4];6(1):2055102919844504. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6482662/
24. Dias Neto D, Nunes da Silva A, Roberto MS, Lubenko J, Constantinou M, Nicolaou C, et al. Illness Perceptions of COVID-19 in Europe: Predictors, Impacts and Temporal Evolution. Front Psychol [Internet]. 2021 [cited 2022 Oct 4];12. Available from: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.640955
25. Chong YY, Chien WT, Cheng HY, Chow KM, Kassianos AP, Karekla M, et al. The Role of Illness Perceptions, Coping, and Self-Efficacy on Adherence to Precautionary Measures for COVID-19. Int J Environ Res Public Health [Internet]. 2020 Jan [cited 2022 Oct 4];17(18):6540. Available from: https://www.mdpi.com/1660-4601/17/18/6540
26. Rezaei S, Nia MH, Vakilian M. The mediating role of illness perception in the relationship between psychological hardiness and the health status of covid-19 (coronavirus disease) survived patients. Health Psychol Res [Internet]. 2021 Jun 19 [cited 2022 Oct 4];9(1). Available from: https://healthpsychologyresearch.openmedicalpublishing.org/article/24839-the-mediating-role-of-illness-perception-in-the-relationship-between-psychological-hardiness-and-the-health-status-of-covid-19-coronavirus-disease-s
27. Sutar R , Lahiri A , Singh G, Chaudhary S. Development and Validation of Structured COVID Perception Interview Guide (COPING) for Assessing the Acute Impact of COVID-19 Diagnosis. 2022, 22; 1-166 DOI: 10.1055/s-0041-1742232