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Validity and Reliability of the Health Belief Questionnaire Model for Mental Health Behavior COVID-19 Survivor

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ABSTRACT

Background: Research using the Health Belief Model (HBM) is expected to be able to determine a determinant model of mental health behavior for Covid-19 survivors. The focus of HBM is Health Promotion at the individual level by looking at the protective and risk factors that are responsible for a person's behavioral resistance. Until now there is no instrument that measures individual attitudes and beliefs based on the HBM for the mental health behavior of Covid-19 Survivors.

Method: To assess the validity and reliability of the Health Belief Model Questionnaire for Mental Health Behavior for COVID-19 Survivors. This study is an observational study with a cross sectional approach that presents the results of the validity and reliability of the Health Belief Model Questionnaire instrument for Mental Health Behavior for COVID-19 Survivors. The questionnaire was compiled as many as 16 statement items based on a literature review. The questionnaire consists of Perceptions of Seriousness, Perceptions of Vulnerability, Perceptions of Benefits, Perceptions of Barriers with 4 question items each. The sample size is 64 people. The validity test uses the Pearson Product Moment Correlation formula with a coefficient value of 0.3, while the reliability test uses internal consistency with Cronbach's Alpha with a coefficient value of 0.7.

Results: The results of the descriptive analysis showed that the average age of Covid survivors was 18-40 years (78.1%), female (79.7%), undergraduate education level (75%), affected in wave II (54.7%)). The results of the validity test of the 16 items contained 1 invalid item (perception of barriers), while the reliability test showed that of the 15 valid items the results were all reliable.

Conclusion: Overall, the HBM questionnaire is valid and reliable to measure mental health behavior in COVID-19 survivors.

KEYWORDS: COVID-19, Health Belief Questionnaire Model, Mental Health Behavior, Reliability, Validity.

INTRODUCTION

COVID-19 survivors reported experiencing mental health problems and persistent neurological symptoms after hospital discharge, such as memory loss (34%), and impaired concentration (28%) and sleep (31%), fatigue (55%) and shortness of breath. (42%) as the most frequently reported symptom of COVID-19 survivors in France (n=279) surveyed at a median of 110 days after the date of hospitalization [1]. Forty-seven per cent of post-ICU patients and 24% of non-ICU patients from a UK study (n=100) at follow-up 48 days after discharge reported symptoms of post-traumatic stress disorder (PTSD) associated with COVID illness. -19 [2]. Patients with COVID-19 (n = 675) who were discharged from a Wuhan hospital in China surveyed at a mean of 37 days after discharge from the hospital, of whom 70 (10%) patients reported moderate to severe symptoms of anxiety, and 218 (32 %) others reported mild anxiety symptoms. In the same study, 128 (19%) had moderate to severe depressive symptoms and 315 (48%) had mild depression [3].

The risk of mental health problems persists even when the patient is declared cured. In some cases, COVID-19 survivors are still symptomatic for more than 60 days after first onset [4]. These symptoms are also found in cases of children and young adults infected with COVID-19 without comorbidities. This condition is known as long COVID and is experienced by individuals who have been declared cured of COVID-19 infection (based on the results of the PCR swab or self-isolation period), but are still experiencing continued physical and mental health impacts as a result of viral infection in certain body parts [5]. Preliminary studies related to the clinical symptoms and quality of life in 463 COVID-19 survivors in Indonesia showed the results: as many as 294 participants (63.5 percent) had advanced symptoms after COVID-19, which consisted of physical and psychological disorders such as coughing, muscle aches, disturbances cardiovascular disease, chronic fatigue, anosmia, diarrhea, sleep disturbances, anxiety, and impaired

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concentration [6], There are 27 percent experiencing psychological problems such as sleep disorders, anxiety, impaired concentration, and depression. This condition affects the recovery process and the quality of life of the survivors. There are even some survivors who have experienced layoffs because they are considered unable due to long COVID-19. Data from Covid Survivor Indonesia (2021) for the period March to August 2021 showed 496 respondents from around 1400 members, 23% had mental problems and 37% had insomnia.

The combination of physical and psychological problems makes survivors vulnerable to emotional problems and anxiety[7]. Experiences during quarantine or isolation can initiate various emotional responses, such as anxiety, sleep disturbances, panic attacks, to symptoms of trauma. The psychological effects of post-infection recovery coupled with stigma affect the function of the survivor's role in daily life [8–10]. Therefore, COVID-19 survivors face the challenge of being able to rise and recover physically and psychologically.

The Health Belief Model (HBM) is one of the theories in Health Promotion that tries to explain and predict healthy behavior by focusing on individual attitudes and beliefs. The Health Belief Model helps to see the problem comprehensively from the aspect of individual perception. Since its inception this model has been successfully applied to various health fields such as predicting the behavior of asymptomatic diseases such as vaccination, cancer or other chronic diseases [11].

HBM has been widely used as a model for disease prevention, including during the COVID-19 pandemic, besides that HBM has also been used as a model in the prevention of several mental disorders and suicidal ideation. The selection of HBM is based on the fact that COVID-19 sufferers are isolated so that it is in accordance with the focus of the HBM, namely Health Promotion at the individual level, besides that HBM explains individual beliefs and behaviors so that they are suitable for mental health problems which include thought processes, feelings, and behavior. Disorders of mental health are influenced by biological, psychological, and spiritual factors, so that the HBM theory coupled with individual level risk factors and protective factors against the impact of COVID-19 is expected to find the determining factors responsible for people's resistance to protective measures against disorders. mental health and reduce behavior that is detrimental to mental health after COVID-19, so that behavioral determinants are found as a model.

The novelty of this research focuses on research results, namely the Health Belief Model Questionnaire for Mental Health Behavior for COVID-19 Survivors. This study aims to assess the validity and reliability of the Health Belief Model Questionnaire for Mental Health Behavior for COVID-19 Survivors. The Health Belief Model (HBM) is applied as a basis for knowing the risk and supporting factors that affect the mental health of survivors, so that it is expected to change negative perceptions and behaviors into positive ones and prevent the emergence and severity of mental disorders in COVID-19 survivors. The author's HBM model proposes that it can be used as a Mental Health Promotion for COVID-19 Survivors. Furthermore, the obtained model can be used to design a mental health promotion module for COVID-19 survivors, so that it can provide benefits for mental health promotion, especially COVID-19 survivors. Therefore, there needs to be an instrument that measures individual attitudes and beliefs based on the HBM for the mental health behavior of COVID-19 Survivors.

METHOD

Research design

This type of research is observational research with data collection method using a cross sectional approach. This study presents the results of the validity and reliability test of the Health Belief Model Questionnaire instrument for Mental Health Behavior for COVID-19 Survivors. The questionnaire was composed of 16 statement items, which was developed from Glanz et al (2008). The questionnaire was created based on a literature review and discussions with experts. The questionnaire was then circulated online on social media. Health Research Ethics Commission of RSUD Dr. Moewardi Surakarta has stated that this research has passed the ethical test with the number 784/VI/HREC/2022. The description of the Health Belief Model for Mental Health Behavior for COVID-19 Survivors is shown in Table 1. The questionnaire compiled is closed, i.e. respondents have alternative answers: strongly disagree, disagree, agree, strongly agree.

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Table 1. Question items in each instrument domain

Domain	Question Items	Number
Seriousness Perception	Untreated major depression can lead to death	1
	The COVID-19 pandemic is causing more people to experience depression and other mental disorders.	2
	Infectious diseases such as COVID-19 can cause mental disorders such as depression and anxiety disorders	3
	Depression and anxiety disorders if ignored can heal by itself.	4
Vulnerability Perception	COVID-19 causes a greater risk of experiencing mental disorders such as anxiety and depression.	1
	I will seek professional help regarding my mental disorder.	2
	A person who has a mental disorder is caused by a lack of gratitude and lack of worship. Excessive worrying can cause difficulty in carrying out daily activities or work.	4
Perception of benefits	Psychiatric help can relieve anxiety or depression due to stress.	1
	Psychiatrists can help patients to recognize problems, think positively about themselves and also the problems they face.	2
	Learning to be more relaxed and calm can avoid stress, anxiety, or tension.	3
	After being exposed to COVID-19 I prefer to maintain a healthy lifestyle.	4
Obstacle perception	People with mental disorders are still not accepted in society.	1
	I no longer need information regarding mental health issues.	2
	Coming to a psychiatrist creates a bad stigma from the people around you.	3
	Going to a psychiatrist takes a long time and is expensive.	4

Questionnaires were distributed via google form, tested the validity using the Pearson Product Moment Correlation formula, if the coefficient between the items and the total items was equal to or above 0.3 then the item was declared valid, but if the correlation value was stated below 0.3 then the value was declared the correlation is invalid. The validity of the measuring instrument was tested by using a computer program Software Statistics and Data (STATA) version 13 for windows.

Reliability test was conducted to determine the consistency and accuracy of the measurement results. The reliability calculation technique uses internal consistency reliability with the reliability coefficient of Cronbach's Alpha using the computer-assisted

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software program Statistics and Data (STATA) version 13 for windows. If the alpha value is 0.7 or more, it is said that the item provides a sufficient level of reliability, on the contrary, if the value is below 0.7, it is said that the item is less reliable.

Research Subject

The inclusion criteria used were COVID-19 survivors who are members of the COVID-19 Survivor community, aged 18 years and over, can speak Indonesian, can use online applications, and are willing to participate in research by signing an informed consent form.

Sample size

Sapnas and Zeller (2002) argue that a sample size of 50 is adequate for evaluating psychometric traits on measures of social constructs. The sample size in this study was 64.

RESULTS

The demographic characteristics of the respondents can be seen in Table 2. As shown in Table 2, most of the respondents were aged 18-40 years (78.13%). This age belongs to the category of young adult age (Harlock, 2011). There are more female respondents (79.69%) than male respondents. The education level of most of the respondents was S1 (75%), and most of the respondents suffered from COVID-19 during wave 2 (54.69%).

Table 2. Demographic Characteristics of Respondents (n 64)

Demographic Data	Category	Amount	Percentage (%)
Age	18-40 years old	50	78,1
	41-60 years old	13	20,3
	Over 60 years old	1	1.6
Gender	Male	13	20,3
	Female	51	79,7
Education	Senior High School	6	9.4
	Bachelor degree	48	75
	Magister	10	15,6
Covid wave	First wave	21	32,8
	2nd wave	35	54.7
	3rd wave	8	12.5

Respondents who were sampled in this study were aged 18 years and over. The majority of those affected are aged 18-40 years (78.13%) with an average education level of S1 (75%) who are of productive age and have high mobility and activities outside the home. The gender characteristics show that women are 79.7% much higher than men. Meanwhile, the highest incidence of COVID-19 was in the second wave of 54.7%.Hasil sebaran item validitas kuisioner penelitian dapat dilihat sebagai berikut:

Table 3. Questionnaire of Perception of Seriousness, Perception of Vulnerability, Perception of Benefit, Perception of Barriers

ITEMS	*corrected item total correlation*	*total correlation*	Information
Seriousness-1	0,470	0,30	Valid
Seriousness-2	0,570	0,30	Valid
Seriousness-3	0,620	0,30	Valid
Seriousness-4	0,501	0,30	Valid
Vulnerability-1	0,680	0,30	Valid
Vulnerability-2	0,484	0,30	Valid
Vulnerability-3	0,339	0,30	Valid

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Vulnerability-4	0,639	0,30	Valid
Benefit-1	0,677	0,30	Valid
Benefit-2	0,530	0,30	Valid
Benefit-3	0,650	0,30	Valid
Benefit-4	0,332	0,30	Valid
Barrier-1	0,710	0,30	Valid
Barrier-2	0,221	0,30	Invalid
Barrier-3	0,332	0,30	Valid
Barrier-4	0,309	0,30	Valid

The Health Belief Model questionnaire consists of four dimensions (16 question items), namely perceived seriousness (4 items) perceived vulnerability (4 items) perceived benefits (4 items) perceived barriers (4 items). The question items in each instrument domain can be seen in Table 1. The assessment uses a Likert scale starting from a score of 1 for the answer "strongly disagree", 2 for the answer "agree", 3 for the answer "strongly agree", and 4 for the answer " strongly agree" for the dimension of perception of seriousness of items number 1, 2, 3, dimension of perception of vulnerability of items number 1, 2, 4, dimension of perceived usefulness of items number 1, 2, 3, 4, and starting with a score of 4 for the answer "strongly disagree", 3 for the answer "agree", 2 for the answer "strongly agree", and 1 for the answer "strongly agree" for the perceived seriousness dimension of item number 4, the dimension of perception of vulnerability item number 3, the dimension of perception of barriers items number 1, 2, 3, 4, with a total score assessment, the greater the score, the better a person's perception of mental health behavior.

Based on Table 3, there are 15 research variable items, where the correlation coefficient is above 0.3 so it is considered valid. The "barrier 2" question has a correlation coefficient (0.221) below 0.3 so it is considered invalid. This means that items with valid values can measure what should be measured, while the "barrier2" item cannot measure. Based on the results of the validity test, it is known that there are 15 valid items; and there is 1 invalid item. Furthermore, from the 15 valid items, the reliability test was carried out. The distribution of the research questionnaire reliability items can be seen as follows:

Table 4. Reliability of the Questionnaire on Perception of Seriousness, Perception of Vulnerability, Perception of Benefit, Perception of Barriers

ITEMS	*Alpha*	*Alpha Cronbach's*	Information
Seriousness-1	0,764	0,7	Reliable
Seriousness-2	0,754	0,7	Reliable
Seriousness-3	0,749	0,7	Reliable
Seriousness-4	0,760	0,7	Reliable
Vulnerability-1	0,744	0,7	Reliable
Vulnerability-2	0,761	0,7	Reliable
Vulnerability-3	0,790	0,7	Reliable
Vulnerability-4	0,749	0,7	Reliable
Benefit-1	0,748	0,7	Reliable
Benefit-2	0,756	0,7	Reliable
Benefit-3	0,747	0,7	Reliable
Benefit-4	0,775	0,7	Reliable
Barrier-1	0,738	0,7	Reliable
Barrier-3	0,779	0,7	Reliable
Barrier-4	0,782	0,7	Reliable

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Based on Table 4 questionnaire reliability test of Perception of Seriousness, Perception of Vulnerability, Perception of Benefit, Perception of Barriers, Cronbach's Alpha coefficient is greater or r alpha (0.776) which is positive and greater than 0.7. This means that all items are said to be reliable as a data collection instrument.

DISCUSSION

The results of the validity test of the questionnaire on perceived seriousness, perceived vulnerability, perceived benefits, perceived barriers showed that 93.75 questions were valid, this means that the questionnaire was declared good and could be applied. Meanwhile, in the questionnaire reliability test, Perception of Seriousness, Perception of Vulnerability, Perception of Benefits, Perception of Barriers was stated to be 100% reliable. These results indicate that the questionnaire used in the study to obtain information used can be trusted as a data collection tool and is able to reveal actual information in the field.

Risk factors for COVID-19 are influenced by demographic factors such as age, gender, lifestyle, race, eating habits and comorbidities that underlie the individual. 12. Based on the results of the 2022 BPS survey, women are more obedient in implementing health protocols than men. Meanwhile, in general, the level of compliance with health protocols between respondents who had been infected and those who had never been infected did not differ significantly. Someone who has been infected with adherence to health protocols below 70%, especially keeping distance and reducing mobility (BPS, 2022)

The results of a survey by the Central Statistics Agency (BPS) in 2022 on the behavior of the pandemic community that causes COVID-19 infection, shows that there is still a lack of awareness of the productive age population to implement health protocols, such as being less obedient to avoiding crowds (22%), maintaining a minimum distance of 2 meters (23%). %) and reduced mobility (24%). The main motivation for the community to apply health protocols is respecting people (1 %), obeying regulations (6.3%), supervising officials (0.4 %), joining in (0.3%) and not caring/trusting (0.5 %). In the 18-40 year age range, many have comorbidities that can increase the risk of exposure to COVID-19 in the form of active smokers, hypertension and diabetes [13].

Young adulthood is an age range that is experiencing a period of transition both physically, intellectually and socially. They have various demands related to work, lifestyle, and careers that require a commitment to form an ideal role model for their lives. Usually young adults try to do activities to get inner pleasure and mental satisfaction after experiencing boredom with routine[14]. This is one of the causes that can make high activities outside the home so that it is possible for the transmission of covid. The majority of people aged 17-30 years, and not yet married, stated that they felt very bored when there were restrictions on outside activities.

Gender tends to have different susceptibility to the COVID-19 virus. Previous research has found that there are sex differences in exposure to the COVID-19 virus, mainly due to the mechanism of viral infection, immune response, development of systemic inflammation, comorbidities [15]. Differences in infectious disease are associated with determinants, namely (1) X-chromosome-associated immunity, (2) sex hormone effects and (3) gender-related behavior, (4) comorbidities, (5) behavioral [15–17]. Other studies have shown that men are more exposed to COVID-19 than women. Biologically, women have a higher immune response than men due to the activation of the X gene which causes a low viral load and high CD4 T cells. Expression of Toll like receptor 7 (TLR7) in women to recognize viral RNA is also high, in addition to interferons and interleukins produced in women's bodies are also higher than men. Women also have higher levels of estradiol, which stimulates humoral and cellular immune responses and increases antibody production. Men tend to have the hormone testosterone which is an immunosuppressant [15,18]

Female respondents (79.69%) in this study were more exposed to COVID-19 than male respondents. According to the WHO report (2020), the largest population (70%) who work as health workers are women, so they are at high risk of being exposed to COVID patients. There is research evidence that says that men adhere to health protocols than women (Pivonello, 2020), maybe this is one of the reasons why more women than men are infected with covid.

Most of the respondents suffered from COVID-19 during wave 2 (54.69%). The second wave of Covid cases in Indonesia occurred in June – July 2021. This incident was triggered by the transmission of the Delta variant, which is 60% more easily transmitted and spreads more easily, and is twice as risky as the Alpha variant. The Delta variant is quite resistant to vaccines and mutates very quickly due to its small incubation period, which can increase transmission. This can lead to a risk of infection, so that more respondents are infected in the second wave [19–21]

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Mental disorders conditions have been reported due to the COVID-19 pandemic, which are more experienced by the 17-30 year age group, namely feelings of irritability (24.7%), excessive fear (16%) and often feel anxious (24.7%) (BPS, 2022). Based on this condition, it is considered necessary to have a mental health promotion model to overcome this problem.

The Health Belief Model (HBM) is a socio-psychological theoretical model developed in the 1950s to explain and predict health behaviors and is used in practice to guide health promotion programs [22,23]. It is a widely used model for assessing personal beliefs and predicting health behavior, and it is based on the idea that people are more likely to change their health behavior if they believe they are at risk.

In a previous study using the Health Belief Model questionnaire to measure perceptions of COVID-19 susceptibility and perceptions of COVID-19 severity to explore people's willingness to be vaccinated against COVID-19[24,25]. Obtained Cronbach's alpha value is 0.7061 for COVID-19 Perceived Susceptibility and 0.7095 for COVID-19 Perceived Severity, indicating good internal consistency.

In another study using The St. Questionnaire. The George Respiratory Questionnaire (SGRQ) was used to measure the health-related quality of life (HRQOL) status of COVID-19. The results show that the HRQOL of COVID-19 survivors living in rural areas is significantly lower than in urban areas. Factors such as living in a rural area, female gender, having co-morbidities, and a history of symptomatic COVID-19 infection were identified as significant predictors of lower quality of life [26].

Health Belief Model. Mental Health Behavior of COVID-19 Survivors was made in the form of a questionnaire consisting of four dimensions (16 question items), namely perception of seriousness (4 items) perception of vulnerability (4 items) perception of benefits (4 items) perception of barriers (4 items)). The validity test of the questionnaire shows that there is one item that is not valid because the correlation value is less than 0.30, so that only 15 items are declared valid. Invalid item on perception barrier 2 is "I no longer need information related to mental health problems". The delivery of information and education on health protocols to the public has been very good, 91% of respondents claimed to have received information education on Covid 19. The community thought that doctors/nakes were the most preferred resource for delivering material (BPS, 2022)

The question on item perception barrier 2 is a closed questionnaire that measures social phenomena, where in this item respondents' answers fluctuate, because respondents will answer strongly disagree or disagree. Respondents need information related to mental problems both for themselves and their families. Information about mental health in the Covid pandemic is very easily accessible through social media.
Table 4 shows that there are 15 items that are considered reliable, so they can be used as a tool to assess perceptions of seriousness, perceived vulnerability, perceived benefits, and perceived barriers to the Health Belief Model of Mental Health Behavior for COVID-19 Survivors.

The limitation of this study is the distribution of questionnaires online due to the Covid pandemic, so the duration of sample data collection is long. Communication with respondents is not direct, but through cellphones, either through whatapps or telegram applications. Communication via online is only limited to respondents who have mobile phones, while those who do not have mobile phones may not be affordable.

The advantage of this research is that the questionnaire created can measure the four dimensions of the HBM theory in order to determine the mental health behavior of Covid 19 survivors. So that this research has its own novelty value which is expected to be able to provide solutions to mental health problems for COVID-19 survivors.

CONCLUSION

Overall, the HBM Questionnaire for Mental Health Behavior for COVID-19 Survivors is a valid and reliable instrument to measure mental health behavior in COVID-19 survivors.

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