

The Indonesian Version of SF-36 Questionnaire: Validity and Reliability Testing in Indonesian Healthcare Workers Who Handle Infectious Diseases

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Abstract

Quality of life is a parameter to measure the position of life for high-risk people, including healthcare workers who handle infectious disease. Quality of life affects productivity and performance. A lot of instruments can be used to measure the quality of life, which one is the 36-item Short From Health Survey (SF-36). It is an international standard questionnaire which measuring health-related quality of life, so a translation process into Indonesian is necessary. The aim of this study is to evaluate the validity and reliability of SF-36 questionnaire on Indonesian version. This study was an observational analytic with a cross-sectional design. This study divided into 2 stages, ie. translating questionnaire into Indonesian version, then testing it with respondents. We evaluated 45 healthcare workers working in the COVID-19 isolation room. Data were taken from September to October 2020. This study was analyzed by Pearson Correlation and Cronbach' alpha with $\alpha=5\%$ and using SPSS v.23 software. Results showed that the overall cronbach' alpha coefficient was 0.883, while the five dimensions were >0.70 (physical function, vitality, mental health, bodily pain, and general health). But, the role physical, role emotional, and social function dimensions had cronbach' alpha coefficient 0.6-0.7. The Indonesian version of SF-36 was valid and reliable, so it could be used as a instruments for measuring health related quality of life among healthcare workers who handle infectious diseases, especially in COVID-19.

Keywords : Health related quality of life, 36-Item Short From Health Survey (SF-36), Healthcare workers, Validity, Reliability

Background

Quality of Life (QoL) is a multidimensional construct influenced by aspects of work and personal life, physical and psychological health, social relationships, and environment in which a person lives. QoL has long been recognized as a measure in high-risk populations, including workers, because work is a social activity that can impact health^{1,2}. Health-Related Quality of Life (HRQL) is a part of QoL which measure individual health status. It can capture individual's subjective evaluations of their current health status, and comparing it in last year³.

The health related quality of life in high-risk group has been the subject of extensive investigation, especially in patients with peacemaker, cancer, and others who are in emergency department. But study focussing on the health related quality of life in healthcare worker is rare and it need to be better appreciated, especially in healthcare workers who handle infectious diseases³⁻⁵. The quality of life aspects could be help to reduce negative effects on their lives.

The 36-item Short From Health Survey (SF-36) has been well-known as an international standard questionnaire which measuring health-related quality of life. It involves 8 domains from physical and mental aspects: physical function, vitality, mental health, bodily pain, role physical, role emotional, social function, and general health⁶. There is no appropriate Indonesian version of SF-36 for healthcare workers

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who handle infectious diseases, maybe most questions to be constructed. The questionnaire to measure health-related quality of life have to not only be responsive, but also appropriate, valid, reliable, and capable of being interpreted^{7,8}

Based on the background description, the aim of this study is to evaluate the validity and reliability of SF-36 questionnaire on Indonesian version for measuring health related quality of life among healthcare workers who handle infectious diseases, especially in COVID-19.

Materials and Methods

This study was an observational analytic with a cross-sectional design. The population in this study was all healthcare workers who work in the hospital and according to the requirements of the inclusion and exclusion criteria, ie. Contact with the patients of COVID-19; and available to be reaserch subjects with informed consent. Sampling was multistage random sampling and obtained 45 healthcare workers.

Data were taken from September to October 2020. This study used the 36-item Short From Health Survey (SF-36) for measuring health related quality of life among healthcare workers who handle infectious diseases. It is an international standard questionnaire, so a translation process into Indonesian language is necessary. This study divided into 2 stages, ie. translating questionnaire into Indonesian version, then testing it with respondents. The translation version was then distributed to 45 healthcare workers via google form. It was to reduce the transmission of COVID-19.

The questionnaire involves 8 domains from physical and mental aspects: physical functioning (PF), role physical (RP), vitality (VT), bodily pain (BP), perceptions of general health (GH), role emotional (RE), social functioning (SF), and mental health (MH). Each respondent filled out 36 questions were multiple choice with a score between 0-100. This study was analyzed by Pearson Correlation and Cronbach' alpha with $\alpha=5\%$ and using SPSS v.23 software.

Results and Discussion

The respondent who participated in this study is healthcare workers who working in the COVID-19 isolation room in various region of Indonesia. Based on

Table 1, 75,6% have living in urban area. This condition showed that in Indonesia, the hospital which capable of handling COVID-19 patients is a hospital that has complete facilities with ventilators. In Indonesia these facilities are mainly found in referral hospitals⁹

Based on the Decree of the Minister of Health of the Republic of Indonesia Number 391 of 2014 declared that all of governor in Indonesia has the right to appoint at least one hospital that will become a referral hospital in order to improve health services in the National Health Insurance or JKN Era. One of the criteria for a referral hospital is that it is able to handle patients across at least 4 districts or cities, and can be reached by land, sea and air transportation at least across 4 districts or cities. This ease of access is the reason why most of the referral hospitals are located in the central city area. All respondents who work at Referral Hospital for Specific Emerging Infectious Diseases as stipulated in the Decree of the Minister of Health of the Republic of Indonesia No. HK.01.07/MENKES/169/2020⁹

Table 1 also shows that most of respondents are at 25-30 years old. The functioning of human organs is at its optimal peak during adulthood and tends to decline when you get older (>45 years). Decree of the Minister of Health of the Republic of Indonesia No. HK.01.07/MENKES/328/2020 explains that workers are divided into 3 field, there are low risk of exposure, moderate risk of exposure, and high risk of exposure. Health workers who have direct contact with COVID-19 patients are categorized as workers with a high risk of exposure. Therefore, one of the special criteria for health workers is that they do not have comorbidity factors. The comorbidity factor which we referred to is old age, the presence of comorbidities such as diabetes, hypertension, pulmonary disorders, kidney disorders, immunocompromised conditions or autoimmune diseases, and pregnancies^{10,11}.

Based on marital status and employment status (**Table 1**), 66,7% are single and 53,3% are work as contract employees at the hospital where they work. Based on hospital policy which is referred to the Circular of the Minister of Health of the Republic of Indonesia No. HK.02.01/MENKES/216/2020 concerning Protocol for the Prevention of COVID-19 Transmission in the Workplace. The circular also regulates self-isolation for

high-exposure workers or workers with symptoms of COVID-19. Health workers who are single more able to occupy the dormitory provided by the hospital as a self-isolated effort than those who are married¹²

Table 1. Respondents Characteristics

Variable	n	%
Living		
Rural	11	24,4
Urban	34	75,6
Age		
20 – 25 years	9	20,0
25 – 30 years	31	68,9
31 – 35 years	4	8,9
35 – 40 years	1	2,2
Marital status		
Single	30	66,7
Married	15	33,3
Employment Status		
Volunteer	5	11,1
Contract Employee	24	53,3
Permanent Employee	13	28,9
Civil Servants	3	6,7

Validity and Reliability Testing

SF 36 is one of the standard instrument to measure health-related quality of life. SF 36 consist of 36 items which is divided to measure 8 domains of health: physical functioning (PF), role physical (RP), vitality (VT), bodily pain (BP), perceptions of general health (GH), role emotional (RE), social functioning (SF), and mental health (MH). SF 36 is flexible and simple instruments so that it is easy to fill out both manually and digitally. This questionnaire is also widely used to measure general health status, including evaluating the effectiveness of an intervention¹³⁻¹⁵

The Validity analysis of SF 36 Indonesian version is carried out by comparing the Pearson Product Moment correlation value with a significance level of 5%, while the reliability analysis used Cronbach's alpha. The analysis of the validity and reliability of the SF 36 questionnaire was carried out per domain where each domain was represented by 2 to 10 questions. The question is said to be valid if the p value is <0.05 and it is said to be reliable if the Cronbach's alpha value is > 0.6¹⁶

Table 2. Validity and Reliability Testing for SF-36 Questions

Subscale and its items in Indonesian Version	r	p	Cronbach's Alpha
Physical Functioning (PF) Mengangkat benda berat atau olahraga berat	0,598	< 0,001	0,767
Memindahkan meja, menyapu, atau jalan santai	0,477	0,001	
Mengangkat atau membawa benda ringan	0,600	< 0,001	
Menaiki lebih dari 1 anak tangga	0,509	< 0,001	
Menaiki 1 anak tangga	0,477	0,001	
Menekuk leher/tangan/kaki, bersujud, atau membungkuk	0,488	0,001	
Berjalan lebih dari 1,5 km	0,806	0,001	
Berjalan melewati beberapa gang atau sejauh 1 km	0,809	< 0,001	
Berjalan sejauh 0,5 km	0,699	< 0,001	
Mandi atau memakai baju sendiri	0,271	0,152	
Role Physical (RP) Menghabiskan seluruh waktu untuk melakukan pekerjaan	0,681	< 0,001	0,610
Menyelesaikan pekerjaan tidak tepat waktu	0,590	< 0,001	
Terbatas pada pekerjaan tertentu	0,739	< 0,001	
Mengalami kesulitan dalam melakukan pekerjaan	0,737	< 0,001	
Role Emotional (RE) Menghabiskan seluruh waktu untuk melakukan pekerjaan	0,732	< 0,001	0,641
Menyelesaikan pekerjaan lebih lama dari biasanya	0,824	< 0,001	
Tidak teliti dalam menyelesaikan pekerjaan dari biasanya	0,732	< 0,001	
Vitality (VT) Merasa penuh semangat	0,790	< 0,001	0,775
Merasa memilikibanyak tenaga	0,829	< 0,001	
Merasa mudah bosan	0,686	< 0,001	
Merasa cepat lelah	0,792	< 0,001	
Mental Health (MH) Termasuk orang yang mudah gugup	0,425	0,004	0,738
Merasa sangat tertekan dan tidak bergembira	0,809	< 0,001	
Merasa tenang dan damai	0,792	< 0,001	
Merasa putus asa dan sangat sedih	0,739	< 0,001	
Termasuk orang yang ceria	0,731	< 0,001	

Cont... Table 2. Validity and Reliability Testing for SF-36 Questions

Subscale and its items in Indonesian Version	r	p	Cronbach's Alpha
Social Function (SF)			0,662
Kesehatan fisik atau emosi mengganggu interaksi sosial	0,835	< 0,001	
Kesehatan fisik atau emosi mempengaruhi kegiatan sosial	0,657	< 0,001	
Bodily Pain (BP)			0,802
Merasakan nyeri di tubuh	0,916	< 0,001	
Rasa nyeri tersebut mengganggu pekerjaan sehari-hari	0,911	< 0,001	
General Health (GH)			0,845
Kondisi kesehatan yang dirasakan sekarang	0,809	< 0,001	
Kondisi kesehatan sekarang jika dibandingkan tahun lalu	0,607	< 0,001	
Saat ini mudah menderita sakit	0,796	< 0,001	
Saat ini sama sehatnya seperti orang lain	0,635	< 0,001	
Merasa kondisi kesehatan saat ini semakin memburuk	0,894	< 0,001	
Kesehatan saat ini sangat baik	0,750	< 0,001	

The question to measure physical functioning is to know that “Does your health now limit you in these activities?” We translating vigorous activities as activities which need a lot of energy or “membutuhkan banyak energi”, moderate activities as activities that do not need a lot of energy or “aktivitas ringan” and add example such as sweeping, jogging and walking. Question about climbing several flights or stairs we translate as climbing some stairs or “menaiki beberapa anak tangga”, and the next 3 question are walking more than 1,5 Km, walking a few alleys which are 1 Km/alley, and walk for 0,5 Km.

The PF domain consists of 10 questions that describe the ability of a physical function to do moderate to vigorous activities. **Table 2** shows that there is one item that has a significant value 0,152 ($p>0,05$) which is the last question about “bathing and dressing by yourself”, this indicates that this question may get the misunderstanding by health workers. Other questions have a significant value $<0,001$ which indicates that the question or instruction can be understanding by health workers. In the conclusion for validity and reliability,

the physical functioning domain consists of 9 valid questions and 1 non-valid question. After we deleted the non-valid question we conducted the reliability analysis and the results showed that Cronbach's alpha value is 0,767 ($>0,6$) which is indicated that the 9 questions to measure the PF domain of healthcare workers is valid and reliable¹⁶⁻¹⁸

The RP domain consists of 4 questions. The translating questions to measure role physical in Indonesian version can we described as “do you had difficulty to spend all of your time to do some work or other activities?”, “do you had difficulty to finish your work on time?”, “do you had a limitation to do your work or other activities?” and do you had difficulty to do your work or other activities that need extra energy like jacking, constructing work, or laundry?”. All of the four questions have a significant level $<0,001$ its indicates that all of the questions are valid and can be the measurer of role physical domain of health workers. The high significant level of each question also indicates that the instruction or questions can be understanding by the respondents. **Table 2** shows that Cronbach's alpha value is 0,61 ($>0,6$), so all questions are reliable and can

measure the role physical domain of healthcare workers consistently^{14,16}

The RE domain consists of 3 questions which are we described in Indonesian version as “do you had the emotional problem that can give you difficulty to spend all of your time to work or do other activities?”, “do you have an emotional problem that gives you difficulty to finish your work on time?”, “do you have an emotional problem that makes you did work or other activities less carefully than usual?”. **Table 2** shows that all questions have a high significant value which is <0.001 this indicates that the instruction or questions is valid and can be understanding by the respondents. Cronbach’s alpha value is 0,641 ($> 0,6$) it means that all questions are reliable and can measure the role emotional domain of healthcare workers consistently¹⁶⁻¹⁸

The VT domain can be measure by 4 questions which in the Indonesian version can we described as how the respondents feeling, is they always feel impassioned, have a lot of energy, feel bored, and feel tired quickly. All of this question has a significant value <0.001 which indicated that all of the questions are valid and can be used to measure the vitality domain of respondents. Besides that the Pearson Product Moment correlation value is high so all the questions is can be understanding by the respondents. **Table 2** shows that Cronbach’s Alpha value is 0,775 ($> 0,6$) which indicated that all of the questions are reliable and can measure the vitality domain of healthcare workers consistently^{14,16}

The MH domain can be measured by 5 questions, which can be used to predicting 5 main dimensions of mental health there are anxiety, depression, emotional control, and psychological well-being. In this Indonesian version the questions can be described as how the respondent feels in the past 4 weeks, including felt very nervous, felt depressed and nothing can cheer you up, felt calm and peaceful, and felt downhearted and sad. Besides that, for the last question, we translating the last question as “were you a happy or cheerful person?”. The lowest score for the mental health domain is if the respondent answer that they felt nervousness and depression all the time, while the highest score is if the respondent answer that they felt peaceful, happy, and calm all the time, past 4 weeks¹⁷. Based on validity analysis results all of the questions have a significant value <0.001 which

indicates that all of the questions are valid. Reliability results also give Cronbach’s Alpha value 0,738 ($>0,6$) so the conclusion shows that the questions are reliable and consistent to measure the mental health domain of healthcare workers¹⁶⁻¹⁸

The SF domain wants to see the extent of the impact of physical health or emotional problems on someone’s social activities on the past 4 weeks, these social activities are general social activities with family, friends, neighbors or groups and social activities like visiting friends, relatives, etc. The social functioning domain of the SF 36 questionnaire consists of 2 questions. **Table 2** shows that $p\text{-value}<0.001$, this indicates that 2 questions on the questionnaire are considered valid, while the Cronbach’s Alpha value is 0.662 (>0.06) which can be concluded that the questionnaire is reliable or consistent¹⁴

The BP domain can measure the extent of pain that can interfere with a person’s normal activities in the past 4 weeks. The questions to measure this domain consist of 2 questions. The lowest score is obtained if the respondent feels the pain that is very severe to the extent that can greatly interfere with daily work. **Table 2** shows that $p\text{-value}<0.001$ on both questions so that it can be concluded that the two questions to measure the bodily pain domain are valid. While Cronbach’s Alpha value is 0.802 (<0.6) so it was considered reliable and consistent¹⁶⁻¹⁸

The last domain measured through the SF 36 questionnaire is the GH domain. The questions in this aspect consist of 6 questions, which are questions number 1, 2, 33 to 36. The questions in this aspect want to see how the respondent’s perceptions of their health in general. The lowest score is obtained if the respondent believes or considers that his health condition is poor and tends to get worse. Based on the results of the analysis of the validity of the questionnaire from 45 respondents, it was found that the $p\text{-value}$ of 6 questions <0.001 , so it was concluded that the 6 questions to measure general health are valid. In the results of the reliability analysis with the same number of respondents, Cronbach’s Alpha value is 0.845 (> 0.6) it indicates that this questionnaire is reliable or consistent (**Table 2**).

Conclusions

The Indonesian version of SF-36 was valid and reliable, so it could be used as a instruments for measuring health related quality of life among healthcare workers who handle infectious diseases, especially in COVID-19. In the the PF domain, we found that one question about “Bathing and dressing by yourself”, is considered not valid. The authors will decide to modification of the questions instead to delete the question, so it can fully measure the PF domain.

Acknowledgments: The authors are grateful to Dean of Vocational Faculty Universitas Airlangga for giving chance and support during research. We would like to thanks to all respondents who participated in this study.

Source of Funding: This study was supported by Universitas Airlangga

Ethical Clearance: This study was received Ethical Approval from the Health Research Ethics Commite, Faculty of Nursing, Universitas Airlangga

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