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Validity of short form 36 (SF-36) Indonesian version on rheumatoid arthritis patients

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ABSTRACT

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Background: Rheumatoid arthritis is a chronic disease that decrease the function of the joint. It usually occurs on the feet and hands which may decrease the quality of one's life. A valid and reliable instrument is needed to measure patients' quality of life. SF-36 is a generic instrument to measure patients quality of life which is widely used in many diseases.
Objective: This study is aimed to get valid and reliable Indonesian version of SF-36 questionnaire.
Methods: We conducted this study in an observational cross-sectional design. Reliability was measured by Cronbach alpha parameter (>0.7). The validation processes included known group validity, convergent validity, and discriminant validity which are part of construct validity.
Results: We recruited 24 RA patients in this study. All the domains met the reliability parameter, except for vitality function (Cronbach alpha : 0.52). The result of convergent and discriminant validities are good in almost all domains, except for questions number 16, 27, and 35 which did not meet discriminant validity and the number 9 which did not meet convergent and discriminant validity. The Known Group Validity test on gender showed that there was no statistically significant difference (ρ >0.05). However, there are significant differences based on general health between age groups, and based on pain and role limitation due to emotional function between educational status.
Conclusion: The Indonesian version of SF-36 in general can be used for measuring rheumatoid arthritis patients' quality of life.

Latar Belakang: *Rheumatoid arthritis (RA), penyakit kronik yang menyerang persendian tulang tangan dan kaki yang dapat menyebabkan menurunnya kualitas hidup pasien. Untuk mengukur kualitas hidup diperlukan instrumen yang valid dan reliabel. SF-36 merupakan kuesioner generik pengukur kualitas hidup yang saat ini banyak digunakan pada berbagai penyakit.*
Tujuan: *Penelitian ini bertujuan untuk mendapatkan kuesioner SF-36 versi Indonesia sebagai instrumen pengukur kualitas hidup pasien RA yang valid dan reliabel.*
Metode: *Rancangan penelitian ini yaitu observasional dengan pendekatan secara cross sectional. Reliabilitas diukur dengan parameter* cronbach alpha *>0.7, sedangkan validasi meliputi* known group validity, *validitas konvergen dan validitas diskriminan yang merupakan bagian dari validitas konstrak.*
Hasil: *Sejumlah 24 responden bersedia untuk berpartisipasi dalam penelitian ini. Semua domain pada SF-36 memenuhi kriteria reliabilitas, kecuali fungsi energi (nilai* cronbach alpha*: 0.52). Validitas konvergen, dan validitas diskriminan baik pada hampir semua domain, kecuali 4 pertanyaan yaitu nomor 16, 27, dan 35 yang tidak memenuhi validitas diskriminan serta nomor 9 tidak memenuhi validitas konvergen dan diskriminan. Uji* known group validity *pada jenis kelamin menunjukkan bahwa tidak ada perbedaan signifikan (p >0,05). Namun terdapat perbedaan signifikan pada fungsi kesehatan umum pada kelompok*

usia, nyeri dan keterbatasan peran karena fungsi emosi pada kelompok tingkat pendidikan akhir (p<0.05)

Kesimpulan: *SF-36 versi Indonesia secara umum dapat digunakan untuk mengukur kualitas hidup pasien RA.*

INTRODUCTION

Rheumatoid arthritis (RA), is a chronic inflammatory disease which mainly affect the joint of hands and feet causing pain, edema, stiffness, limitation of range of movement, and even degradation of the joint itself.[1,2] This disease usually occurs in age group between 30 – 55 years old, marked with an inflammation of the synovium, degradation of the joint and muscle, and progressive erosion of the bones.[3] RA can cause a decrease in one's quality of life in terms of their physical function, social function, and psychological function. There will also be a lot of unwanted side effects from its pharmacological treatment which includes NSAID, corticosteroid, and DMARD; causing a suppression of the immune system, muscle pain and weakness, as well as osteoporosis.[1-2] SF-36 questionnaire is an instrument to measure the quality of life[4] which has been widely translated and validated in many countries, such as England,[5] Lithuania,[6] Singapore,[7] and Denmark.[8]

A research conducted in Singapore, has shown that the Chinese version of SF-36 questionnaire is valid and reliable to measure the quality of life in patients with RA. In which, the domain of pain scale, physical function, physical role, and social function has the best result to determine any behavioral changes, while general health is the most responsive domain to determine changes in its activity. In conclusion, pain and physical function is an ideal psychometric domain to measure the quality of life in patients with RA.[6]

In Indonesia, the validity of SF-36 questionnaire for patients with RA has never been determined. However, the Indonesian version of SF-36 questionnaire is already available.[9-11] Therefore, this study is aimed to get a valid and reliable Indonesian version of SF-36 questionnaire as an instrument to measure the quality of life in patients with RA.

METHODS

This study was conducted in an observational cross-sectional design. It was done at the Rheumatology Clinic of PKU Muhammadiyah Yogyakarta general hospital. Data was collected directly using the Indonesian version of Short Form 36 (SF-36) questionnaire.

SF-36 is a generic instrument to measure quality of life, which means it can be used within either general population or patients with diseases. However, before being used in a certain population, this questionnaire needs to be validated.[9,12] This questionnaire is conducted by 36 questions which are classified into eight different domains : physical functions, role limitation function due to physical condition, social function, emotional function, role limitation function due to emotional condition, pain scale, vitality function, and general health. The questions in this questionnaire are filled using the Likert scale, and then, during the scoring process, are converted into 0-100 scores. The higher the score of one domain, the better its function.[4]

The subject of this research is all patients who are diagnosed with rheumatoid arthritis at PKU Muhammadiyah Yogyakarta general hospital, and who meet the inclusion criteria. The inclusion criterias are : patients who are diagnosed with rheumatoid arthritis, between the age of 18–70 years old, undergo outpatient treatment, able to read and understand the content of the questionnaire, and willing to sign the informed consent of the research.

Demographical datas, include : age, gender, educational status, and occupation, are taken from the medical record. SF-36 questionnaire is given one time to the subjects while they are queueing to wait for their check-ups at the Rheumatology Clinic of PKU Muhammadiyah Yogyakarta general hospital. This research was conducted within April-June 2014. This research has been granted by the Ethical Committee of the Faculty of Medicine at Muhammadiyah Yogyakarta University with the' Letter of Ethical Clearance' No: 752/EP-FKIK-UMY/IV/2014.

Demographical data is presented using the number of people and its percentage. Reliability is measured using cronbach alpha

parameter. Convergent and discriminant validities are measured by pearson correlation test. Convergent validity is met if ≥0.40, while discriminant validity is met if the valuse of a certain domain is higher than the other domains. Known group validity is measured with T-test with confidence interval 95%.

RESULTS

Table 1 shows the characteristic of the subjects in this study. The distributions of subjects based on gender is 4 male (16,7%) dan 20 female (83,3%). Based on their age group, it can be seen that most patients who suffer from RA are within the age group of 56-65 years old (10 subjects), while the age group 36-45 years old has the least (3 subjects). Based on their educational status, most RA patients in this research graduated senior high school, which are 14 subjects (58,3%). Based on their occupation, most of RA patients in this research are housewives, which are 9 subjects. (37,5%).

Table 2 shows the value of cronbach alpha in physical function domain, physical role domain, emotional role domain, social function domain, pain scale, and general health, are more than 0,70, which mean that the Indonesian version of SF-36 questionnaire for RA patients has very good reliability. However, on the vitality domain, the result is less than 0,70 (0,523), which mean that the questions within this domain has lower reliability.

Table 3 shows the result of known group validity test of the Indonesian versio of SF-36 questionnaire, which shows no statistically significant difference in the quality of life in patients with RA based on their gender, as well as skilled and unskilled occupations ($\rho \geq 0,05$). However, there are statistically significant difference within the age group of 55 and the educational status of highschool, based on their general health domain, role limitation domain due to emotional condition, and pain scale.

Table 1 Demographical characteristic of patients with RA at PKU Muhammadiyah Yogyakarta general hospital (n=24)

Demographical Characteristics	n	(%)
Age (years)		
36 – 45	3	12,5
46 – 55	7	29,2
56 – 65	10	41,7
66 – 75	4	16,7
Gender		
Male	4	16,7
Female	20	83,3
Educational status		
Elementary school	3	12,5
Junior highschool	1	4,2
Senior highschool	14	58,3
Diploma	3	12,5
Bachelor	3	12,5
Occupation		
Farmers	3	12,5
Housewives	9	37,5
Retired	2	8,3
Entrepreneur	8	33,4
Government employee	2	8,3

Table 2 Reliability test of the Indonesian version of SF-36 questionnaire in patients with RA

Domain	Cronbach's Alpha
Physical function	0,848
Motional function	0,925
Social function	0,782
Physical role	0,899
Emotional role	0,820
Pain	0,879
Vitality	0,523*
General health	0,709

* : Cronbach alpha ≤0,70

Tabel 3 Known Group Validity SF-36 Indonesian version in patients with RAs

Group	N	Mean±SD							
		PF	EF	SF	PR	ER	Pn	V	GH
Gender									
Male	4	80,00 ±13,54	62,50 ±47,87	83,32 ±33,35	73,75 ±20,56	96,00 ±8,00	59,38 ±11,97	37,50 ±43,30	82,50 ±5,00
Female	20	53,50 ±20,27	26,25 ±37,59	36,68 ±40,33	67,00 ±14,18	84,80 ±27,02	66,25 ±22,25	33,75 ±20,32	65,50 ±12,45
ρ value		0,523	0,586	0,133	0,513	0,077	0,058	0,059	0,052
Age (years)									
≤55	10	68,50 ±13,13	40,00 ±42,82	53,34 ±42,17	69,50 ±10,40	91,20 ±20,38	71,25 ±20,45	37,50 ±24,30	70,50 ±8,96
>55	14	50,36 ±23,57	26,79 ±39,79	38,10 ±43,09	67,14 ±18,05	83,43 ±28,28	60,71 ±20,72	32,14 ±24,86	66,79 ±15,64
ρ value		0,131	0,609	0,692	0,229	0,197	0,867	0,678	**0,027***
Occupation									
Unskill	14	60,71 ±23,19	30,36 ±40,64	42,86 ±44,20	70,00 ±17,43	83,71 ±28,43	63,39 ±19,89	33,93 ±27,05	70,36 ±15,38
Skill	10	54,00 ±19,55	35,00 ±42,82	46,68 ±42,17	65,5 ±11,41	90,80 ±20,23	67,50 ±22,97	35,00 ±21,08	65,50 ±9,26
ρ value		0,535	0,833	0,752	0,668	0,185	0,188	0,515	0,290
Educational status									
≤senior high-school	18	50,00 ±21,70	31,94 ±41,84	48,16 ±43,12	67,22 ±15,07	83,11 ±28,04	70,14 ±21,92	31,94 ±22,37	66,39 ±13,70
>senior high-school	6	66,67 ±20,41	33,33 ±40,82	33,33 ±42,17	70,83 ±16,25	97,33 ±6,53	50,00 ±0,00	41,67 ±30,28	74,17 ±10,21
ρ value		0,934	0,658	0,478	0,780	**0,011***	**0,000***	0,587	0,162

*: significant difference

Notes : PF : physical functions; EF : emotional function; SF : social function; PR : physical role; ER : emotional role; Pn : pain; V : vitality function; GH : general health

Table 4 shows the result of convergent and discriminant validity test. It can be seen that question number 9 does not meet either convergent or discriminant validity. While, questions number 16, 27, and 35 does not meet the discriminant validity. This is probably because question no. 16 and 27 related more to the patient's vitality function. While question no.35 related more to the pain that was felt after patients were diagnosed with RA.

DISCUSSION

The validity of SF-36 Indonesian version in patient with rheumatoid arthritis is the first study that was done in Indonesia. Prior to this study, similar study had been done to patients with cancer and hypertension in Indonesia.[9-11] A greater percentage of female subjects are found in this study. Another study by Afriyanti,[12] had also shown similar result, where among 100 subjects 71 (71%) are female, and 29 (29%) are male. In addition to that, data from American College of Rheumatology,[1] showed that in America among 1,3 million people who suffered from RA, 75% are female. The percentage of patients diagnosed with RA in the age group of 56 and above is 57%. A research by Nainggolan, showed that among the age group of 35-44 years old, 34,5% from

Table 4 Convergent and Discriminant Validity Test of SF-36 Indonesian version in patients with RA

No Item	Physical Function	Emotional Function	Social Function	Physical Role	Emotional Role	Pain	Vitality	General Health
1	**0,74**	-0,07	0,28	0,57	0,40	0,14	0,48	0,41
2	**0,68**	0,10	0,29	0,43	0,60	0,07	0,46	0,37
3	**0,71**	0,15	0,14	0,27	0,14	0,26	0,27	0,43
4	**0,48**	0,43	0,01	0,15	0,23	0,21	0,36	0,28
5	**0,45**	-0,02	0,07	0,24	-0,79	0,07	0,30	0,44
6	**0,82**	0,11	0,30	0,47	0,48	-0,04	0,30	0,47
7	**0,78**	0,10	0,25	0,59	0,53	0,04	0,43	0,49
8	**0,80**	0,06	0,31	0,63	0,60	0,06	0,45	0,51
9	**0,29***	0,35	0,41	0,06	0,20	0,28	**0,62**	0,22
17	**0,65**	-0,27	0,32	0,41	0,38	0,40	0,31	0,28
10	0,12	**0,98**	-0,23	-0,13	0,12	0,28	0,44	0,29
11	-0.13	**0,89**	-0,39	-.27	0,00	0,11	0,13	0,13
12	0,84	**0,99**	-0,20	-0,18	0,84	0,21	0,35	0,29
13	0,10	**0,99**	-0,23	-0,17	0,08	0,21	0,36	0,31
27	0,47	**0,40****	0,42	0,11	0,22	0,21	**0,76**	0,43
14	0,32	-0,44	**0,89**	0,09	0,26	0,14	0,27	0,04
32	0,31	-0,27	**0,94**	-0,31	0,37	-0,06	0,35	0,12
18	0,57	-0,10	0,14	**0,88**	0,63	0,17	0,23	0,15
19	0,55	-0,18	0,22	**0,94**	0,62	0,06	0,24	0,12
20	0,52	-0,23	0.37	**0,92**	0,64	0,13	0,36	0,02
21	0,52	-0,05	0,08	**0,76**	0,51	0,06	0,32	0,18
22	0,47	0,22	0,38	0,55	**0,87**	0,22	0,49	0,16
23	0,48	-0,04	0,37	0,69	**0,92**	0,19	0,40	0,11
24	0,43	0,08	0,14	0,52	**0,78**	0,13	0,64	0,35
25	0,13	0,10	0,17	0,15	0,24	**0,96**	0,39	0,06
33	0,28	0,36	-0,15	0,07	0,15	**0,94**	0,45	0,39
26	0,58	0,3	0,36	0,52	0,23	0,24	**0,63**	0,48
28	0,45	0,39	0,32	0,05	0,19	0,13	**0,76**	0,46
31	0,26	0,22	0,20	0,34	0,68	0,34	**0,74**	0,23
35	0,45	0,31	0,02	0,12	0,21	**0,59**	**0,55****	0,57
15	0,42	0,37	0.04	-0,02	0,17	-0,09	0,42	**0,61**
16	0,52	0,46	0.41	0,17	0,22	0,30	**0,61**	**0,45****
29	0,46	0,47	0,20	0,08	0,18	0,36	0,38	**0,85**
30	0,48	0,36	-0,05	0,15	0,22	0,11	0,37	**0,81**
34	0,44	-0,22	0,22	0,38	0,46	-0,03	0,43	**0,51**
36	0,31	-0,15	0,12	0,01	-0,06	0,28	0,31	**0,65**

* : the question is not valid, either in convergent or discriminant

** : the question is valid in convergent, but not in dicriminant

217.393 people were diagnosed with RA. While among the age group of 55-64 years old, 56,7% were diagnosed with RA. And at the age group of 65 years old and above, 63,1% were diagnosed with RA. Nainggolan,[14] stated that the prevalence of RA would increase as a person grow older. This is different from the result of this research, probably because the number of subjects in this research is less.

This research has similar result with a research by Pradana,[15] where the precentage of RA patients who graduated senior highschool is 50%. In this case, it is assumed that educational status will not predisposed RA. People with higher educational status does not necessarilly has higher health conscience.

Based on their occupation, 37,5% of subjects are housewives. This result is different with similar research by Putri16 which showed that occupations with more long term hand-involved activities, would more likely caused symptoms similar to RA, such as myalgia and athralgia.

The result of reliability analysis shows that, in general, the questions in SF-36 are reliable enough to be used in RA patients, except for the questions in vitality domain. This result is in line with a research by Perwitasari,[10] which showed low reliability in vitality domain (0,60).

The result of known-group validity shows that SF-36 questionnaire can be used in RA patients with different gender in a population. However, the usage of this questionnaire in patients within the age of 55 years old and senior highschool graduates should be mmonitored, especially in general health domain, role limitation due to emotional condition, and pain. This result is likely, because general health, emotional function, and pain might be subjective, depending on one's age and educational status.

The result of construct validity shows that question no.9 does not meet either convergent or discriminant validity. While, questions number 16, 27, and 35 does not meet the discriminant validity. This is probably due to the selection of terminology during translation process that can be interpreted differently by subjects and researcher. As stated by Perwitasari,[11] in her research about developing the Indonesian version of SF-36 questionnaire in cancer patients. Her research was done in Sardjito General Hospital Yogyakarta in patients diagnosed with cancer at Oncology departement who was treated with cisplatin ≥50mg/m^2 in dosage, either as monotherapy or combination therapy. The validation process in this research included known-group validity, convergent validity, discriminant validity, and factor analysis. The result of this research showed that, within 203 subjects, there were no statistically significant difference in the Indonesian version of SF-36 questionnaire which were applied to different kind of diagnosis. All questions met the convergent validity, except for questions no. 26, 28, 30, and 32. While, questions no. 2 and 28 did not meet the discriminant validity criterias. It was also stated that many questions from SF-36 questionnaire need to be reconstructed, because the result from factor analysis showed a lot of questions has significancy with other domain. Based on these result, further research with newer construction of questions is needed. [11]

The limited number of subjects in this research might affect the validity and reliability analysis. In addition to that, the clinical condition of subjects were not able to be substracted from the medical record, hence known-group validity analysis based on patients clinical condition was not able to be done. Further research with greater number of subjects is expected to be done.

CONCLUSION

Generally, the Indonesian version of SF-36 can be used for measuring rheumatoid arthritis patients' quality of life. Another research is needed to modify the questions and with a greater number of subjects.

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