RESEARCH ARTICLE

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Validity Test of the Indonesia Version of Revised American Pain Society Outcome Questionnaire (APS-POQ-R) to Evaluate Postoperative Management Quality

Aida Rosita Tantri*, Darto Satoto, Rahendra, Besthadi Sukmono, and Ratna Widiyanti Kusumaningati

Department of Anesthesiology and Intensive Care, Faculty of Medicine, Cipto Mangunkusumo Hospital, Universitas Indonesia, Jakarta, Indonesia

Introduction: The Revised American Pain Society Patient Outcome Questionnaire (APS-POQ-R) is the most commonly used instrument to assess the quality of pain management in many countries but the validity and reliability of this instrument has not been verified in Indonesia. *Methods*: This is a descriptive, cross-sectional psychometric study to test the validity and reliability of Indonesia version of APS-POQ-R instrument to evaluate postoperative pain management quality. The APS-POQ-R was translated into Bahasa Indonesia according to international guidelines. The translation result was tested in 102 patients who underwent elective surgery at Cipto Mangunkusumo Hospital from March to April 2017. Coefficient Aiken V formula was used for content validity test while factor analysis and corrected item total correlation were used for construction validity test. Reliability was tested using internal consistency (Chronbach α). *Results*: Aiken V formula showed the Indonesian version of APS-POQ-R was valid with score of 0.8–1 (scale V was $\geq$0.5). Factor analysis generated five main factors out of 18 instrument questions: activity and sleep disturbances, impact of pain to emotion, side effects, pain management perception, and pain scale. Construction validity test with corrected item total correlation showed all questions has good correlation, which ranged between 0.244–0.799 (correlation $\geq$0.3). Correlation between each factors of the Indonesian version of APS-POQ-R ranged 0.319–0.407. Internal consistency test showed the Indonesian version of APS-POQ-R was reliable with score of 0.663 ($\alpha > 0.5$). *Conclusion*: The Indonesian version of APS-POQ-R is valid and reliable to measure postoperative pain management quality.

Keywords: Pain Management Quality, Postoperative, APS-POQ-R Indonesian Version, Validity, Reliability.

1. INTRODUCTION

Adequate postoperative pain management is necessary because it can reduce the risk of morbidity and mortality. Monitoring the quality of postoperative pain management while simultaneously improving performance is a basic requirement of standardized health care.[1–3] Although postoperative pain management continues to grow, poor postoperative pain management is still common nowdays. This is due to the obstacle in conducting a comprehensive postoperative pain management. The Agency for Healthcare Research and Quality (AHRQ) divides these barriers into three, namely the barriers derived from the healthcare system, practitioner, and patient.[4,5]

The American Pain Society Patient Outcome Questionnaire Revised (APS-POQ-R) is the most commonly used instrument for assessing the quality of postoperative pain management in different countries. The American Pain Society (APS) developed this questionnaire since 1991.[3] In many countries APS-POQ-R has been validated to have good psychometric characteristics and able to assess the quality of pain services.[6–10] However, the validity and reliability of this questionnaire has not been assess in Indonesia for postoperative patients. Therefore this study aims to assess the validity and reliability of this questionnaire in postoperative patients at Cipto Mangunkusumo Hospital.

2. MATERIALS AND METHODS

2.1. Study Design

This was a cross sectional study design with survey method in patients who had undergone elective surgery in Cipto Mangunkusumo Hospital. Panel discussions were conducted at the

*Author to whom correspondence should be addressed.

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Department of Anesthesiology and Intensive Care of Cipto Mangunkusumo Hospital. The minimum number of samples of this study was 102 subjects which was calculated using sample formula for correlative research with the estimated drop out of 10%. Research sampling was conducted after approval from the Ethics Committee of the Faculty of Medicine, University of Indonesia.

2.2. Inclusion and Exclusion Criteria

Patients scheduled elective surgery in the period March–April 2017 were assessed for inclusion criteria in this study. Inclusion criteria of this study are patients aged 18–65 years, conscious, able to communicate with the Indonesian language, able to hear, read and write and willing to be included in the study. Exclusion criteria for this study were patients with impaired cognitive function, psychiatric disorder or drug dependence who were uncooperative and prevented patients from understanding and/or completing questionnaires.

2.3. Study Protocol

The first phase of the study is to translate and adapt the cross-cultural APS-POQ-R questionnaires from the original language which is in English into Indonesian language after obtaining permission from the original instrument maker. Translation is done by two different certified translators from International Language Institute of Universitas Indonesia. Expert panel from Department Anesthesiology and Pain Therapy discussed two forms of translation and selected the most appropriate one with proper sentence structure and word selection. This process produced the first APS-POQ-R instrument ready for use in the following phase.

Twenty people from the population tested the Indonesian version of APS-POQ-R instrument. Assessment of the Indonesian version of APS-POQ-R instrument aimed to verify whether the forms, statements, and instructions are understandable to target population. The back translation to original language is then compared with original APS-POQ-R instrument version. Assessment of the results of the re-translation was performed with the help of the original instrument maker. The Indonesian version of APS-POQ-R instrument was then used to 102 patients who fulfilled the inclusion and exclusion criteria. The 24-hour postoperative visit was performed in the inpatient wards by the author. Subjects were asked to fill out the questionnaire after the author gave explanations on how to fill it out. Questionnaire was completed by study subjects accompanied by author. Subjects can ask questions to author if there was an unclear question and the researcher will explain without affecting the subject answer.

2.4. Statistical Analysis

Statistical analysis was performed using SPSS version 20. Numerical data presented in the form of mean ± standard deviation when the distribution is normal or in median form (minimum value – maximum value) when the data is not distributed normally. Unpaired t test or Mann-Whitney test is used to compare two numeric variables. The categorical data are presented in n (%) and tested using Chi square test or Fischer test. Test is assumed to be significant if p value <0.05.

3. RESULTS

The translation process of the APS-POQ-R questionnaire from English to Indonesian was conducted under the International Guidelines of Cross-Cultural Adaptation of Measuring Instruments.[11]

3.1. Result of Translation and Cross Cultural Adaptation

Cross-cultural adaptation and translation of the APS-POQ-R instrument was conducted with the help of a translation team from the International Language Institute of Universitas Indonesia and a discussion of experts panel from the Department of Anesthesiology and Intensive Care of Cipto Mangunkusumo Hospital. The pilot test was performed using the translation of APS-POQ-R instrument on 20 respondents that had undergone elective surgery at RSUPN Cipto Mangunkusumo. In general, the patient assessed the form of the instrument to be easily understood and did not require additional explanation on how to fill the instrument. The average time required by the respondent to complete the instrument translation is $\leq$6.9 minutes. Based on the results, the expert panel does not add or reduce the selection of words and sentences in the translation results. The pilot test results are attached to Table I.

After back translation was performed, it was assessed by one of original authors of the APS-POQ-R instrument, Mrs. Debra B. Gordon RN. She found that the results of back translation has no significant difference with the original APS-POQ-R instrument.

3.2. Study Subjects' Characteristics

Demographic characteristics of study subjects taken in this study include age, sex, education, occupation, previous surgery history, and type of surgery. After the statistical test, the characteristics of the research subjects were obtained in Table II.

3.3. Validity Test

The validity of the content is determined by the assessment of 4 pain management experts from the Department of Anesthesiology and Intensive Care of Cipto Mangunkusumo Hospital, which is further included in Aiken's V formula. Validity of the content is considered good if the value of Aiken's V coefficient $\geq$0.5. The mean, range, and coefficient values of Aiken's V based on expert panel can be seen in Table III.

Table I. Assessment on the ease of APS-POQ-R instrument.

Question	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
Questionnaire instruction is clear and easily followed	6 (30%)	14 (70%)	–	–	–
Question is clear and understandable	8 (40%)	12 (60%)	–	–	–
Question is easily answered	6 (30%)	12 (60%)	2 (10%)	–	–
Question answer is bothering/ difficult to be understood	–	–	10 (50%)	10 (50%)	–

Table II. Subjects' characteristics.

Variable	N	Percentage
Age (average ± SD)	41 ± 13.72	
Sex		
Male	47	46%
Female	55	54%
Education level		
Primary	11	11%
Junior secondary	24	24%
Senior secondary	38	37%
Tertiary	29	28%
Occupation		
Civil servant/police	7	7%
Entrepreneur	44	43%
Housewife/Unemployed	51	50%
History of surgery		
Yes	42	41%
No	60	59%
Type of surgery		
Head-neck	41	40%
Abdomen-pelvis	31	30%
Orthopedic	14	14%
Other	16	16%

Note: Value is expressed in average ± SD, N (%).

Based on Table III it was found that the 23 questions of the Indonesian version of APS-POQ-R instrument are valid for use in assessing the quality of postoperative pain management with value of Aiken's V coefficient ≥0.5.

3.4. Construction Validity Test

Construction validity test was conducted on 18 items of APS-POQ-R questions which were assessed using a continuous Numeric Rating Scale (NRS). Five other questions were additional information which descriptive analysis will be performed. The validity test of construction is assesed by Exploratory Factor Analysis (EFA) and corrected item-total correlation test.

Table III. Mean, range and coefficient values of Aiken's V on validity test.

No.	Question item	Average/ Range	Aiken coefficient
1	Least pain	5/5	1
2	Worst pain	5/5	1
3	Percentage of time when patient experience pain	4.75/4–5	0.93
4	Pain interfering activity in bed	5/5	1
5	Pain interfering activity out of bed	4.7/4–5	0.93
6	Pain interfering falling asleep	4.7/4–5	0.93
7	Pain interfering staying asleep	4.5/4–5	0.87
8	Pain causing anxiety	5/5	1
9	Pain causing depression	4.5/4–5	0.87
10	Pain causing fear	5/5	1
11	Pain causing helpless	5/5	1
12	Nausea level	5/5	1
13	Drowsiness level	5/5	1
14	Itch level	5/5	1
15	Dizziness level	5/5	1
16	Pain relief	5/5	1
17	Participation in decision making	4.75/4–5	0.93
18	Satisfaction level	5/5	1
19	Information of pain management	5/5	1
20	Helpfulness of information	5/5	1
21	Usage of non-pharmacological method	4.5/4–5	0.87
22	Type of non-pharmacolgic method	4.5/4–5	0.87
23	Frequency of health practictioner education	5	1

Note: Valid if Aiken coefficient ≥0.5.

Table IV. Rotated component matrix of Indonesian version of APS-POQ-R.

	Component				
Question item	1	2	3	4	5
Variance explained	18.663%	14.329%	13.948%	13.698%	11.220%
Least pain	−0.235	0.191	−0.019	0.1	**0.718**[a]
Worst pain	0.095	0.074	0.03	−0.323	**0.651**[a]
Percentage of time when patient experience pain	0.386	0.046	0.156	−0.476	**0.553**[a]
Pain interfering activity in bed	**0.785**[a]	0.23	0.032	−0.171	0.289
Pain interfering activity out of bed	**0.851**[a]	0.198	−0.027	−0.09	0.1
Pain interfering falling asleep	**0.835**[a]	0.264	0.142	−0.101	−0.151
Pain interfering staying asleep	**0.825**[a]	0.101	0.147	−0.147	−0.267
Pain causing anxiety	0.452	**0.618**[a]	−0.032	−0.107	0.277
Pain causing depression	0.131	**0.839**[a]	−0.182	−0.105	0.054
Pain causing fear	0.27	**0.735**[a]	0.025	−0.038	0.109
Pain causing helpless	0.097	**0.821**[a]	−0.039	−0.057	0.028
Nausea level	−0.002	−0.129	**0.77**[a]	0.004	0.064
Drowsiness level	0.116	−0.012	**0.83**[a]	−0.016	0.052
Itch level	−0.093	−0.023	**0.716**[a]	0.319	−0.07
Dizziness level	0.183	−0.022	**0.75**[a]	−0.14	−0.019
Pain relief	−0.009	−0.205	−0.128	**0.826**[a]	0.109
Participation in decision making	−0.17	−0.053	0.148	**0.782**[a]	−0.113
Satisfaction level	−0.204	0.014	0.098	**0.783**[a]	−0.315

Note: a = Factor loadings: The magnitude of the correlation between the question items on its constituent factors.

3.5. Factor Analysis

Factor analysis was conducted to determine factors that make up Indonesian version of the APS-POQ-R instrument. Factor analysis was done by using Exploratory Factor Analysis (EFA) with varimax rotation technique. The result of factor analysis then form the rotated component matrix shown in Table IV.

From the analysis of 18 continuous variables used to measure postoperative pain management, it can be grouped into 5 factors, namely "influence of pain on activity," "influence of pain on emotion," "side effect," "pain management perception" and "severity of pain." Thus it is clear that the construction of postoperative pain management is a multidimensional construction consisting of five factors.

3.6. Inter-Variable Correlation with Total Score

The validity of the construction of each variable can be done by finding the correlation between the score of each item of question with the total score of the questionnaire using corrected item-total correlation technique. The minimum correlation value considered valid is 0.3. The value of the validity coefficient can be seen in Table V.

Table V. Coefficient value corrected item-total correlation Indonesia version of APS-POQ-R.

Question item	Total score	Severity of pain	Influence of pain on activity	Influence of pain on emotion	Side effect	Pain management perception
		0.321	0.407	0.319	0.324	0.398
Least pain	0.307	0.331				
Worst pain	0.450	0.455				
Percentage of time when patient experience pain	0.330	0.464				
Pain interfering activity in bed	0.606		0.700			
Pain interfering activity out of bed	0.552		0.769			
Pain interfering falling asleep	0.615		0.811			
Pain interfering staying asleep	0.476		0.754			
Pain causing anxiety	0.535			0.627		
Pain causing depression	0.319			0.715		
Pain causing fear	0.459			0.635		
Pain causing helpless	0.339			0.616		
Nausea level	0.485				0.589	
Drowsiness level	0.340				0.662	
Itch level	0.244				0.523	
Dizziness level	0.314				0.560	
Pain relief	0.565					0.774
Participation in decision making	0.321					0.650
Satisfaction level	0.427					0.636

Note: Corrected item-total correlation test.

Most of the factors and variables have a good correlation with the total score except the variable "severity of itch" with a correlation coefficient of 0.244. However, the variable "severity of itch" still has a good correlation coefficient of with side effect factor which is 0.523, thus this variable is still acceptable as valid.

3.7. Reliability Test

From the analysis, value of Cronbach's α for APS-POQ-R instrument is 0.663. All factors and instrument variables APS-POQ-R has a fairly good internal consistency with Cronbach coefficient value $\alpha > 0.5$. This is shown in Table VI.

Value of Cronbach coefficient α for each factor vary from 0.561 to 0.825. The factors of influence of pain on activity and emotion showed the highest Cronbach's α coefficient (0.891 and 0.825), followed by side effect (0.778) and pain management perception (0.773). The lowest reliability value is in the severity of pain factor (0.561).

Table VI. Internal consistency of Indonesia version of APS-POQ-R instruments.

Question item	Cronbach alpha subscale	Cronbach alpha if item deleted
Severity of pain	0.561	
Least pain		0.636
Worst pain		0.513
Percentage of pain		0.597
Influence of pain on activity	0.891	
Activity in bed		0.880
Activity out of bed		0.851
Falling asleep		0.838
Staying asleep		0.858
Influence of pain on emotion	0.825	
Anxious		0.784
Depression		0.746
Fear		0.781
Helpless		0.793
Side effect	0.778	
Nausea		0.722
Drowsiness		0.684
Itching		0.754
Dizziness		0.736
Pain management perception	0.773	
Pain relief		0.774
Participation level		0.650
Satisfaction level		0.636

Note: Cronbach alpha test.

3.8. Analysis of Service Information on Postoperative Pain Management

The APS-POQ-R instrument designed 23 questions in which 5 questions were information about how much interaction between healthcare practitioners and patients in health services. These five questions are were assessed by descriptive analysis which can be seen in Table VII.

Table VII. Analysis of service information on postoperative pain management.

Question item	Yes	No		
Did you receive any information about your pain treatment options?	(69) 67%	(33) 34%		
Did you use any non-medicine methods to relieve your pain?	(58) 56%	44 (43%)		
	Min	Max	Mean	SD
How helpful is information on your pain treatment?	0	10	7,47	1,12
How often did a nurse or doctor encourage you to use non-medicine methods?	1	3	1,52	0.77
	Percentage			
Type of non-pharmacological method used				
• Deep breathing technique	63,1%			
• Relaxation	39,4%			
• Message	36,2%			
• Cold compression, listening to music, worship	7,2%			

Note: Value is expressed by N (%), and mean ± SD (minimum–maximum).

Approximately 69 patients (67%) stated that they received information about the pain treatment given. The mean score of whether the information helped the patient was 7.47 ± 1.12 (with a range of values 0 = not at all helpful, up to 10 = very helpful). This demonstrates the importance of educational adequacy and information about pain management as an important aspect of postoperative pain management.

In this study, 58 patients (56%) used nonpharmacological methods. The most widely used nonpharmacology methods are deep breathing technique (63,1%), relaxation (39,4%), and massage technique (36,2%). It showed that the use of nonpharmacology methods is quite important in the management of postoperative pain.

4. DISCUSSION

4.1. Cross Cultural Adaptation of Indonesia Version of APS-POQ-R

The process of cross-cultural adaptation of psychological instrument from abroad is a very complex work. Adaptation is linked to the need to translate the questionnaire into a new language so that it can be used to study populations with different cultural backgrounds. In addition to being evaluated by the original instrument maker, the process of adaptation is done by translating back and forth. This is done to avoid any errors in the meaning of the language or meaning of the statement in the instrument and to assess validity of the content by expert panel.

In the process of formulating the translations of the APS-POQ-R instrument, the expert panel make language adjustments taking into account several factors such as semantic, idiomatic, conceptual, and contextual factors. This adjustment aimed to ease of understanding by Indonesian people. The results of translation were first administered to 20 subjects to ensure that the instrument is easily understood. Comments and suggestions from 20 subjects were made as reference in the preparation of the Indonesian version of the APS-POQ-R instrument. The most frequent comments is on the question of the percentage of worst pain in the last 24 hours. Some patients claimed that they felt a little confused to answer the question. They argued that it is easier to answer in hours or times than in percentages. Improvement in instrument appearance and additional explanation of instruction filling were made by author for Indonesia version of APS-POQ-R instrument by taking into account suggestions made by 20 subjects.

4.2. Study Subjects' Characteristics

The number of subjects obtained in this study were 102 patients with the range of age from 18 years to 65 years with an average age of 41 years (Table II). The proportion of research subjects at each level of education were almost the same, which are primary 11%, junior secondary 24%, senior secondary 37%, and tertiary 28%. During the filling of questionnaire, study subject is given the opportunity to ask if there are any contents of the questionnaire that is not understood. Most subjects did not experience any significant obstacles in filling in the questionnaire. It can be concluded that the Indonesian version of APS-POQ-R questionnaire can be used for research subjects with different educational backgrounds.

4.3. Content Validity Test

In this research, the value of content validity is good with all question items show the Aiken coefficient ranges from 0.8 to 1 (Table III). The same is also evident from the validity test results of APS-POQ-R questionnaire in other countries such as America, China, Iceland and Denmark.[3, 7–10] The quality of pain management includes several main aspects namely, (1) Assessment of pain degree, (2) Treatment of pain with multimodal analgesia approach, (3) Prevention and control of severity of pain until the patient can perform functional activity, (4) Prevention of the occurrence of side effects, and (5) Sufficient education and information on patient pain management.[12–14]

4.4. Factor Analysis

From the factor analysis, there are 5 main factors underlying the construction of 18 questions in the Indonesian version of APS-POQ-R instrument (Table IV). All questions have good correlation value with its constituent factor with factor loading value >0.55. Of the five factors obtained from the analysis, it also has a good value of data coverage with total variance explained value of 71.85%. This value is better than the American version of APS-POQ-R instrument which only able to reveal the construction of 64.05%.[3] This result is also better than other APS-POQ-R language questionnaire such as Chinese (62.88%), Iceland (62.6%), Denmark (58.1%) and Australia (52.9%).[7–10]

The compilation of the APS-POQ-R factor of the Indonesian version is almost similar to factors that make up the original or American version of APS-POQ-R questionnaire. The five main factors of the APS-POQ-R instrument are the influence of pain on activity, the influence of pain on emotion, side effects, pain management perception, and severity of pain. The difference from the result of factor analysis found is the incorporation of "sleep disturbance" variable on different factors. The "sleep disturbance" variable is incoporated in the same factor as "severity of pain" in the American version of the APS-POQ-R instrument. Gordon explained that the incorporation of sleep disturbance variables along with the severity of pain as one factor in the American version of APS-POQ-R instrumens is due to the possible correlation between the two.[3] However, "sleep disturbance" variable may also be associated with activity variable considering that these two variables are both adapted from the Brief Pain Inventory assessment.[15]

4.5. Construction Validity Test

Overall the value of the validity coefficient of each factor is good (>0.3) (Table V), the influence of pain on activity has the highest correlation coefficient value (0.407). Psychometric analysis is not a static value. Changes in the value can be caused by differences in characteristics such as socio-cultural, experience, and environment of the subjects.[16] From research conducted by Wartonah it is known that most people of Indonesia assess the level of health based on their ability to perform daily activities.[17] This might explain why "the influence of pain on activity" factor has the greatest correlation value in the analysis results of APS-POQ-R instrument of Indonesia version.

There is one question with a low correlation value which is "severity of itching." This question is included in "side effect" factor that has a correlation coefficient of 0.244. This variable still has a good enough correlation coefficient to the supporting

factor which is equal to 0.523, so this variable is still acceptable as valid. Gordon et al. conducted a validity study of the original American questionnaire also showed a low correlation coefficient of "severity of itching" which is 0.282.[3] This also occurred in validity studies in several countries, which are the Chinese (0.145), Denmark (0.160) and Iceland (0.200).[7–10]

The low correlation coefficient can be caused by low number of respondents who reported side effect of itching as only 17 respondents reported it. The same is true in other studies including the American version in which out of 286 respondents only 39 people reported itching.[3] In some studies it was also found that although the correlation coefficient value for the total score was low, the correlation coefficient of the constituent factor is still good (>0.3). Thus this variable is still considered has significant clinical significance and can be accepted as valid.[7–10]

4.6. Reliability Test

The reliability of the Indonesian version of APS-POQ-R instrument showed good results with internal consistency test (Cronbach's α) of 0.663 with the value of each factor or variable in the instrument >0.5 (Table VI). The value of Cronbach's α Indonesian version of APS-POQ-R instrument is lower than the reliability value of American APS-POQ-R instrument which is 0.86. However, this result is equivalent to the reliability value of other countries APS-POQ-R questionnaire such as China (0.770), Iceland (0.42), Denmark (0.65) and Australia (0.67).[7–10]

If an instrument has a low value of Cronbach's α then the relation between the statements in the instrument is so low that it unable to construct an instrument homogeneity. Field AP in his book explains there are several factors that affect the reliability of an instrument. These factors include:[11, 18, 19]

1. Question items. The greater the number of question items the higher the reliability. This happens because the longer the test (the more question items) the more precise is the behavior that are being measured.
2. Range of scores. The reliability coefficients are directly influenced by the range of scores in the measured group. So the greater the range of the score thus the better the reliability index obtained.
3. Objectivity. When the assessment of an instrument is done objectively, the higher the probability of obtaining the same result.

4.7. Limitations of Study

This study has several limitations. First, sampling is obtained from one hospital thus it is insufficient to represent of the postoperative patient population in Indonesia. In this study the influence of different characteristics of respondents (socioeconomic status, age, ethnic background, education, and various backgrounds of patients at Cipto Mangunkusumo Hospital) to the validity and reliability test result was not analyzed.

5. CONCLUSION

We conclude that this study produced a valid and reliable Indonesian version of APS-POQ-R instrument to assess the quality of postoperative pain management at Cipto Mangunkusumo Hospital. The validity value is good with content validity value of ranges from 0.8–1 and construction validity value of ranges from 0.244–0.799. The reliability value is good with the value of 0.663. The correlation value between each criterion ranged from 0.319 to 0.407.

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