Original Article

Evaluation of the Psychometric Properties of the Malaysian Version of Ottawa Decisional Conflict Scale among Cardiovascular Patients Undergoing Major Surgery

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Abstract

Background: The Ottawa Decisional Conflict Scale (ODCS) is one of the initiatives developed to determine the information about the patient's decision and the factor that influence the decision made. Therefore, a systematic and structured process of decision-making can express the difficult action to be taken by patients.

Objectives: This study aimed to evaluate the psychometric properties of the Malaysian version of ODCS among cardiovascular patients undergoing major surgery.

Methods: This study used the forward-backward translation method to develop an instrument that enabled Malaysians to know about this variable. Therefore, the researcher decided to make a transcultural adaptation and evaluate the decision-making of the Malaysia version of the ODCS, which seeks information about decision-making and the factors that influence the choices made. This study was conducted from January 2015 to July 2016 through a convincing sampling of 520 cardiovascular patients who need to undergo major surgery with a focus on decision-making regarding the diseases.

Results: The results obtained on the reliability tests showed good internal consistency for all items (Cronbach α=0.914-0.917). From the analysis, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.886, while the significant value of Bartlett's Test of Sphericity was $P<0.001$. Therefore, the analysis concluded that the data were appropriate for principal component analysis.

Conclusion: The psychometric properties of the Malaysian version of the ODCS are considered appropriate to be administered to patients who need to undergo cardiac surgery. Patients' provision of information was able to decrease decisional conflict among them with cardiovascular disease.

Keywords: Cardiovascular patients, Confirmatory factor analysis, Ottawa decisional conflict scale, Patient decision making, Validation study

1. Background

A decision-making process is a mental act that is seen as a skill. Decision-making skills that are required following a problem need to go through steps including recognizing the problem and the current situation, finding different solutions to solve it, evaluating, and ultimately making a choice . Patients' right to make medical decisions is respected in all legal and ethical statements around the world (1). Patient decision-making is important because it is related to treatment, medical tests, and health issues chosen by the patients. Patient participation in decision-making reduces patient fear and depression, improves the quality of life, increases patient satisfaction, reduces overuse of treatment options and various forms of non-standard methods, and contributes to job satisfaction among physicians. (2). The decision from the patient might give a clear advantage or possibility give benefits or trauma that affect the patient differently (3). Furthermore,

decisional conflict is a state of uncertainty about the course of action to take. The main behavioral manifestations of decisional conflict include verbalized uncertainty about choices, verbalization of the undesired consequences of alternatives, vacillation between choices, and delayed decision-making. Minor manifestations include verbalized distress (4) while attempting decision-making, self-focusing, physical signs of distress or tension, and questioning personal values and beliefs while attempting to make a decision (5, 6). Although decisional conflict occurs as a consequence of the difficulty inherent in the type of decision being made, cognitive, affective, and social factors, which are amenable to decision support interventions, can exacerbate the perceived uncertainty (7). Uncertainty is greater when a person feels uninformed about the alternatives, benefits, and risks; is unclear about personal values; experiences unwanted pressure from others; and has skill deficits in making and implementing decisions that may have existed

premorbid or as a consequence of the medical condition and its functional squealed (8, 9).

The healthcare practitioners were always involved in advising the patients who are deciding about their health. For making the decision, the patient should know their diagnosis and treatment plan to make sure they understand well (10, 11). The knowledge of the patient was subjective and cannot be determined by the healthcare practitioners (12). Therefore, the healthcare practitioner should determine the initiative for patient decisions (13, 14). The Ottawa Decisional Conflict Scale (ODCS) was one of the initiatives developed to determine the information about the patient's decision and the factor that influence the decision made. The conceptual framework guiding the scale development was derived from the construct of decision conflict developed by Janis and Mann and refines as diagnosed by the North American Nursing Diagnosis Association (15). The clarifying of the question with an accurate ability with supporting validity that determines the patient decision-making was related to the quality of life for the patient, as well as the cost engagement for the hospital organization (16). This was because a few health care decisions were unclear, clinically preferable, and made based on individual preferences towards individual options (17). The previous study has stated that the ODCS was to help the patient to understand the choices, benefits, and risks of deciding about the treatment and diagnosis (18, 19) Moreover, the ODCS was a systematic and structured process of decision making that can express the difficult action to take by patients (20). However, there are difficulties with the language for the ODCS which was not suitable in Malaysia, as well as Indonesia, in which the Malay language is used for answering the question. Patients became more involved in decisions affecting their health, especially cardiovascular patients who need to undergo major surgery, such as cardiothoracic surgery. Accordingly, it was important to monitor and improve their decision-making (21). Therefore, the evaluation of the psychometric properties of the Malaysian version of ODCS among cardiovascular patients undergoing major surgery was determined in this study.

2. Objectives

This study aimed to evaluate the psychometric properties of the Malaysian version of ODCS among cardiovascular patients undergoing major surgery.

3. Methods

2.1. Study Design

This quantitative study was conducted at Cardiothoracic Clinic, University Malaya Medical Centre (UMMC). The study sample was determined

using the test-retest survey research through the questionnaire from 520 samples of respondents taken in this study. This study includes psychometric data on the reliability and validity of the sample.

2.2. Setting and Sample

This study was conducted at the Cardiothoracic Clinic, UMMC. The National Heart Institute states a 5.5% patient growth from 2002 to 2006. Surgery plays an important role in the UMMC, especially for cardiovascular patients. The cardiothoracic clinic in the UMMC was used to assess, manage, and teach the patient about cardiovascular disease.

2.3. Participants

In this study, a convenience sampling technique was used in the recruitment of respondents who were cardiovascular patients requiring to undergo major surgery. The inclusion criteria were patients within the age range of 20-70 years, those who understand Malay and English, and cases who were candidates for major surgery on the day of enrollment.

The researcher has decided to select a population of approximately about 520 samples. The total number of the sample was determined after conducting the pilot study (November 2014- December 2015). The pilot study result gave the mean and standard deviation from pre and post-test which were used to divide with effect size and gave the sample size needed.

2.4. Instrument

The data were collected using a well-established questionnaire which was the ODCS to determine the factor that influences the perception or decisions of the patient choose. This questionnaire consists of two sections, namely A and B. Section A consists of five social demographic questions and three multiple-choice questions (22).

Section B includes ODCS divided into five subscales of uncertainty, informed, values clarity, support, and effective decision making. This section is also composed of 16 items measuring personal uncertainty about the decision and the factors contributing to uncertainty. It is rated on a 5-point Likert-type response (i.e., strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree).

2.5. Pilot study

A pilot study was carried out among 40 respondents. Those involved in this pilot study were excluded from the actual study. The ward manager was informed of this earlier pilot study, and the purpose was to get help and cooperation from the respondents. Each respondent was given the form of questionnaires, and the researcher gave a brief and clear explanation of the purpose and importance of the study.

2.6. Declaration of potential consent

All the participants of this study were given a letter explaining the purpose of the study, as well as the way their anonymity was assured and their confidentiality was protected. The respondents were coded with numbers to maintain their anonymity. The researcher handled the answered questionnaires carefully.

2.7. Data Collection

The data were collected by a cross-sectional survey from January 2015 to July 2016. Data collection began with respondent selection based on the inclusion criteria. The patients that meet the requirement have explained the research study and asked for permission by the letter of consent. Next, the patient was given 20 to 30 minutes to complete the questionnaire. Following that, at least one week later, the same respondents who came for treatment were asked again to complete the questionnaire for the second time. Eventually, the result of the question was analyzed.

2.8. Data Analysis

Data were analyzed using Statistical Package or Social Science (SPSS) software (version 20) to examine internal reliability, concurrent validity, content validity, construct validity, and test-retest reliability. Descriptive statistical methods were used for demographic data by using the frequency and percentage. The researcher also conducted Intraclass Correlation Coefficient (ICC) and Cronbach's alpha through SPSS. ICC was used to measure inter-rater reliability for two or more raters. It may also be used to assess test-retest reliability. Moreover, it is conceptualized as the ratio of between-groups variance to the total variance, while Cronbach's alpha is a coefficient (a number between 0 and 1) that is used to rate the internal consistency (homogeneity) or the correlation of the items in a test.

2.8.1. Content Validity

The content validity of the ODCS was tested using the content validity index (CVI). Eight clinical experts in nursing and medicine used CVI to evaluate each item. Furthermore, the experts evaluated the items in terms of word choice, length, and scoring, which was a widely used method of measuring content validity that was developed by Lawshe. It has been reported in the literature that a mean CVI score of .80 or more is acceptable in terms of validity (23).

2.8.2. Construct Validity

The Kaiser-Meyer-Olkin (KMO) test was used to determine the sufficiency of the sample size, and Bartlett's test was utilized to determine the appropriateness of the correlation matrix for factor analysis. KMO values greater than 0.50 indicate a sample size that is sufficient for factor analysis. The construct validity of the scale was tested using

confirmatory factor analysis (CFA) and exploratory factor analysis (EFA). First, in CFA, the goodness-of-fit index was used to determine whether the obtained data fit the scale well. To this aim, the comparative fit index was calculated. For EFA, principal component analysis (PCA) and varimax were employed.

4. Results

Table 1 represents the demographic characteristics of the respondents. The study's population was made up of 520 respondents. The majority of the participants were male (83.8%), and the mean age range was between 41 and 50 (58.7%) years. Furthermore, most of them have a secondary level of education (60.2%) and are employed (66.2%). In terms of race, the majority of them were Malay (52.3%).

PCA was carried out to determine the construct validity of the Malaysian version of the ODCS. There are three important steps in PCA which are verifying data suitability for PCA, the number of the component to be extracted, and factor rotation to determine which items in the ODCS Malaysian version clump with one another.

In the first step, the data were considered to be suitable for PCA if the KMO measure of sampling adequacy was >0.5, and Bartlett's test of sphericity significance was ≤0.05. From the analysis, as shown in Table 2, the KOM measure of sampling adequacy is 0.886 while Bartlett's test of sphericity significant value is 0.000. Therefore, the analysis is concluding that the data are suitable for PCA analysis.

The second step as shown in Table 3 was to determine the number of components to extract. The number of the component to be extracted can be determined by using the eigenvalue. According to the Kaiser criterion, a component that has an eigenvalue greater than 1 was considered a component that can

Table 1. Distribution of demographic characteristics of the respondents in percentage. (n=520)

Variables	Frequency (f)	Percentage (%)
Gender		
Male	42.5	82.7
Female	84	16.0
Age Group		
<40	6	1.1
41-50	38	7.2
51-60	305	58.0
61-70	171	32.5
Ethnicity		
Malay	272	51.7
Chinese	223	42.4
Indian	25	4.8
Educational Level		
Primary	29	5.5
Secondary	313	59.5
Tertiary	178	33.8
Employment Status		
Employed	344	65.4
Unemployed	176	33.5

Table 2. Verification of Data Suitability for Principal Component Analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.886
Bartlett's Test of Sphericity	Approx. Chi-Square	6160.849
	df	120
	Sig.	0.000

be extracted. From this table, there were 3 components with an eigenvalue greater than 1. Therefore, the number of components that can be extracted was 3. These 3 components contain 68.745% variation of the 16 original variables.

The number of the component to be extracted can also be determined through a screen plot as shown in Figure 1. Based on the screen plot above, 2 plots have an eigenvalue greater than 1. This screen plot again proves that 3 components can be extracted.

The third step is to determine which items of the questionnaire are grouped. Table 4 tabulates a component matrix that has not undergone factor rotation. The 3 components in the table are the components that the analysis obtains at the second

step of PCA. Table 5 summarizes the component matrix that has been rotated through orthogonal rotation by the varimax method.

Table 6 shows the rotated data of the component matrix. As explained above, ODCS has five domains, and the bold numbers have the highest correlation. The analysis also shows that all of the items in the subdomain support and effective decision domain were in Component 1. Component 2 comprises items 1 and 2 from the uncertainty domain, as well as items 5 and 6 from the informed subdomain. Item 4 from subdomain informed, and items 7, 8, and 9 from subdomain values clarity were grouped in Component 3.

The Cronbach's alpha analysis of reliability test was to determine the internal consistency of the Malaysian version of ODCS. The table shows the Cronbach's alpha for every domain. Cronbach's alpha that was greater than 0.7 was considered good. From Table 7, the Cronbach's alpha for five domains ranges between 0.710 and 0.904 with the informed domain having the lowest Cronbach's alpha and the support

Table 3. Extraction number of component

Total Variance Explained									
Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	7.301	45.630	45.630	7.301	45.630	45.630	4.702	29.387	29.387
2	2.564	16.026	61.656	2.564	16.026	61.656	3.395	21.221	50.608
3	1.134	7.090	68.745	1.134	7.090	68.745	2.902	18.137	68.745
4	0.913	5.703	74.448						
5	0.741	4.634	79.082						
6	0.632	3.951	83.033						
7	0.528	3.298	86.331						
8	0.437	2.728	89.059						
9	0.364	2.275	91.334						
10	0.318	1.989	93.323						
11	0.281	1.755	95.078						
12	0.197	1.233	96.311						
13	0.173	1.080	97.391						
14	0.165	1.031	98.422						
15	0.136	0.850	99.272						
16	0.117	0.728	100.000						

Extraction Method: Principal Component Analysis

Figure 1. Extraction number of component

Table 4. Component matrix does not undergo factor rotation

Component Matrix[a]

	Component		
	1	**2**	**3**
Easy	.598	.537	.345
Sure	.597	.521	.298
Clear	.600	.302	-.005
Aware	.333	.239	-.247
Benefits	.602	.526	.145
Risks	.620	.581	.267
Important 1	.773	.263	-.333
Important 2	.771	.214	-.416
More important	.656	.087	-.493
Choice	.768	-.255	-.210
Support	.790	-.348	-.119
Enough advice	.784	-.405	.079
Informed choice	.791	-.414	.113
Shows important	.622	-.427	.292
Expect stick	.685	-.459	
Satisfied	.661	-.453	.162

Extraction Method: Principal Component Analysis.
a. 3 components extracted.

domain having the highest Cronbach's alpha. The bottom part of the table shows that the overall Cronbach's alpha for ODCS Malaysian version is

0.914. From this analysis, the Malaysian version of ODCS was reliable as the Cronbach value was 0.914.

Table 5. Component matrix undergoes factor rotation

Rotated Component Matrix[a]

	Component		
	1	**2**	**3**
Easy	.143	.851	.140
Sure	.140	.816	.176
Clear	.208	.512	.382
Aware	.002	.213	.428
Benefits	.099	.746	.306
Risks	.107	.855	.226
Important 1	.265	.407	.736
Important 2	.274	.331	.793
More important	.260	.145	.770
Choice	.643	.099	.525
Support	.746	.089	.441
Enough advice	.833	.143	.263
Informed choice	.853	.157	.237
Shows important	.794	.153	-.002
Expect stick	.845	.136	.067
Satisfied	.804	.090	.120

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Table 6. Rotation data of the component matrix

Domain	Item no.	Component		
		1	**2**	**3**
Uncertainty	1	0.143	0.851	0.140
	2	0.140	0.816	0.176
	3	0.208	0.512	0.382
Factors contributing to uncertainty				
Informed	4	0.002	0.213	0.428
	5	0.099	0.746	0.306
	6	0.107	0.855	0.226
Values clarity	7	0.265	0.407	0.736
	8	0.274	0.331	0.793
	9	0.260	0.145	0.770
Support	10	0.643	0.099	0.525
	11	0.746	0.089	0.441
	12	0.833	0.143	0.263
Effective Decision	13	0.853	0.157	0.237
	14	0.794	0.153	-0.002
	15	0.845	0.136	0.067
	16	0.804	0.090	0.120

Table 7. Cronbach's Alpha Analysis

Domain	Item no.	Mean±SD	Cronbach's Alpha
Uncertainty	1	3.81	
	2	4.02	0.805
	3	4.32	
Factors contributing to uncertainty			
Informed	4	4.78	
	5	4.24	0.710
	6	3.93	
Values clarity	7	4.39	
	8	4.30	0.870
	9	4.46	
Support	10	4.30	
	11	4.24	0.904
	12	4.21	
Effective Decision	13	4.17	
	14	4.16	0.882
	15	4.06	
	16	4.04	

Overall Cronbach's Alpha for Malay Version DCS = 0.914

5. Discussion

This study based our work on the Ottawa Decision Support Framework (ODSF). According to ODSF, patients can be guided through multiple phases in making an informed decision regarding their social or health status. During this process, decision-support requirements are identified, designed, and evaluated. The conceptual framework guiding the scale development was derived from the construct of decisional conflict (24). Decisional conflict is a state of uncertainty about the course of action to take. This state is likely when making choices involving risk or uncertainty of outcomes, high stakes in terms of potential gains and losses, the need to make value trade-offs in selecting a course of action, and anticipated regret over the positive aspects of the rejected options (5, 6).

The Malaysian version resulted in three factors, which explained 68.745% of the total variance, indicating that the instrument measured three domains of conflict when a decision in health was made. This conclusion was supported by correlation analysis among the three dimensions, which showed that the correlations among all dimensions and the global scale were stronger than the correlation only among the dimensions. The new administration of the tool to confirm the obtained results is recommended (25). The evaluation of the fidelity of the scale ranged between 0.73 and 0.93 for the three dimensions, verifying a good intercorrelation and homogeneity within the items that composed it. The names adopted for the dimensions in the Malaysian version attempted to meet the original subscales designation.

It was observed that the factorial solutions encountered were the same as the original version (three dimensions); however, some items saturated factors other than the initial, maintaining very good results of internal consistency. The number of participants was considered to be a strong point of this study (n=520) and exceeded the amount recommended in the literature for factor analysis. Concerning the demographic characteristics, as with the reality of a higher predominance of males, compared to females, 436 (83.8%) of the respondents were male while 84 (16.2%) cases were female, which strengthens the possibility of generalizing results (26).

The Cronbach's alpha value obtained was superior to the original scale in English (Cronbach α=0.86) and in Spanish (Cronbach α=0.72). This may happen due to the difference in sample size. This study included 520 respondents; however, in the validation of the ODCS (English version), only 63 respondents showed a small sample size. Validations of the Spanish version use the low literacy level of the ODCS questionnaire while Malaysian versions use the statement type of the ODCS questionnaire. This may

explain the difference in the Cronbach value obtained. In this study, the researcher evaluated the psychometric properties of the Malay version of the DCS on decisional conflict among patients who need to undergo major surgery. The Malaysian version of the ODCS showed high reliability and validity with Cronbach's alpha of 0.914 (27). The study findings showed that the analysis of PCA and the items of the Malaysian version of DCS were not contained in the same component as in the original version of DCS. Items of support and effective decision are in the same component. The Cronbach's alpha also shows that the Malaysian version of the DCS has a good internal consistency. Hence, the psychometric properties of the scale are acceptable; moreover, it is feasible and easy to administer. Evaluations of responsiveness to change and validation with more difficult decisions are warranted (28).

Given the need to weigh benefits, harms, and inconveniences across options, patients are likely to experience personal uncertainty about the best option and require support to participate in decision-making. Personal uncertainty, also called "decisional conflict", is more prevalent when patients are uninformed, have unclear values, and do not feel adequately supported. The extent to which patients are involved in decision-making in ways they prefer and how they resolve their uncertainty is unclear. The validation of the Malaysian version was related to the patient satisfaction with the service provided by health care organizations which gives a clear understanding of decision making. The patient was a consumer of the healthcare organization. The good satisfaction from the patient with the healthcare services was important, the benefits for the healthcare organization will be gained, and the cost obtained from the patient is increasing because the amount of patients is rising. The patient dissatisfaction with the service provided will give a poor outcome and induce the loss of investment because of the loss of a patient (29). Patients offered choices are more likely to take an active role in decision-making, be more satisfied, and prefer to be involved in subsequent health-related decisions. When preferred and perceived roles are mismatched, patients prefer more involvement in decision-making. To support patients to be more involved in making decisions about their illness, providers need to give (30) those patients treatment options and more information on the benefits and risks of those options, provide them with more time for discussion with the health care team, and have the health care team better listen to their needs (31).

This study had its implications for the validation of the Malaysian version of the ODCS. It was another alternative that was suitable for the patient. This was very important because not all patients were able to understand the English language. Otherwise, the patient had to learn English or make other people

explain the questions. This alternative is not only for the Malaysian patient to understand the question provided but also for Indonesians to be able to well understand the Malay language. Moreover, the patients may understand the question by themselves although another person can explain it (32). This was because the patient's perception and others' perception can be different. It can be more complicated to make the patient understand and make a decision. Therefore, the validation of the Malay version makes the patient easy and satisfied with the nursing care provided and makes the nurse's responsibility easier (33).

The validation of the Malaysian version will also improve the nurses' perception and understanding. Regarding nursing care, this study gives the hints required by nurses to have strong support on information related to patient decision-making that is related to the quality of nursing care (8). In clinical practice, health care professionals, such as nurses, should be able to determine the factors influencing the patient in deciding for the patient and ensure patient satisfaction with the service that is provided to them (34). The perception of this study improved the quality of nursing care and the rate of health care services that determine satisfaction. Moreover, it may help the healthcare provider or researcher to identify the decisional conflict level among the patients during the decision-making process for their treatment.

Regarding the limitation of this study, the researcher was unable to examine criterion-related validity since there was no alternative scale to measure decisional conflict in Malaysia. Moreover, this study included patients with cardiovascular disease and other medical illnesses, such as hypertension, hypercholesterolemia, diabetes mellitus, and chronic kidney disease, were not investigated. Different treatment regimens may influence the extent of the change of decisional conflict. Patient understanding was one of the implications of this study. This was very important because not all patients were able to understand the English language. Otherwise, the patient had to learn English or make other people explain the question. For this alternative, not only the Malaysian patient understands the question provided but also Indonesians are able to well understand the Malaysian language. This study also gives an impact on the nurses' perception. It may help the healthcare provider/researcher to identify the decisional conflict level among the patients during deciding on their treatment and make the healthcare professional take part in the decision-making process among patients. It is recommended that this study be conducted in many settings. Different places have a different understanding of the Malaysian version of the DCS. By researching many places, it will be able to determine many perceptions of the Malaysian version

of the ODCS. Moreover, future research should b focused on the decisional conflict with several types of patients. This is important because different diseases faced by the patient may influence more understanding of the question provided.

6. Conclusion

The research findings indicate that the items of the Malaysian version of ODCS were not contained in the same component as in the original version of ODCS. Items of support and effective decision were in the same component. The Malaysian version of ODCS had also a good internal consistency. These results suggested that in the area of health, when the options of choice in this matter arise from a personal perspective, the level of uncertainty emerges, making it urgent to have more information about the available options. Therefore, strategies for decision support in health can be developed in patients, making the process of decision-making more clear, informed, consistent with personal principles, and consequently, more satisfactory.

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Footnotes

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