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Adaptation and validation of the Beliefs about Medicines Questionnaire (BMQ) in HIV out-patients in Indonesia

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ABSTRACT

This study aimed to translate and cross-cultural adapt the version of the Beliefs about Medicines Questionnaire (BMQ) into Indonesia language, and explored its psychometric properties, and establish preliminary norms. We followed the guideline for forward-backward translation and 201 HIV out-patients were recruited. They all completed BMQ-general and BMQ-specific scales that were previously culturally adapted and translated into the Indonesian language. All participants were patients visiting a referral hospital in Papua Province, Indonesia. One-third of participants were indigenous Papuans, and the majority were female. The overall Cronbach's alpha of BMQ was acceptable (0.80) however each domain of BMQ was lower than the original study. The Cronbach alpha value for each section of BMQ-Indonesian version was as follows: BMQ Specific-Necessity 0.56; BMQ Specific-Concerns 0.50; BMQ General-Overuse 0.65; and BMQ General-Harm 0.53. The reasons for the distinction between this study to original may be complex and HIV associates with the problem in neurological and cognitive symptoms at a later stage. Since the Cronbach alpha in this study was within the range of the original study the BMQ-Indonesian version is applicable to be used in Indonesia, especially among HIV patients but caution is still needed in this questionnaire.
Keywords: cross-cultural; BMQ; HIV; Indigenous; Indonesia

INTRODUCTION

Indonesia, one of the middle-income countries in Asia, has experienced a fivefold increase in the Human immunodeficiency virus (HIV) death rates [1] and number of HIV patients [2], and in the last 20 years. Even though antiretroviral therapy (ART) has been provided free, so far less than 20% of HIV patients in Indonesia were on ART [3]. The limited range of ART regimens being available [4] and non-adherence [5] and loss to follow-up were remain problems among patients in Indonesia.

The existence of ART has changed HIV from a fatal illness to a manageable disease [6]. Even though ART has reduced mortality and better life expectancies, adherence plays a significant role in achieving good clinical outcomes. Adherence, intentional and unintentional, remains complicated to manage [7] since various determinants of adherence were significantly associated with medication problems [8], [9].

HIV patients would receive long-term therapy which patients may need to take their medication correctly. This process would be difficult to achieve for patients who had a poor belief about their medication. Furthermore, complexity [10] and side effects of ART [11] tend to be significant predictors for non-adherence. Most patients perceived the necessity of the medication about their concerns about potential adverse effects was difficult to be followed. According to some studies, non-adherence is not necessarily related to the type or severity of disease or sociodemographic factors but the causes of their intentions [12]. Patients' preferences, motivations, and beliefs were intentional predictors, and those have created difficulties in making decisions to take ART appropriately. Patients perceived the necessity of lifetime ART about their concerns about potential adverse effects was strongly found.

According to previous studies, the personal need for the treatment (necessity beliefs) and concerns about the potential adverse consequences of taking medication play a significant role [13], and patients who were non-adherence tend to have insufficient concern and necessity. The Belief about Medicines Questionnaire (BMQ) is a method

for assessing cognitive representations of medication and has been developed by Horne [14]. The questionnaire consists of general and specific assessments of belief on medication treatment. This questionnaire has been translated and validated into several languages and illnesses, and the assessment was produced reproducible findings. In addition, it has been shown that BMQ-specific scores represent strong predictors of adherence to the treatment of patients with long-term conditions [13].

This questionnaire consists of two parts: a) the Specific part, which incorporates two subscales, the Specific- Necessity and the Specific-Concern and assesses patients' personal beliefs and concerns regarding their medication and b) the General part, which also incorporates two subscales, the General-Harm and General-Overuse and addresses patients' beliefs and perceptions about medicines in general [15]. According to the developers of this tool, individuals' beliefs abfout the Necessity of medication are positively correlated with adherence, while their Concerns about adverse outcomes from its use are correlated negatively.

Furthermore, personal beliefs about medicines seem to be a stronger predictor of adherence than any other sociodemographic factor. Since the BMQ was written in English, using a psychometric instrument in a different language to that in which it has been originally constructed, it needs to be appropriately translated, considering cross-cultural issues, conceptual equivalence and it needs to possess adequate psychometric properties [16]. To date, there is no version of the BMQ in the Indonesian language and therefore this valuable instrument cannot be used in studies aimed at better understanding Indonesian patients' beliefs about medicines. The translations must be performed so that the original meaning is kept and adapted to the new cultural and linguistic contexts. Cross-cultural content and translation of true meaning from one language to another should be subject to cross-cultural validation [17]. Even though a prior study on BMQ among pregnant women was conducted [18] however validated Indonesian versions of BMQ are unavailable. It may be necessary to have this version in helping to assess the belief in medication of ART among patients and what intervention should be conducted among patients to improve the belief due to adherence. The study aimed to translate the Beliefs about Medicines Questionnaire into the Indonesian language and cross-culturally adapt the version, explore its psychometric properties and establish preliminary norms.

METHODS

Study design and setting

The cross-sectional study was conducted in HIV outpatient clinics of a referral hospital in Jayapura, Papua Province. This location of the study was related to the urgency of increasing the number of HIV participants in Papua where the level of adherence was low compared to the rest of the area of Indonesia [19]. The government provides ART free of charge to patients. Participants were included if they were at least 18 years old, on ART for more than six months, able to read by showing their ability to write their name and their age, and signed informed -consent. Participants were recruited and informed about the study while they were collecting their ART in the hospital. The participants signed the informed consent and completed the questionnaires in visiting room of the hospital. Each questionnaire was anonymous, and all participants, after they had been informed of the aims of the study, provided written informed consent. The recruiters were available for questions. Information about the age and types of ART were collected from medical records (Table I). Data were collected between September and November 2016.

The study protocol was approved by the Committee on Ethics Universitas Gadjah Mada, Yogyakarta Indonesia (KE/FK/1108/EC/2016). All study participants gave written informed consent.

Table I. Demographic characteristics of the participants (n=201)

Characteristics	Frequencies (n)	%
Age; (Mean ± SD): 33.30±9.70		
Sex		
Male	82	40%
Female	119	60%
Education level		
6 years	4	3%
9 years	18	9%
12 years	35	17%
Higher	144	71%
Marital status		
Married	129	64%
Single	72	36%
ART		
Single	86	42%
Multi tablet	115	58%
Ethnicity		
Papuan	135	67%
Non-Papuan	66	33%
Status employment		
Unpaid	86	42%
Paid	115	58%

*ART: Antiretroviral Therapy

Instrument

Beliefs about medicines questionnaire (BMQ)

The BMQ assesses patient's about medication use in general and their beliefs about the medication they use. The BMQ-General part of the questionnaire consists of two scales asking about their views on overuse and harm related to medication (four questions each). An example of a statement on overuse is: "doctors use too many medicines". An example of a statement on harm is: "most medicines are addictive."

The BMQ-Specific part consists of two scales about the necessity and concerns of patients regarding their medicine (5 questions each). An example of a statement on necessity is: "my antiretroviral medication protects me from becoming worse". An example of a statement of concern is: "I am sometimes worried about becoming too dependent on antiretroviral medication". All 18 statements were scored on a 5-point Likert scale as 1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, 5 = strongly agree. The total from every scale of the BMQ was calculated. Higher total scores on necessity indicated patients being positive and seeing the advantages of taking their medication. Higher total scores on concern, overuse, and harm indicated concerns about the treatment.

Translation and validated questionnaire

We followed translation guidelines [16], and the process of translation consisted of 2 phases, cultural translation, and validation of the Beliefs about Medicines Questionnaire. In the first phase, we translated the instruments forwards into Bahasa Indonesia and backward into English. Two Indonesian certified translators did the forward translation. DPA assessed both versions as proofreader and reviewer with a lot of experience in translating questionnaires. A final reconciled Bahasa version was agreed on. This version was back-translated by an English native speaker who had no information about the original versions

of the questionnaires. The backward translation was modified several times because the target language does not recognize verb tenses.

In the second phase, the validated questionnaire has been conducted on 201 participants. This process also consists of 2 stages are internal consistency and construct validity. Cronbach's alpha coefficient, alpha, was used to determine the internal consistency of the BMQ, thus defining the degree to which all items in the BMQ sub-scales measure the same construct, also referred to as inter-relatedness of items which ensures reliability. The Cronbach's alpha coefficient (α) was used, and it ranges from 0 (the items are independent) to 1 (the items are perfectly correlated). A generally accepted rule is that (α) of 0.6-0.7 indicates an acceptable level of reliability, and 0.8 or greater is a very good level [20]. Spearman's rho was used to measure the reliability of the items present on each sub-scale, further confirming the Cronbach alpha values obtained. Significance was defined at $p<0.05$.

Construct validity was evaluated the correlation between item-domain and item-other domains. The Kaiser-Melkin-Olkin (KMO) test was performed to show whether the correlation occurred by chance. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity were initially employed to determine the appropriateness of the dataset for factor analysis. High values (>0.5) in KMO indicate that factor analysis is appropriate. Factor analysis using the correlation matrix was conducted to extract underlying subscales. Items with factor-loadings >0.30 were considered important contributors to a factor and played a key role in interpreting and labeling the construct they loaded on. Solutions deriving factors with less than 3 items with loading >0.30 were disregarded. The known-group validity was conducted based on the number of ART, ethnicity, and education level.

Descriptive statistics were used to describe the demographic and disease characteristics of the patients and their questionnaire scores. Percentages and frequencies were used for the categorical variables. Means and standard deviations were calculated for the continuous variables. Statistical analyses were conducted using the statistical computer software SPSS v.18 (SPSS Inc. Chicago, IL, USA).

RESULTS AND DISCUSSION

Demographic Characteristic

This study was a non-probability sampling with 201 participants was recruited to be part of the translation process. This number was fair for validating the questionnaire [21]. The patient's mean ±SD age was 33.30±9.70 years. The majority of participants were female and married. More than half of the participants had higher education and Papuans. The number of unpaid and paid was 42% and 58%, respectively. The majority of participants had a single tablet of ART for their prescriptions (Table I).

Translation and Validation

Table II shows several problems related to translation backward-forward translation. The common problems in translation were the time frame of a tense, polysemous word, syntagmatic, and differentiation. The process of modification has occurred several times and it was shown in the supplement.

Table III shows overall Cronbach's alpha was acceptable (0.80). The Cronbach alpha value for each section of the BMQ-Indonesian version was as follows: BMQ Specific-Necessity (N1–N5) 0.56; BMQ Specific-Concerns (C1–C5) 0.50; BMQ General-Overuse (O1–O4) 0.65; and BMQ General-Harm (H1–H4) 0.53.

In addition, the mean scores for the BMQ-Indonesian version were as follows: BMQ Specific-Necessity (mean 18.38 ± 3.37; range 5–25), BMQ Specific-Concerns (mean 16.43 ± 3.59; range 5–25), and BMQ General-Overuse (mean 13.01 ± 3.15; range 5–20), BMQ General-Harm score (mean 11.66 ± 3.00; range 5–20).

Table II. The common problems in translation process

No	Original questionnaire	Forward Translation	Backward Translation	Problem
1.	My health ***at present depends*** on my antiretroviral medicines	Kesehatan saya saat ini bergantung pada terapi antiretroviral	***At the moment*** my health depends on antiretroviral therapy	timeframe
2.	***Having to take antiretroviral*** medication worries me	Keharusan mengonsumsi obat-obatan antiretroviral membuat saya khawatir	***The need to consume antiretroviral*** medicine makes me anxious	Polysemous word
3.	My life ***would be impossible*** without my antiretroviral medication	Saya tidak mungkin bertahan hidup tanpa terapi antiretroviral	I ***could not possibly*** survive without antiretroviral therapy.	Polysemous word
4.	Without my antiretroviral medication ***I would be very ill***	Tanpa terapi antiretroviral saya akan menjadi sangat sakit	Without antiretroviral therapy ***I would become very ill***	Polysemous word
5.	I ***sometimes worry about becoming*** too dependent on my antiretroviral medication	Kadang-kadang saya khawatir menjadi terlalu bergantung pada terapi antiretroviral saya	***Sometimes I worry that I am too*** dependent on my antiretroviral therapy	Syntagmatic
6.	My antiretroviral medication ***protects*** me from becoming worse.	Terapi antiretroviral saya mencegah kondisi saya menjadi lebih buruk	My antiretroviral therapy ***prevents*** my condition from worsening	Differentiation
7.	Doctors ***place*** too much trust on medicines	Para dokter terlalu percaya pada obat-obatan	Doctors ***put*** too much faith in medicines	Differentiation

Table IV shows overall KMO measure for the 10-items of the Specific part of the BMQ was 0.69, and it was lower than the KMO measure for the General part of the BMQ was 0.76, and those were also sufficiently high. The numbers of BMQ-specific items consisted of 3 factors. In table IV also shows the first six items load heavily on a Factor, the next three items on Factor 2, and the last two on Factor 3.

In general, factor loadings of the BMQ specific ranged from 0.64 to 0.88 (Table IV). From factor loadings of BMQ general, only item number 7 was to be part of the second component, and the rest of the items entered to the first factor. In general, factor loadings of the BMQ specific ranged from 0.37 to 0.87 (Table V).

Table VI presents the Pearson correlation coefficients of all items were positive correlation and significantly different. These obtained values were higher than the critical value for 201 participants (critical values of 0.14).

A statistically significant difference was found for the Concern subscale in correlation with ethnicity. In addition, the overuse

Table III. Correlation of each question with total correlation

Questionnaire item	Mean ±SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha	Original study Developer of BMQ (Horne *et al.*, 1999)
N1	4.37 ±0.90	,21	,80		
N2	2.79 ±1.29	,52	,78		
N3	3.92 ±1.06	,39	,79	0.56	0.55-0.86
N4	3.96 ±1.09	,26	,80		
N5	3.35 ±1.20	,44	,79		
Total Necessity	18,38 ± 3.37				
C1	3.17 ±1.25	,40	,79		
C2	4.16 ±0.98	,27	,80		
C3	2.45 ±1.20	,40	,79	0.49	0.63-0.80
C4	3.03 ±1.29	,41	,79		
C5	3.63 ±1.29	,27	,80		
Total Concern	16,43 ± 3.59				
O1	3.00 ±1.26	,42	,28		
O2	2.30±1.14	,50	,44	0.65	0.60-0.80
O3	2.84 ±1.19	,46	,38		
O4	2.62 ±1.20	,45	,45		
Total Overuse	10,76 ± 3.36				
H1	2.53 ±1.20	,47	,48		
H2	2.38 ±1.20	,33	,18		
H3	3.68 ±1.11	,19	,18	0.53	0.47-0.83
H4	3.08 ±1.21	,42	,25		
Total Harm	11.66 ± 3.00				
Overall Cronbach's alpha for BMQ=0.80					

subscale was significantly different in correlation with the level of education (Table VII).

This study aimed to translate and cross-cultural adapt the Beliefs about Medicines Questionnaire into Indonesia language, explore its psychometric properties, and establish preliminary norms. The participants were selected to HIV patients who were on ART which poor knowledge of ART was common in this area [22]. The assessments of validity and reliability that were employed and the Belief about Medicines Questionnaire were challenging to use among Indonesian patients, especially in HIV settings. Even though the Cronbach alpha in this study was lower than the previous study in Greece among chronic disease [23], however, it was similar to the study among diabetes patients in France [24].

The translation BMQ questionnaire was conducted to forward and backward translation [25] and modification was done several times. The modification commonly occurs from a questionnaire written in English to a targeted language [25]. In this study, the complex process in translation identified that several limitations were found in the Indonesian language. Besides the timeframe of the verb, the limited words to express feeling and emotions have been added to the complexity of the translation process. Moreover, cross-culturally adaptation was necessary to be conducted. Some adjustments such as how to express plural-singular, as well as countable- uncountable forms, were

Table IV. Principal component analysis results for BMQ-specific

No	Beliefs about Medicines Questionnaire-Specific	Component		
		1	2	3
7.	My health in the future will depend on my antiretroviral medication	0.88		
1.	My health at present depends on my antiretroviral medicines	0.85		
3.	My life would be impossible without my antiretroviral medication	0.75		
9.	I sometimes worry about becoming too dependent on my antiretroviral medication		0.71	
8.	My antiretroviral medication disrupts my life		0.69	
6.	I don't know how my antiretrovirals work		0.68	
5.	I sometimes worry about the long-term effects of my antiretroviral medication		0.64	
2.	Having to take antiretroviral medication worries me		0.64	
4.	Without my antiretroviral medication I would be very ill			0.84
10.	My antiretroviral medication protects me from becoming worse			0.69
Kaiser-Meyer-Olkin Measure of Sampling Adequacy= 0.69				
Bartlett's Test of Sphericity=0.00				

Table V. Principal component analysis results for BMQ-general

No	Beliefs about Medicines Questionnaire-General	Component	
		1	2
4.	Natural remedies are safer than medicines	0.86	
5.	Medicines do more harm than good.	0.81	
2.	People who take medicines should stop their treatment for a while every now and again	0.76	
1.	Doctors use to many medicines	0.42	
3.	Most medicines are addictive	0.37	
6.	All medicines are poisons	0.37	
7.	Doctors place too much trust on medicines		0.87
8.	If doctors had more time with patients, they would prescribe fewer medicines.		0.61
Kaiser-Meyer-Olkin Measure of Sampling Adequacy= 0.76			
Bartlett's Test of Sphericity=0.00			

present. In line with other studies, one word might be difficult to be interpretated [26], and it was common to replace some words from sentences [27]. It is not easy to get a reliable and valid questionnaire from English to the targeted language by direct translation process [28].

Methods for testing scale reliability vary, and Cronbach alpha is still the most frequently used [20]. The obtained Cronbach alpha values of the BMQ-Indonesia version were similar to original study 14 except the Specific-Concern. This study highlighted that there was an anomaly in internal consistency which the overall internal consistency of all items in BMQ was similar to the result among Malaysian patients [29] but low compared to the Polish study [30]. The similarity of overall internal consistency between Malaysia and Indonesia translation may occur from the identical stem of those languages.

Caution is needed while using the Specific-Concern subscale since the inconsistency among HIV patients in

Table VI. Pearson's correlation coefficient between scales

Questionnaire item	Total Necessity-Concern	Total Overuse-Harm
N1	0,42	0.08
N2	0,54	0.53
N3	0,58	0.24
N4	0,44	0.15
N5	0,62	0.28
C1	0.51	0.36
C2	0.47	0.14
C3	0.46	0.40
C4	0.58	0.29
C5	0.52	0.02
O1	0.33	0.59
02	0.35	0.67
03	0.41	0.56
04	0.32	0.64
H1	0.29	0.70
H2	0.25	0.51
H3	0.13	0.40
H4	0.34	0.56

Table VII. Medians and SD for the scales used to assess participant's Beliefs about Medicines (BMQ) comparing ART, Ethnicity and Education Level

Variables		Necessity Mean ± SD	Concern Mean ± SD	Overuse Mean ± SD	Harm Mean ± SD
ART	Single tablet	18.04±3.36	16.43±3.52	11.013.41	11.34±2.92
	Multi tablet	18.63±3.37	16.43±3.65	10.58 ±3.32	11.89±3.06
Mann-Whitney U test		0.13	0.89	0.23	0.2
Ethnicity	Papuan	18.57±3.35	16.72±3.64	10.81±3.57	11.69±3.05
	Non-Papuan	18.00±3.41	15.84±3.43	10.66±2.90	11.59±2.94
Mann-Whitney U test		0.20	0.04	0.85	0.69
Education Level	6 years	17.25±4.11	16.00±4.00	12.25±3.59	13.00±3.16
	9 years	18.72±3.28	18.38±3.14	13.11±4.08	12.11±2.78
	12 years	19.05±3.26	16.17±3.51	11.17±2.99	11.82± 2.95
	Higher	18.20± 3.39	16.26±3.61	10.33±3.23	11.52±3.05
Mann-Whitney U test		0.61	0.09	0.03	0.66

*ART: Antiretroviral Therapy

Indonesia remained high compared to specific diseases such as asthma [31], and cardiovascular [30]. Even though the Cronbach alpha coefficient was low for all subscales, the results of BMQ-Indonesia were comparable to other indigenous people, the Navajo study [32] and the original study [14]. The difference results in Indonesia was high to compare translation in developed countries which English might associate with study setting was conducted. Since this study was conducted on HIV patients, HIV patients living in France had better consistency in completing the questionnaire than those living in Indonesia [24]. It may be explained that Indonesian patients may have more complex

SUPPLEMENT BMQ

No	Original Questionnaire	Indonesian Version
1.	At the moment my health depends on antiretroviral therapy	Kesehatan saya saat ini bergantung pada terapi antiretroviral
2.	The need to consume antiretroviral medicine makes me anxious	Keharusan mengonsumsi obat-obatan antiretroviral membuat saya khawatir
3.	I could not possibly survive without antiretroviral therapy	Saya tidak mungkin bertahan hidup tanpa terapi antiretroviral
4.	Without antiretroviral therapy I would become very ill	Tanpa terapi antiretroviral saya akan menjadi sangat sakit
5.	Sometimes I worry about the long-term effect of my antiretroviral therapy	Kadang-kadang saya kuatir dengan dampak jangka panjang dari terapi antiretroviral saya
6.	I don't know how my antiretroviral therapy works	Saya tidak tahu cara kerja obat antiretroviral saya
7.	My future health depends on my antiretroviral therapy	Kesehatan saya di masa depan tergantung pada terapi antiretroviral saya
8.	Antiretroviral therapy disrupts my life	Terapi antiretroviral mengganggu hidup saya
9.	Sometimes I worry that I am too dependent on my antiretroviral therapy	Kadang-kadang saya khawatir menjadi terlalu bergantung pada terapi antiretroviral saya
10.	My antiretroviral therapy prevents my condition from worsening	Terapi antiretroviral saya mencegah kondisi saya menjadi lebih buruk
11.	Doctors use too many medications	Dokter menggunakan terlalu banyak obat-obatan
12.	People who take medication should stop taking them from time to time	Orang yang mengonsumsi obat-obatan harus menghentikan pengobatan mereka sesekali
13.	Most medications have an addictive effect.	Kebanyakan obat-obat memiliki dampak ketagihan.
14.	Natural remedies are safer than medicine.	Penyembuhan alami lebih aman daripada obat.
15.	Medicines have more adverse effects than good effects	Obat-obatan lebih memberi dampak merugikan daripada yang baik
16.	All medicines are poison	Semua obat adalah racun
17.	Doctors put too much faith in medicines	Para dokter terlalu percaya pada obat-obatan
18.	If doctors gave more time to the patient, they would prescribe fewer medications	Jika dokter meluangkan waktu lebih banyak untuk pasien, dokter akan memberi lebih sedikit obat-obatan

problems related to medication than language itself. HIV patients in France might also have better-coping strategies related to their medication, especially for adverse effects than those in Indonesia. Despite the sample size being fair, the anomaly of low Cronbach alpha coefficient, especially in Specific-Concern, remained unclear.

In addition, other findings showed that there was a significant difference in concern subscale between Papuans and Non-Papuans. Papuans were more difficult to cope with

adverse effects than non-Papuans. This might occur Papuans had more problems in communication with healthcare providers than Non-Papuans [33]. Similar way, the level of education was significantly different from the overuse subscale. It means different education levels yielded a different view of patients to accept their doctors prescribed them drugs as they needed. This finding might be similar to HIV patients with low literacy where they also had more worries about the doctor giving them more drugs prescribed than medically necessary [22]. This fact is important to be highlighted since more than one-fifth of inhabitants in Papua were low literacy [34].

This study has several limitations. First, this study was conducted among HIV patients in the rural area of Indonesia, and thus it cannot assuredly extrapolate to other areas of Indonesia. In addition, this study merely focused on HIV patients and might be different from other chronic diseases. However, this study recruited indigenous people to be part of participants, reflecting the actual description of Indonesian society. Second, the sample size in this study was acceptable.

CONCLUSION

The BMQ-Indonesian version exhibits moderate to be used in Indonesia especially among HIV patients. Even though the obtained Cronbach alpha values of the BMQ-Indonesia version were lower than the original study however it was common to participants with HIV who have neurological and cognitive problems at a later stage. Caution is still needed in this questionnaire.

COMPETING INTERESTS

The authors have indicated that they have no competing interest**s**

ETHICS AND CONSENT TO PARTICIPATE

This study was approved by the Committee on the Ethics Commission, Faculty of Medicine, Public Health, and Nursing Universitas Gadjah Mada, Yogyakarta Indonesia (KE/FK/1108/EC/2016).

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PATIENT CONSENT

All participants, men, and women, gave written informed consent.

CONSENT FOR PUBLICATION

Not Applicable

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