

## Original Article

## Translation and Validation of the Indonesia Version of Prenatal Attachment Inventory: A Preliminary Study

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### Abstract

**Background:** Across cultures, mothers who feel strong attachment to their unborn children are less likely to experience post-partum depression or to abuse their children. Such children also show better social and cognitive abilities. However few formal studies have investigated maternal-fetal attachment in Indonesia, possibly because a valid and reliable tool for measuring it has been lacking.

**Aim:** This paper is to define the translation procedure using Brislin framework to adapt the Prenatal Attachment Inventory into Bahasa.

**Methodology:** Ethical consideration for using the instrument and admission to pregnant women have been gained.

**Results:** A sample of 194 primigravida withdrawn from the population. An *independent t-test* was performed to explore the score between the two groups. The reliability test was performed. A-21 items of the Indonesian version of the instrument has resulted. The construct validity has supported the hypothesis. The two groups differed significantly ( $p < .001$ ), with a higher score in later stages of pregnancy. Cronbach's alpha coefficient was .84. The translation process showed a rigorous selecting language term based on culture. The resulted tool possesses acceptable reliability and validity for measuring maternal-fetal attachment in Indonesia. Recommendation for stakeholder as well as maternity nursing-practitioner have been provided to enhance attachment during pregnancy.

**Keywords:** Bahasa, Prenatal Attachment Inventory, translation

### Introduction

Knowing about prenatal attachment is very crucial, because it plays a significant role in the health of both pregnant women and their babies. Healthcare provider, particularly midwives, need to understand the concept of attachment between mother and infant beyond the baby is born.

Measuring prenatal attachment can provide crucial information for health care providers to make changes in their prenatal care practices (Sukriani and Suryaningsih, 2018; Güney and Uçar, 2019). Therefore, a valid and reliable measure to evaluate pregnant women's attachment to their unborn babies is important for

program and evaluation. The availability of the prenatal attachment instrument also crucial to understand psychological problems during pregnancy (Sivaraman *et al.*, 2018). Prenatal Attachment Inventory (PAI) developed by Muller (1989) is a valid and reliable instrument for measuring the concept of prenatal attachment during pregnancy and it has been tested its validity and reliability from the original population (Muller, 1989). This instrument also remain showed the reliability when it was translated and tested into many studies across a range of cultures such as Italian women (Vedova, Debrassi and Imbasciati, 2008), as well as women in German (Doster *et al.*, 2018) and also among Italian women (Samani *et al.*, 2016).

According to John Bowlby's theory (Bowlby, 1958), attachment is an enduring affection that one person forms for another specific individual (Damato, 2004). Building on this concept, experts have defined maternal-fetal attachment as a bond of affection between mothers and their unborn babies (Muller and Mercer, 1993; Condon and Corkindale, 1997). The most commonly used instrument for measuring maternal-fetal attachment in the nursing literature is the Maternal-Fetal Attachment Scale (MFAS) developed by Cranley (1981). However, there were serious shortcomings to the MFAS. The lack of validity and reliability found in this instrument (Gau and Lee, 2003) make it harder to draw valid inferences. In 1989, Muller developed a new tool based on Cranley's instrument for measuring maternal-fetal attachment, the Prenatal Attachment Inventory (PAI) (1989, 1993). Muller used Bowlby's attachment model to test the construct validity of the PAI by correlating scores on the PAI with scores from instruments that measure adaptation to pregnancy and marital satisfaction. Further, to assess concurrent validity of the PAI, Muller also administered the MFAS and correlated the MFAS scores with the PAI scores for the same group (Muller, 1993). She successfully provided evidence that the PAI validly and reliably measures prenatal attachment. Gau and Lee (2003) also tested the construct validity of the PAI using a different method, confirmatory factor analysis, on a sample of 344 pregnant American women in their third trimester. The Cronbach's alpha coefficient in their study was .89 and the mean was 63.7. The dearth of research on maternal-fetal attachment in Indonesia (Suryaningsih, 2016b, 2016a; Sukriani and

Suryaningsih, 2018), might be due to the absence of the instrument to measure the concept.

Borrowing and applying instruments for use in different cultures and concept, researchers need to ensure that these are tested for suitability and virtually, and also equally in term of linguistic or literal by using a vigorous and transparent outline (Abujilban, Sinclair and Kernohan, 2012). The works search used CINAHL, MEDLINE, EBSCO, PubMed, as well as a web search using Google search engine, we found that the most frequently used framework to culturally translate the instrument in the health literature is Brislin's Method (Haj-yahia *et al.*, 2008; Chow, Chan and Choi, 2013; Xiao *et al.*, 2017; Gaúcha, 2018). Brislin has developed an outline for guiding researchers to conduct the translation process include forward translation and back-translation, expert panel, and pilot study (Hilton and Skrutkowski, 2002; Maneesriwongul and Dixon, 2004). This outline is selected in this study due to this typical suggested some component of self-assurance in the equivalence of the surveys and sureness in the evidence gained from translated questionnaire. Therefore, the aim of this procedural paper is to validate the Indonesian version of PAI using Brislin outline.

## Methodology

The validation of new version of instrument, translation and back-translation procedures adopted from Brislin's guidelines was applied. Then, a cross-sectional approach to tested the contrasted group approach was established as the construction validation. The Prenatal Attachment Inventory (PAI) originally developed by Muller (Muller, 1989) consist of 21 items and a self-report scale consisting of Likert-type items ranging from 1 ('almost never') to 4 ('almost always'). All items are added to produce a single score, and possible scores range from 21 to 84. To produce the Indonesian version of PAI, the following steps were conducted; step I: translation and back translation, step II: committee review, step III: expert judgment. Resulted version completed by committee review was examined by a committee of three subject matter experts in the field of test construction.

Contrasted group approach was obtained to build construct validity. The study population consisted of pregnant women at any age and at less than 20 weeks' gestation or after 30 weeks' gestation, any parity, education level, as well as occupation and

visit to the antenatal care primary health care center in Yogyakarta during August to October 2014. Using a *G-Power software* (effect size = 0.5, B= .95 and  $\alpha$  error probability= .05) the researcher calculated a sample size of 176 (88 for each group) would be needed for meaningful results (Faul *et al.*, 2007). However, this subsample was constituted by 194 pregnant women (97 for each group). The administration of questionnaire was conducted privately in the specific room and the researcher assures the respondents that their information was limited as strictly confidential. Only the researcher and those directly involved with the study will have access to the data. The validity of Indonesian version of PAI was performed through two components of Content Validity Index (CVI) by three expertise, item-CVI (I-CVI) and scale-CVI (S-CVI). If the I-CVI was higher than .79, the item was judged appropriate. Otherwise, if the I-CVI was lower than .79, the item needed to be revised. Then, to achieve S-CVI, researchers computed the proportion of items on the instrument that achieved a rating of 3 or 4 by the experts.

The method of the universal agreement among experts (S-CVI/UA) also applied in this study. The mean and standard deviation values were calculated for numerical variables. The independent *t-test* was performed to evaluate the difference score between two groups to confirm construct validity. Cronbach alpha value was calculated for the analysis of internal consistency, with values above 0.70 indicating high internal consistency (Tavakol and Dennick, 2011). There were two ethical approval in this study, first, grant permission to use the instrument was provided by DR. Muller through email. Second, permission for data collection was taken from the Institutional Review Board of Yogyakarta (No. 070/2760-5302/34). The researcher also reassured to obtain ethical consideration includes achieved informed consent from respondents as well as consider their privacy and confidentiality.

## Results and Discussion

**Translation and back-translation:** After the researcher grant permission from Muller then we invited the independent bilingual translator who having seven years of experience in relevant academic field and accustomed with the vocabulary of the parts that were being covered and was very contented with her knowledge of

English-speaking culture. Her original language was Bahasa and that was important as it was the goal nation and dialectal pertinent for accomplishment the forward translation. Researcher was instructed to emphasize on the conceptual and cultural, rather than the verbatim and translation to be simple, clear and brief in formulating a statement. The requirement to custom normal and suitable language for the broader hearing was also underlined. Succeeding this instructions, the forward translator carried out the translation and the Bahasa version was ready to be back-translated by the second translator.

Then, another qualified bilingual translator having ten years' experience with sufficient competency and who had no knowledge of the PAI questionnaire has blind-back translated instrument from Bahasa into English. The identical instruction for the forward translation were used for this process.

**Committee review:** A parallel comparison was undertaken by two translators in teamwork with the principal investigator, and discrepancies and inconsistencies the content of the instrument were debated. Each item was argued in detail to be adjusted with regard to ambiguities of used words and culture in Bahasa. This process is replicated many times until a conceptually equivalent and accurate version was gained. We identified some discrepancies and culturally inappropriate terms in the Bahasa version. For instance, on item 4; "I think that my baby already has a personality," was translated into Bahasa as: "*Aku berpikir bahwa bayiku sudah memiliki sifat.*" "Sifat" is a formal term that can be used to express the idea "personality," but it also has other meanings. Indonesian more commonly use the term "*kepribadian*" than "*sifat*" to describe this concept. The committee agreed to change the term "*kepribadian*" over the term "*sifat*". The phrasing of many objects also was changed in order to growth accurateness and culturally understanding and to make it relevant to Indonesian women with diverse socio-culture and education background.

**Expert judgement:** The expert consist of three Midwife and Nurse faculty members (one Assistant Professors and two lecturers of maternity). These individuals review the Bahasa version resulted from the previous procedure and aimed to giving rate for its content using Content Validity Index (CVI). The experts were asked to

evaluate the measure based on four criteria: (1) relevance, (2) ambiguity, (3) simplicity, and (4) clarity. Experts of committee suggested to have the universal agreement on each item in order to be considered valid. Experts judgment procedure consist of two rounds. In the first round (Table 1), the researcher focused to analyze the results in a rating scale for each item that was given by the three experts. In the second round, the researcher contacted the same experts to reevaluate the set's revised items. Furthermore, the experts reached an agreement on the scale of a score of four for those two revised items. While the second-round panel gained a reviewed set of items, the S-CVI can be computed. Finally, all the experts approve each item without adding new items or deleting the original one from the instrument and the emergent Bahasa version of

the PAI was organized for constructing validity trough contrasted group approach among Indonesia pregnant women.

**Contrasted group approach:** A purposive sample of 194 pregnant women fulfilled in the questionnaire. The women's age mean of 23.85 years and gestational age ranged from 4 weeks to 40 weeks, all the respondents were married and have no complication during this pregnancy. The majority of the samples are a housewife (52.8%). Mostly, the respondents were secondary school educated (n=111, 56.9%) and a total of 61.5% (n=120) of the sample confirmed if they have felt the fetal movement sensation. From 194 sample, it is been reported 3.1 % (n=6) have experience loss their fetal. The independent t-test between the two groups shows in the table 2.

**Table 1. Rated by experts for content validity in the first round**

Items	Rating 4****	Rating 3***	Rating 2**	Rating 1*	I-CVIs	Interpretation
1	3	0	0	0	1	Valid
2	3	0	0	0	1	Valid
3	3	0	0	0	1	Valid
4	2	0	1	0	.66	Invalid
5	3	0	0	0	1	Valid
6	2	0	1	0	.66	Invalid
7	3	0	0	0	1	Valid
8	3	0	0	0	1	Valid
9	3	0	0	0	1	Valid
10	2	1	0	0	1	Valid
11	2	1	0	0	1	Valid
12	3	0	0	0	1	Valid
13	3	0	0	0	1	Valid
14	3	0	0	0	1	Valid
15	3	0	0	0	1	Valid
16	3	0	0	0	1	Valid
17	2	1	0	0	1	Valid
18	3	0	0	0	1	Valid
19	2	1	0	0	1	Valid
20	3	0	0	0	1	Valid
21	3	0	0	0	1	Valid

**I-CVI = 0.96**

Number of items considered relevant by all the judges = 19 Number of item = 21

**S-CVI/UA = 21/21 = 0.90**

\* the number of expert who gave rate 1 \*\*the number of expert who gave rate 2 \*\*\*the number of expert who gave rate 3 \*\*\*\*the number of expert who gave rate 4

**Table 2. Independent t-test analysis**

Classification of gestational weeks	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>t</i> value
Gestational weeks less than 20 weeks	98	55.48	10.396	<i>P</i> < .001
Gestational weeks after 30 weeks	96	62.66	6.558	

**Internal consistency of The Bahasa of PAI:** The Indonesia version of PAI consisted of 21 item. The assesment of reliability of the Indonesian version of PAI was based on a sample of 194 pregnant women. In the preliminary study, the Cronbach's alpha coefficient of the translated tool was .842 for the total item. The reliability of this new 21-item instrument was determined to be .842 and the minimally changed items were removed (.827-.848). This was indicated a high level of internal consistency.

The value of this paper is the transparent process undertaken to translate the PAI from English to Bahasa and the novelty of this translation instrument in Indonesia. This paper also provides information about the validity and reliability of the PAI in Bahasa and contributes to the knowledge transfer process. On the basis of scrupulously procedures of scale translation, 21 items were successfully translated same as the original Prenatal Attachment Inventory (Muller, 1993). Translated Prenatal Attachment Inventory was validated by inviting three experts to rating the scale and provides suggestions on the items based on four criteria. To support the validity, the researcher comparing mean scores of the two groups of pregnant women on the Bahasa version of the PAI. The results showed that the women who were tested at the end of pregnancy displayed greater attachment to their fetuses than those who were studied earlier in their pregnancies. This finding supports the proposition that prenatal attachment is a developmental process of bonding, as described by Muller (1993). Similarly, Sjogren et al (2004) found a significant difference between groups in total scores ( $p < .01$ ); women in the late pregnancy group had a higher mean attachment score than the women in the early pregnancy group. Likewise, Vedova et al (2008) and Ustunzoz et al (2010) found that PAI scores increased with weeks of gestation. In other words, the fact that findings produced by this

study using the contrasted group approach are consistent with prior results indicates that the Bahasa version of the PAI successfully measures maternal-fetal attachment. In line, as explained by Bruno and Hugglof (2000), that maternal prenatal attachment during the third trimester of pregnancy is associated with the postnatal maternal involvement (Siddiqui and Hägglöf, 2000). In related but separate study described, in pregnancy, the expectant mother develops a loving relationship with her fetal, which Muller define as prenatal attachment (Sandbrook, 2009). It has been found that maternal-fetal attachment develops throughout pregnancy and facilitates behavioral changes in the woman that are protective to ensure the fetal has the right environment to promote the development and birth of a healthy baby.

In this study, the internal consistency of the scale also indicated high inter-relatedness between items. The alpha coefficient for the total score on the Indonesian version was actually high ( $\alpha = .937$ ). This finding result supported by previous study, Siddiqui et al (1991) was validated PAI in a Swedish sample of 171 pregnant women, confirmed the Cronbach alpha coefficient was .86, and the mean was 57.22 ( $SD = 5.916$ ). In 2003, another researcher from Taiwan also found the highness of PAI, Gau and Lee tested the construct validity of the instrument by using confirmatory factor analysis (CFA) on a sample of 344 pregnant American women in their third trimesters. Cronbach's alpha coefficient was .89 and the mean were 63.7 (Gau and Lee, 2003). Similarly, the reliable PAI was reported found when it administered among Italian pregnant women and Korean pregnant women ( $\alpha = .87$  and  $\alpha = .94$ , respectively) (Shin and Kim, 2007; Maria, Vedova and Dabrassi, 2016).

The Indonesian version of the PAI shows great promise for use with Indonesian childbearing women; this measurement tool will establish a

guide for Indonesian midwives and nurses to recognize mothers with poor maternal-fetal attachment, enabling them to provide support that could improve the quality of their relationships with their children throughout their lives. Exploring prenatal attachment could assist health professionals to promote better health behaviors among pregnant women and help improve the quality of mothers' care of their children. The results of this study have implications for different areas, including policy development, midwifery practice, and midwifery education. Management in clinical settings need to establish guidelines to provide this instrument as part of routine prenatal care in the third trimester to identify attachment problems between mothers and fetuses that can impact the emotional health of both. Midwives themselves can take the initiative, using this instrument to recognize mothers with poor maternal-fetal attachment, creating opportunities to encourage bonding between mother and child. The midwifery department of 'Aisyiyah University of Yogyakarta is already incorporating maternal attachment into the curriculum. Other health education institutions in Indonesia may soon follow suit.

Literature about postpartum bonding is abundant in Indonesia compared with other countries, but studies concerning attachment during the prenatal stage have been scarce. This Indonesian version of the PAI was created to rectify that situation. Now, other researchers can use this valid instrument to explore prenatal attachment, increasing the number of studies on this topic in Indonesia. In fact, this Indonesian version of the PAI is already in use in ongoing studies there (Alvianty and Suryaningsih, 2016; Suryaningsih, 2016b; Sukriani and Suryaningsih, 2018; Suryaningsih *et al.*, 2018). The authors look forward to studies that include respondents from other parts of Indonesia to test the representativeness of the findings, since the population of Indonesia is ethnically diverse. In addition, the Indonesian version of the PAI could be used to analyze factors that impact the level of maternal-fetal attachment. Future studies of maternal-fetal attachment in Indonesia will provide additional evidence for modifying maternity and nursing-care practices there. The authors of this study plan to use items on the PAI to design interventions that promote attachment. For example, mothers with weak attachment to their fetuses might be advised to stroke their

bellies and speak to their babies by name. The researchers will then test the efficacy of these interventions.

**Conclusion:** The current study has provided evidence for a valid and reliable instrument to measure prenatal attachment in Indonesia. The process of adaptation and testing of instruments as suggested by the Brislin's guideline has enhance the transferability and rigor of the PAI. Conceptual, contextual and cultural differences are important factor for consideration when using borrowed instrument regardless of their proven reliability and validity as demonstrated by Indonesian pregnant women in this study. The major limitation for this methodological study was, the inclusion of only 194 purposive pregnant women. Further large scale study is recommended to explore reliability, criterion-related validity, CFA and EFA.

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