ADAPTATION AND VALIDATION OF THE INDONESIAN VERSION OF THE HEALTH BELIEF MODEL INSTRUMENT FOR PARENTS

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ABSTRACT

Children are a crucial population requiring COVID-19 vaccination. With the global rollout of COVID-19 vaccines, the increasing number of unvaccinated children and adolescents has raised concerns**.** To was translated, adapted, and validate the Health Belief Model instrument for parents of children aged 6–11 years regarding COVID-19 vaccination in the Indonesian language. Cross-cultural translation and adaptation were conducted according to international standards. The instrument testing process, according to Beaton et al., (2020), involves five stages: forward translation, synthesis of the translation results, back translation, review of the back translation, and readability testing. Respondents were purposively selected from the parents of children aged 6–11 years. Face and content validity were achieved for the Indonesian version of Health Belief Model for parents of children aged 6–11 years. The validity of each statement item was assessed using Pearson Correlation with a significance level of 0.05 and 193 respondents, resulting in an r table value of 0.1406. The constructs within the Health Belief Model were deemed valid based on the Pearson Correlation values, as the coefficient values were greater than the r-table value ($r > 0.1406$; $p < 0.05$). The constructs in the Health Belief Model were also reliable, with a Cronbach's alpha value of 0.657. The culturally adapted Indonesian version of the Health Belief Model instrument for parents of children aged 6–11 years regarding COVID-19 vaccination is considered valid and reliable for use in research among the parent population of children aged 6–11 years in the context of COVID-19 vaccination.

Keywords: Instrumen, Health Belief Model, Parents, adaptation ,Validity

INTRODUCTION

The outbreak of pneumonia that began in Wuhan, China, in December 2019 quickly evolved into a global pandemic caused by the coronavirus (COVID-19) (Wang *et al.*, 2020). This pandemic has led to over 676 million confirmed cases and more than 6.8 million deaths, posing a significant health threat. (Hopkins, 2023). The COVID-19 virus, which is an RNA virus, has a high mutation rate (Peck and Lauring, 2018), leading to the emergence of new unpredictable variants. The immense scale of infections has the potential to generate new mutations with unforeseeable impact. Empirical data show varying characteristics of the effects of the virus with the emergence of new variants, presenting challenges in preventing and treating COVID-19 (El-Shabasy *et al.*, 2020). Scientists have been searching for effective treatments and prevention methods, and vaccination has been identified as the most effective method to prevent infectious diseases (Anderson *et al.*, 2020). Sufficient

vaccination coverage can result in effective herd immunity (Iwasaki and Omer, 2020). Several potential vaccines have been developed, with nine approved by the EUA and various countries, including three approved for use in the United States (Kashte *et al.*, 2021). Vaccination is considered a practical approach for improving individual health behaviors to combat the COVID-19 pandemic. However, current COVID-19 vaccines are only effective for a limited time, making ongoing vaccination efforts crucial (Dutta, 2023). The global acceptance and uptake rates of COVID-19 vaccination are approximately 67.8% (Wang *et al.*, 2022). Vaccine hesitancy, which refers to the delay in acceptance or refusal of vaccination despite available vaccination services, is complex and context-specific and varies based on factors such as complacency, convenience, and confidence (Callaway, 2021). Children are a crucial population requiring COVID-19 vaccination. The transmission of COVID-19 among children can occur in families, childcare facilities, and schools. Vaccination of children and adolescents is recommended not only for their protection but also to contribute to achieving herd immunity across all age groups. With the global rollout of COVID-19 vaccines, the increasing number of unvaccinated children and adolescents has raised concerns (Callaway, 2021). Vaccine hesitancy can change over time, but behavior change does not occur over time, which is in accordance with the Health Belief Model, which assumes that a person can change unhealthy behavior if he/she feels the risk of getting sick, and the severity and benefits of changing unhealthy behavior are greater than the barriers to change (Monika *et al*., 2022). The Health Belief Model questionnaire is one of the questionnaires that can be used to determine parents' doubts about giving vaccines, and was adapted from Saudi Arabia because the questionnaire has undergone modifications in the 3rd part of the questionnaire, which focuses on the concepts of the Health Belief Model, and the questionnaire has been tested for validation and reliability. This questionnaire was developed by Ohoud S. Almalki and consists of 3 sections: the first section related to parental demographic data, the second section investigated the history of SARS-CoV-2 infection, and the third section focused on the concept of the Health Belief Model. The Health Belief Model questionnaire is in Arabic and then translated into English; therefore, its use in Indonesia is still limited. Therefore, the authors are interested in adapting and validating the Indonesian version of the Health Belief Model questionnaire to obtain a valid and reliable version of the questionnaire to assess vaccine acceptance doubts in Indonesia.

RESEARCH METHODS

The study aimed to was translated, adapted, and validate the Health Belief Model instrument for parents of children aged 6–11 years regarding COVID-19 vaccination in the Indonesian language. This quantitative study adopted a cross-cultural approach for the adaptation and validation of the instrument.

Equipment and Materials

Prior to the adaptation, permission was obtained from the original authors of Saudi Arabia. This cross-sectional survey was conducted in Banyumas, Central Java. The sample was purposively selected from parents of children aged 6–11 years. A total of 193 respondents participated in this study. Data were collected using a Google form containing the adapted Health Belief Model questionnaire from Saudi Arabia, distributed via WhatsApp. Participants were then asked about their intention to vaccinate their 5–11 year-old children using a four-level approach. The Likert scale ranged from absolutely yes to absolutely no. The section [14 items: 17–30] focused on concepts from the HBM, including parents' perception of their children's susceptibility to SARS-CoV-2 infection [perceived susceptibility: 3 items] and the severity of their condition if they had the infection [perceived severity: 3 items], parental perception of the benefits of their children receiving the COVID-19 vaccine [perceived benefit: 2 items], reasons that may prevent them from vaccinating their children [perceived barriers: 4 items], and motives that would prompt them to vaccinate their children [cues to action: 2 items]. Responses to these items were recorded on a four-point Likert scale ranging from strongly agree to strongly disagree.

Research Procedure

The instrument testing process, according to Beaton et al., involved five stages: forward translation, synthesis of the translation results, back translation, review of the back translation, and readability testing (Beaton *et al.*, 2000).

Stage 1 Translation

In the translation stage, according to Beaton *et al*., the translation process was conducted by two translators. The first translator understands the concept or procedure that will be adapted to obtain an appropriate perspective. The second translator is a person who does not have a health background, does not understand at all the concepts or procedures of the object of adaptation, or is called a translator. The purpose of the translator is so that this translator can produce language that is easily understood by lay people.

Stage 2 Synthesizing Translation Results

The results of the translation by the two translators were then analyzed to become one translation. All issues that arise, such as differences in meaning and word choice, are discussed and agreements are made. This process should be clearly documented for easy validation.

Stage 3 Back Translation

The results of the merged translation were then translated back to the original language (English). This was performed to check the validity of the language. Whether the translation results had the same meaning and language as the original version of the questionnaire. This check was carried out by a native or person who has English as a mother tongue but also has the ability in the language that is used as the subject of adaptation, in this case, Indonesian. In addition, the back translator has no knowledge of the concept of the adapted object. The result of this process can be called the draft questionnaire

Stage 4 Review Back Translation

The draft of the questionnaire was reviewed. This review process involves several people who understand the research methodology, concepts in the health sector, and language. This study involved 2 experts. The results of the analysis were then tested using the content validity index (CVI) as a validity test (22). If the CVI value is <0.6, the questionnaire must be revised; the last stage is a trial or reliability test. The reliability test in the adaptation process should be conducted on at least 30–40 participants from the respondents or the desired target sample. The sampling technique used purposive sampling with inclusion criteria, namely, parents of children aged 6–11 years whose children had or had not received the COVID-19 vaccine. Parents who refused to complete the questionnaire were excluded.

Stage 5 Readability Test

After translating the questionnaire, the researcher conducted cognitive interviews with 10 participants from the intended respondents to evaluate the readability, language, sentence structure, cultural appropriateness, clarity of instructions for each section, and the ease with which the participants understood the questions.

RESULTS AND DISCUSSION

This study emphasizes the necessity of cross-cultural adaptation when validating translations. Cross-cultural adaptation involves modifying an instrument to align it with social, cultural, and linguistic values without altering the original meaning. The instrument validated in Indonesian regarding the HBM for parents of children aged 6–11 years against COVID-19 vaccination had no previous versions. The adapted questionnaire was chosen because the majority of the Muslim population in Indonesia is similar to Saudi Arabia, assuming a comparable acceptance of COVID-19 vaccination in society. The adaptation process included forward translation, synthesis of translations, back translation, analysis with expertise, and reliability testing. Validation of the translation was essential to ensure the suitability of the measurement tool for the local context, as the original and modified versions of the questionnaire might not be applicable because of cultural and social background differences. The Health Belief Model (HBM) questionnaire, adapted from the

Saudi Arabian version, was translated by two translators familiar with the instrument. The adapted questionnaire consisted of five dimensions (14 statement items), including perceived susceptibility (3 items), perceived severity (3 items), perceived benefits (2 items), perceived barriers (4 items), and cues to action (2 items). Self-efficacy-related items (2 items) were obtained from two different articles, as they were not found in the Saudi Arabian HBM for parents of children aged 6–11 years. Each statement item in the instrument's domains was evaluated using a Likert scale ranging from 4 ("strongly agree") to 1 ("strongly disagree").

Stage 1 Translation - Stage 3 Back Translation

The procedures for translation into Indonesian. The translation coordinator contacted two experts in the English Department of the two universities independently to perform the forward translation of the Health Belief Model. The research coordinator compared the two forward translations and checked for any discrepancies. Discrepancies between the two translations were discussed with the translators until we agreed on a single provisional forward translation. Modifications were made in this draft to diminish discrepancies and were adjusted according to the habits of the Indonesian people. The single forward translation was then independently back-translated by two native speakers of English. The English back-translations and the original English version were compared to ensure that there was no difference in the meaning of the questions in the questionnaires. Discrepancies were discussed and resolved until an agreement within the translation group was reached. The stages of adaptation were as follows.

Table I. Stage 1 Forward Translation - Stage 3 Back Translation

No	English Original	Hasil Forward Translation	Back Translation
A	The following statements are related to the perceived susceptibility of contacting SARS-CoV-2 by your children (5–11 years):	Pernyataan berikut terkait dengan persepsi kerentanan anak Anda (5–11 tahun) terkena SARS-CoV-2:	The following statements relate to your perception about your child's/children's (aged 5–11 years) vulnerability to SARS-CoV-2:
	The chance of my children getting the SARS-CoV-2 in the next few months is high.	Peluang anak saya terkena SARS-CoV-2 dalam beberapa bulan ke depan tinggi.	The chance of my children contracting SARS-CoV-2 in the next several months is high.
	I am worried about the likelihood of my children getting the SARS-CoV-2.	Saya khawatir tentang kemungkinan anak-anak saya terkena SARS-CoV-2.	I am worried about the chance of my children contracting SARS-CoV-2.
	Getting the SARS-CoV-2 is a possibility for my children.	Mendapatkan SARS-CoV-2 adalah hal yang memungkinan untuk anak-anak saya.	It is possible for my child/children to get SARS-CoV-2.
B	The following statements are related to the perceived severity of SARSCoV-2	Pernyataan berikut terkait dengan persepsi keparahan infeksi SARS-CoV-2 untuk salah satu anak Anda (usia 5–11 tahun):	These statements are related to the perception of severity of SARS-CoV-2 infection for one of your children (aged 5–11 years old):

	infection for one of your children (5–11 years):		
	In general, complications from the SARS-CoV-2 are serious.	Secara umum, komplikasi dari SARS-CoV-2 tergolong serius.	In general, complications of SARS-CoV-2 are serious.
	If one of my children gets infected with the SARS-CoV-2, he will be very sick.	Jika salah satu anak saya terinfeksi SARS-CoV-2, dia akan sangat menderita.	If one of my children is infected with SARS-CoV-2, she/he will greatly suffer.
	I am worried that my children will get the SARS-CoV-2.	Saya khawatir anak-anak saya akan terkena SARS-CoV-2.	I am worried that my children will be infected by SARS-CoV-2.
C	The following statements are related to the perceived benefits from the COVID-19 vaccine:	Pernyataan berikut terkait dengan manfaat yang dirasakan dari vaksin COVID-19:	The following statements relate to perceived benefits of the COVID-19 vaccine:
	Vaccination is a good idea because i will not have to worry about my children catching the SARS-CoV-2.	Vaksinasi adalah ide yang bagus karena saya tidak perlu khawatir anak-anak saya terkena SARS-CoV-2.	Vaccination is a good idea because i don't have to be worry that my child/children is/are infected by SARS-CoV-2.
	Vaccination decreases the chance of my children getting the SARS-CoV-2 or its complications.	Vaksinasi mengurangi kemungkinan anak saya terkena SARS-CoV-2 atau komplikasinya.	Vaccination reduces the possibility of my children contracting SARS-CoV-2 or its complications.
D	The following statements are related to the perceived barriers to receiving the COVID-19 vaccine:	Pernyataan berikut terkait dengan anggapan hambatan untuk menerima vaksin COVID-19:	The following statements relate to perceived resistances to receive the COVID-19 vaccine:
	The possible side effects from receiving the COVID-19 vaccine would interfere with my children’s usual activities.	Kemungkinan efek samping dari menerima vaksin COVID-19 akan mengganggu aktivitas rutin anak saya.	The potential side effects of receiving the COVID-19 vaccine will disrupt my child's/children’s routine activities.

	I am concerned about the efficacy of the COVID-19 vaccine.	Saya khawatir dengan kemanjuran vaksin COVID-19.	I am concerned about the efficacy of the COVID-19 vaccine.
	I am concerned about the safety of COVID-19 vaccine.	Saya khawatir tentang keamanan vaksin COVID-19.	I am concerned about the safety of the COVID-19 vaccine.
	I am concerned about the fake/faulty COVID-19 vaccine.	Saya khawatir dengan vaksin COVID-19 yang palsu/rusak.	I am worried about fake/damaged COVID-19 vaccines.
E	The following statements are related to the cues to action for receiving the COVID-19 vaccine:	Pernyataan berikut terkait dengan tindakan untuk menerima vaksin COVID-19:	These statements are related to the action of receiving COVID-19 vaccine:
	I will register my children to receive the COVID-19 vaccine, if i was given adequate information.	Saya akan mendaftarkan anak saya untuk menerima vaksin COVID-19, jika saya diberi informasi yang memadai.	I will register my children to receive COVID-19 vaccine, if i am given adequate information.
	I will register my children to receive the COVID-19 vaccine, if the vaccine is taken by many in the public.	Saya akan mendaftarkan anak saya untuk menerima vaksin COVID-19, jika vaksin tersebut digunakan oleh banyak orang di masyarakat.	I will register my children to receive COVID-19 vaccine, if the vaccine is used widely in the society.
F	Self-efficacy It would be very easy for me to get my child a COVID-19 vaccine (Armenia).	Efikasi Diri Sangat mudah bagi saya untuk mendapatkan vaksin COVID-19 untuk anak saya.	Self-efficacy It was very easy for me to get the COVID-19 vaccine for my child.
	I can get my child vaccinated against COVID-19 on time if the vaccine is available (China).	Saya dapat memperoleh vaksin COVID-19 untuk anak saya tepat waktu jika vaksinnya tersedia.	I can get the COVID-19 vaccine for my child on time if the vaccine is available.

Table II. Final Results of Forward and Backward Translation of Health Belief Model Questionnaire for Parents of Children Aged 6–11 Years version

Construct	Item Statement	Options
Persepsi kerentanan	Peluang anak saya terkena COVID-19 dalam beberapa bulan ke depan tinggi	Sangat tidak setuju, Tidak setuju Setuju, sangat setuju
	Saya khawatir tentang kemungkinan anak-anak saya terinfeksi COVID-19	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
	Terinfeksi COVID-19 adalah hal yang mungkin terjadi pada anak-anak saya	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
Persepsi keparahan	Secara umum, komplikasi dari COVID-19 tergolong serius	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
	Jika salah satu anak saya terinfeksi COVID-19, dia akan sangat menderita	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
	Saya khawatir anak-anak saya akan terinfeksi COVID-19	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
Manfaat yang dirasakan dari vaksin COVID-19	Vaksinasi adalah ide yang bagus karena saya tidak perlu khawatir anak-anak saya akan terinfeksi COVID-19	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
	Vaksinasi mengurangi kemungkinan anak saya terinfeksi COVID-19 atau komplikasinya	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
Persepsi tentang hambatan	Kemungkinan efek samping dari vaksin COVID-19 akan mengganggu aktivitas rutin anak saya	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
	Saya khawatir tentang kemanjuran vaksin COVID-19	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
	Saya khawatir tentang keamanan vaksin COVID-19	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
	Saya khawatir tentang adanya vaksin COVID-19 yang palsu/rusak	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
Isyarat untuk	Saya akan mendaftarkan anak saya untuk	Sangat tidak setuju,

mendapatkan vaksin COVID-19	mendapatkan vaksin COVID 19, jika saya memperoleh informasi-informasi yang memadai	Tidak setuju, Setuju, Sangat setuju
	Saya akan mendaftarkan anak saya untuk mendapatkan vaksin COVID-19, jika vaksin tersebut telah digunakan oleh banyak orang di masyarakat	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
Keyakinan diri untuk mendapatkan vaksin COVID-19	Sangat mudah bagi saya untuk mendapatkan vaksin COVID-19 untuk anak saya	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju
	Saya dapat memperoleh vaksin COVID-19 untuk anak saya tepat waktu jika vaksinnya tersedia	Sangat tidak setuju, Tidak setuju, Setuju, Sangat setuju

Validity and reliability analyses of the questionnaire were conducted using SPSS Version 25.0. The validity of each statement item was determined using Pearson Correlation with a significance level of 0.05 and a sample size of 193, resulting in a table r value of 0.1406. Items with a correlation coefficient equal to or greater than the table r value were considered valid (Soleymanian *et al.*, 2014). The reliability of each dimension was tested at a significance level of 0.05, by observing Cronbach's alpha values. Items were considered reliable if the Cronbach's alpha was greater than 0.6–0.8 (Prahadi, 2022).

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After the questionnaire was completed, a validity test was conducted. The results were used to determine construct validity of the adapted instrument. The validity test of this instrument was conducted on 193 parents who have children aged 6–11 years in the district area in Central Java, because in the central Java region, there are districts that are the locations for the first time administering the COVID-19 vaccine. The results of the validity test of the adaptation questionnaire given to respondents with the value of the r table and r count are shown in Table III.

Table III. Table of Validity and Reliability Tests of the Health Belief Model Adaptation Questionnaire for Parents of Children Aged 6–11 Years

No	Construct	Pearson Correlation	r Tabel	Description	Cronbach's Alpha
1	Perceived susceptibility	0,670 0,804 0,805	0,1406 0,1406 0,1406	Valid Valid Valid	0,637
2	Perceived severity	0,848 0,842 0,796	0,1406 0,1406 0,1406	Valid Valid Valid	0,771
3	Perceived benefit	0,936 0,930	0,1406 0,1406	Valid Valid	0,787
4	Perceived barriers	0,749 0.814 0,852	0,1406 0,1406 0,1406	Valid Valid Valid	0,787
5	Cues to action	0,916 0,896	0,1406 0,1406	Valid Valid	0,780
6	Self-efficacy	0,900 0,858	0,1406 0,1406	Valid valid	0,703

All statements in the HBM adaptation questionnaire for parents of children aged 6–11 years given to 193 respondents were declared valid based on the Pearson Correlation value, because the coefficient value was greater than the r table value (> r table 0.1406; $p < 0.05$) (Tareke *et al*., 2022). Furthermore, each statement item in the HBM construct was tested for reliability by using internal consistency at a significance level of 0.05. The reliability test in this study used Cronbach's alpha with a value of > 0.6 as the limit of reliability that is considered good. The results of the reliability test of the adapted HBM questionnaire for parents of children aged 6–11 years have a Cronbach's alpha value greater than 0.657, which indicates that the HBM questionnaire adapted from Saudi Arabia is reliable because, based on the Cronbach's alpha value, which is greater than 0.6 (Prahadi, 2022).

Discussion

Testing the validity of translation needs to be performed using the concept of cross-cultural adaptation. Cross-cultural adaptation is a process of modifying an instrument into a version that aligns with social and cultural values, including language, without changing the meaning of the original version of the instrument (Putra *et al.*, 2020). Cross-cultural adaptation research for an instrument requires a clear, thorough, and reliable methodology to produce reliable and dependable adaptation (Lino *et al.*, 2017). To the researcher's knowledge, there hasn't been any instrument validation in the Indonesian language regarding the Health Belief Model (HBM) for parents of children aged 6–11 years concerning COVID-19 vaccination. In this article, the researcher validates a questionnaire adapted from Saudi Arabia because the majority of Indonesia's population is Muslim, which is similar to Arab countries, making it assumed that there is similarity in COVID-19 vaccine acceptance in society. The stages in this adaptation process include 5 steps: forward translation, synthesis of translation results, back-translation, review of back-translation, and readability testing. The adaptation process must maintain the original questionnaire's meaning, and one way to do this is through back translation, which serves for validity checking (Beaton *et al.*, 2000). Furthermore, forward and backward translation processes are commonly used by researchers for cultural adaptation. Validation of the translation results is required to ensure the suitability of the measuring tool for local conditions. This is because the original version and the modification of the questionnaire cannot be applied due to cultural and social background differences and Indonesian society's unfamiliarity with this measuring tool. Next, the adapted version will be evaluated based on fundamental measurements, such as validity and reliability (Putra *et al.*, 2020).

This aligns with Beaton *et al*.'s statement that the number of respondents for reliability in cross-cultural research is usually between 30 and 40 individuals (Beaton *et al.*, 2000). The evaluated aspect in this study is construct validity, which assesses the extent to which items in a test or instrument can measure what is intended according to the conceptual definition or specific concept established. Construct validity was assessed using the Pearson's product moment. In the assessment of construct validity, the tabulated r-value for a sample size of 193 was 0.1406. In the construct validity test, the obtained values (Pearson product moment) were greater than the tabled r-value for all questionnaire items. Therefore, it can be concluded that all the questions are valid. The construct validity results for the Health Belief Model questionnaire adapted for parents of children aged 6–11 years in Indonesia have a validity > r-value of 0.1406; $p < 0.05$). Internal consistency reliability is a measure of reliability used to evaluate the extent to which various types of test items that assess the same construct or characteristic produce relatively consistent results. Reliability testing using Cronbach's alpha yielded a value > 0.657, indicating that the instrument was reliable (Ghozali, 2018).

CONCLUSION

The Health Belief Model instrument for parents of children aged 6–11 years towards the administration of the COVID-19 vaccine, which is cross-culturally adapted into Indonesian, is considered valid and reliable for use in research in the population of parents of children aged 6–11 years towards the administration of the COVID-19 vaccine.

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