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Validity and Reliability of Champion's Health Belief Model Scale to Measure Beliefs in Breast Self-Examination Practices in Vietnamese Women

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ABSTRACT

Objective: The purpose of this study was to translate, adjust and evaluate the validity and reliability of the Champion's Health Belief Model scale, so as to measure the beliefs of self-examination practices of Vietnamese women.

Material and Methods: The adaptation and psychometric characteristics test of the Vietnamese HBM scale was performed, with 40 participants, from October 2021 to June 2022. Of these, 10 women were initially randomized to adjust the translation version, and 30 women were to evaluate the reliability of the scale. The content value of the scale is measured by the opinion of 5 experts. Reliability was measured by Cronbach's alpha, while An estimation of stability is commonly assessed by a test–retest reliability analysis (ICC).

Result: The Vietnamese version of the Health Belief Model scale (V-HBMS) demonstrated good content validity, with the Items content validity index (I-CVI) score for all 42 items> 0.79. Internal consistency with Cronbach's alpha ranges from .715 to .954 and the reliability of the ICC re-test ranged from .954-.000 (p-value = 0.000) determined with good results.

Conclusion: The Vietnamese version of the Health Belief Model scale can be considered a valid tool to survey the belief of Vietnamese women in the implementation of breast self-examination behavior.

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INTRODUCTION

Breast cancer is the most common cancer and a hight rate of death among women worldwide [1]. Breast cancer has also become an important public health problem in Vietnam, Breast cancer incidence is increasing steadily, with an estimated more than 15.000 new breast cancer cases annually and 6103 deaths[2]. For women, the leading cancer site in 2025 is predicted to be breast cancer because demographic changes of an aging population coupled and changes in ifestyle[3]. Unfortunately in Vietnamese, 49.5% of women were diagnosed at Stages III & IV[4,5]. Breast cancer in an earlier stage has a better prognosis if treated adequately and has been shown to decrease the mortality level[6,7] and the cost of treatment in the early stage is only 20% compared to the treatment in the late stage[8]. So, Screening programs were really necessary to increase the life expectancy of women with breast cancer in Vietnam. It will not decrease the incidence of breast cancer cases, but it will certainly improve the prognosis and treatment outcomes.

Breast self-examination (BSE) is one of the strategies which can be employed to achieve earlier detection of breast cancer. It is an inexpensive, *safe*, non-invasive, and non-hazardous technique that is simple, does not involve time, and does not depend on the medical staff. *up to 90% of BC cases can be diagnosed early through the patient's monthly BSE practice*.[4–6]. *The American* Cancer Society (ACS) recommends that women around the age of 20 years should perform a BSE every month.[4,7]. Although the benefits are good, only a few Vietnamese women performed BSE regularly[8,9].

*V*ictoria Champion developed the HBM scale the first in 1984-1999 to measure women's breast cancer screening beliefs, and then she revised it to better measure women's breast screening beliefs including breastself-examination

(BSE), mammography or both of these methods. All revisions include testing the content validity and construct validity, as well as the internal consistency and reliability of the test-retest. [10–12] At the same time, the HBM scale has been widely used and proved evidence reliable and valid in many different countries and cultures around the world: [10,13–16] However, in Vietnam, there has not been a publication on the value of this CHBMS. Many researchers has conducted surveys on the knowledge and practice of BSE in Vietnamese women.[8,17] but the tools in these studies were self-designed and have not been published on their reliability and value.

In addition, the development of a reasonable and comprehensive theoretical-based scale is the scientific basis for accurately analyzing the differences between the study groups, thereby providing appropriate medical interventions to improve the screening behavior and prognosis of BC patients.[10] At the same time, to apply a scale to women in other countries, the scale needs to be translated and tested as a new scale to assess whether the translation is reliable and valid for the woman.[15] Therefore, the purpose of this study ware to present the process of transliteration and the results of assessing the reliability and content validity of the Vietnamese version of the CHBMS to measure the belief of Vietnamese women in BSE practice.

METHODS

Design & Setting

From August 2021 to March 2022, we performed a descriptive cross-sectional design. with a simple random method were selected from women who had data from locals in Hai Duong province, Vietnam. Tsang, & et.al.(2017)[18] recommends that the sample size appropriate for pre-pilot testing and pilot testing is 30 -50 samples, so we invited a total of 60 women to participate in the study that was divided into two stages: In phase 1 we collected information from a total of 30 women who participated in the process of adjusting the Vietnamese translation of the HBM scale, and in phase 2 was performed on 30 women for the test-rest reliability. The women were included in the study, if they were: 1) aged over 20 years; 2) not diagnosed with BC; 3) not pregnant or breastfeeding; 4) able to speak, read and write Vietnamese; 5) consenting to participate in the study.

Measurement

The health belief model (HBM)was developed in the 1950s as a behavior prediction model. Champion developed and validated a scale the first in 1984 (Champion's Health Belief Model Scale [CHBMS]). The scale was originally validated in Indiana, United States by Champion in a cohort of 804 women aged 50 years and older in a population of Whites (68%) and African Americans (30%), accounting for 54% of the variance and showing adequate construct validity and reliability. The psychometric parameters obtained were satisfactory. Cronbach's reliability for internal consistency in 6 subscales from 0.80 – 0.93[19]. In the different versions of CHBMS, the 1993 version was the most widely used to measure women's breast screening beliefs including breast self-examination (BSE)[10]. It included 42 items in six subscales: perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, cues to action, and self-efficacy[10]. All items were rated on a 5- Likert scale, from one = 'strongly disagree' to five = 'strongly agree'. Possible scores range from 5–25 for susceptibility; 7-35 for seriousness; 6–30 for benefits; 6–30 for barriers; 7–35 for cues to action and self-efficacy scores range from 11-55. Higher scores indicated stronger agreement.

Translation

Once Victoria Champion granted the permission to modify and use CHBMS (Personal email dated May 5, 2021), translate and use CHBMS into the Vietnamese context and validate the scale among Vietnam women was started by using the forward and backward method based on published methods [20,21]. According to the recommendation of Guillemin & et.al.(1993), the translation has good quality should be from two independent translators[22]. The back-translated and original versions of the CHBMS were compared with attention given to the meaning, grammar, and cultural differences.The cross-cultural adaptation process included six steps[23]: (1) forward translation, (2) synthesis (3) back word translation, (4) pretesting of the translated version with a pilot study, (5) experts committee reviewed all translations to make a prefinal, (6) submission of respective reports, forms, and documents for appraisal, respectively (Figure 1)

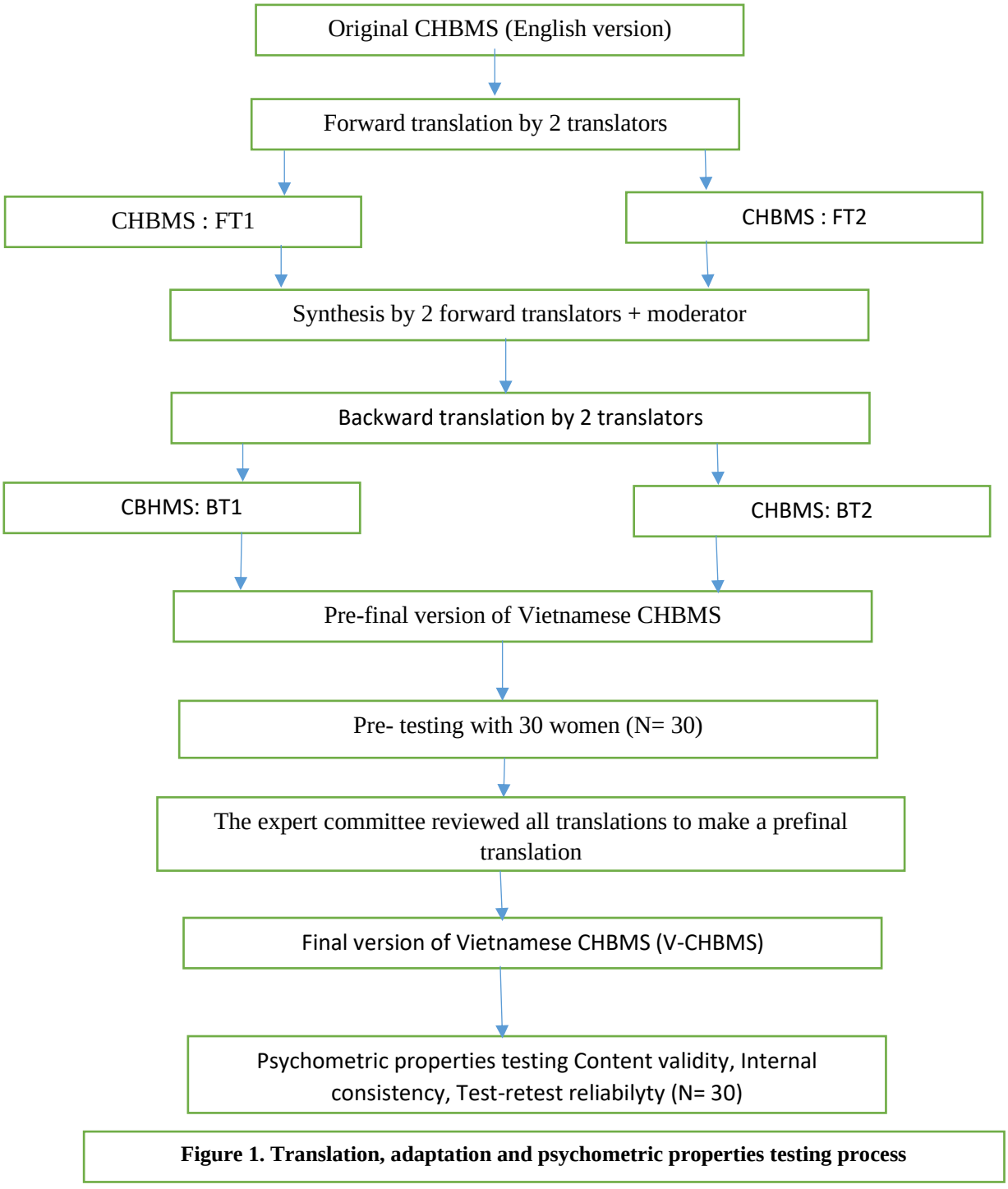

Figure 1. Translation, adaptation and psychometric properties testing process

Face validity

After the back-translation of items into English for an exact match to the original version, the final version is ready to check the validity and reliability tests. An experimental survey was conducted with 30 Vietnamese women to assess the linguistic clarity and cultural appropriateness of the instrument (face validity). They were asked to score the comprehensibility of each item of the instrument. Cognitive questions are given when the interviewer starts by reading the questions and answering options as they appear in the scale, after which the answer is recorded:

(a) Do you understand what is being asked in the scale?

(b) have you had any difficulty selecting the response options?

(c)Any words you don't understand?

(d) Is the question easy or difficult to answer? why?

In any answers "yes", the interviewer asks if there is a better way to express the question. At the end of the interview ask the subject to complete the questionnaire by themselves. The results showed that the participants completed all the questions within 7-10 minutes, with no difficulties related to the Vietnamese version.

Content validity

The relevance of the content of the CHBMS with 42 items related to Vietnamese culture was assessed by experts using content values. At the suggestion of Lynn[24] and Davis[25], in this study, we invited 5 expert panel members including 03 doctors (master's degree - Ph.D.) with experience in BC; 01 public health doctor and 01 nursing doctor who is familiar with the HBM structure and have experience in building and developing a toolkit.

The research team sends to each expert the purpose, theoretical framework of the study, and the questionnaire of the scale to evaluate the Content validity (I-CVI) of each question with 4 levels: 1= not relevant; 2=somewhat relevant; 3= Quite relevant; 4=hightly relevant. Researchers advocating using this approach specify that ratings of 1 and 2 are considered "content invalid," whereas ratings of 3 and 4 are considered content valid"[26]. The I-CVI was compared with thresholds for the clarity of the questions, as >0.79 (clear), 0.70-0.79 (needs correction), <0.70 (should be unusable). If the number of experts was equal to or less than 5, a consensus of all experts was required to demonstrate that the questionnaire achieved content validity (I-CVI=1)[27].

The opinion of experts was largely similar to each other but have some minor word differences suggested modifying such as "I can find a breast tumor the size of a quarter" was modified to "I can find a breast tumor the size of a walnut" and " I can find a breast tumor the size of a dime" was modified to " I can find a breast tumor the size of a marble" were changed because there are no Vietnam coins similar to quarters and dimes but the size of marble and walnut was similar to that of a quarter and a dime, so the marble and walnut were chosen as appropriate translations. At the end of the meeting, a uniform translation in Vietnamese was produced.

Reliability

The internal consistency reliability of the items of the scale was checked using Cronbach's α confidence coefficient. Cronbach's $\alpha \geq 0.7$ is considered acceptable but The item - subscale correlation coefficients were between 0.3 and 0.7[28,29].

The Intraclass correlation coefficient (ICC) was used to Estimation of stability measure commonly assessed by a test–retest reliability analysis. The experiment was repeated twice on the same group of women over a period of two weeks[28], with a two-way mix model consistency method for total score and subscale score. ICC which should be at least 0.6; 0.9 indicate good reliability, and values greater than 0.90 indicate excellent reliability[29,30].

RESULTS

Demography

There were 30 women participated in pilot testing, their mean age was 38.13 ± 11.08, of which 20% were under the age of 50 and most (73.3%, n = 22) of them were married. More than half of the women participating (96.7%, n = 29) had incomes above the minimum income. 50.0% of the participants were farmers, and workers for 36.7%. Regarding the family history of breast cancer, only 6.7%. The detaile was showned in table 1.

Table 1. Socio-demographic characteristics of women in Hai Duong, north Vietnam.

Variables	Frequency (n = 30)	Percent (%)
***Mean age** (SD)*	*38.13 ± 11.08*	
Nhóm tuổi		
≥ 50	*24*	*80*
< 50	*6*	*20*
Woman's educational status		
Less than12th grade	*2*	*10*
Grade 12 complete and diploma 12 grade and Diploma	*22*	*73.3*
BSc and above	*6*	*16.7*
Marital status		
- Single	*8*	*26.7*
- Married	*22*	*73.3*
Profession		
Farmer	*15*	*50*
Worker	*11*	*36.7*
freelance workers	*3*	*10.0*
Students	*1*	*3.3*
Income per month		
< 2 million vn	*1*	*3.3*
>= 2 million vn	*29*	*96.7*
Family history of breast cancer		
yes	*2*	*6.7*
No	*28*	*93.3*

Content Validity

All 42 items of the Vietnamese version of the V- CHBMS questionnaire showed a content validity index higher than 0.79, showing the validity of the content at a goog level (Table 2).

Table 2. Content validity of the V- CHBMS

Item of the V- CHBMS	Obtained score (I-CVI)
Item 1	1 (>0.79)
Item 2	1 (>0.79)
Item 3	1 (>0.79)
Item 4	1 (>0.79)
Item 5	1 (>0.79)
Item 6	1 (>0.79)
Item 7	1 (>0.79)
Item 8	1 (>0.79)
Item 9	1 (>0.79)
Item 10	1 (>0.79)
Item 11	1 (>0.79)
Item 12	1 (>0.79)
Item 13	1 (>0.79)
Item 14	1 (>0.79)
Item 15	1 (>0.79)
Item 16	1 (>0.79)
Item 17	1 (>0.79)
Item 18	1 (>0.79)
Item 19	1 (>0.79)
Item 20	1 (>0.79)
Item 21	1 (>0.79)
Item 22	1 (>0.79)
Item 23	1 (>0.79)
Item 24	1 (>0.79)
Item 25	1 (>0.79)
Item 26	1 (>0.79)
Item 27	1 (>0.79)
Item 28	1 (>0.79)
Item 29	1 (>0.79)
Item 30	1 (>0.79)
Item 31	1 (>0.79)
Item 32	1 (>0.79)
Item 33	1 (>0.79)
Item 34	1 (>0.79)
Item 35	1 (>0.79)
Item 36	1 (>0.79)
Item 37	1 (>0.79)
Item 38	1 (>0.79)
Item 39	1 (>0.79)
Item 40	1 (>0.79)
Item 41	1 (>0.79)
Item 42	1 (>0.79)

(V-CHBMS Vietnameses-Champion'Health belif model scale, I-CVI= the Items Content Validity Index).

Reliability

Table 3 shows that all 42 items with the 6 subscales were retained for the V-CHBMS questionnaire, Cronbach's α for the 6 subscales with all 42-item instruments from .72 to .86. The corrected item-total correlation ranged from 0.32 to 0.68, which means that the items were sufficiently related and contributed to the score measurement.

Table 3. Intenal consistence reliability of V-CHBMS

Các mục con trong thang đo V-CHBMS	Corrected Item-Total correlation	Cronbach's Alpha if Item Deleted
Susceptibility (Cronbachalpha =0. 814)		
Item1	.613	.780
Item 2	.483	.812
Item 3	.601	.778
Item 4	.665	.759
Item 5	.677	.755
Seriousness (Cronbachalpha =0.805)		
Item 6	.618	.768
Item 7	.594	.769
Item 8	.609	.766
Item 9	.478	.792
Item 10	.560	.781
Item 11	.373	.811
Item 12	.601	.768
Benefits-BSE (Cronbachalpha =0.805)		
Item 13	.636	.756
Item 14	.499	.791
Item 15	.688	.744
Item 16	.523	.783
Item 17	.472	.794
Item 18	.569	.774
Barriers-BSE (Cronbachalpha =0.725)		
Item 19	.506	.672
Item 20	.321	.722
Item 21	.580	.647
Item 22	.569	.650
Item 23	.347	.716
Item 24	.422	.698
Health motivaton (Cronbachalpha =0.798)		
Item 25	.537	.771
Item 26	.551	.768
Item 27	.476	.782
Item 28	.576	.765
Item 29	.442	.788
Item 30	.581	.766
Item 31	.577	.763
Self-efficacy (Cronbachalpha =0.863)		
Item 32	.509	.855
Item 33	.636	.848
Item 34	.50	.856
Item 35	.603	.847
Item 36	.665	.842
Item 37	.340	.864
Item 38	.486	.856

Item 39	.633	.845
Item 40	.60	.848
Item 41	.542	.852
Item 42	.650	.844

Test-retest reliability

The Intraclass correlation coefficient was used to measure test-retest reliability (ICC) on 30 women samples. The stability of V- CHBMS was assessed via a two-way mixed effects ICC, ICC of each subscale from 0.762 to 0.904 and the Average Measures for 42 Items was 0.907 (p= .000). (Table 4).

Table 4. Test-retest reliability of V-CHBMS

	Intraclass Correlation	95% Confidence Interval		F Test With True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Average Measures for 42 Item	.907	.852	.948	10.702	29	2407	.000
Susceptibility	0.880	.804	.935	8.344	29	261	.000
Seriousness	0.784	.651	.882	4.629	29	377	.000
Benefits-BSE	0.762	.614	.871	4.210	29	319	.000
Barriers-BSE	0.784	.650	.883	4.635	29	319	.000
Health motivaton	0.799	.676	.891	4.983	29	377	.000
Self-efficacy	0.904	.846	.947	10.393	29	609	.000

DISCUSSION

There were 30 women who participated in pilot testing, their mean age was 38.13 ± 11.08, of which 80% were over 50 years old, and most (73.3%, n = 22) of them were married and Grade 12 complete and diploma 12 grade or Diploma. 50.0% of the participants were farmers and workers for 36.7%. Regarding the family history of breast cancer, only 6.7%. These criteria matched that of the original questionnaire author, Victoria Champion. In this study, we translated based on the strict procedure backward method and 100% of women participating in the trial with the Vietnamese version answered all questions easily. The content validity of the instrument, which was reviewed by an expert panel, the opinion of experts was largely similar to each other for each question and the whole V-CHBMS questionnaire gave I-CVI and Scale content validity index (S-CVI) results that were equal to 1. Therefore, this tool is very common, simple, and suitable for women at the general education level. This conclusion is similar to the versions in some other countries when compared to the English original of Champoin. [14,15]

The internal reliability of V-CHBMS Cronbach's α was calculated in this study, Each subscale had Cronbach's α range from 0.72 to 0.86 was considered an acceptable level, The corrected item-total correlation ranged from 0.32 to 0.68, which means that the items were sufficiently related and contributed to the score measurement. So that no items of the V-CHBMS were removed and repeated. Most of these results are very similar to the original English version of Champion.16 However, a subsection in the Vietnamese version (Barriers-BSE) has Cronbach's (.725) is lower than the original English version of Champion (.88)[19]16 and but quite similar to the Korean version (.74)[15]. This was explained by the different personal and environmental, but Vietnam and South Korea are two countries of the same Asia, so there are many similarities in culture and beliefs.

This study demonstrated that the test-retest reliability indicates a good level with ICC = 0.9 (p=.000) for 42 items and for each subscale the ICC value ranges from 0.762 to 0.904 (p=.000)[30].

This study demonstrated that the test-retest reliability indicates a good level with ICC = 0.9 (p=.000) for 42 items and for each subscale the ICC value ranges from 0.762 to 0.904(p=.000) (ICC) in this study is high compared to some versions in other countries such as Moreira's (2020) study with two Maltese versions from 0.62- 0.76 and English from 0.61- 0.84[31]. In the study of Zelviene et al. (2007), the test-retest reliability for 6 subscales ranged from 0.58-1.00[16]. This is explained by the fact that the women who participated in our study were highly relevant in the two weeks of investigation. This suggests that our women will perform BSE behavior if they believe they are susceptible to BC and are aware of the severity of the disease, and they believe in their ability to be effective when they are aware of the benefits of BSE behavior that will overcome barriers.

LIMITATIONS

In this study, investigators tested the psychometric properties of a translated Vietnamese version of the CHBMS to assess the screening BSE behavior among Vietnamese women. The final instrument contained 6 subscales with 42 items. Now,

this is the first study performed to translate, adapt, and validated the CHBMS in Vietnam. Although our preliminary internal consistency and test–retest reliability correlation scores were relatively similar or higher to those reported in prior validation studies. However, we recognize this study's limitations. First, the study only was done on women living in Hai Duong province, so the results may be not a generalization to women in Vietnam. Second, in the processing of translation without native English language speaker translators, and primary author of CHBMS participated in expert committe. its may be lead to some differences between native English language speakers and the original author. But despite these limitations, our confidence in a rigorous approach to translating and adapting the instrument. We are ready to collect data from the population of Vietnam.

CONCLUSION

The translation, adaptation, and validated evidence of the psychometric properties assessment of the V-CHBMS shows promise of being a valid and reliable instrument that can be used among Vietnam women to assess screening BSE behavior.

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CONFLICT OF INTEREST

The author declares that there are no conflicts of interest in this study.

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