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Thai Translation and Cross-cultural adaptation of the Activities-specific Balance Confidence (ABC) Scale

การแปลแบบประเมิน Activities-specific Balance Confidence (ABC) Scale ฉบับภาษาไทยโดยคำนึงถึงวัฒนธรรมไทย

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Abstract

Fear of falling can influence the ability to perform outdoor activities. Two self-administered measures are recommended for assessing fear of falling; The Fall Efficacy Scale (FES Scale) and the Activities-specific Balance Confidence Scale (ABC Scale). The ABC Scale could assess a variety of activities and environmental contexts with less ceiling effect than the FES Scale but there is no Thai translated version of the ABC scale, resulting in limited implementation of this scale in Thai population. This study aimed to translate, cross-cultural adaptation of the ABC Scale into Thai and to examine its test-retest reliability. This study consisted of two main processes, 1) Thai translation & cross-cultural adaptation and 2) assessing the test-retest reliability of the ABC scale Thai version. The final ABC Thai version was further assessed in 40 Thai elderly subjects twice within one week for its test-retest reliability. Estimation of test-retest reliability was indicated by the intraclass correlation coefficient (ICC3,1). The final Thai version of the ABC scale has been developed. Four items of the ABC scale were modified from the original version to ensure content equivalence and accommodate cultural, environment and climate differences of Thailand. The adjusted items were items 10, 12, 13 by adapting the word "mall" to "mall/market" to fit the lifestyle of elderly in Thai. Item 16 was adapted the word "icy sidewalk" to "slippery sidewalk" to accommodate climate difference in Thailand where there was no snow. Regarding the test-retest reliability, the total ABC score's ICC was 0.99 (95% CI=0.98-0.99) indicating excellent test-retest reliability in elderly persons. Each item of the ABC scale also demonstrated excellent test-retest reliability from the ICC ranged from 0.79-0.96. The ABC Thai version was cross-cultural translated according to the WHO guidelines. This scale showed excellent test-retest reliability in elderly persons.

บทคัดย่อ

การกลัวการหกล้มส่งผลต่อความสามารถในการทำกิจวัตรประจำวัน แบบประเมินตนเองที่นิยมใช้ตรวจประเมินการกลัวการหกล้ม มี 2 แบบประเมิน ได้แก่ แบบประเมิน Fall Efficacy Scale (FES Scale) และแบบประเมิน Activities-specific Balance Confidence (ABC) Scale แบบประเมิน ABC Scale สามารถประเมินการทำกิจกรรมในชีวิตประจำวันได้ครอบคลุมบริบทด้านสภาพแวดล้อม อีกทั้งพบ ceiling effect น้อยกว่าแบบประเมิน FES Scale แต่แบบประเมินนี้ไม่มีการแปลเป็นฉบับภาษาไทย ส่งผลให้เกิดข้อจำกัดในการนำไปใช้ในประเทศไทย วัตถุประสงค์การศึกษา เพื่อแปลปรับแบบประเมิน ABC เป็นภาษาไทยโดยคำนึงถึงวัฒนธรรม และเพื่อทดสอบความน่าเชื่อถือโดยทดสอบซ้ำ การศึกษานี้มี 2 ขั้นตอนหลัก ดังนี้ 1) แปลและปรับแบบประเมิน ABC เป็นฉบับภาษาไทย 2) ทดสอบความเที่ยงโดยการวัดซ้ำ แบบประเมิน ABC ฉบับภาษาไทย ทดสอบซ้ำสองครั้ง ภายใน 1 สัปดาห์ ซึ่งศึกษาในผู้เข้าร่วมวิจัยผู้สูงอายุ 40 คน การประเมินค่าความน่าเชื่อถือโดยทดสอบซ้ำใช้ค่าความเชื่อมั่น (ICC3,1) แบบประเมิน ABC ได้พัฒนาเป็นฉบับภาษาไทยอย่างถูกวิธี แบบประเมิน ABC จำนวน 4 ข้อ มีการปรับจากต้นฉบับเพื่อให้สอดคล้องเหมาะสมทางด้านภาษา วัฒนธรรม วิถีชีวิต และความต่างทางภูมิศาสตร์ของประเทศไทย มีการปรับข้อคำถามที่ 10, 12, 13 ปรับคำว่า "ห้างสรรพสินค้า" เป็น "ห้างสรรพสินค้า/ตลาด" เพื่อให้สอดคล้องกับวิถีชีวิตผู้สูงอายุไทย ข้อ 16 ปรับคำว่า "ทางเดินน้ำแข็ง" เป็น "ทางเดินที่ลื่น" เพื่อปรับความต่างทางภูมิศาสตร์ให้สอดคล้องกับประเทศไทย ที่ไม่มีหิมะ ABC ฉบับภาษาไทย มีความเที่ยงโดยการวัดซ้ำในข้อคำถามทั้งหมด ค่า ICC เท่ากับ 0.99 (95%CI=0.98-0.99) แสดงให้เห็นว่ามีความเที่ยงในการวัดซ้ำในผู้สูงอายุระดับดีเยี่ยม แต่ละข้อคำถามของแบบประเมิน ABC พบว่ามีค่าความเที่ยงในการวัดซ้ำ ICC ช่วงตั้งแต่ 0.79-0.96 แสดงให้เห็นว่ามีค่าความเที่ยงระดับดีเยี่ยม, มีการแปล ปรับตามหลักเกณฑ์ของ WHO และมีความเที่ยงในการวัดซ้ำระดับดีเยี่ยมในผู้สูงอายุ

Keywords: older adults, fear of falling, self-efficacy theory, test retest reliability

คำสำคัญ: ผู้สูงอายุ, การกลัวการหกล้ม, ทฤษฎี self-efficacy, ความน่าเชื่อถือในการทดสอบซ้ำ

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Introduction

In Thailand, according to the survey in 2014 by National Statistical Office, Ministry of Information and Communication Technology, the percentage of falls within 6 months of Thai elderly people was 11.6% in which women (12.8%) fell more than men (10.2%) (NSO, 2014). The circumstances of fall are different between male and female. The majority of male (43.9%) fell during outdoor activities but those of female (39.5%) fell during indoor activities (NSO, 2014). Fall can result in minor to major life-threatening injuries that require immediate attention or hospital admission. Emergency department's visits from fall injuries in Western Australia and the United Kingdom (UK) were also high: 5.5-8.9 per 10,000 population. The rate of hospital admission due to falls for people at the age of 60 and older in Australia, Canada, UK ranged from 1.6 to 3.0 per 10,000 population (WHO, 2007).

Apart from physical injuries, fall can lead to decreased performance in activities of daily living, increased risk of placement in nursing home (Cumming, Salkeld, Thomas, & Szonyi, 2000; Kannus, Sievänen, Palvanen, Järvinen, & Parkkari, 2005; Tinetti & Speechley, 1989) and a few negative psychological consequences such as fear of falling (Howland et al., 1993; Hull, Kneebone, & Farquharson, 2013; Jung, 2008). Such changes in behavior of fallers could be explained by Self-efficacy theory. Based on this theory, the performance of each person is directly related to self-believe of oneself, or perceived self-efficacy (Bandura, 1977). The elderly who had experienced falls showed decrease in perceived self-efficacy as well as demonstrated fear of falling (Jorstad, Hauer, Becker, & Lamb, 2005; Scheffer, Schuurmans, van Dijk, van der Hooft, & de Rooij, 2008). Previous study also demonstrated the relationship between the fear of falling and lower balance confidence (Tinetti, Speechley, & Ginter, 1988). Those elderly who fear of falling were likely to reduce their mobility in order to prevent themselves from fall which led to limited mobility and reduced ability to performed daily activities. As a result, fear of falling will affect their work and social life and eventually become a burden to their family and society (Coimbra, Ricci, Coimbra, & Costallat, 2010; Howland et al., 1993; Shumway-Cook et al., 2009; Yardley & Smith, 2002). Therefore, the detection of fear of falling is necessary for fall management and prevention.

Currently, two common clinical measures are recommended for assessing fear of falling; The Fall Efficacy Scale (FES Scale) (Tinetti, Richman, & Powell, 1990) and the Activities-specific Balance Confidence Scale (ABC Scale) (Powell & Myers, 1995). Both scales are self-administered scale. The FES Scale is the standard measurement to assess fall efficacy related to daily functional activities (Payette, Belanger, Leveille, & Grenier, 2016; Tinetti, Mendes de Leon, Doucette, & Baker, 1994; Tinetti et al., 1990). It consisted of 10 items representing general activities in daily living such as taking a bath or shower, reaching into cabinet or closet, walking around the house (Tinetti et al., 1990). The total score ranges from 10 (best possible) to 100 (worst possible) (Tinetti et al., 1990). The ABC Scale was developed to assess perceived level of confidence in maintaining balance when performing daily function and social activities (Powell & Myers, 1995). ABC Scales was designed to assess subjective balance confidence in ambulatory dwelling older people (Powell & Myers, 1995). The instrument contains 16 items, including the enquiries about indoor and outdoor activities such as walk around the house, step onto an escalator, and walk outside on icy sidewalk (Powell & Myers, 1995). Respondents are requested to specify their level of confidence in performing activity by using a 0% to 100% scale distribution where 100% means completely confident (Powell & Myers, 1995). The interpretation of confidence scores are as follows: more than 80% indicates high level of physical functioning, 50-80% indicates moderate level of physical functioning and less than 50% indicates low level of physical functioning (Myers, Fletcher, Myers, & Sherk, 1998). In addition, the score of ABC scale less than 67% in the elderly is the indicator of future fall (Lajoie, Girard, & Guay, 2002).

The ABC Scale demonstrate good psychometric properties with high internal consistency (Cronbach $\propto$ =0.96), excellent test-retest reliability (r=0.92), good

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convergent validity with physical activities subscale of the physical self-efficacy scales (r=0.63) and discriminant validity between fallers and non-fallers (Powell & Myers, 1995). The Meta Analytic Review demonstrated an actual link between FES and ABC scales for performing daily functional activities (Schepens, Sen, Painter, & Murphy, 2012). However, there are some differences between these two scales (Schepens et al., 2012). The ABC Scale could assess more variety of activities and environmental contexts than the FES Scale (Schepens et al., 2012). Moreover, in contrast to the ABC scale, the FES scale showed ceiling effect in high mobility subjects (Tinetti et al., 1990). These make the ABC scale more popular to be used in both research and clinic.

As the ABC scale is the self-administered scale, the language of the scale needs to be understandable for the target population. Many countries that do not use English as the native language have translated and adapted the questions and activities in the ABC scale based on their culture. There are Canadian (Salbach, Mayo, Hanley, Richards, & Wood-Dauphinee, 2006), Chinese (Mak, Lau, Law, Cheung, & Wong, 2007), Brazilian-Portuguese (Marques, Mendes, Taddei, Pereira, & Assumpcao, 2013), Turkish (Karapolat et al., 2010), Spanish (Montilla-Ibanez et al., 2017), Swedish (Ylva & Anette, 2012), German (Schott, 2008) and Dutch (van Heuvelen et al., 2005) versions of the ABC scale. However, there is no Thai translated version of the ABC scale, leading to limited implementation of this scale in Thai population. Therefore, the purpose of this study is to translate, cross-cultural adaptation of the Activities-specific Balance Confidence (ABC) Scale into Thai and to examine its test-retest reliability.

Methodology

There were two parts of this study. The first part was the process of translation and cross-cultural adaptation of the ABC in Thai and the second part was the process of the testing the psychometric properties; test-retest reliability of the ABC scale Thai version in Thai elderly subjects. In phase 1, starting with forward translation, two independent translators who are fluent in both Thai and English languages translated English version of the ABC scale into Thai version.

Translator 1 was the one who have knowledge in the medical related field and aware of the content of ABC Scale. The translator 2 was not the person in the medical related field (Beaton, Bombardier, Guillemin, & Ferraz, 2000; Guillemin, Bombardier, & Beaton, 1993). The comments during the translation was recorded. Researchers compared the draft of the translated version. When there is any disagreement in the translation, researchers discussed to determine the choice of words to be used in the translated version. The next step was backward translation: Another two independent translators who are fluent in both Thai and English languages translated Thai version of the ABC scale into the English version. Translator 1 was the one who have knowledge in the medical related field and aware of the content of ABC Scale. The translator 2 was the person in the medical related field (Beaton et al., 2000; Guillemin et al., 1993). The comments during the translation recorded and the researchers compared the draft of the translated version. When there is any disagreement in the translation, researchers discussed to determine the choice of words to be used in the translated version.

Once the backward translation was completed, the next step was committee review. Eleven experts in the field were selected and invited form a committee to review the translated version of the ABC scale. Two experts reviewed the content of scale, whereas the other experts who are fluent in the language compared the ABC scale original English version with the ABC scale Final English version. The adjustments or corrections (if any) was made by the committee to represent the accuracy of the content and the meaning of the scale. The pre-final version of the ABC scale Thai version obtained as the result of this process. The pre-final version of the ABC Scale Thai version was piloted in the targeted population for its instruction, items and response format clarity. This process was performed in 20 elderly participants (Beaton et al., 2000; Guillemin et al., 1993; Sousa & Rojjanasrirat, 2011). All participants were screened using the inclusion & exclusion as listed in the following section. The primary investigator read the instruction and testing items of the scale to each participant.

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The response and in-depth comments were recorded. After the final adjustments of the scale (if any), the Thai version of the ABC scale was ready for further psychometric testing. The summary of the translation process shown in figure 1.
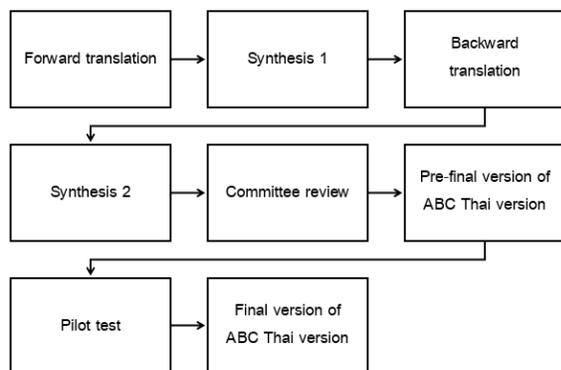
Figure 1. the summary of the translation process

The test retest reliability was carried out in elderly persons. The elderly participants were recruited from Klong Luang District, Pathum Thani Province, Thailand. There was randomly selected using random programs from the list appearing in the house registration of 40 persons. The recruitment period was from July 2017 to January 2018. All subjected were screened by a physical therapist. The elderly subjects were healthy older adult persons, male and females, aged between 60-85 years. The inclusion criteria were as follows: older adult aged 60-85 years from Klong Luang District, Pathum Thani Province, Thailand, able to understand Thai language, able to walk independently at least 3 meters. The exclusion criteria were as follows: poor communication & cooperation, blind or having hearing loss, having Neurological diseases such as Parkinson's disease, stroke and having cognitive impairment (Mini-Mental State Examination score Thai version < 24 score) (Crum, Anthony, Bassett, & Folstein, 1993; Folstein, Folstein, & McHugh, 1975; Folstein, Robins, & Helzer, 1983).

Forty participants were tested for test retest reliability. The sample size for the reliability study was selected according to the COSMIN checklist (Mokkink et al., 2010) where 40 participants would be sufficiently to obtain fair reliability (Mokkink et al., 2010). All participants gave inform consent prior to the study. This study received ethical approval of the human research protection committee at Public health office Pathum Thani province and from ethic review board at the Faculty of Physical Therapy, at Srinakharinwirot University, Thailand. Prior to the data collection, common data included history of health, history of fall, fear of falling using the questionnaire were collected. Basic cognitive function was assessed in each participant using Mini-Mental State Examination Thai version. The test-retest reliability study, all participants were interviewed twice one week apart using the ABC scale Thai version. All collected data was analyzed using statistics software SPSS 23 version. Intraclass correlation coefficient was used to estimate the test retest reliability (ICC3,1) using the following criteria poor= ICC < 0.40; adequate= 0.40≤ICC≤0.75; excellent=ICC > 0.75) (Fleiss & Shrout, 1978).

Results

Translation and cross-cultural adaptation of the ABC scale

Some items of ABC English version have been modified to accommodate cultural differences. Those cultural adapted items are shown in Table 1 where the modification has been bolded. In items 10, 12 and 13, the word "mall' has been adapted to "mall/market" to fit the lifestyle of Thai community. Item 16 was cultural modified to "walk outside on slippery sidewalks" from "walk outside on icy sidewalks" due to different geography of Thailand. The final Thai version of ABC scale is shown in Appendix A.

Table 1 the comparison of original and cultural adapted items in the cross-cultural adaptation of the ABC scale Thai version

Items	Original Items of the ABC Scale	Modified Items of the ABC Thai version
10	Walk across a parking lot to the mall	Walk across a parking lot to the mall/market
12	Walk in a crowded mall where people rapidly walk past you	Walk in a crowded mall/market where people rapidly walk past you
13	Are bumped into by people as you walk through the mall	Are bumped into people as you walk through the mall/market
16	Walk outside on icy sidewalks	Walk outside on slippery sidewalks

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The characteristics of the participants are shown in Table 2. Out of 40 participants in this study, there were more male participants than female but there were no age differences between these two genders. All participants had body mass index within normal range. More than half of participants reported no history of fall. Those with fall history were with multiple falls than single falls where they felt indoor more than outdoor. All participants had no cognitive impairments as seen by the score of TMSE.

Table 2 Characteristics of subjects (n=40)

Variables	Mean ± SD or N (%)	Range
Age (years)	66.5 ± 5.7	60.0-80.0
Male	66.1 ± 5.6	60.0-77.0
Female	67.1 ± 5.9	60.0-80.0
Gender		
Male	24 (60.0%)	-
Female	16 (40.0%)	
BMI	24.1 ± 4.7	15.0-36.0
Education		
Primary education	35 (87.5%)	-
Secondary education	5 (12.5%)	
Fall history (in the past 12 months)		-
No	25 (62.5%)	
Yes	15 (37.5%)	
Number of fall		
One fall	5 (12.5%)	
Two or more falls	10 (25.0%)	-
Place of fall		
Indoor	9 (22.5%)	
Outdoor	6 (15.0%)	-
TMSE /30	28.3 ± 1.5	25.0-30.0
ABC /100	79.9 ± 16.0	35.6-100.0

BMI = Body mass index, TMSE = Mini mental status examination Thai version, ABC = Activities-specific Balance Confidence scale

Test-retest Reliability of ABC scale Thai version

The test retest reliability of the ABC Thai version is shown in Table 3. The test retest reliability of total ABC scores was excellent as indicated by an ICC of 0.99 (95% confidence interval, 0.98-0.99). When considering each item of the ABC Thai version, the ICC values of each item were ranged from 0.79-0.96, indicating excellent test-retest reliability.

Table 3 Item analysis of the Activities specific balance confidence (ABC) scale Thai version: test-retest reliability

Items	ICC	95% CI	
		Lower bound	Upper bound
Total ABC	0.99	0.98	0.99
ABC1	0.92	0.85	0.96
ABC2	0.94	0.89	0.97
ABC3	0.89	0.8	0.94
ABC4	0.89	0.8	0.94
ABC5	0.8	0.65	0.89
ABC6	0.88	0.78	0.93
ABC7	0.86	0.76	0.93
ABC8	0.92	0.85	0.96
ABC9	0.89	0.8	0.94
ABC10	0.79	0.64	0.89
ABC11	0.93	0.88	0.96
ABC12	0.96	0.92	0.98
ABC13	0.94	0.89	0.97
ABC14	0.9	0.83	0.95
ABC15	0.88	0.78	0.93
ABC16	0.84	0.72	0.91

Discussion and Conclusion

This study developed the Thai version of the Activities-specific Balance Confidence (ABC) Scale using cross-cultural translation method as suggested by the WHO guidelines (WHO, 2007). The process of forward and backward translations as well as expert panel and cognitive interview put more focus on the cross-cultural and conceptual equivalence rather than on linguistic and literal equivalence

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to ensure that the translated version was conceptually equivalent in Thailand as in the country of ABC scale origin.

We presented in this paper the ABC Thai version that was adjusted to the environment, lifestyle and climate of Thailand. The result of this cross-cultural translation demonstrated that four items of the final ABC Thai version differed from the origin ABC scale that was developed in Canada by Powell and Myers in 1995 (Powell & Myers, 1995). The adjustments were mainly in the adaptation of "mall" in item 10, 12 and 13 to "mall/ market" because the majority of elderly people in Thai community frequently went to the market more than the mall. Our adjustment during translation of the word "mall" in item 10,12 and 13 were similar to the cross-cultural translation of the ABC Brazilian-Protuguese version (Marques et al., 2013) possibly due to the same lifestyle and culture of elderly participants in these two countries. Another adjustment was in item 16 due to the climate differences between Canada and Thailand where there is no snow. Therefore, our ABC Thai version adapted the "icy sidewalk" to "slippery sidewalk" which was similar to the other versions of the ABC scale that was translated in the countries that had no snow such as the ABC Chinese Cantonese version (Mak et al., 2007), Brazilian-Protuguese version (Marques et al., 2013) and Turkish version (Karapolat et al., 2010).

In addition, the ABC Thai version demonstrated excellent test-retest reliability with an ICC of 0.99 (0.98-0.99). The excellent test-retest reliability of the ABC scale Thai version was in accordance with the test-retest reliability of the other versions of the ABC, for example, ICC 0.92 of the ABC Scale original version (Powell & Myers, 1995), 0.98 of the Chinese Mandarin version (Guan et al., 2012), 0.99 of the Chinese Cantonese version (Mak et al., 2007) and 0.99 of the Turkish version (Karapolat et al., 2010). In the Thai version, not only the total scale showed excellent test-retest reliability, but each item of the ABC scale Thai version also demonstrated excellent test-retest reliability ranging from 0.79 to 0.96. The lowest ICC value (0.79) was in the item 10 (walk across a parking lot to the mall/market) and item 5 (stand on your tiptoes and reach for something above your head) because these two activities may not be commonly performed in all elderly participants, so they had to use their imagination to answer the items, resulting in lower test-retest reliability. Nevertheless, excellent test-retest reliability of each item would allow the consistency when administering the ABC scale to assess the fear of falling in Thai elderly.

This study has some limitations. The test-retest reliability testing was performed in the elderly participants who lived in the rural community and for those who were very active in daily activities. Future study should cover the elderly persons who live in the city or those who are frail. In addition, only test-retest reliability has been reported in this study. Further studies should be performed to test other psychometric properties such as internal consistency and validity of the ABC Thai version. The ABC Thai version was cross-cultural translated according to the WHO guidelines. This scale showed excellent test-retest reliability in elderly persons.

Acknowledgements

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