Cross-cultural adaptation of the foot care confidence scale into Thai and relationship between the foot care confidence scale and foot care behavior in people with diabetes

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Background   :   *Diabetic foot care is a part of basic self-care for people with diabetes. The Foot Care Confidence Scale (FCCS), as a subjective measure, designed to measure foot care self-beliefs of people with diabetes, was previously introduced and used for assessing people with diabetes's confidence in carrying out foot care activities. However, there is a lack of such instrument for use in people with diabetes. It will be useful for assessing the confidence of foot care self-efficacy in people with diabetes.*

Objective   :   *To cross-culturally adapt the Foot Care Confidence Scale into Thai and to test the reliability of Thai-FCCS and Thai foot care behavior with questionnaires. Additionally, the relationship between foot care self-efficacy and foot care behavior in Thai people with diabetes was investigated.*

Design   :   *A cross – sectional descriptive study.*

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Setting   : *Bangjak Community, Samutprakarn province*

Materials and Methods   : *The English FCCS questionnaire was translated with forward/ backward translation process into Thai language. Meanwhile, a foot care behavior questionnaire was adapted from the recommendation of the National Diabetes Education Program (NDEP) combined with some items obtained from the Perrin's foot care behavior questionnaire. Thirty people with diabetes were interviewed with the Thai-FCCS and the foot care behavior questionnaire on two occasions separated by a time interval of two weeks for test-retest reliability. Internal consistency of the two questionnaires and the relationship between foot care self-efficacy and foot care behavior were tested in 373 people with diabetes.*

Results   : *The test-retest reliability and the internal consistency of the Thai-FCCS were acceptable with an intraclass correlation coefficient (ICC) of 0.733 (p <0.0001) and a Cronbach's alpha coefficient (CA) of 0.877. The foot care behavior questionnaire showed good test-retest reliability with an ICC of 0.808 (p <0.0001), while its internal consistency was moderate with a CA of 0.667. A weak relationship between foot care self-efficacy and foot care behavior among 373 people with diabetes was found with Pearson product-moment correlation coefficient of 0.155 (p = 0.003).*

Conclusion   : *The Thai version of the FCCS and the Thai foot care behavior questionnaires were reliable. Therefore, both questionnaires can be used for assessing confidence and practice of foot care in Thai people with diabetes. However, there was a weak relationship between foot care self-efficacy and foot care behavior.*

Keywords   : *Diabetes, diabetes foot, foot care self-efficacy, reliability.*

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เหตุผลของการทำวิจัย : *การดูแลเท้าเป็นส่วนหนึ่งของการดูแลตนเองในผู้ป่วยเบาหวาน ทั้งนี้*
ความมั่นใจเป็นส่วนหนึ่งที่สำคัญของการดูแลเท้า แบบประเมินความมั่นใจ
ในการดูแลเท้านี้จึงถูกสร้างขึ้น เพื่อวัดความมั่นใจของผู้ป่วยเบาหวานใน
การดูแลเท้าด้วยตนเอง แต่อย่างไรก็ตามยังขาดแคลนเครื่องมือดังกล่าว
ฉบับภาษาไทย ซึ่งจะได้ใช้ประโยชน์ในการประเมินความมั่นใจในการดูแล
เท้าด้วยตนเองสำหรับผู้ป่วยเบาหวานต่อไป

วัตถุประสงค์   : *เพื่อแปลแบบประเมินความมั่นใจในการดูแลเท้าในผู้ป่วยเบาหวานจาก*
ภาษาอังกฤษเป็นภาษาไทยผ่านกระบวนการปรับข้ามทางวัฒนธรรม หา
ความน่าเชื่อถือของแบบประเมินความมั่นใจในการดูแลเท้า และแบบประเมิน
พฤติกรรมในการดูแลเท้าฉบับภาษาไทย และหาความสัมพันธ์ระหว่าง
ความมั่นใจ และพฤติกรรมในการดูแลเท้าในผู้ป่วยเบาหวาน

วิธีการศึกษา   : *แปลแบบประเมินความมั่นใจในการดูแลเท้าผ่านกระบวนการปรับข้ามทาง*
วัฒนธรรมจากภาษาอังกฤษเป็นภาษาไทย ในขณะเดียวกันทีมผู้วิจัยได้
สร้างแบบประเมินพฤติกรรมการดูแลเท้าในผู้ป่วยเบาหวาน โดยปรับสร้าง
จากคำแนะนำของ National Diabetes Education Program ร่วมกับแบบ
ประเมินจากการศึกษาของ Perrin ที่ผ่านมา โดยเก็บข้อมูลด้วยแบบประเมิน
ทั้งสองด้วยการสัมภาษณ์ผู้ป่วยเบาหวานในชุมชนบางจาก จำนวน 30 คน
เพื่อหาความน่าเชื่อถือโดยการวัดซ้ำ 2 ครั้งห่างกันระยะเวลา 2 สัปดาห์
และสัมภาษณ์ผู้ป่วย 373 คน เพื่อหาความสอดคล้องภายในของแบบ
ประเมินทั้งสองชุด และหาความสัมพันธ์ระหว่างแบบประเมินทั้งสอง

รูปแบบการวิจัย   : *การศึกษาวิจัยเชิงพรรณนา ณ จุดเวลาใดเวลาหนึ่ง*
สถานที่ทำการศึกษา : *ชุมชนบางจาก จังหวัดสมุทรปราการ*
ผลการศึกษา   : *ความน่าเชื่อถือในการวัดซ้ำและความสอดคล้องภายในของแบบประเมิน*
ความมั่นใจการดูแลเท้าฉบับภาษาไทยอยู่ในระดับที่ยอมรับได้ โดยค่า
Intraclass correlation coefficient (ICC) เท่ากับ 0.733 (p <0.0001)
และค่า Cronbach's alpha coefficient (CA) เท่ากับ 0.877 สำหรับ
แบบประเมินพฤติกรรมในการดูแลเท้ามีค่าความน่าเชื่อถืออยู่ในระดับดี

โดยมีค่า ICC เท่ากับ 0.808 (p <0.0001) และค่าความสอดคล้องภายใน CA เท่ากับ 0.667 ซึ่งอยู่ในระดับปานกลาง ทั้งนี้ความสัมพันธ์ระหว่างพฤติกรรมการดูแลเท้าด้วยตนเองในผู้ป่วยเบาหวานและความมั่นใจในการดูแลเท้านั้นอยู่ในระดับต่ำที่ค่าสัมประสิทธ์สหสัมพันธ์เพียร์สันโปรดัคโมเมนต์เท่ากับ 0.155 (p = 0.003)

สรุป : แบบประเมินความมั่นใจการดูแลเท้าฉบับภาษาไทยและแบบประเมินพฤติกรรมในการดูแลเท้าในผู้ป่วยเบาหวานมีความน่าเชื่อถือ จึงสามารถนำไปใช้เพื่อประเมินความมั่นใจและพฤติกรรมการดูแลเท้าในผู้ป่วยเบาหวานไทยได้ โดยความสัมพันธ์ระหว่างความมั่นใจและพฤติกรรมในการดูแลเท้าอยู่ในระดับต่ำ

คำสำคัญ : เบาหวาน, เท้าเบาหวาน, ความมั่นใจในการดูแลเท้าด้วยตนเอง, ความน่าเชื่อถือ.

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The prevalences of diabetes and impaired fasting glucose (IFG) in Thailand have been reported as 6.7% and 12.5%, respectively. This equates to an estimated 3.0 million for diabetes and 5.6 million for IFG. [1] Diabetic peripheral neuropathy is very common complication affecting up to 50% of patients[2] and leading to development of foot ulcer. [3] Diabetic peripheral neuropathy is associated with the high risk of amputation of the lower extremity.[4] Guidelines on the management of diabetic foot have recommended that all people with diabetes should receive enhanced foot care knowledge for preventing foot complications.[5, 6] However, people with diabetes adherence to specific behaviors which require lifestyle changestend to be difficult.[7] Self-efficacy has been shown to be an important and an effective predictor of adherence in the self-care management[8-12] such as on diet,[13] physical activity[14] and foot care.[15]

Self-efficacy belief is concerned with judgment of one's ability to organize and execute given types of performances which points toward the goals that people set for themselves and their performance achievement. Self-efficacy is as part of personal factors of triadic reciprocal causation determining the relationship between personal factor, external environment and behavior.[16]

Specific to foot care self-efficacy measurement, Sloan (2002) has developed a subjective instrument to measure foot care self-efficacy called Foot Care Confidence Scale (FCCS) guided by Bandura's self-efficacy theory. The original version of FCCS had a Cronbach's alpha coefficient (CA) of 0.92 and total of 100% content validity using content validity index. FCCS is used to measure foot care self-efficacy beliefs of people with diabetes, to evaluate and improve outcomes of confidence self-care of the feet. [15, 17] The FCCS consists of 12 items related to the confidence of diabetes foot-care. For each item, a Likert scale with 5 statements (strongly not confident, moderately not confident, confident, moderately confident, and strongly confident) is used to response the foot care confidence level. [17] The FCCS has been used in previous research in America,[16] Australia,[17] and Iran.[18]

Previously, Perrin (2009) applied the FCCS to investigate the relationships between foot care self-efficacy beliefs and foot care behavior in diabetes with peripheral neuropathy. In Iran, FCCS was used by Hamedan (2011) to determine the relationships between foot care self-efficacy beliefs and foot care behavior in Iranian people with diabetes. Both of them, Perrin and Hamedan, found a weak relationship between foot care confidence and foot care behavior. There is no published Thai version of foot care confidence questionnaire. A cross-cultural adaptation of such instrument must be performed before it can be accepted for clinical use and for cross-culturally comparison in various countries. Therefore, the objectives of this study were to translate and adapt a Thai version of FCCS, to develop a Thai foot care behavior questionnaire, to investigate the test-retest reliability and internal consistency of both questionnaires, and to investigate a relationship between foot care self-efficacy and foot care behavior.

Method

The current study was carried out from June 2011 to June 2012 in two phases: instrument development and evaluation of instrument reliability. Subject samples were Thai people with diabetes living

in community located in Bangkok and suburban areas. Inclusion criteria for all subject recruitment were: 1) age > 18 years, and 2) having type 2 diabetes. People who cannot understand Thai language were excluded. Before recruitment, the potential subjects were given an informed consent form at the beginning of the study.

Phases I: Instrument development
Translation and adaptation of Thai-FCCS questionnaire

The original FCCS in English contained of twelve items that were designed to combine the three dimensions of self-efficacy: magnitude, strength and generality.[16] In each item, a five-point Likert scale was used to response to a statement concerning foot care confidence including the following responses: "strongly not confident", "moderately not confident", "confident", "moderately confident", and "strongly confident". As instructed by Sloan (2002), the highest possible score could be sixty, and higher score indicated a higher level of self-efficacy beliefs.

A Thai version of FCCS was developed using the most frequently recommended systematic approach called a cross-cultural adaptation.[19-22] The translation and cross-cultural adaptation of FCCS was carried out from June 2011 to December 2011.

Stage I: Initial translation

Initially, three bilingual translators whose mother tongue was Thai produced the independent translations. The three translators included the main researcher who was informed of the concepts being covered by the questionnaire, a Thai physical therapist who considered the words used in the

questionnaire from the therapist's attitude, and a naive translator who produced a translation that reflected the language used. The three translations were then directly compared to determine the differences regarding the word usage. Subsequently, the consensual version obtained from the three translations was produced as the first draft of Thai-FCCS.

Stage II: Back translation

The first draft of Thai-FCCS was translated back into English language by 2 independent naive English speakers who understood Thai language and did not have previous knowledge of FCCS. This stage was a process that reflects the same content as an original version regarding the content and instruct of each question and each response continuum.

Stage III: Expert Committee review

The expert committee consisted of one senior academic physiotherapist, one senior clinical physiotherapist and one physician of rehabilitation medicine. The committee developed the pre-final Thai FCCS by comparing between the original and the two independent back-translation versions. The equivalence, idiomatic, experiential and conceptual issues were goal of this stage. Once any discrepancy was detected between the original and the back translated versions, the committee would evaluate the significance of the discrepancies and resolved to establish the pre-final Thai FCCS.

Stage IV: Test of the pre-final version

The pre-final Thai version of FCCS was tested in 68 people with diabetes regarding the accuracy of

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wording and the ease of understanding. Each subject completed the questionnaire using the interview method. They were asked to comment on the questionnaire and identify any words that might be difficult for them to understand. The interviewer also noted any problems that happened during the interview. From this test, incombination with the committee's instruction, the final version of FCCS in Thai language was developed. Figure 1 demonstrates Thai-FCCS cross-cultural adaptation procedure.
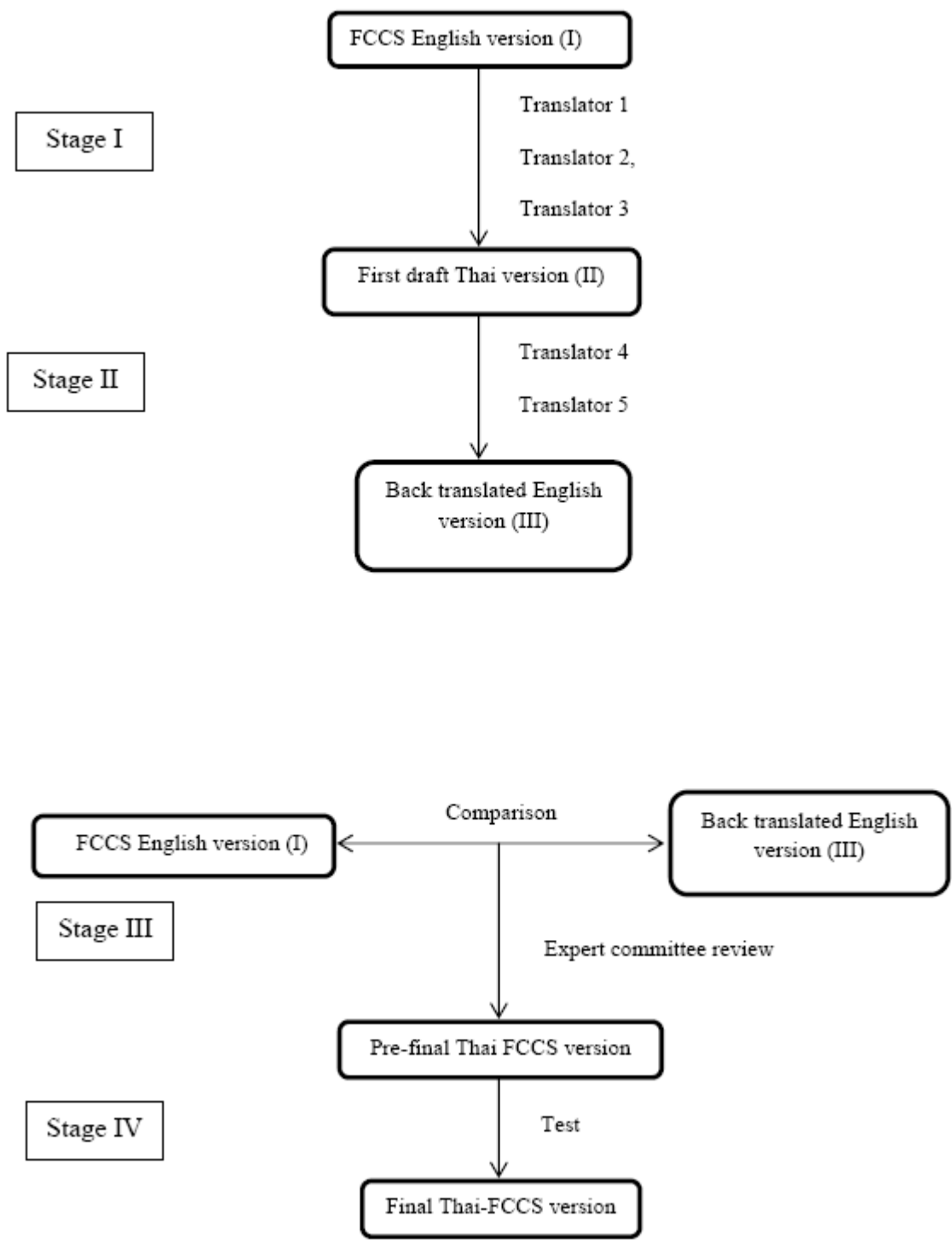

Figure 1. Flow diagram of Thai-FCCS cross-culturally adapt procedure

Development of Thai foot care behavior questionnaire

       TheThai foot care behavior questionnaire was derived from the recommendations documented in "Feet Can Last a Lifetime"; a guideline for foot care practice which was produced by the National Institutes of Health, the Centers for Disease Control and Prevention Guideline combined with some items obtained from the Perrin's foot care behavior questionnaire.[17] In the Perrin's questionnaire, various common foot care behaviors were grouped into two domains: preventative and potentially damaging behavior domains. However, Perrin found no relationship between FCCS and the potentially damaging behavior domain.[17] Therefore, only the preventative behavior domain of foot care was included to produce the Thai foot care behavior questionnaire. To ensure content validity, the questionnaire was reviewed by the expert committee. The committee was required to determine if the questionnaire appeared to measure levels of foot care behavior. Additionally, they were asked if the questionnaire could cover all foot care behaviors that the diabetic patients should regularly perform. All the comments obtained from the committee were considered by the researcher team for the revision of the questionnaire. Afterwards, the revised version was tested in ten subjects with diabetes regarding wording, clarity, and the simplicity of application. Based on the subject comments and suggestions, the final version of the questionnaire was then accomplished.

       The questionnaire consisted of 15 items concerning foot care behavior performed by people with diabetes. Thirteen items, from Item 1 to Item 13, were designed to ask people with diabetes either those who had never had foot ulcer or those with past or present history of foot ulcer. The other two items, Items 14 and 15, were designed to ask only for diabetes patients who were currently having foot ulcer or those who had previous history of foot ulcer. All the 15 items required respondents to indicate the frequency of their performance in foot care behavior. In order to give response to each behavior, two different types of four-point scales were used. Certain foot care behaviors such as washing, or investigating the foot required the respondents to rate their frequency as every day, every other day, once to twice a week, or never. Meanwhile, other behaviors such as using lotion after washing, cutting nail, or removing callus required the respondents to rate their frequency in doing as: always, most of the time, occasionally, or never. Because of differences in the type of scale and its associated scoring methods, a response of each item was converted to be a scale that ranged from 0-1 before summating scores. After re-coding, higher scores indicated more preventative foot behaviors.

Phase II: Evaluation of instrument reliability

Test-retest reliability study

       The second phase examined the reliability of the Thai version of FCCS and Thai foot care behavior questionnaire. Regarding the study of the test-retest reliability, thirty consecutive people with diabetes were interviewed by the main researcher twice with a 2-week period interval. Data collection of the test-retest reliability study was conducted between December 2011 and January 2012.

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Internal consistency study

To examine the internal consistency of the Thai-FCCS and Thai foot care behavior questionnaire, 373 people with diabetes in the community which had the same criteria as reliability study were interviewed by the main researcher. Apart from this, the correlation between Thai-FCCS and Thai foot care behavior questionnaire was determined. Data collection of the internal consistency study was conducted between May and June 2012.

Statistical analysis

Subject characteristics were calculated and presented with percentage, as well as mean and standard deviation (SD). In the present study, each subject was interviewed by the same researcher to prevent any error of bias from observer variation. Intraclass correlation coefficient (ICC) was calculated to determine test-retest reliability. Regarding the data analysis, the ICC values <0.5 indicate poor reliability: 0.5 - 0.75 indicate moderate reliability: and, >0.75 indicate good reliability.[23] The internal consistency reliability presents the correlation of the items in the scale to certify that they measure the same variable.[24] CA was assessed for internal consistency. CA can vary from 0 - 1, with the higher the CA values, the higher the reliability.[24] The CA values $\geq$ 0.6 and <0.9 are considered acceptable internal consistency.[25] To determine the relationship between FCCS scores and foot care behavior scores, Pearson product-moment correlation coefficient (*r*) of correlation was estimated to measure the linear correlation between two variables. Where 1 is total positive correlation; 0 is no correlation; and -1 is total negative correlation.[26] The significant level was set at 0.05. All statistical analyses

were performed using the Statistical Package for the Social Sciences software, version 17.0 (SPSS Inc, Chicago, IL, USA).

Results

Of the 30 subjects who participated in the test-retest reliability study, all of them had diabetes type 2 with mean body mass indexes (BMI) of 26.36 $\pm$ 3.93 kg/m^2 (range, 19.10 - 35.46 kg/m^2). There were 9 male and 21 female patients. The mean age of the subjects was 60.20 $\pm$ 10.27 years (range, 35 - 76 years). The mean duration of having diabetes was 5.60 $\pm$ 4.95 years (range, 1 - 20 years).

The demographic and clinical data of 373 patients with diabetes participated in the internal consistency study are shown in Table 1. Seventy-nine percent of the subjects were female. The mean age of the subjects was 62.34 $\pm$ 9.70 years (range, 16 - 92 years) with the mean BMI of 26.40 $\pm$ 4.28 kg/m^2 (range, 16.00 - 40.79 kg/m^2). The mean duration of having diabetes was 7.36 $\pm$ 6.17 years (range, 1 - 39 years). Most subjects completed their primary school (80.43%) and were non-smokers (89.01%). As for the frequency of exercise participation, almost 50% were rarely engaged in any type of exercise, whereas approximately 30% reported of doing exercise at least once a week. Having classified the subjects into two groups, according to the occurrence of foot complication, the result showed that 217 subjects (58.18%) had foot complications. Foot complications were considered as having at least one of the following foot and toe skin conditions candida: dryness, callus, crack, ulcers, redness, swelling, or Charcot foot. This subject group had a moderate level of self-efficacy beliefs with the mean of FCCS of 38.72 $\pm$ 6.88 scores.

Table 1. Demographic and clinical characteristics of 373 subjects in the internal consistency
study.

Characteristics	Patients (n = 373)
Age (years), ± SD	62.34 ± 9.70
Duration of diabetes (years), ± SD	7.36 ± 6.17
Gender (male/female)	78/295 (20.91/79.09)
BMI (kg/m^2), ± SD	26.40 ± 4.28
Education level (%)	
None	25 (6.70)
Primary school	300 (80.43)
Secondary school	33 (8.85)
Bachelor and above	15 (4.02)
Smoking (%)	
Non-smoker	332 (89.01)
Ex-smoker	27 (7.24)
Current smoker	14 (3.75)
Exercise frequency (%)	
None	74 (19.84)
Rarely	186 (49.87)
1-2 times per week	18 (4.83)
3-4 times per week	45 (12.06)
5 times per week and more	50 (13.40)
Having foot complications (yes/no)	217/156 (58.18/41.82)
Average score of FCCS, ± SD	38.72 ± 6.88
Average score of foot care behavior questionnaire, ± SD	0.70 ± 0.15

Also, they had moderate level of preventative foot behaviors with the mean of foot care behavior score of 0.70 ± 0.15.

As for each subject, face-to-face interview was carried out and completed in 15 - 20 minutes. Table 2 presents the reliability and internal consistency of the Thai questionnaires. The Thai-FCCS demonstrated moderate 2-week test-retest reliability with an ICC of 0.733 (p <0.0001), and high internal consistency with a CA of 0.877 (p <0.0001). The Thai foot care behavior questionnaire showed good test-retest reliability with an ICC of 0.808 (p <0.0001), while its internal consistency was moderate with a CA of 0.667. A weak relationship between Thai-FCCS scores and foot care behavior scores of all participants was found with of 0.155 (p = 0.003). However, the results showed that the relationship between foot care self-efficacy and foot care behavior in subjects with foot complications was more significant than that in subjects without foot complications, as seen in Table 3.

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Table 2. Reliability study of the Thai-FCCS and Thai foot care behavior questionnaire.

Questionnaire	Test-retest reliability (ICC)	Internal consistency (CA)
Thai-FCCS	0.733*	0.877
Thai Foot Care Behavior Questionnaire	0.808*	0.667

*p-value < 0.0001

Table 3. Relationships between FCCS scores and foot care behavior scores.

	All subjects (n = 373)	Subjects with foot complications (n = 217)	Subjects without foot complications (n = 156)
Pearson's correlation (r)	0.155*	0.198*	0.790
p-value	0.003	0.003	0.329

*p-value < 0.05

Discussion

Foot care self-efficacy belief represents the "confidence" that people with diabetes have in performing preventative foot care behavior.[17] It is thus necessary to evaluate the individual's belief, as the low self-efficacy belief has been shown to be one of the risk factors of foot ulcer.[18] The original FCCS is a foot care confidence scale designed to be completed by patients with diabetes to assess their belief in their own foot care behavior. To best of the authors' knowledge, a low number of studies assessing this aspect in Thai people with diabetes. Therefore, the authors cross-culturally adapted a Thai version of this scale and examine its psychometric properties. In general, there are three different ways to translate the questionnaire, translating forward from original version to target language version; translating by the committee without back-translation method, and forward and backward translation. Forward and backward translation technique was selected for the current study because this methodology called "cross-cultural adaptation" was recommended in the literature.[27] Prior to the commencement of the cross-cultural adaptation process, the original authors provided their consent for adaptation and use of the scale in Thailand.

The current study applied the interview method for collecting data from people with diabetes. During the cross-cultural adaptation method, some modifications were made to the wording of scale items in order to facilitate participant's understanding of scale items and to ensure their subsequent accurate response to each item. In item responses, for example, some participants did not truly understand the

meaning of various responses in the five-point Likert scale, thus a ranking scale from 1 to 5 was replaced by the interviewer with "scale 1" indicating to "strongly not confidence" and "scale 5" indicating to "strongly confidence". Moreover, some changes were made to the wording of questions that were ambiguous or technical jargon. For instance, most participants were not familiar with a professional called "podiatrist", the wording "a foot care expert" was then used instead of "a podiatrist" in question 4 and 10. Apart from the difficulty in understanding of the wording in some scale items, it was found that some foot care items listed in the FCCS such as "trimming toenails straight across" and "using a pumice stone to smooth corns and/or calluses" were novel knowledge to the participants. According to the fact that most Thai people with diabetes often have their curved nails cut and calluses removed with clipper or blade, they are more unlikely to provide responses to the different foot care behaviors.

To determine the reliability of the Thai-FCCS, the internal consistency of the scale was analyzed from the data of 373 people with diabetes. Generally, the acceptable level of CA is 0.6-0.9.[25] The CA values of the Thai-FCCS ranged between 0.858 and 0.895, demonstrating that the translated version had good internal consistency. The overall CA of the Thai-FCCS was 0.877, which was with in the acceptable level and was in line with the internal consistency of the original English version, with the overall CA of 0.92.[16] This result revealed that the structure of the Thai-FCCS was homogeneity of similar content items and particular expression of foot care self-efficacy beliefs in people with diabetes.

The test-retest reliability of the Thai-FCCS was 0.733. The acceptable level of test-retest reliability is 0.7.[28] The current result indicated that the Thai-FCCS was reliable. The duration of repeated measurement was 2 weeks apart; however, the test-retest reliability was shown to be moderately high, this might be related to the fact that a long period of time is needed for individual to change his/her confidence or behavior.[8]

With regard to the Thai foot care behavior questionnaire, it was developed by the current authors. Its content items were mainly based on the recommendations documented in "Feet Can Last a Lifetime"; a guideline on foot care practice produced by the National Institutes of Health. During the face-to-face interview method, some minor changes in the wording use of the content items were made. The item responses were shown to be appropriate as no modification was performed. The CA was calculated from 373 people with diabetes to reflect the correlation among the items within questionnaire, showing that the Thai foot care behavior questionnaire had acceptable internal consistency with the CA of 0.667. The 2-week test-retest reliability of Thai foot care behavior questionnaire was satisfactory with the ICC of 0.808, indicating that the Thai foot care preventative behavior questionnaire was a reliable tool and could be used to assess individual's foot care behavior.

Self-efficacy beliefs has been used to judge the "confidence" that people with diabetes have in performing foot care behavior.[17] Sarkar and colleagues (2006) measured self-efficacy beliefs, health literacy and self-management behaviors and found that self-efficacy beliefs were associated with self-management behaviors which meant that the patients were confident in their capacity to undertake

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การแปลแบบปรับข้ามวัฒนธรรมของแบบสอบถามความมั่นใจในการดูแลเท้าเป็นภาษาไทย
และความสัมพันธ์ระหว่างความมั่นใจและพฤติกรรมในการดูแลเท้าในผู้ป่วยเบาหวาน

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appropriate self-foot care behaviors. However, the current study showed the conflicting results with the previous study mentioned. It showed poor relationship between foot care self-efficacy beliefs and preventative foot care behaviors of people with diabetes. The current result is consistent with other two previous studies conducted by Perrin and Hamedan. Both studies also found a weak relationship between foot care self-efficacy and preventative foot care behavior. They demonstrated that people with diabetes might feel confident for carrying out appropriate foot care and yet presented low levels of actual preventive foot care behavior.[17] The current study obtained some results relevant to this notion. For example, approximately 40 percent of the participants indicated their strong confidence in selecting suitable shoes for their diabetic feet, contrasting to the fact that they actually wore unsuitable footwear. Perrin (2009) stated that psychosocial and environmental issues were needed to be accounted for when considering the self-management of people with diabetes; the authors therefore concluded that self-efficacy was not a useful predictive factor for the evaluation of foot care behavior.

Self-efficacy is a major basis of action.[8] However, behavior change depends on many factors; psychological variables and environment support, thus only self-efficacy is not enough to predict human behavior. Knowledge and literacy are also necessary.[29 - 31] This study found female had better foot care behavior than male. Perrin cited that "males generally are less likely to rest or seek medical advice during an illness and engage in fewer health promoting activities", and female are more sensitive

than male to take care their feet. Moreover, Perrin reported that older people had problems in foot care behavior which is consistent with the recent study. Older people might have difficulty in doing some basic activities such as feet inspection and nail cutting.

Although a weak relationship between foot care self-efficacy and foot care behavior was found when considered as a whole group of participants, the current study showed that diabetic patients with foot complications were more likely to have foot care behavior relating to self-efficacy than those without foot complications. From the definitions of foot complications in this study, participants with peripheral neuropathy were included into the group. This current finding might indicate that, apart from self-efficacy, foot complications could affect to foot care practice of diabetes patients. Further research is needed to determine the association among foot complication, self-efficacy and foot care behavior.

Conclusion

Reliability and internal consistency of the Thai-FCCS and foot care behavior questionnaires were acceptable. The study supported that utilization of Thai-FCCS and foot care behavior questionnaire among people with diabetes in Thailand. Even though, the association between self-efficacy beliefs and foot care practice was weak, it seemed that diabetic patients with foot complication had better relationship between confidence and behavior than those without foot complication.

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Conflict of Interest

The authors, hereby, declare no conflicts of interest in the research.

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