

Cross-Cultural Adaptation and Validation of the Diet and Exercise Social Support Questionnaire for Thai University Students

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Abstract:

Objective: This study aimed to cross-culturally adapt and validate a social support questionnaire for diet and exercise behaviors for use in Thailand.

Material and Methods: This study undertook the cross-cultural adaptation of a social support questionnaire and assessed its reliability and validity for application in Thailand. Forward-backward translation was conducted to translate the questionnaire from English to Thai. Then, the semantic, idiomatic, experiential, and conceptual equivalences were assessed by 2 experts in adolescent behavior and social support. A cross-sectional study was then conducted on 200 young Thai women with an average age of 18.32 years to test the Thai version of the self-reported social support questionnaire. The content validity was determined from the S-CVI score, and Cronbach's alpha was computed to estimate the internal consistency of the scale.

Results: The Thai translated version showed an average equivalence score of 0.92–1 and an S-CVI of 0.93. The respective Cronbach's α for the diet and exercise modules were 0.91 and 0.81.

Conclusion: This is the first Thai language social support questionnaire to assess diet and exercise behaviors and will be advantageous for health promotion or weight management programs in Thailand.

Keywords: diet behaviors, exercise behaviors, adolescent, cross-cultural

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Introduction

Nowadays, many people in Thailand are facing chronic diseases and overweight issues due to their eating habits and lack of exercise, as the surrounding society does not support healthy behaviors. Lack of exercise can lead to obesity and sedentary behavior. When combined with unhealthy eating habits, this will result in chronic diseases such as diabetes and fatty liver. Social support is an activity that helps an individual move toward achievement. Social support also includes methods for engaging others to facilitate and influence an individual's engagement in specific behaviors. For example, spending time together on various activities can be considered a form of social support¹. The social support theory plays an important role in describing exercise and eating behaviors, especially in adolescents^{2,3}. Most undergraduate students in Thailand live together in university dormitories, making friends an important source of support. Several previous studies have found that peer support can have a strong influence on the exercise and eating behavior of college students^{4,5}. Thailand promotes a peer education system, making most teenagers familiar with receiving peer support in promoting various activities⁶. Additionally, in Thailand's public health sector, peer support and social support are commonly used to promote physical and mental health, as well as in the treatment process⁷⁻⁹. However, there has not been any integrated information about the type of social support provided in Thailand to guide exercise and diet and resolve health behavior problems because different questionnaires were used based on researchers' interests¹⁰⁻¹². There are numerous social support questionnaires in international research, but to use them in a Thai setting, they must first undergo a cross-cultural adaptation process. This process is necessary when an instrument is to be used internationally, in a language different from its original version. The items should not only be translated but also must be adapted to be culturally and linguistically appropriate, while effectively maintaining the instrument's content validity at a conceptual level¹³.

If there were a standardized questionnaire specifically for measuring social support within peer groups, it would enhance the coherence of diet and exercise research in Thailand¹⁴. Hence, a standard Thai language questionnaire regarding social support in exercise and eating behavior is necessary. This study aimed to cross-culturally adapt and validate a social support questionnaire for diet and exercise behaviors for use in Thailand.

Material and Methods

Study design

A cross-sectional study

Study participants

The participants in this study were female university freshmen. This research collected data from 2 groups of participants: the pilot group and the tryout group. The pilot group consisted of first-year female students from the Faculty of Education, while the tryout group included students from the Faculty of Communication Arts and the Faculty of Law at Chulalongkorn University. We included research participants using the convenience sampling method. We set up a recruitment booth in areas where students typically gather for activities, selecting areas within faculties that allowed us to set up a recruitment booth. Written informed consent was obtained from participants before the study began, and the research was approved by the Ethics Review Committee for Research Involving Human Subjects at Chulalongkorn University, Thailand. (COA No. 142.1/60)

Research methods

The study was conducted in 3 phases: The first phase involved selecting an appropriate questionnaire. The second phase focused on translating and culturally adapting the social support questionnaire for dietary and exercise behaviors into Thai, following the guidelines developed by

Sperber¹⁵. The third phase involved analyzing the reliability and validity of the adapted Thai version of the questionnaire.

Questionnaire selection

First, previous research using a social support questionnaire in a weight management program was extracted from the Pubmed database. The single citation matcher function was used for the 1983–2018 search using the keyword ‘social support weight’, which identified 57 relevant studies. All studies were then scrutinized to examine their relevance; the criteria were an RCT/quasi-experimental research or survey research that used questionnaires about weight management in adults or adolescents with a greater focus on females and examined no other disease conditions.

Cross-cultural translation and adaptation

There were 4 steps in the cross-cultural translation and adaptation.

1) Forward translation

The questionnaire was first translated into Thai by 2 independent translators, both of whom were public health lecturers and adolescent specialists who had graduated from an International Public Health Program: one taught at a public university (T1) and the other taught at a private university (T2). Their focus was on the language and Thai culture.

2) Translation synthesis

Two Ph. D lecturers in the public health field from Srinakharinwirot University were selected for the translation synthesis, neither of whom had been involved in the forward translation, and one of whom was a Thai native and bilingual. T1 and T2 were synthesized to produce one common translation, Translation 12 (T12), and a Thai language report was written documenting how any synthesis issues had been addressed and resolved.

3) Back Translation

The original questionnaire was unknown to the back translator. The back translator, who was from the Chalermprakiat Center of Translation and Interpretation, Faculty of Arts, Chulalongkorn University (BT1), was given the synthesized questionnaire, T12, to back translate it into English. To reduce information bias, the translator was unaware of the questionnaire’s concepts and did not have a background in behavioral science or public health.

4) Comparison of the original and back-translated versions

The expert committee, which comprised a behavioral statistician, adolescent health professionals, and language professionals, consolidated all questionnaire versions and developed the pre-final version for field testing. The committee reviewed all translations and reached a consensus on any discrepancies. The committee was given the original questionnaire and each translation (T1, T2, T12, and BT1) together with the corresponding reports that explained the rationale for each decision and checked the semantic idiomatic, experiential, and conceptual equivalences of the 15 items, with each expert giving a score of 1 for equivalence, a score of 0.5 for items that were evenly matched, and a score of 0 if the items were unequally matched.

Questionnaire Validity and Reliability

Validity

Content validity

The 4 public health experts, 2 of whom had a PhD in Psychology (adolescence major) and another had a PhD in Social Sciences (medical and public health social sciences), assessed the content validity using a four-point Likert scale (4=very relevant to 1=not relevant). The content validity index for the items (I-CVI) and the content validity index for the scale (S-CVI) were calculated based on a previous report¹⁶. The S-CVI value should not be lower than

0.80, and a value of 0.90 or higher is considered excellent. Meanwhile, the I-CVI value should not be lower than 0.78, then it will be acceptable. The pilot test results, including feedback and suggestions, were analyzed by 3 expert committee members, who then suggested modifications to the pre-final questionnaire. Judgment on each item follows Yaghmale 2003¹⁷: If the I-CVI is not less than 0.75, the item will be appropriate. If it is less than 0.75 but not less than 0.70, it needs revision. If it is less than 0.70, it will be eliminated

The pilot testing of the pre-final questionnaire was conducted on 40 first-year female students from the Faculty of Education at Chulalongkorn University. After receiving approval from the faculty, we posted brochures about the survey activity for 2–3 days before the data collection day. The brochures also mentioned a pen as a token of appreciation for those who completed the questionnaire. On the day of data collection, every participant who expressed interest was informed about the research and asked to sign a consent form before beginning the questionnaire. Once the participant had given consent, they were provided with a private corner to complete the questionnaire and give their comments, which allowed for further refinements to be made. The pilot test results were analyzed by the 4 expert committee members, and modifications were suggested. Then, 200 first-year female students from the Faculties of Communication Arts and the Faculty of Law were invited to test the prefinal questionnaire.

Reliability

Internal consistency

Cronbach's coefficient was used to evaluate the internal consistency of the prefinal social support questionnaire for diet and exercise behaviors completed by the 200 first-year female students. Cronbach's alpha is a measure of overall scale reliability.

Results

A total of 240 female students from Chulalongkorn University were included in this study (40 participants for the pilot and 200 participants for the tryout). Participants' demographic and academic characteristics are presented in Table 1.

Table 1 Participant's demographic and academic characteristics

Demographic characteristics	n	Mean SE
Pre-final (Faculty of Education)	40	
Age (years)		18.28 (0.82)
BMI		21.77 (1.35)
Normal (18.5–22.9 kg/m ²)	33	
Overweight (23–24.9 kg/m ²)	7	
Final version	200	
Faculty of communication arts	111	
Faculty of Law	89	
Age (years)		18.32 0.79)
BMI		21.84 0.94)
Normal (18.5–22.9 kg/m ²)	169	
Overweight (23–24.9 kg/m ²)	31	

BMI=body mass index

Questionnaire selected

Eight of the 57 studies matched the set criteria. We found that among the 57 studies meeting our criteria, the questionnaire by Sallis (1987)¹⁸ was the most frequently used across all time periods. This questionnaire specifically measured social support on diet and exercise behavior. Widely known as the *Sallis Social Support Scale*, it has been translated and used over 2,000 times. Even in 2025, more than 40 studies have adopted and translated this scale into various languages, which were adapted to fit the local language and cultural context^{19,20}. The objective of the Sallis questionnaire was to develop a tool specifically designed to measure social support related to exercise and diet. This questionnaire covered social support measurements for diet and exercise behaviors that are now widely recognized as key components in NCD and weight control. Therefore, this

questionnaire was selected. Respondents rate the frequency with which friends did or said what was consistent with the item during the previous 3 months on a 5-point Likert scale, ranging from 1 (none) to 5 (very often).

Translation and cross-cultural processes

Translation

T1 and T2 translators used a similar selection of Thai words. Some words in Thai can be used interchangeably with the same meaning. For example, “reminded”

Translator T1 uses the word *ย้ำเตือน* (in Thai) while Translator T2 uses the word *ตักเตือน* (in Thai), which both mean remind. Or “Complained”, Translator T1 uses the word *ตำหนิ*, and Translator T2 uses the word *ต่อว่า*, which both mean complain and in Thai are used interchangeably. However, in the end, both T1 and T2 decided to choose the version with the closest meaning, which turned out to be the T12 version; this version was used for the back translation (Table 2).

Table 2 Comparison between the forward and backward translations of the original questionnaire

Original	Translate (English to Thai)	Back Translate (Thai to English)
1. Reminded me not to eat unhealthy food, high-salt, high-fat foods or high sugar	ตักเตือนไม่ให้ฉันรับประทานอาหารที่ไม่ดีต่อสุขภาพ เช่น เค็มจัด ไขมันสูง และหวานจัด	Reminded me not to eat unhealthy food such as food with high salt, fat and sugar
2. Encouraged me not to eat high-salt, high-fat foods and high sugar when I’m tempted to do so	สนับสนุนให้ฉันไม่รับประทานอาหารเค็มจัด, ไขมันสูง และหวานจัด เมื่อฉันตั้งใจจะทำ	Supported me not to eat food with high content of salt, fat and sugar when I intend to do
3. Commented if I went back to eating unhealthy food such as high-salt, high-fat foods or high sugar	แสดงความเห็นเมื่อฉันกลับไปรับประทานอาหารไม่ เป็นประโยชน์เช่น เค็มจัด, ไขมันสูง หรือ หวานจัด	Comment if I go back to eat unhealthy food such as food with high content of salt, sugar or fat
4. Complimented me about changing my eating habits	ชมเชยฉันเกี่ยวกับการปรับเปลี่ยนพฤติกรรมมารับ ประทานอาหาร	Have given me compliments about change in eating behavior
5. Discussed my eating habit change with me	พูดคุยกับฉันเกี่ยวกับการปรับเปลี่ยนพฤติกรรมมารับ ประทานอาหาร	Discussed with me about change in eating behavior
6. Made negative comments when I went back to eating high-salt, high-fat foods	ว่ากล่าวเมื่อฉันกลับไปรับประทานอาหารจำพวกเค็ม จัด, หรือไขมันสูง	Reproved me when I go back to eat unhealthy food such as food with high content of salt or fat
7. Complained that I spent too much money on low-salt, low-fat foods	บ่นว่าเมื่อฉันใช้จ่ายฟุ่มเฟือยในการบริโภคอาหารที่มี เกลือหรือไขมันน้อย	Complained me when I spent too much on food with low content of salt or fat
8. Refused to eat the same foods I eat	ปฏิเสธที่จะรับประทานอาหารแบบเดียวกันกับที่ฉัน รับประทาน	Refused to eat the same food I am having
9. Got angry when I encouraged them to eat low-salt or low-fat foods	ไม่พอใจเมื่อฉันส่งเสริมให้รับประทานอาหารที่มีเกลือ และไขมันน้อย	Have been dissatisfied when I encouraged them to have food with low salt and fat content
10. Told me eating a low-salt, low-fat diet is a waste of time	บอกฉันว่าการรับประทานอาหารที่ไม่เค็มจัด, ไขมัน ต่ำนั้นเป็นการสิ้นเปลืองเวลา	Have told me that eating food with low salt and fat content is wasting time
11. Exercised with me	ออกกำลังกายกับฉัน	Have exercised with me
12. Offered to exercise with me	เสนอตัวไปออกกำลังกายกับฉัน	Offered to exercise with me
13. Gave me helpful reminders to exercise	คอยช่วยย้ำเตือนให้ฉันออกกำลังกาย	Have been reminding me of exercising
14. Gave me encouragement to stick with my exercise program	สนับสนุนให้ฉันได้ปฏิบัติตามโปรแกรมการออกกำลังกายอย่างเคร่งครัด	Encouraged me to strictly follow my exercise program
15. Changed their schedule so we could exercise together.	เปลี่ยนแปลงตารางภารกิจของเขาเพื่อให้เราได้ออก กกำลังกายด้วยกัน	Have changed their schedule so that we can exercise together

Cross-cultural translation and adaptation

Based on an expert analysis, there were 2 items that received the lowest score (item 2, “Encouraged me not to eat high-salt, high-fat foods and high sugar when I’m tempted to do so,” and item 6, “Made negative comments when I went back to eating high-salt, high-fat foods”). Item 2 in the back translated version used the word “support” instead of “encourage” from the original. One expert, from 3, gave an opinion that encouraged was incompatible with encouraged in idiomatic terms. However, the other 2 experts agreed because when translated into Thai, they can use the word “สนับสนุน” (in Thai), which translates to both “support” and “encourage”.

Item 6 from the back translated version used the word “reprove” instead of “negative comment” from the original. Then an expert mentioned that reprove was incompatible with a negative comment in both semantic and idiomatic terms, but the 2 other experts approved. Because “negative comment” is usually used in formal, academic Thai, in the case of this questionnaire, which asked the

adolescents about support from friends in daily life, we can use the word “reprove”, which is “ว่ากล่าว” in Thai, and easier to understand. Additionally, the Thai language has no tense transformation; therefore, all the back translations were in the simple tense. Overall, the experts agreed that the translated questionnaires were equivalent to the original in terms of the semantic, idiomatic, experiential, and conceptual equivalence (Figure 1).

Questionnaire validity and reliability test

Response process validity

At the prefinal stage, test participants were confused by 2 questions, questions 11 and 12. The research assistant explained that item 11 meant that the respondent was already exercising and asked a friend to accompany them, and the friend accepted, whereas item 12 meant the respondent’s friend asked to join the respondent without being asked. Because of this confusion, an explanation was put in brackets at the end of items 11 and 12 in the final version.

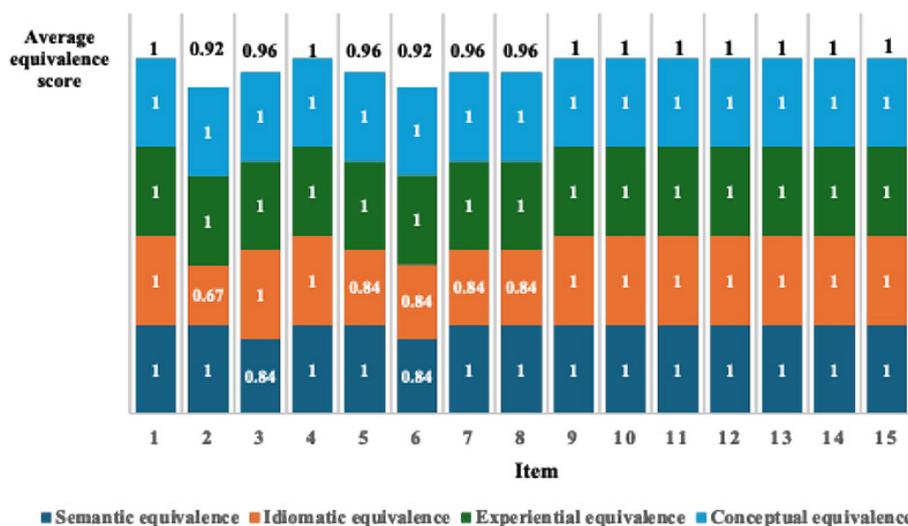


Figure 1 The average equivalence of the original questionnaire, Thai version, and the back-translated version in terms of semantic, idiomatic, experiential, and conceptual aspects is presented as a ratio for each item

Content Validity

The content validity results indicated that the Thai social support questionnaire had an S-CVI score of 0.93, and I-CVI scores ranging from 0.75 to 1.00, as shown in Table 3. The revised terms and sentences were approved by the expert committee.

Table 3 The CVI score of questionnaire items

Item	Expert 1	Expert 2	Expert 3	Expert 4	CVI
1	3	3	4	4	1
2	4	3	4	4	1
3	3	3	4	3	1
4	4	4	4	3	1
5	4	4	4	4	1
6	4	4	4	4	1
7	2	3	4	3	0.75
8	4	2	3	4	0.75
9	3	4	3	3	1
10	4	3	2	3	0.75
11	4	3	2	3	0.75
12	3	4	4	3	1
13	3	3	3	4	1
14	4	3	4	4	1
15	4	4	4	3	1

CVI=content validity index

Coefficient of internal consistency

Forty first-year female students completed the prefinal questionnaire for which the Cronbach’s alpha for social support (eating) was 0.88, and for social support (exercise) it was 0.85. The final test on 200 first-year female students showed that Cronbach’s alpha for social support (diet) was 0.91 and for social support (exercise) 0.81.

Discussion

This study aimed to develop a valid and reliable transitional social support questionnaire for diet and exercise behaviors for use in Thailand. The Cronbach’s α coefficients for both diet and exercise were acceptable, with slight differences from the original questionnaire (diet 0.87 and exercise 0.84). The original version of this questionnaire has been translated into several languages for use in health

promotion activities through social support processes²¹⁻²³, and this study is the first time it has been adapted into Thai. However, some previous studies also had lower internal consistencies than the original^{24,25}.

In this research, the Item-Objective Congruence (IOC) measure was not used to evaluate the questionnaire items because of the questionnaire selection process and because the chosen questionnaire had been previously used in several studies to evaluate social support in diet and exercise. Therefore, greater attention was focused on accurately conveying the meaning in Thai to ensure consistency with the original. The results showed that the content validity and coefficient of internal consistency were all acceptable. However, based on the results of the CVI analysis by experts, items 7, 8, 10, and 11 had lower average scores compared to the other items. In addition, the original version of the questionnaire indicated that items 6-10 did not correlate with healthy dietary habits. As for item 11, when translated into Thai, it was found to be so similar to item 12 that it could be perceived as redundant, while item 12 had a higher CVI. Therefore, the researchers suggest that when using this questionnaire, these items (7, 8, 10, and 11) should be excluded. The revised questionnaire would then consist of 6 items on eating behavior (items 1-6) and 4 items on exercise behavior (items 12-15), totaling 10 items. In addition, when using this questionnaire, it should begin with the phrase: “In the past 3 months, my friends have expressed support for me in terms of eating and exercising in the following ways.”

Social support plays a significant role in adolescents’ eating and exercise behaviors in various ways. It has been found that peer groups influence the choice of food or menus when eating together. Moreover, social environment can lead to trend-based eating, such as bubble tea or fast food. It demonstrates that social support from peers influences the eating behavior of university students²⁶. Regarding exercise, several studies consistently report that not having a friend to

exercise with is one of the main reasons adolescents avoid physical activity. Even if they don't intend to exercise, being invited by friends can increase the likelihood of engaging in physical activity^{27, 28}. In health promotion work, these forms of social support can be applied as a framework for monitoring social influences alongside tracking health behaviors. Therefore, having a standardized questionnaire to measure peer social support for diet and exercise in the Thai language would create unity in evaluating the effectiveness of health promotion programs that aim to measure social support related to eating and exercise behaviors; this should be emphasized. Future studies should focus on developing social support measurement tools related to other key health issues that contribute to chronic diseases, such as emotional well-being.

A strength of this study is that it presents the first cross-cultural translation of a social support scale specifically focused on diet and exercise in Thai. This questionnaire will be valuable for health-related work involving chronic diseases, which are currently a major issue in Thailand. It also has potential applications in other areas, such as promoting healthy environmental development in office settings or among social groups that rely on peer support²⁹. However, the study also has a weakness related to the cross-cultural translation process. The Thai language has more diverse word usage compared to English, which makes it challenging to assess equivalence across various aspects. The interpretations provided by the experts varied considerably, making for a long and difficult evaluation process.

Conclusion

The diet and exercise social support questionnaire was developed to be the standard social support assessment tool for diet and exercise; until recently, it had not been used in Thailand. Therefore, the Thai version of the questionnaire from this research can be used to assess

social support related to health behaviors associated with chronic diseases, including weight management, especially among Thai university students.

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Conflict of interest

This work has no conflict of interest to declare.

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