



Content Validity of Thai Version Screening Tool for Cervical Spine Instability

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ABSTRACT

Introduction: Cervical spine instability is a disorder in which the cervical spine cannot maintain its normal alignment under physiological loads to protect the blood vessels, nerves, and spinal cord from damage or irritation. The symptoms of cervical spine instability present include neck pain, dizziness, inability to prolong holding the head, and impaired movement. The more severe symptoms can cause cervical spondylolisthesis. Therefore, it is necessary to have an early screening tool for cervical spine instability to avoid complications and consequences. However, this screening tool is limited in its use by language for the Thai therapist who is a non-English speaker.

Objective: The primary objective of this study was to translate the 16 items of the cervical spine instability screening tool from English to the Thai language. The secondary objective was to test the content validity of the cervical spine instability screening tool Thai version.

Methods: The cervical spine instability screening tool was translated from the original English language into the Thai language by the process of cross-cultural adaptation. Then, the content validity was tested by using the index of Item-Objective Congruence (IOC) which was obtained by a group of experts. 5 independent experts with clinical experience more than 5 years in treating neck pain patients including 3 physiotherapists and 2 orthopedic surgeons.

Results: The IOC index rating by 5 independent experts reached an average of 0.90 (range 0.60-1.00).

Conclusion: The screening tool (Thai version) for patients with cervical instability has satisfactory content validity (average IOC = 0.90) for application in clinical practice.

Keywords: cervical spine instability; non-specific chronic neck pain; content validity; screening tool

Introduction

Neck pain is one of the most common musculoskeletal pains among the population, which can be suffered at any age [1]. The prevalence of neck pain ranged from 48.5% of people over their lifetime (range:

6.9% -54.2%) and 29.8% of people in the past six months (range 14.2%- 71%) reported by the previous prevalence studies [2]. Moreover, contributing factors for neck pain include poor posture, neck injuries, degenerative changes [3], working more than four hours

daily, stress, etc. [2]. Patients with neck pain usually suffer from symptoms such as arm pain/numbness, nerve root irritation, and spinal cord compression, depending on the location of the pathology. Therefore, limitation of daily activities and eventually a decline in their quality of life can occur due to neck pain. Current treatment of neck pain is mainly managed with supported treatment, including heat, cold, physical therapy modalities, and exercise to relieve pain. However, there may be a need for surgery in some cases. The literature reported that cervical degeneration was associated with cervical spine instability [5]. Acute or chronic injury from work induced fluid in the herniated disc (nucleus pulposus) to flow out and decreased disc height and make disc degeneration, annulus fibrous ruptures, disc herniated, and lead to cervical spine instability [6]. Cervical spine instability is a disorder in which the cervical spine cannot maintain its normal alignment under physiological loads to protect the blood vessels, nerves, and spinal cord from damage or irritation [7]. Neck pain, pain/numbness in the arm, dizziness, inability to hold head for long periods, hypermobility of movement, impaired movement, or cervical spondylolisthesis are all symptoms of cervical spine instability [8]. Therefore, early screening for cervical spine instability is important to avoid complications and consequences. According to the literature review, X-rays in full flexion and extension postures are most commonly used to diagnose cervical spine instability [10,11]. When the vertebral displacement is greater than 3.5 mm or the angle is greater than 11 degrees, the patient is judged to have cervical spine instability [7]. Furthermore, patient history is considered during the clinical diagnosis process [8]. A common question may not cover all symptoms of patients with cervical instability. However, Cook et al. (2005) found the symptoms to screen for cervical spine instability, which contained 16 questions covering the symptoms of cervical spine instability. However, this questionnaire is written in English and has not been translated into Thai. Due to language difficulties, this makes it difficult to use and may result in errors in the use of this screening form. As a result, the objectives of this study are to translate the cervical spine instability screening tool into Thai and test the content validity of a screening tool for evaluating Thai patients with cervical spine instability.

Methodology

The procedure was divided into two stages: 1) development of the Thai cervical instability screening tool and 2) testing content validity of the tool.

Development process of Thai cervical instability screening tool

Step 1: Forward translation

The original English version was translated into Thai by three native Thai speakers with advanced English skills. One of the translators is an orthopedic surgeon, while the others are physical therapists who are experts in musculoskeletal fields. All of the translators have at least five years of clinical experience. As a result of this process, three Thai language variations were created. (version 1: T1, T2, and T3).

Step 2: Compared and discussed/synthesis

The three translators discussed the three different versions (version 1: T1, T2, and T3) in detail for each item. After that, a new version of the screening tool was generated (T123). The best translated version should be reflective of Thai culture and acceptable to at least two translators. Thai language variants emerged as a result of this stage (version 2: T123).

Step 3: Backward translation

Three native English speakers who can read and understand Thai, there were a general native English speaker, a Thai physical therapist, and Thai orthopedic surgeon working abroad who had never seen the original version, translated the Thai version (version 2: T123) into the English language (version 3: BT1, BT2, and BT3).

Step 4: Comparison and Discussion

Version 3 (BT1, BT2, and BT3) and the original version were compared to consider the meaning of each item by two researchers. Both were native Thai speakers with excellent English skills. If it is discovered that a question has a different meaning from the original, it will be investigated and corrected by the translators immediately. The process was repeated until the questions had the same or similar meaning as the original, resulting in version 4: BT123.

Step 5: Expert committee review

The physicians who understand and are familiar with the assessment's content were involved in these steps, including three physical therapists who are experts in musculoskeletal fields and two orthopedic surgeons who have experience of at least 5 years of treating neck pain patients. They examined all 3 versions of screening tools (version 2, version 4, and original) together, then corrected and revised them. As a result of this procedure, version 5 was created (pre-final version).

Step 6: Pretesting

Thirty participants with non-specific neck pain tested the questions on the assessment form version 5 for comprehension before using them. The comments section from participants' feedback will be provided for additional ideas. After then, the participants were asked whether they understood the answers to the questions that matched the study team's answers or not. If more

than 20% of the participants (more than 6 persons per question) did not comprehend the question, the research team revised it to make it more understandable and dispatched specialists to respond to the issue. It didn't need to be changed if the experts agreed. As a result, the questions as mentioned earlier were put to the same test on the same people. (Of the 30 participants, 10 were chosen randomly).

Content validity assessment of Thai cervical instability screening tool

The content validity was reported by the index of item-objective congruence (IOC). It was rated by 5 independent experts who have experience in treating patients with neck pain for more than five years, consisting of 3 physical therapists who are experts in musculoskeletal fields and 2 orthopedic surgeons. By using the criteria for consideration, the experts evaluate and determine each item for its quantifiable regard to content measurement standards. The expert review's rating was as follows: consistent +1, non-conforming -1 and unclear 0. After reviewing and obtaining a rating score for each item from the experts, this information was used to figure out the index of item-objective congruence (IOC). If the IOC value was ≥ 0.50 , the questionnaire was measured on purpose or it can apply to that question.

Results

Characteristics of participants

Thirty patients with non-specific neck pain with more than 3 months of symptoms were included in this study. The duration of pain ranges from 3 months to 10 years and the average pain intensity was 5.29 (range from 3.2 to 8.2.) rated by VAS. The detailed characteristics of the patients in this study were shown in table 1.

Table 1 Characteristics of the participants

Demographic Characteristics	N (%)	Mean±SD	Range
Age (y)	30	45.33±6.57	35-55
Sex			
Male	11 (36.67%)		
Female	19 (63.33%)		
Pain duration (mo)		16.80±23.78	3-120
3 mo to 1 yr	23 (76.67%)		
> 1 yr	7 (23.33%)		
Education			
Primary school	1 (3.33%)		
High school	5 (16.67%)		
University	24 (80.00%)		
VAS (0-10)		5.29±1.57	3.2-8.2

Development process of Thai cervical instability screening tool

At the final stage of the translation process, all items in the questionnaire were modified. Therefore, the final version of Thai was developed, which is easier to use.

Content validity assessment of Thai cervical instability screening tool

For all 16 items, content validity for the Thai screening tool was reported by the mean IOC of 0.90 (range 0.60-1.00). The IOC mean values for each item of the screening tool was presented in table 2.

Table 2 The content validity of each item of the screening tool

No.	Detail	IOC
1	Feeling fatigue when in a prolonged static posture	0.8
2	Fatigue and difficult to hold head up	0.6
3	Better when supporting the head with a hand or using cervical collar	1
4	Frequent neck manipulation own self	1
5	Feeling of instability, shaking, or uncontrol	1
6	Increase episode of acute neck pain	0.8
7	Sharp pain with sudden movements	0.6
8	Head feels heavy	1
9	Neck feels stuck or locked with movement	1
10	Better in unloaded position such as lying down	1
11	Neck catching, clicking, or popping	1
12	History of neck disorder or trauma	1
13	Neck pain with minimal head or neck movement	0.8
14	Feeling stiff or tightness of neck muscles	1
15	Fear of movement	1
16	Temporary improvement with neck manipulation	0.8

Discussion

Individuals suffering from chronic neck pain may have cervical spine instability due to ligament degeneration of the cervical spine. Because of this instability, a neighboring nerve becomes irritated and may eventually develop spondylolisthesis. Therefore, people experiencing neck pain should be screened to prevent as well as rule out spondylolisthesis. The most popular and widely used method of diagnosis for cervical spine instability is an X-ray. However, it has several drawbacks, including high costs, radiation exposure, and the inability to do it on specific patients, such as pregnant women. In addition, in clinical practice, the patient's history is screened. However, it is board screening with no specific evaluation. Moreover, the Delphi technique study investigates cervical spine instability symptoms, including 16 items. But its psychometric properties are inconclusive. The screening tool has developed and designed to be completed by physical therapists and doctors. A score range of 0 (not associated with cervical spine instability) to 16 (strongly about cervical spine instability). The mean age of participants included in our study was 45.33±6.57 years, which was consistent with the studies of Cramer et al. [12], Lim et al. [13], and Uthakhip et al. [14], with a mean age of between 49±16 years, 44±12 years, and 48.7±11.3 years, respectively. In addition, the present study was the first study of the cervical spine instability

screening tool in Thai patients with non-specific neck pain. Although no research was conducted to determine the psychometric property of cervical spine instability, previous studies have demonstrated a relationship between chronic neck pain and instability of the cervical spine. So instead, a study was conducted to determine the psychometric properties of neck pain using a screening test called the neck disability index, which was administered to patients with neck pain all over the world and cross-cultural adaptation into various languages. According to the study's findings, there were no floor or ceiling effects between the studies by Uthakhip et al. [14], which looked at the content validity of the NDI-TH, and Lim et al. [13], which looked at the content validity of the simplified Chinese version of the Neck Disability Index. The current study found the content validity of the cervical spine instability screening tool, which showed good content validity (IOC = 0.90). The strength of this study is that it is the first Thai language version of the cervical spine instability screening tool which was translated by Beaton guidelines [15]. The study also provided evidence of Indexes of Item-Objective Congruence (IOC) of the Thai version of the cervical spine instability screening tool. Nevertheless, our study still had some limitations. Other psychometric property values such as reliability, construct validity, convergent validity, and cut-off score have not been studied, so future studies will explore these values of this screening for further clinical benefit.

Conclusion

The screening tool (Thai version) for patients with cervical instability has satisfactory content validity (average IOC = 0.90) for application in clinical practice.

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