

Research Paper: Translation and cross-cultural adaptation of the traumatic injuries distress scale to persian



Shirin Modarresi^{1*}, Golale Modarresi², Maryam Farzad^{3,4}, Erfan Shafiee³, Mahshad Maleki⁴, Joy C. MacDermid^{1,5,6,7}, David M. Walton¹

1. School of Physical Therapy, Western University, London, ON, Canada
2. Centre for Addiction and Mental Health (CAMH), Toronto, ON, Canada
3. Department of Health and Rehabilitation Sciences, Western University, London, ON, Canada
4. University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
5. Department of Orthopedic Surgery, Western University, London, ON, Canada
6. School of Rehabilitation Sciences, McMaster University, Hamilton, ON, Canada
7. Roth|McFarlane Hand and Upper Limb Centre, St Joseph's Health Care, London, ON, Canada

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ABSTRACT

Objective: Psychological factors have been consistent predictors of recovery following musculoskeletal injuries. The Traumatic Injuries Distress Scale (TIDS) is a risk-based prognostic screening tool that has been developed for predicting recovery from acute musculoskeletal trauma. The purpose of this study was to translate and cross-culturally adapt the TIDS to Persian.

Methods: The forward-backward translation technique was used to translate the TIDS from English to Persian. The final version was obtained by consensus with the translation committee. Cognitive interviews were used to evaluate lingual accuracy and cultural or contextual appropriateness. 13 participants completed cognitive interviews based on the talk-aloud and probing approach to explore individual items.

Results: Participants (age range 22-58) had no problems in questions two, six, eight, and 11. Participants identified potential issues in 4/6 areas of a cognitive interview coding system: comprehension/clarity, inadequate response definition, perspective modification, reference point, and calibration across items. These issues informed changes made to arrive at the final version of the P-TIDS.

Conclusions: The TIDS, which is a tool to assess psychological distress following musculoskeletal trauma was translated and culturally adapted to Persian. Through cognitive interviewing, some issues were identified that were related to cross-cultural interpretation and application of the items that were resolved through rewording and recalibration of the tool. The TIDS-P can be a significant addition to the toolbox of Persian healthcare providers for assessing the risk of developing chronic pain post-musculoskeletal trauma. Psychometric studies are now underway to further evaluate the properties of the translated tool.

* **Corresponding Author:**

Shirin Modarresi

Address: School of Physical Therapy, Western University, London, ON, Canada

Tel: +1315 464 7040

E-mail: smodarre@uwo.ca

1. Background

Pain that persists longer than the expected recovery period or more than three months, is considered chronic. [1,2] Transition to chronicity not only occurs in patient populations such as whiplash associated disorder (WAD) [3] or low back pain,[4] but it can also occur in seemingly innocuous injuries such as an ankle sprain. [5] Understanding prognostic factors associated with the development of chronic pain is important and can have a significant positive impact on individual patients and society by facilitating the care pathway and developing more targeted interventions and therapies while still in acute stages.

The fear-avoidance model of pain explains that there are psychological aspects that play key roles in the persistence of pain.[6] Psychological factors such as depression, anxiety, and post-traumatic stress disorder (PTSD), have been reported as strong predictors of recovery in various types of musculoskeletal (MSK) injuries.[7] A recent study examined the recovery trajectories of patients following distal radius fractures and concluded that depression was the strongest distinguishing factor between people that recovered within the first three months and those that developed chronic pain and disability.[8] Emotional distress, rumination, anger, and negative interpretations of the memories of the incident have also been reported as significant predictors of persistence of pain and disability.[9]

The significance of negative psychological sequelae like distress as strong predictors of recovery following MSK injuries highlights the importance of using psychometrically sound measures to evaluate these factors to identify patients that are at risk of developing chronic pain. The traumatic Injuries Distress Scale (TIDS) is a risk prognosis screening tool that has been developed specifically for assessing the magnitude of distress in people with acute MSK injuries[10]. The TIDS is a 12-item questionnaire that is easy to administer, score, and interpret, and can be completed in less than three minutes. It has three subscales of 'uncontrolled pain', 'negative affect', and 'intrusion/hyperarousal' that allows the clinician to gain a better understanding of why the patient is at risk of developing chronic pain. An important advantage of a multi-item and multi-construct prognostic scale that focuses on patient pain experience, psychological status, and cognition is that it can be helpful in efficiently identifying treatment targets while avoiding diagnostic categorizations that may result in patient blaming. An additional important advantage of

TIDS is that it is freely accessible for use by clinicians and researchers and is currently available in English, French, and Spanish.

Given the valuable use of TIDS in identifying individuals at risk of developing chronic pain following MSK injuries through the lens of psychological distress, it is imperative to adapt its use and increase accessibility to it in more cultures and communities. Cross-cultural translation goes beyond converting existing items into a new language but also has to consider that the concepts and contexts may vary sufficiently that alternative items may need to be considered. Therefore, a rigorous process of developing and evaluating cross-cultural translations is essential to their usefulness. The purpose of this study was to translate, assess the cultural equivalency, and adapt the TIDS to Persian culture and language.

2. Methods

The translation and cross-cultural adaptation process consisted of eight steps in two major phases.[11] Phase one consisted of the translation process and phase two consisted of the cross-cultural adaptation procedure. An overview of this process is depicted in Figure 1. Permission was obtained from the developer of the scale before initiating the study.

Phase 1: Forward-backward translation

The first step in the translation process was forward translation of the TIDS from English (original language) to Persian by two independent translators (a medical doctor GM and a rehabilitation scientist SM). Two versions of the translated scale were obtained. In the second step, the two translators held a discussion, and a consensus was reached to create a single prototype Persian version. The third step consisted of backward translation from Persian to English by another pair of independent translators (two occupational therapists MF and ES), also resulting in two English versions. The percentage of agreement within each translator pair was calculated using the number of items that were not the same as compared to the total number of items. All translators were native Persian speakers and fluent in English. The fourth step involved forming a committee with all four translators and comparing the backward translated version with the original English version and constructing the first version of the Persian translated TIDS (TIDS-P-1).

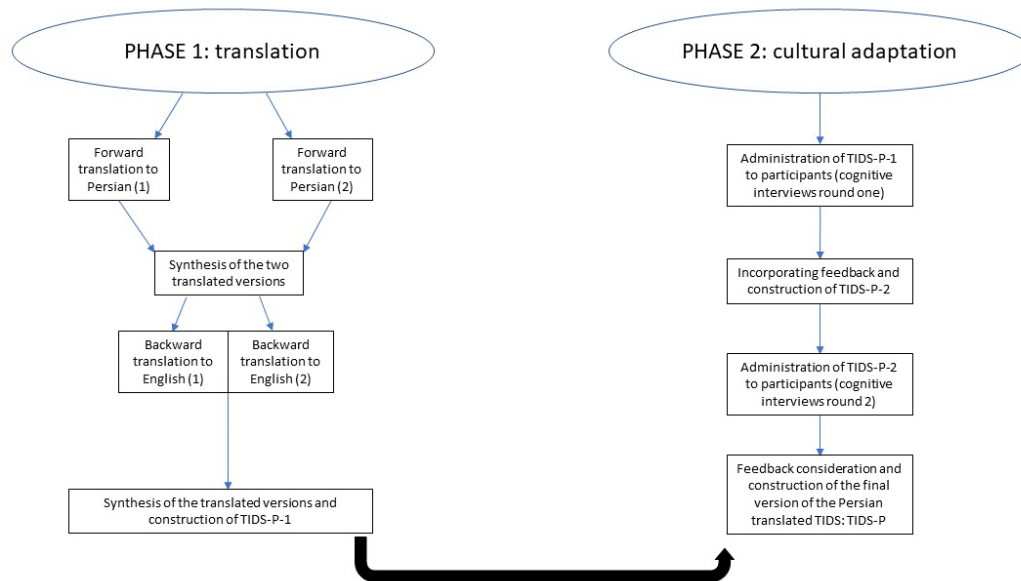


Figure 1. An overview of the translation and cultural adaptation of the Traumatic Injuries Distress Scale to Persian

Phase 2: Cognitive Interviewing and cultural adaptations

The fifth step was to administer TIDS-P-1 and perform cognitive interviews. Cognitive interviewing is a technique that can be used to evaluate the cultural equivalency, identify problems in the translated version, and assess whether the translated items fulfill their purpose in order to maintain content validity.[11] In the cognitive interviews, a talk aloud approach and probes were used to understand participants' interpretation of the items and response options of the questionnaire, as well as the cognitive process of deciding how to respond.[12–14] During the talk aloud stage, participants completed and discussed all the items of the scale and explained their interpretations of the items. [13] Probes are used to understand in more detail what the participant thinks about each specific keyword.[13] The probes were designed and used to explore the cultural appropriateness of the items. All interviews were conducted by one researcher. The results of the cognitive interviewing step were used to refine the tool as described below.

Setting and sample

Participants were recruited by convenience from Sarallah Physiotherapy and Orthopedic clinic in the city of Arak in Iran. The inclusion criteria were being at least 18 years old, native Persian speaker, and having recent (less than four weeks) non-catastrophic MSK injuries of any etiology. The exclusion criteria were any major systemic

illness including cancer, organ disease, blood clotting disorder, neuromuscular disorder, rheumatoid condition, or uncontrolled psychopathology. The interviews were conducted in a private room in this clinic and lasted between 8 to 34 minutes. All interviews were recorded and transcribed verbatim. Participant characteristics including age, sex, education level, work status, number of people living with them, type of injury, and mechanism of injury were also collected. Participant recruitment was stopped when saturation of responses was reached.[12] Ethical approval was obtained from the University of Social Welfare and Rehabilitation Sciences.

Analysis

In step five a coding system for classifying the results of cognitive interviews of outcome measures designed by MacDermid (2018) was used to synthesize the findings and identify any problematic wordings.[13–15] This coding system consists of issues related to clarity or comprehension, relevance, inadequate response definition, reference point, perspective modifiers, and calibration across items.

Reconciliation stage 1

In step six, the same committee discussed the issues that were identified during the cognitive interviews regarding TIDS-P-1. Changes were made accordingly, and the proposed TIDS-P-2 was constructed.

The second round of cognitive interviews

In step seven, the adapted Persian version of the TIDS (P-TIDS-2) was administered to another set of participants to identify any final concerns with the proposed P-TIDS-2. The same procedures for the interview and analysis were repeated.

Reconciliation stage 2

In step eight, the results of the second round of cognitive interviews were discussed in a meeting with all translators, and TIDS-P(final version) was constructed.

3. Results

The translation (steps one to four)

There was 64% agreement between the forward translators in step one, and the minor wording issues were discussed and resolved by agreeing upon the most appropriate terms. There was 71% agreement between the backward translators in step two. The developer reviewed the back-translated versions and approved the content accuracy of both. The wording of the final forward translated version was discussed and ambiguities were resolved in step

three. The consensus that was reached by the translation committee was to clearly describe words that did not have an equivalent term in Persian. A summary of this process is presented in Table 1.

The first round of cognitive interviews (steps five and six): Following the translation process, a total of 13 people participated in cognitive interviews. Participants' characteristics and demographic information are summarized in Table 2. In the first round of cognitive interviews, participants had no problem understanding questions two, six, eight, and 11 of the TIDS-P-1 . Data analysis indicated that participants had issues that matched 4/6 themes according to the coding system in questions one, three, four, five, seven, nine, 10 and 12 (the frequency of these issues for each item is summarized in Table 3).

Question one (Difficulty maintaining your concentration): two participants had issues regarding inadequate response definition as they needed more explanation to understand the word 'concentration'. Two participants had issues regarding clarity/comprehension as they did not understand the meaning of 'concentration' in general.

Table 1. Forward and backward translation of the Traumatic Injury Distress Scale

Forward translations			
Original English	Translator #1	Translator #2	Agreed upon terms for the forward translation
Maintaining	تداوم	نگه داشتن	نگه داشتن
Overwhelm	احساس غرق شدن	بیش از حد تحمل بودن	بیش از حد تحمل بودن
wound up	زخم روانی	اسارت	اسارت
Frustration	نامیدی	کلافگی	کلافگی
Loss of motivation	تمایل نداشتن	عدم تمایل	تمایل نداشتن
Backward translations			
Forward translated (Persian)	Translator # 3	Translator #4	
یاد آوری از آن دهنده حادثه در بیداری بطوری که بسیار واقعی به نظر می رسد	Recalling the accident when you are awake in a way that it seems real	Having flashbacks of the accident as if it is real	
احساس اسارت، آشفتگی، یا ترس در مکان هایی که یاد آور حادثه است، مثلا در ماشین یا محل کار یا قرار گرفتن روی سطوح لغزنده	Having a feeling of bondage, turmoil, or fear in places that are reminders of the incident. For example in a car, at work, or on a slippery surface	Being scared or overwhelmed when in places that remind you of the accident such as being in a car, work, or slippery surfaces	
تمایل نداشتن به آراستگی ظاهر	Not caring about appearance	Being careless about your appearance	
احساس بی حوصلگی یا بی قیدی به طوری که انگار دنیا را از پشت یک شیشه تماشا می کنید	Feeling numb or insouciance as if you are watching the world from behind a glass	Feeling numb or detached as if you are watching the world through a glass	
Step three (Based on a discussion with all translators)			
Forward translated version	P-TIDS-1		
نگه داشتن	حفظ		
اسارت	برانگیختگی		
تمایل نداشتن	از دست دادن انگیزه		

Table 2. Characteristics and demographic information of the cognitive interviewing participants

Participant ID	Sex	Age	Number of people living with the participant	Education	Work status	Type of injury	Mechanism of injury	Duration of interviews (in minutes)
1	Male	41	1	PhD	Part-time	Partial ACL, PCL, and meniscus tear	Sudden change of direction during soccer	27
2	Female	38	3	Master's	Part-time	Partial tear of flexor carpi ulnaris	Fall of a heavy object on a hand	34
3	Female	58	1	High school	Homemaker	Lateral malleolus fracture	Fall on a slippery surface and landing on the lateral malleolus	26
4	Male	26	0	Bachelor's	Full-time	ACL and meniscus tear	Collision with another player during soccer, resulting in a fall	24
5	Female	24	4	Bachelor's	Full-time	Partial plantaris tendon tear	Collision with an object leading to excessive abduction of the toe	22
6	Female	33	3	College degree	Homemaker	Proximal ulna fracture	Fall on elbow	20
7	Female	45	1	High school	Homemaker	Colles' fracture	Fall on an outstretched hand	15
8	Male	24	3	Bachelor's	Full-time military service	First meta-tarsal fracture	Fall of a heavy object on the toe	16
9	Male	22	3	College degree	Full-time military service	Partial Fibularis tendon tear	Inversion ankle sprain	21
10	Male	29	2	Bachelor's	Part-time	Calcaneus fracture	Jump	23
11	Female	33	1	Bachelor's	Homemaker	Lateral malleolus fracture	Loss of balance leading to falling and inversion ankle sprain	8
12	Female	32	3	Junior high school	Homemaker	Femur fracture	Fall from a staircase	30
13	Male	55	1	Bachelor's	Retired	Meniscus partial tear	Fall leading to excessive knee flexion	12

Question three (A feeling of being overwhelmed by pain or other symptoms): one participant had a problem regarding calibration across items in that his interpretation of question three was influenced by question two.

For example, he mentioned that “pain affects your concentration and your thoughts and now the pain has also affected my mental health in a way that I keep thinking if I will ever get better or not and this makes me very nervous”.

Question four (Flashbacks of accident while you're awake that feel very real): two participants had difficulty understanding the question, which relates to the theme of comprehension/clarity. For example, one participant mentioned, “yes, I remember the incident and I remember it really well and I keep blaming myself for it”. This suggests that some participants may have difficulty distinguishing reflection from flashbacks.

Question five (feeling wound up, agitated or scared

when in a place that remind you of the accident e.g. in a car, at work or on a slippery surface): one participant did not understand the word ‘wound up’, which relates to the issue of clarity/comprehension. Two participants had problems regarding calibration across items as they were not able to understand the difference between this and the previous question.

Question seven (loss of motivation to get up and start a new day): one participant had difficulty regarding the reference point, and he explained: “do you mean motivation after I get better? I can't do much right now because of the doctor's orders but when I get better, I can do more”. This statement indicates that the participant does not understand what time frame the item is referring to.

Question nine (Loss of interest in your appearance): one participant did not understand the question and this relates to the theme of clarity/comprehension as he mentioned:

“do you mean if I care that I am wearing a cast? No, I don’t care about the cast”. Four other participants had issues about inadequate response definition as they interpreted the question as being physically unable to dress because of the injury.

Question 10 (difficulty doing the things that you would normally enjoy): there was an issue about inadequate response definition for seven participants; they interpreted the “difficulty” in terms of physically being unable to do things due to the injury. For example, one participant said, “I used to enjoy participating in sports, but now I have difficulty doing that because of my injury”.

Question 12 (Anger directed at others): three participants had issues with perspective modification; they interpreted this question as anger towards people that were somehow responsible or at fault for their injury which might indicate that some participants may interpret the question differently depending on their personal experiences. In the reconciliation stage one (step six), after the first round of cognitive interviews, all four translators discussed the items and the responses. The consensus was reached, modifications were applied, and TIDS-P-2 was created. The changes are summarized in Table 4.

Table 3. Classification of issues and frequency of each in this sample. Bolded rows are items that participants had no issue **understanding**

Items	Clarity/Comprehension	Relevance	Inadequate response definition	Reference point	Perspective modification	Calibration across items
1	22%		22%			
2						
3						11%
4	22%					
5	10%					22%
6						
7				11%		
8						
9	11%		44%			
10			77%			
11						
12					33%	

Table 4. Modifications made according to the cognitive interviews

P-TIDS-1	P-TIDS-2	Explanation based on cognitive interviewing results
مشکل در حفظ تمرکز	مشکل در حفظ تمرکز فکری	This item was modified to make it clearer so not to be confused with balance.
احساس بیش از حد تحمل بودن درد و یا سایر علائم	احساس کلافگی و یا غیر قابل تحمل بودن درد و یا سایر علائم	This additional description was added to ensure participants understand the psychological aspect of the item.
یاد آوری حادثه در بیداری به طوری که بسیار واقعی به نظر می رسد	یاد آوری آزاردهنده حادثه در بیداری به طوری که بسیار واقعی به نظر می رسد	This item was modified to emphasize on flashback rather than reflection.
از دست دادن انگیزه برای برخاستن و شروع روزی تازه	از دست دادن روحیه برای شروع روز	This item was modified so that it is not confused with motivation for physical recovery.
عدم توجه به آراستگی ظاهر	اهمیت ندادن به آراستگی ظاهر به دلیل بی حوصلگی	This item was modified to ensure that the loss of interest is not due to physical limitations but rather due to psychological factors.
مشکل در انجام دادن کارهایی که به طور معمول از آن لذت می بردید	عدم تمایل به انجام کار هایی که به طور معمول از آن لذت می بردید	This item was modified to ensure that the loss of interest is not due to physical limitations but rather due to psychological factors.
خشم نسبت به دیگران	احساس خشم بی دلیل	This modification was made to ensure participants understand that the anger can be towards anyone for any reason.

The second round of cognitive interviews

Following the creation of P-TIDS-2, it was administered to another set of participants (step seven). The majority of participants had no issues understanding and answering the entire questionnaire, and response saturation was reached. Only one participant had an issue in terms of clarity/comprehension for question one.

In the reconciliation stage two (step eight), after the second round of cognitive interviews, all four translators evaluated and discussed the response, and the final draft of the Persian version of the TIDS (P-TIDS) was confirmed (Figure 2).

4. Discussion

This study successfully translated and culturally adapted a psychological distress scale that was originally developed in an English-North American context to the Persian language and culture.

During the process, issues around clarity were identified and rectified to optimize future implementability.

The term ‘psychological distress’ has been defined as “a wide spectrum, ranging from normal feelings of vulnerability, sadness, and fears to problems that can become disabling, such as depression, anxiety, extensive worries, negative thoughts, or social isolation”. [16] Generally, it has been shown to be associated with decreased functionality, increased morbidity, hospitalization, and mortality. [17,18] Psychological distress can be caused by a variety of factors such as life experiences or consequences of an acute injury such as pain. Psychological distress can significantly change the normal course of recovery and has been shown to be a strong predictor of chronic pain. [19] In a longitudinal study by Mayou and Bryant that investigated chronic pain in a large sample of 1148 participants, distress was found to be a common and significant predictor of chronic pain. [9] These authors concluded that evaluating psychological variables including distress following an injury can help identify those that have a higher risk of developing chronic pain. [9] It is imperative to note that distress can also be an outcome of MSK injuries that are ostensibly not catastrophic and can lead to chronic pain and resultant disability. [5] For this reason, having a prognostic tool such as the TIDS to assess

مقیاس پریشانی و درماندگی بعد از آسیب های تروماتیک (ناشی از ضربه)

هیچوقت	گاه به گاه	بیشتر وقتها یا همیشه	به چه میزان علائم زیر باعث ایجاد مشکل برای شما پس از آسیب شده است؟
۰	۱	۲	۱ مشکل در حفظ تمرکز فکری
۰	۱	۲	۲ مشکل در فکر کردن به هر چیزی به جز درد
۰	۱	۲	۳ احساس کلافگی و یا غیر قابل تحمل بودن درد یا سایر علائم
۰	۱	۲	۴ یادآوری آزار دهنده حادثه در بیداری بطوری که بسیار واقعی به نظر می‌رسد
۰	۱	۲	۵ احساس برانگیختگی، آشفتگی، یا ترس در مکانهایی که یادآور حادثه است (مثلا در ماشین محل کار یا قرار گرفتن روی سطوح لغزنده)
۰	۱	۲	۶ احساس کلافگی از عدم توانایی کنترل درد
۰	۱	۲	۷ از دست دادن روحیه برای شروع روز
۰	۱	۲	۸ دردی که تمام روز پابرجاست و کاهش نمی‌یابد
۰	۱	۲	۹ اهمیت ندادن به آراستگی ظاهر به دلیل بی حوصلگی
۰	۱	۲	۱۰ عدم تمایل به انجام کارهایی که به طور معمول از آن لذت می‌بردید
۰	۱	۲	۱۱ احساس بی حوصلگی یا در خود فرو رفتگی، به طوری که انگار دنیا را از پشت یک شیشه تماشا می‌کنید
۰	۱	۲	۱۲ احساس خشم بی دلیل

Figure 2. The Persian version of the Traumatic Injuries Distress Scale (P-TIDS)

distress after MSK trauma in order to better evaluate the risk of developing chronic pain is important. This tool has the potential to be particularly beneficial in places where the prevalence of MSK injuries, chronic pain, or distress are high. In a large cohort of Iranian participants (n=4762), it was found that MSK complaints were significantly associated with psychological distress,[20] and in another Iranian study, it was reported that the majority of people suffered from chronic pain and this was significantly correlated with distress.[21] Therefore, the applicability of the TIDS-Pin Iran is high.

With regards to the translation of the TIDS, certain considerations and modifications were taken into account, most of which were based on the responses received in the cognitive interviews. These modifications were specifically for words or phrases that did not have an exact equivalence in Persian or had various meanings that needed to be described in more detail. These modifications were made to ensure that the scale is not only translated to Persian linguistically but also content validity is preserved via cultural adaptation at a conceptual level. Through the use of these equivalency techniques and reaching response saturation in the interviews, we are ensured that the TIDS-Phas content accuracy compared to the original English version.

The cultural adaptation of the TIDS was faced with a particular difficulty. The identified issue was regarding the problem of mental illness being a stigma. The responses received in the cognitive interviews pointed to this issue because most people tended to be guarded as some of the symptoms may have a stigma associated with them and that mental health symptoms seem to be more stigmatized than physical health symptoms. The majority of the participants tried to explain away their symptoms of distress by relating it to their physical symptoms. The stigma associated with mental health issues can lead to negative consequences such as an increased likelihood of treatment avoidance.[22] Although the problem of mental illness being perceived as a stigma is a global issue, it is more pronounced in non-western societies.[23] One study compared the stigma associated with mental illnesses in Sweden and Iran and concluded that 16% of the Swedish population compared to 40% of the Iranian population experienced stigma.[24] To circumvent this issue at least with this scale, we provided a brief description to the name of the scale in parenthesis to emphasize that this scale is evaluating your distress 'after an injury' to provide more clarity that we are not assessing their psychology in general. In addition, since the TIDS evaluates psychological distress, patients that suffer from an acute MSK injury may at first find the scale irrelevant to them, which is an understandable assumption given

that it may not be common knowledge that psychological variables can affect recovery in MSK injuries. For this reason, we recommend providing a simple explanation in lay language to patients and future research participants about the impact of psychological variables on recovery following an MSK injury.

5. Strengths and limitations

The main strength of this study is that all the procedures for translation and cross-cultural adaptation of the TIDS were according to previously published guidelines.[11,12] Another strength of the study is that the translators were experts in the field, including a medical doctor, a rehab scientist, and two occupational therapists, which increases our confidence in the face validity of the P-TIDS. The main limitation of this study is that the construction of the TIDS-Pwas not based on a literal translation of the original version. However, cultural adaptations were performed to ensure that the content validity of the tool is preserved, which is an essential step when the intent is to make the tool useable in another culture or society. Future studies are needed and are underway in order to assess the reliability and construct validity of the P-TIDS.

6. Conclusion

In this study, the TIDS, which is a tool to assess psychological distress following MSK trauma was translated and culturally adapted to Persian using the cognitive interviewing technique. This is the first Persian culturally adapted tool to assess this construct in this patient population, which can be a significant addition to the toolbox of Persian healthcare providers in order to assess the risk of developing chronic pain post-MSK trauma.

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