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Research Paper

Cross-cultural Adaptation, Validity, and Reliability of the Persian Version of Back Pain and Body Posture Evaluation Instrument for Adults

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ABSTRACT

Background and Objectives: Back pain and neck pain are prevalent health concerns, emphasizing the importance of identifying effective risk factors for prevention. This study aimed to cross-culturally adapt and validate a tool assessing back and neck pain in adults, with a specific focus on body posture, to the Persian language.

Methods: A methodological study was conducted involving forward and backward translation of the original English questionnaire into the Persian language. Face validity was evaluated with feedback from 30 participants, and content validity was determined using content validity ratio (CVR) and content validity index based on expert opinions from 10 physiotherapy specialists. A total of 237 participants were involved in the study, with 90 completing the questionnaire again after one week for test re-test reliability assessment.

Results: The Persian version of the questionnaire demonstrated high content validity with a CVR above 0.6. The Persian version had suitable face validity. Test re-test reliability, assessed using percentage agreement and the Kappa coefficient, revealed satisfactory results, with all percentages above 70%. Notably, the intraclass correlation coefficient for questions 16 and 20 was 0.898 and 0.878, respectively.

Conclusion: The Persian version of the tool exhibits high validity and reliability, making it a valuable instrument for use within the Persian-speaking community.

Keywords: Low back pain, Neck pain, Posture, Questionnaire, Validity, Reliability, Cross-cultural adaptation

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What is "already known" in this topic:

There are various questionnaires to evaluate back pain and neck pain. The back pain and body posture evaluation instrument for adults is for checking the risk factors of back pain and neck pain.

What this article adds:

The Persian version of back pain and body posture evaluation instrument is valid and reliable. This questionnaire can be use in clinicals.

Introduction

In recent years, the scientific and public health communities have acknowledged the growing significance of back and neck-related pains, making them pivotal areas of concern [1]. As of 2020, the annual prevalence of back pain was reported at 245.9 cases per year [2], with neck pain reaching a minimum of 2443.9 cases per 100000 individuals [3]. Interestingly, both reports that are mentioned indicated a slightly higher prevalence of back and neck pain in women compared to men, with an observable increase from the age of 70 onwards [2, 3]. Globally, the impact of back and neck pain extends beyond personal discomfort, with these conditions constituting common causes of disability. Their effects ripple through personal, work, and societal dimensions, exerting a multifaceted influence on physical, social, and economic aspects and consequently contributing to an escalation in societal costs [4, 5].

The identified risk factors for back and neck pain are diverse and include age, gender, a history of neck or back pain, psychological factors, a sedentary lifestyle, prolonged sitting, incorrect posture, computer use in bed, and levels of physical activity, among others [6, 7]. The investigation of these risk factors is imperative for effective pain prevention, diagnosis, treatment, and the mitigation of associated effects [3, 8].

While numerous tools are available for assessing posture and risk factors related to back and neck pain, the practicality and accessibility of a questionnaire make it an invaluable choice. A questionnaire not only facilitates assessments across a large population but also provides meaningful insights [9]. The research team, recognizing the critical importance of assessing back pain and neck pain factors with a special emphasis on posture, identified the back pain and body posture evaluation instrument for adults that was developed in 2018 as the most suitable at the initiation of the study [10].

To introduce a robust tool for evaluating back pain and body posture in adults and concurrently raise awareness regarding posture's pivotal role in back pain, the research team undertook the crucial step of cultural adaptation within the Iranian population. It is emphasized that for international questionnaires, mere translation is insufficient. The fundamental challenge lies in cultural adaptation to preserve the intended meaning and purpose, ensuring comprehension within the unique sociocultural context of the target society [11].

Materials and Methods

This is a cross-cultural adaptation study design. The process of translation and cultural adaptation was done based on standard protocols [12]. In the first step, we got permission from the authors to translate the questionnaire. After that, translation and cross-cultural adaptation were done. For forward translation, two translators with proficiency in English were asked to translate the BackPEI-A separately.

Two different translations were suggested in the committee with two translators and two physical therapists and a single Persian version presented.

For backward translation, two other translators who were blind to the original version translated the Persian version into English. The diversions of these two versions were resolved and suggested by a committee between translators and two experts in physical therapy. The confirmation for not changing the meaning and concept in the backward translation version was obtained from the authors.

Face validity: For face validity, the face validity along with the translated version was given to 30 qualified people according to the study entry criteria [13]. In this form, the questions were evaluated in terms of simplicity and comprehensibility. People were asked to mention their suggestions.

Content validity: To perform content validity, 10 physiotherapists were asked to evaluate the Persian version based on the content validity form. In this form, the questions were examined based on whether they were necessary, useful but unnecessary, or unnecessary. The content validity ratio (CVR) was calculated based on the "Lawshe" method; for ten experts, a minimum score of 0/6 is needed and the Equation 1 was used [14].

1. $CVR=\frac{Ne-\frac{N}{2}}{\frac{N}{2}}$

(N=number of experts, Ne=the number of experts who have chosen necessary options)

To calculate the content validity index (CVI), the average scores of the content validity ratio were used [1].

Reliability: The questionnaire was given to 240 individuals who visited health centers in Tehran. Sampling was done in 4 different areas of Tehran. Simple and non-probability sampling was used. The criterion for entering the research was the age of over 18 years old and under 80 years. Participants took part in this study voluntarily and, they could quit the research under any conditions participants.

To ensure the reliability of the tool, a test re-test was used, and in this research, the questionnaire was again given to 90 people who had previously completed the questionnaire [13]. The interval between the two tests was one week. Seven days is long enough to forget questions [15].

In the process of data analysis for questions 1-15 and 17-19 unweight- κ conflict was used with a confidence interval of 95% and percentage of agreement.

In this research, Kappa value is interpreted in this way: κ less than 0.200 announced as poor, between 0.20-0.400 is fair, 0.401-0.600 is moderate, 0.601-0.800 is good, and 0.801-1.00 is very good [14].

For agreement of questions 16 and 20, the intraclass coefficient (ICC) was used. The acceptable ICC was considered 0.5 [10].

All statistical analysis was performed by SPSS, software, version 26. The level of significance was set at $P<0.05$. All participants were aware of the research process and could withdraw from the research if they wished. Sampling was done from the people who visited the health centers (known as Sarai Mahalle) in different areas of east, west, south, and north of Tehran. It was done from June to October 2023.

Results

The Persian back pain and body posture evaluation instrument (BackPEI-A) questionnaire was administered to a total of 240 individuals, and 237 subjects completed questionnaires. Among the participants, 161 were women (67.9%), and 76 were men (32.1%) (Tables 1 and 2). Analysis of participants' occupations revealed that the highest percentage was represented by housewives (36%), followed by office employees at 14.4%. Students (16.1%) and teachers (5.5%) ranked third and fourth, respectively. Additionally, 27 other occupations were reported, including secretary and engineer (Table 3). On the visual analog scale (VAS), the average score for back pain was 4.61 and 4.75 for neck pain.

According to the aforementioned formula, the CVR for 11 questions was 0.8 and 0.6 for the rest of the questions. The CVI was obtained at 0.71, which means that they achieved the expected level in our research, and it can be said that the content validity of the Persian version of BackPEI-A is acceptable.

In the face validity form, most of the people chose the simple and understandable option and said that the questionnaire was completely fluent and clear for them.

Table 1. The demographic characteristics of the study participants

Variables	Mean±SD	Min	Max
Age (y)	42.08±14.27	18	76
Weight (Kg)	67.97±12.40	45	167
Height (cm)	166.64±8.40	147	187

Table 2. Frequency of back pain and neck pain in each gender

Variables		No.	
		Yes	No
Neck pain	Female	62	96
	Male	29	45
Back pain	Female	104	57
	Male	35	41

Among the total female population, approximately 64% experienced back pain, while 46% of the total male population reported back pain. Within the female population, 39% of women had neck pain, a percentage mirrored in the male population.

Among housewives, 70% experienced back pain, and 36% reported neck pain. For employees, the figures were 58% for back pain and 50% for neck pain. Among students, 28% had back pain and 8% experienced neck pain.

The κ score, as presented in Table 4, indicated that three questions achieved a moderate rating, four questions demonstrated very good reliability, and the remaining questions exhibited a good reliability score. This collectively affirms the robustness of all questions in the questionnaire.

Specifically, for questions 16 and 20, which address pain intensity, the intraclass correlation coefficient (ICC) demonstrated a high correlation. The ICC for low back pain intensity was 0.889, and 0.878 for neck pain intensity. Both scores were excellent, with a significant $P<0.001$, indicating a strong level of agreement in responses to these questions.

These findings underscore the overall reliability of the Persian BackPEI-A, particularly in assessing pain intensity, reinforcing its credibility as a dependable instrument for research and clinical applications.

Discussion

Our primary objective was to implement a cultural adaptation of the BackPEI-A to assess back pain and body posture in adults, and then assess its validity and reliability. The main findings indicated that the Persian version is reliable and similar to the original version.

The BackPEI-A tool has been uniquely developed to comprehensively examine back and neck pain collectively in adults, emphasizing crucial risk factors. The present study contributes to the field by culturally adapting this tool to the Persian language, and visualizing its application in research, clinical settings, and education. By emphasizing the importance of proper daily postures, this questionnaire has the potential to reduce risk factors associated with back and neck pain, ultimately preventing complications.

The accurate validation process, which encloses translation quality, face validity, and content validity, assures the tool's reliability and applicability. Experts and specialists have confirmed the clarity and simplicity of the questionnaire, ensuring its accessibility to the general population within the Iranian cultural context.

Furthermore, the findings from the face validity examination affirm the clarity and comprehensibility of all items within the questionnaire, supporting its suitability for use. The content validity survey involving physiotherapists demonstrated satisfactory CVI and CVR values, reinforcing the tool's quality.

Table 3. The presence of neck pain or back pain in the three most mentioned job titles

Occupation	Back Pain		Neck Pain	
	Yes	No	Yes	No
Housewives	61	25	31	54
Office employees	20	14	17	17
Students	11	27	3	33

Table 4. Results of κ coefficient for the categorical variables in the Persian BackPEI-A

Question	Agreement	K-value	95% Confidence Interval	
			Lower	Upper
1	85	0.698	0.547	0.848
2	83	0.667	0.512	0.821
3	85	0.713	0.571	0.854
4	75	0.443	0.247	0.639
5	90	0.786	0.654	0.917
6	83	0.657	0.499	0.815
7	74	0.554	0.305	0.802
8	100	1	-	-
9	73	0.654	0.534	0.773
10	83	0.609	0.432	0.785
11	90	0.716	0.543	0.888
12	78	0.540	0.367	0.712
13	92	0.842	0.730	0.953
14	80	0.714	0.555	0.872
15	93	0.816	0.616	1
17	87	0.761	0.584	0.892
18	82	0.750	0.573	0.926
19	97	0.892	0.684	1

This study highlights the significance of posture as a pivotal factor influencing musculoskeletal health, with profound effects on joint and muscle function. While correct posture promotes optimal functionality, poor posture can lead to fatigue, pain, muscle strain, and associated issues, as supported by existing literature [16]. Notably, despite the availability of various questionnaires for assessing back and neck pain, few specifically focus on evaluating individuals' postures during daily activities.

Quantitative analysis, specifically the ICC, substantiates the high degree of correlation between repetitions of questions 16 and 20, exceeding the targeted threshold of 0.6. Additionally, the tool's reproducibility and reliability were assessed through the Kappa coefficient and percentage of agreement, with results indicating substantial agreement and reliability.

The demonstrated reliability of the Persian version of the BackPEI-A tool underscores its repeatability and dependability. This practical instrument addresses a societal need for assessing and addressing musculoskeletal health, contributing to the advancement of healthcare practices.

Investigating the prevalence of back pain and neck pain concerning gender, our study reveals a notable gender-based difference. Women exhibit a higher frequency of back pain, suggesting that gender may be a significant factor influencing the occurrence of back pain. This outcome aligns with Ye et al.'s research, which identifies gender as a key risk factor for back pain, emphasizing a higher probability of occurrence in women [17]. Despite this gender-related trend, our findings indicate that the prevalence of neck pain remains consistent across both genders. It is noteworthy to mention Kazeminasab's arti-

cle [3], which suggests that gender ratios can affect neck pain prevalence. This discrepancy might be attributed to variations in sampling locations and participant numbers, underscoring the importance of further research. It is essential to emphasize that gender alone may not provide a comprehensive understanding, and additional investigations, possibly considering various occupations, are warranted for a more nuanced perspective.

A deeper analysis of Table 2 results indicates a significant number of individuals are experiencing either back pain or neck pain. The questions within the tool offer insights into participants' lifestyles, encompassing factors such as sitting habits and exercise routines. This information holds potential for tailoring interventions and planning targeted healthy lifestyle training programs.

When examining the three most frequently mentioned occupations, housewives emerge as a group with a higher prevalence of both neck and back pain compared to employees and students. Arju et al.'s research supports this observation, establishing a direct and significant relationship between housework and the occurrence of back pain [18]. These findings underline the importance of recognizing the impact of different occupations on musculoskeletal health.

Looking forward, future research endeavors should explore the intricate relationship between questionnaire items and the presence/intensity of back and neck pain across diverse occupational groups and age ranges. While we acknowledge limitations such as limited sample size and a lack of categorization, expanding research parameters will contribute to a more comprehensive understanding of the factors influencing musculoskeletal health.

In summary, the BackPEI-A tool not only provides valuable insights into the prevalence of back and neck pain but also serves as a promising and reliable instrument. Its potential applications extend beyond identifying pain occurrences, laying the groundwork for further exploration into its implications for diverse populations and the development of targeted interventions.

Conclusion

Persian BackPIE-A is a reliable and valid tool that can be used for Iranian society.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of University of Social Welfare and Rehabilitation Sciences (Code: IR.USWR.REC.1402.027) and the participants completed an informed consent form.

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Authors' contributions

Conceptualization and writing: Delaram Pourbafrani; Data analysis: Mohsen Vahedi; Supervision: Farhd Azadi.

Conflict of interest

The authors declared no conflict of interest.

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مقاله پژوهشی

انطباق فرهنگی،بررسی روایی وپایایی ابزار سنجش درد کمر وگردن وپاسچردر بزرگسالان

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چکیده

مقدمه مقدمه: کمردرد و گردن درد نگرانی های رایج سلامتی هستند که بر اهمیت شناسایی عوامل خطر موثر برای پیشگیری تاکید دارند. این مطالعه با هدف تطبیق و اعتبارسنجی بین فرهنگی ابزاری برای ارزیابی کمردرد و گردن در بزرگسالان با تمرکز ویژه بر وضعیت بدن با زبان فارسی انجام شد.

مواد و روش ها یک مطالعه روش شناختی شامل ترجمه رو به جلو و عقب پرسشنامه اصلی انگلیسی به زبان فارسی انجام شد. روایی صوری با بازخورد ۳۰ شرکت‌کننده ارزیابی شد و روایی محتوا با استفاده از نسبت اعتبار محتوا (CVR) و شاخص اعتبار محتوا (CVI) بر اساس نظرات متخصصان ۱۰ متخصص فیزیوتراپی تعیین شد. در مجموع ۲۳۷ شرکت کننده در مطالعه شرکت کردند که ۹۰ نفر بعد از یک هفته مجدداً پرسشنامه را برای ارزیابی پایایی آزمون-آزمون تکمیل کردند.

یافته‌ها نسخه فارسی پرسشنامه دارای روایی محتوایی بالا با CVR بالای ۰.۶ بود. نسخه فارسی از روایی صوری مناسبی برخوردار است. پایایی آزمون-آزمون مجدد، که با استفاده از درصد توافق و ضریب کاپا ارزیابی شد، نتایج رضایت‌بخشی را با تمام درصدهای بالای ۷۰ درصد نشان داد. قابل ذکر است که ضریب همبستگی درون کلاسی (ICC) برای سوالات ۱۶ و ۲۰ به ترتیب ۰/۸۹۸ و ۰/۸۷۸ بوده است.

نتیجه‌گیری نسخه فارسی این ابزار از روایی و پایایی بالایی برخوردار است و آن را به ابزاری ارزشمند برای استفاده در جامعه فارسی زبان تبدیل کرده است.

کلیدواژه‌ها:
کمردرد، گردن درد، پاسچر، پرسشنامه، روایی، پایایی، انطباق فرهنگی

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