Patient Preference and Adherence

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Validation of the Arabic Version of the Attitude Toward Education and Advice for Low Back Pain Questionnaire

Ahmed S Alhowimel[1], Collins Ogbeivor[2], Ahmad Dalli Alruwaili[3], Omar M Morizn[1], Abdulaziz Aljamaan[1], Aqeel M Alenazi[1], Norah A Alhwoaimel[1], Mohammed M Alshehri[4], Bader A Alqahtani[1], Faris A Alodaibi[5]

[1]Department of Health and Rehabilitation Sciences, College of Applied Medical Science, Prince Sattam Bin Abdulaziz University, Alkharj, Saudi Arabia; [2]Department of Physical Rehabilitation, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia; [3]Joint Clinic, Riyadh, Saudi Arabia; [4]Physical Therapy Department, Jazan University, Jazan, Saudi Arabia; [5]Department of Rehabilitation Science, King Saud University, Riyadh, Saudi Arabia

Correspondence: Ahmed S Alhowimel, Department of Health and Rehabilitation Sciences, College of Applied Medical Science, Prince Sattam Bin Abdulaziz University, Alkharj, Saudi Arabia, Tel +96611558888, Email a.a;howimel@psau.edu.sa

Purpose: This cross-sectional study aimed to validate the Arabic version of the Attitude toward Education and Advice for Low Back Pain (AxEL) Questionnaire.

Patients and Methods: This study was conducted in two phases. First, the AxEL questionnaire was translated into Arabic and cross-culturally adapted. Second, the psychometric properties (such as validity) of the translated AxEL were evaluated.

Results: The results showed that back translators and language specialists had no trouble translating the AxEL. The translators' agreement was very high (88.2%), and the questionnaire items were logically and clearly translated from English into Arabic.

Conclusion: The Arabic version of AxEL is a valid tool that can assess individuals' beliefs and attitudes towards low back pain (LBP). It fills a significant void in cross-cultural research and can help healthcare providers understand the attitudes and beliefs influencing individuals' management of LBP within the Arabic context.

Keywords: education, low back pain, outcome measures

Introduction

Individuals experiencing lower back discomfort frequently encounter work-related limitations.[1] The Global Burden of Disease Study 2019 (GBD 2019)[2] highlighted an increase in disability days attributed to low back pain (LBP) over the past three decades. This trend is expected to continue, exacerbating the burden on global healthcare systems. To mitigate this issue, evidence recommends prioritizing advice, education, and reassurance as foundational strategies in LBP management.[3–6] This implies that, irrespective of the duration of a patient's LBP, healthcare practitioners are encouraged to promote physical activity actively, offer education and reassurance on the nature of LBP, and spread awareness that this condition is not a severe illness. However, a systematic review of the health information needs of people who experience LBP found that there was a disparity between the recommended treatment prescribed in the clinical practice guidelines for the initial treatment of LBP and the actual therapy. Several factors pertaining to healthcare providers and patients contribute to the underutilization of first-line therapies. Foster et al[7] reported that clinicians frequently express concerns regarding insufficient time and resources to provide optimal primary care during the initial consultation. Slade et al[8] discovered that patients' treatment expectations and attitudes significantly influenced medication adherence to first-line therapies. Clinicians informed by patients' perspectives on first-line treatment options could deliver more effective and efficient consultations despite the constraints of their time. Clinicians possess the ability to modify their approaches toward patient care in accordance with the patients' emotional states and personal expectations, which can enhance patient satisfaction, the efficacy of primary care interventions, and treatment outcomes.[9]

Received: 10 November 2023
Accepted: 25 April 2024
Published: 17 May 2024

Conducting research on patients' perspectives of the first treatment options for LBP could help physicians determine the preferred first-line therapies of individuals with this condition. Surveys designed to assess the subjective experiences of individuals experiencing pain face several methodological challenges. A prevalent issue arises when assessments simply evaluate one aspect of an individual's attitude, compounded by several individuals undergoing the examination. The Pain and Impairment Relationship Scale is used to assess an individual's perspectives and emotions regarding persistent pain, as well as their capacity to engage in job activities while experiencing pain.

Darlow et al[10] and Slater et al[11] suggested that a limited number of 15 "yes/no" questions might effectively gauge individuals' attitudes and perspectives. The Survey of Pain Perspectives examined seven perspectives on pain. In a study conducted by Riley et al,[12] participants were asked to indicate their level of agreement with 57 statements related to LBP using a five-point Likert scale. Further, in the Back Pain Attitude Questionnaire, participants were required to indicate their level of agreement with each item on a five-point Likert scale.[13] The measurement characteristics of the aforementioned scales[14,15] showed sufficient internal consistency, test-retest stability, and hypothesis testing capabilities, thus providing evidence for the presence of convergent and discriminant validity. Although each survey has its strengths and weaknesses, a gap remains effective in capturing patient perspectives on initial LBP treatments. Consequently, valuable professional time and resources could be wasted or misallocated.

According to a collaboration between experienced academics, physicians, and patients, the public should be informed of a list of evidence-based "essential key messages" about LBP.[16] O'Hagan et al[17] created a poll to gauge people's responses to such communications, which could help clinicians tailor their recommendations for specific patients. Clinicians could inform patients about the benign nature of LBP if they have a negative attitude toward it. It is possible that doctors will not have to spend as much time repeating that message if they have a good outlook on active communication. The psychometric testing of the tool revealed its outstanding reliability and validity.[17] The Attitude toward Education and Advice for Low Back Pain (AxEL) is a questionnaire used to assess attitudes toward first-line education and guidance for people with LBP. This 11-item questionnaire evaluates perceptions related to LBP etiology, management, and prevention. While this scale has been validated in English, French, and Dutch, its validation in Arabic is yet to be undertaken.

Objective

This study aims to establish the cross-cultural validity of the Arabic version of the AxEL questionnaire. The findings might be used to guide the effective management of LBP among Arabic-speaking stakeholders, encompassing patients, healthcare professionals, researchers, and policymakers.

Methods

This study was conducted in two phases. First, the AxEL questionnaire was translated into Arabic and cross-culturally adapted. Second, we assessed the questionnaire's psychometric properties. The study complies with the Declaration of Helsinki.

The participant recruitment process involved consecutively selecting participants from a database of individuals who had indicated their willingness to participate in the research. The study included individuals who experienced LBP for varying durations and were able to speak and write in Arabic.

The AxEL

Translation and validation are crucial procedures that guarantee that questionnaires can be used across cultural boundaries to provide accurate measurements. This study focuses on significant investigations, strategies, challenges, and findings related to the translation and validation of the AxEL questionnaire in Arabic-speaking environments. These findings highlight the significance of linguistic equivalence, cultural adaptability, and psychometric traits when assessing the level of success in language learning in Arabic-speaking societies.

The validity and reliability of the instrument must be ensured across various groups and cultures, according to the theoretical literature on cross-cultural adaptation and validation of questionnaires.[10,18] This process includes language

translation, cultural adaptation, content and construct validity, as well as reliability testing. Achieving conceptual equivalence with the original form ensures the questionnaire measures the same construct within the target population.[19]

Translation and Cross-Cultural Adaptation

Translation and cultural adaptation were examined by two scholars with expertise in this field. The AxEL questionnaire was translated from English into Arabic by two independent translators who were multilingual, fluent in both English and Arabic, and whose first language was Arabic. The first translator had no training in medicine, whereas the second was a professional translator specializing in physiotherapy. The aims of the AxEL questionnaire were known to the first translator, who was also familiar with the procedure. Following the presentation of each translator's distinct Arabic translation, the two translators compared their copies, addressed any problems, and eliminated disparities between the two translations.

Twenty patients with LBP were evaluated using the culturally adapted Arabic version of the AxEL questionnaire, which was well-received. Thus, this study adhered to the pre-made translation, which was then examined by the researchers, who discovered that it had successfully completed the translation procedures in accordance with the guidelines provided by Beaton et al[14] and Guillemin et al,[15] who divided the process into eight phases.

Phase 1: Approval to translate: Initially, we obtained approval from the original developers of the AxEL questionnaire before commencing the translation process. The purpose and process of translation were explained before approval was granted.

Phase 2: Initial translations: Two independent forward translations from English to Arabic were completed, with translators providing reports on any challenging terminology or ambiguous phrases.

Phase 3: Synthesis: The original questionnaire and both Arabic translations were synthesized into version T12, correcting any unsuitable language identified during discussions with the translators. A written report detailing the synthesis process and the steps taken to address new concerns was produced.

Phase 4: Backward translation: Two native English speakers, who were blinded to the original translation, independently back-translated Version T12 into English. This step verified the equivalence of content between T12 and the original version.

Phase 5: Expert committee review: Backward translations were evaluated against each other and the original questionnaire by an expert committee, which included two health professionals, one Arabic language specialist, and four translators. Discrepancies in linguistic accuracy and cultural relevance were analyzed, and modifications were made if necessary. Email correspondence with the creator of the AxEL questionnaire was established. This phase resulted in a pre-final version of the Arabic translation of the AxEL questionnaire, and a detailed written report on the challenges encountered along the way was produced.

Phase 6: Pre-final version testing: The expert team evaluated the backward translations and the pre-final version. Participants' feedback on comprehension and relevance was solicited and analyzed. Despite some participants facing difficulties with certain items (17 and 3), less than 15% of the sample reported issues, which was deemed acceptable by the committee. The expert panel refined the translation based on this feedback.

Phase 7: Pilot study: The pilot study focused on evaluating the clarity and comprehensibility of the pre-final Arabic version of the questionnaire to ascertain if further adaptations or revisions were necessary. This was assessed by the same expert scholars who conducted the translation. Twenty participants answered the pre-final Arabic version in the pre-test study. Participants comprised both men and women aged 20 years or older with LBP at the time of the investigation. They were asked to comment on how clear they thought the questionnaire items were.

We employed a modified version of a previously used questionnaire to comprehensively assess the face and content validity of the preliminary Arabic version. The questionnaire items were similar to those used in the initial questionnaire. A poll was conducted to inform the expert committee about the general clarity of the final questionnaire. Participants reported that it took them an average of five minutes to complete the questionnaire.

Phase 8: Final version: The completed Arabic version of the AxEL questionnaire, along with the necessary documentation, was submitted to the original developer for final approval.

Psychometric Properties Assessment

Sample and Recruitment

Patients (aged 20–70 years) with LBP from the King Faisal Specialist Hospital who met the eligibility criteria were invited to complete the Arabic version of the AxEL. Although there was no gold standard in sample size estimation for psychometric validation studies, Elsabbagh et al[16] recommended that a sample of at least 50 participants be required to assess validity and reliability. Therefore, we aimed to recruit more than 50 participants. Participants who could not read Arabic, had a noted health condition (such as a cauda equina, tumor, infection, or inflammatory condition), or had just undergone spinal surgery were excluded from this study.

Data Collection Process

Eligible participants were asked to complete a questionnaire booklet that included the following:

1. A questionnaire to collect data on sociodemographic and health characteristics.
2. The Arabic version of the AxEL.
3. Description of the Arabic version of AxEL and the seven-point Likert scale used to assess participant satisfaction, comprehension, and item clarity. Participants identified their level of agreement with each of the seven items on the scale from "strongly agree" to "strongly disagree". Seven more statements on a scale from "very disturbing" to "very reassuring" and another from "very frustrating" to "very motivating" were also evaluated. This scale was used to assess the questionnaire content.

Statistical Analysis

- Participants' demographic and health characteristics were summarized using descriptive statistics, including means, standard deviations, and frequencies. The face and content validity scale and the level of agreement were presented as percentages for each item.
- The floor and ceiling effects of AxEL were determined by calculating the percentage of participants scoring at the extremes of the scale for the total score. Floor or ceiling effects were present when 15% of the participants scored the lowest or highest possible score.
- Convergent reliability was assessed using correlational analysis of the AxEL total score and education level. We chose this level of education because it has been shown to impact overall health; higher education indicates better health.[20] Furthermore, higher levels of education were associated with a higher level of medical knowledge.[21]
- The internal consistency of the AxEL was evaluated using Cronbach's alpha coefficient (α). An alpha coefficient greater than 0.9 indicates excellent reliability, 0.7 to 0.9 high reliability, 0.5 to 0.7 moderate reliability, and less than 0.5 low reliability.[22] Cronbach's alpha was 0.91, indicating that this tool has excellent reliability.
- All statistical analyses were performed using SPSS 25.0 (SPSS Inc., Chicago, IL, USA), with statistical significance set at $P < 0.05$.

Results

Sample Description

A total of 65 participants met the eligibility criteria, provided informed consent, and enrolled in the study. The average age of the participants was 45 years, with an average pain intensity of 5.97 (on the VAS) and a mean pain duration of 1.2 months. More than half the participants were women (n = 34, 52%). The average weight and height of the sample were 77 kg and 165 cm, respectively. Further, 47.7% of the sample were employed and 72.3% had a university education. About 80% were nonsmokers. The results are summarized in Table 1.

Validation and Reliability

Most participants found the questionnaire understandable and relevant, highlighting its content and face validity (Table 2).

Table 1 Distribution of Respondents According to Demographic Variables (n = 62) and Reliability Testing (n = 20)

Demographic Variables	Construct a validity test (n = 65)	Pilot Study (n = 20)
Mean age (years) ± SD	45.16 ± (14.21%)	*NA*
Sex		
Male	31 (47%)	13 (65%)
Female	34 (52%)	7 (35%)
Education		
Elementary	3 (4.6%)	5 (25%)
Middle school	3 (4.6%)	1 (5%)
Secondary school	12 (18%)	0
University	47 (72%)	14 (70%)
Occupation		
Employed	31 (47%)	10 (50%)
Retired	12 (18%)	2 (10%)
Unemployed	22 (33%)	8 (40%)
Marital status		
Single	15 (23%)	7 (35%)
Married	45 (69%)	12 (60%)
Divorced	3 (4.6%)	1 (5%)
Widowed	2 (3%)	0
Smoking		
Yes	13 (20%)	14 (70%)
No	52 (80%)	6 (30%)
Weight mean ± SD (kg)	77.0 ± 14.229%	*NA*
Height ± SD (cm)	165.93± 7.601%	*NA*
Low back pain duration		
Less than 3 months	13 (20%)	3 (5%)
More than 3 months	52 (80%)	17 (85%)
Low back pain rate mean ± SD	5.969 ± (2.046%)	*NA*

Notes: Table 1 shows the distribution of the sample according to demographic variables.
Abbreviations: SD, standard deviation; NA, not asked.

The agreement between translators was high (88.2%), and the expert panel reached a consensus on the most accurate translations. While most participants rated the questionnaire's comprehensibility positively, a small number had difficulty with certain items (17 and 3). Nevertheless, the incidence of these difficulties was below the 15% threshold established by the panel for significant concerns (item 17 = 5.7%; item 3 = 2.85%), allowing the adoption of the final version without further amendments.

Table 2 Translation and Cross-Cultural Adaptation of the Arabic Version of AxEL

No.	Item	7	6	5	4	3	2	1
1	questions were clear and easy to understand	46.3%	71.2%	7.9%	1.8%	0.9%	17.6%	34.1%
2	Questions covered all problem areas concerning back pain	27.1%	39.3%	22.4%	3.3%	1.9%	42.1%	5.9%
4	The questionnaire lacks important questions	3.7%	23.4%	36.1%	21.2%	3.7%	25.1%	17.9%
5	Some questions violate your privacy	2.8%	4.7%	11.3%	35.2%	43.6%	10.6%	26.7%
6	You would recommend this questionnaire to another volunteer	23.4%	45.1%	19.0%	7.3%	3.9%	13.5%	39.7%
7	The questions appear to encourage a specific answer	12.1%	30.2%	20.3%	16.3%	7.5%	25.1%	17.6%
8	You found it difficult to answer any of the questions	3.7%	34.4%	10.3%	35.1%	23.5%	9.4%	21.3%

Internal Consistency

The Cronbach's alpha values revealed excellent internal consistency across the four factors: the first factor (0.92), the second factor (0.91), the third factor (0.90), and the fourth factor (0.91).

ICC, SEM, and SDC

The ICC for the four-factor model was sufficient (0.94–0,90-0,91–0,89), respectively, although the SEM and SDC presented moderate to high values ranging from 2.4 to 5.1 and 5.6 to 11.9, respectively (Table 3).

Floor and Ceiling Effects

The "ceiling effect" and "floor effect" are distinct yet related phenomena, referring to the clustering of responses at the upper and lower limits of the scale, respectively. Specifically, ceiling effects occur when many participants achieve the best or highest possible score, whereas floor effects occur when many participants achieve the lowest or poorest possible score. These effects indicate a limitation in the range of the instrument. In our study, the floor effect was evidenced by 0.43% of participants scoring the lowest (n = 4), while the ceiling effect was observed in 0.80% of participants scoring the highest (n = 8), as shown in Figure 1.

Discussion

The translation of the AxEL questionnaire into Arabic addressed a critical gap for assessing beliefs around LBP among Arabic-speaking population. Participants reported that the Arabic version of the questionnaire was easy to complete and understandable. Feedback from the pre-test phase led to iterative refinements, ensuring clarity in the final version.

Table 3 Results of the Reliability, Measurement Error, and Validity of the Translation Validation for AxEL

	ICC (95% CI)	SEM(%SEM)	SDC_{90}(%SDC_{90})
First factor	0.94(0.89, 0.97)	5.14(3.78)	11.93 (8.8)
Second factor	0.90(0.85, 0.94)	2.43(6.07)	5.63 (14.1)
Third factor	0.91(0.86,0.93)	3.26(2.58)	11.93 (8.8)
Fourth factor	0.89(0.88,0.91)	4.13(2.77)	5.63 (14.1)

Notes: SDC_{90}: smallest detectable change with 90% confidence level; %SDC_{90}: percentage width of the SDC_{90}.
Abbreviations: ICC, intraclass correlation coefficient; CI: confidence interval; SEM: standard error measurement; %SEM, percentage of SEM.

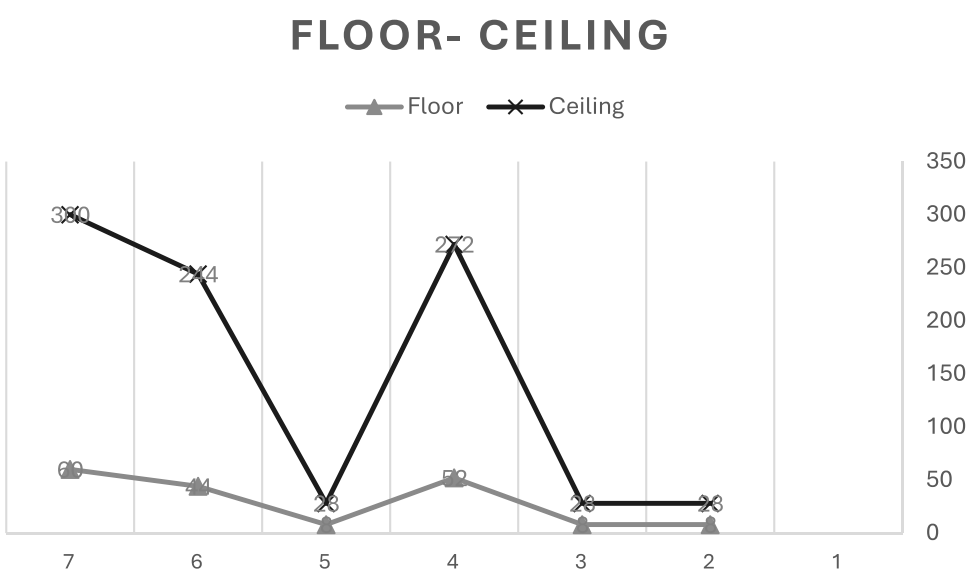

Figure 1 Floor and ceiling effects.

Given the absence of a gold-standard for assessing patients' beliefs about LBP in Arab countries, construct validity was utilized rather than criterion validity. The lack of equivalent Arabic tools necessitated the AxEL as the only option for this purpose. Our findings demonstrated significant convergent validity between the AxEL scores and the physical activity subscale, affirming its relevance in the assessment of LBP.

There was a high degree of agreement between the translators, with any disparities resolved by the expert committee. The Arabic AxEL has excellent internal consistency, reliability, and construct validity, similar to the characteristics of the original version. These results reinforce the tool's applicability in Arabic-speaking contexts.

The inclusion of the adaptive cross-cultural process into the validation procedure enhanced the robustness of the AxEL. The Arabic AxEL version demonstrates excellent internal consistency with a Cronbach's alpha of 0.92, which compares favorably to Moran et al[23] al.'s alpha of 0.91) and surpasses the reliability reported by Darlow et al[10] al.'s alpha of 0.70. These comparisons underscore the AxEL's reliability across different cultural contexts and affirm its potential for widespread clinical use in Arabic-speaking populations.

Despite its strengths, this study acknowledges certain limitations. First, one of the translators did not have a medical background. This was to ensure the language used could be easily understood by the general public. The current results indicated that the translated version of the questionnaire was clear and that participants could easily and clearly understand the questions. Second, increasing the sample size could help minimize possible sampling errors. Third, the high educational level (72.3% with a bachelor's degree) and employment status (47.7% employed) of the sample may have contributed to the ease with which the questionnaire was handled and validated. However, the diversity of the sample, encompassing a spectrum from the general public to healthcare professionals, lends valuable insights into the questionnaire's applicability across various demographic strata.

Future studies should further investigate people's perceptions of LBP among diverse populations. With the cross-cultural adaptation of AxEL for Arabic speakers, this instrument is now equipped to accurately assess attitudes and beliefs about LBP in both the general public and among healthcare professionals. Consequently, the findings of this study can inform targeted educational and intervention strategies to address LBP within the public domain, healthcare systems, and stakeholders at various levels.

Conclusion

The Arabic version of the AxEL exhibited good psychometric properties, affirming its utility in assessing beliefs and attitudes toward LBP among Arabic-speaking individuals. This validated tool fills a significant void in cross-cultural research and enables healthcare providers to better understand the attitudes and beliefs that influence individuals'

management of LBP within Arabic cultures. It will also facilitate the development and evaluation of culturally sensitive interventions aimed at improving educational strategies and providing advice for LBP in this specific cultural context. With its successful adaptation, the Arabic version of the AxEL will enable Arabic-speaking individuals to fully participate in research and interventions, resulting in more thorough and culturally relevant methods for managing LBP.

Ethics Approval and Informed Consent

The study was approved by the Research Ethics Committee in King Faisal Specialist hospital. Ethical approval number: 2221079

Consent for Publication

All participants have consented to participate in the study.

Data Sharing Statement

The datasets utilized in this investigation can be obtained from the corresponding author upon reasonable request.

Acknowledgments

We thank the physiotherapy department at King Faisal Specialist hospital for assisting with data collection.

Author Contributions

All authors made a significant contribution to the work reported, whether it is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; approved of the version to be published; agreed on the journal to which the article has been submitted; and agreed to be accountable for all aspects of the work.

Funding

The project was funded by the Deputyship of Research and Innovation, Ministry of Education in Saudi Arabia (Project number: IF2/PSAU/2022/03/21121).

Disclosure

The authors report no conflicts of interest in this work.

References

1. GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2017;390(10100):1211–1259. doi:10.1016/S0140-6736(17)32154-2
2. GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet*. 2020;396(10258):1204–1222. doi:10.1016/S0140-6736(20)30925-9
3. Hartvigsen J, Hancock MJ, Kongsted A, et al. What low back pain is and why we need to pay attention. *Lancet*. 2018;391(10137):2356–2367. doi:10.1016/S0140-6736(18)30480-X
4. Dagenais S, Tricco AC, Haldeman S. Synthesis of recommendations for the assessment and management of low back pain from recent clinical practice guidelines. *Spine J*. 2010;10(6):514–529. doi:10.1016/j.spinee.2010.03.032
5. Koes BW, Van Tulder M, Lin CWC, Macedo LG, McAuley J, Maher C. An updated overview of clinical guidelines for the management of non-specific low back pain in primary care. *Eur Spine J*. 2010;19(12):2075–2094. doi:10.1007/s00586-010-1502-y
6. Kamper SJ, Logan G, Copsey B, et al. What is usual care for low back pain? A systematic review of health care provided to patients with low back pain in family practice and emergency departments. *Pain*. 2020;161(4):694–702. doi:10.1097/j.pain.0000000000001751
7. Foster NE, Anema JR, Cherkin D, et al. Prevention and treatment of low back pain: evidence, challenges, and promising directions. *Lancet*. 2018;391(10137):2368–2383. doi:10.1016/S0140-6736(18)30489-6
8. Slade SC, Kent P, Patel S, Bucknall T, Buchbinder R. Barriers to primary care clinician adherence to clinical guidelines for the management of low back pain: a systematic review and metasynthesis of qualitative studies. *Clin J Pain*. 2016;32(9):800–816. doi:10.1097/AJP.0000000000000324
9. Jensen MP, Turner JA, Romano JM. Pain belief assessment: a comparison of the short and long versions of the surgery of pain attitudes. *J Pain*. 2000;1(2):138–150. doi:10.1016/S1526-5900(00)90099-3

10. Darlow B, Perry M, Mathieson F, et al. The development and exploratory analysis of the Back Pain Attitudes Questionnaire (Back-PAQ). *BMJ Open*. 2014;4(5):e005251. doi:10.1136/bmjopen-2014-005251
11. Darlow B, Perry M, Stanley J, et al. Cross-sectional questionnaire of attitudes and beliefs about back pain in New Zealand. *BMJ Open*. 2014;4(5). doi:10.1136/bmjopen-2013-004725
12. Slater MA, Hall HF, Atkinson HJ, Garfin SR. Pain and impairment beliefs in chronic low back pain: validation of the Pain and Impairment Relationship Scale (PAIRS). *Pain*. 1991;44(1):51–56. doi:10.1016/0304-3959(91)90146-O
13. Riley JF, Ahern DK, Follick MJ. Chronic pain and functional impairment: assessing beliefs about their relationship. *Arch Phys Med Rehabil*. 1988;69(8):579–582.
14. French SD, Nielsen M, Hall L, et al. Essential key messages about diagnosis, imaging, and self-care for people with low back pain: a modified Delphi study of consumer and expert opinions. *Pain*. 2019;160(12):2787–2797. doi:10.1097/j.pain.0000000000001663
15. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*. 2000;25 (24):3186–3191. doi:10.1097/00007632-200012150-00014
16. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures: literature review and proposed guidelines. *J Clin Epidemiol*. 1993;46(12):1417–1432. doi:10.1016/0895-4356(93)90142-n
17. Elsabbagh L, Al-Atwi T, Aldossary D, et al. Cross-cultural adaptation and validation of the STarT Back Tool for Arabic-speaking adults with low back pain in Saudi Arabia. *J Orthop Sci*. 2019;24(2):200–206. doi:10.1016/j.jos.2018.09.007
18. O'Hagan ET, Skinner IW, Jones MD, et al. Development and measurement properties of the AxEL (attitude toward education and advice for low-back pain) questionnaire. *Health Qual Life Outcomes*. 2022;20(1):1–13.
19. Nicolaysen MS, Larsen DB, Palsson TS. Danish version for the Back Pain Attitudes Questionnaire—Translation and cross-cultural adaptation. *Musculoskelet Sci Pract*. 2021;52:102348.
20. Tay HA, Özgül B, Darlow B, Sarı Z. Cross-cultural translation, validity, and reliability of the Turkish version of the Back Pain Attitudes Questionnaire. *Musculoskelet Sci Pract*. 2022;57:102472. doi:10.1016/j.msksp.2021.102472
21. Raghupathi V, Raghupathi W. The influence of education on health: an empirical assessment of OECD countries for the period 1995–2015. *Arch Public Health*. 2020;78(20). doi:10.1186/s13690-020-00402-5
22. Alkatheri AM, Albekairy AM. Does the patients' educational level and previous counseling affect their medical knowledge? *Ann Thorac Med*. 2013;8(2):105–108. doi:10.4103/1817-1737.109823
23. Moran RW, Rushworth WM, Mason J. Investigation of four self-report instruments (FABT, TSK-HC, Back-PAQ, and HC-PAIRS) to measure healthcare practitioners' attitudes and beliefs toward low back pain: reliability, convergent validity and questionnaire of New Zealand osteopaths and manipulative physiotherapists. *Musculoskelet Sci Pract*. 2017;32:44–50. doi:10.1016/j.msksp.2017.08.008