Content Validity of a Questionnaire to Assess the Knowledge of Low Back Pain of College Students

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ABSTRACT: Low back pain (LBP) is defined as discomfort or pain in the lower back region, which is located below the ribcage and above the buttocks. It is a common condition caused by a number of factors such as poor posture, muscle strain or injury, spinal problems, or degenerative conditions. Low back pain can be mild to severe, acute (lasting only a short time), or chronic (lasting for months or longer). LBP is a serious problem for global health that affects millions of people. 80% of people are predicted to suffer LBP at some point in their lives, according to the World Health Organization (WHO), making it one among the top causes of disability globally. LBP is the top cause of missed workdays and the second most frequent reason for doctor visits in the United States alone. Consequently, the goal of this study was to create and validate a questionnaire to evaluate college students' understanding of Low back. The challenges this study faces include ensuring enough coverage of the concept of interest, developing acceptable response formats, overcoming linguistic and cultural hurdles, and minimising response biases. It was challenging to conduct the necessary reliability, validity, and responsiveness testing needed for questionnaire validation.

The study has two important phases -instrumental design and judgmental evidence. The questionnaire was validated using quantitative (content validity) technique with the panel of 12 subject expert using the content validity index (CVI). A second round of validation was sent for the items with the lowest scores (I-CVI <.80) in the preliminary version of this tool which revealed moderate content validity of individual questions. The tool has 30 questions that test your understanding of Anatomy, physiology, general facts, risk factors, causes, sign, symptoms as well as diagnosis, management, prevention and complication.

A structured 30-item questionnaire with acknowledged content validity was produced, with a CVI score of at least 0.80 for each item. Utilizing an iterative process, the questionnaire's development and validation showed strong item-content validity for assessing college students' knowledge of Low back pain. Additionally, it enhances the degree of knowledge held by college students in relation to low back pain, identifies knowledge gaps, offers suggestions for prevention and management, and has implications for policymakers, educators, and healthcare professionals.

Keywords: Content Validity, CVI score, Low Back Pain, Questionnaire, College Students.

INTRODUCTION

Low back pain is a common condition that affects millions of people worldwide. It is characterized by pain or discomfort in the lower back region, which can range from mild to severe (Pengel *et al.,* 2003; Price, 2021). The pain can be caused by a variety of factors, including muscle strain, herniated discs, osteoarthritis, spinal stenosis, and more (Barrey *et al.,* 2019). Low back pain can be acute (short-term) or chronic (long-term) and can significantly impact a person's daily activities and quality of life (Rezaei *et al.,* 2021). Acute low back pain refers to pain that lasts for a short period of time, usually less than six weeks. Chronic low back pain refers to pain that lasts for more than three months (Knezevic *et al.,* 2021).

According to recent studies, it is estimated that approximately 60-70% of adults will experience low back pain at some point in their lives. The incidence of low back pain can vary depending on various factors such as age, gender, occupation, lifestyle, and medical history (Ardakani *et al.,* 2018). The overall prevalence of low back pain was estimated to be 21.5% based on a systematic review and meta-analysis of 55 studies completed in India between 1990 and 2016. Women (22.8%) had a higher prevalence than men (19.8%) (Harr *et al.,* 2021). According to the study, metropolitan areas had a higher prevalence of low back pain than rural areas, and it rose with age (Abbasi *et al.,* 2020; Wu *et al.,* 2021). Adolescents frequently experience low back discomfort, which can significantly affect their everyday lives (Henn *et al.,* 2020). Research has revealed that the incidence of low back pain in adolescents can range from 10 to 70%. According to certain research, female adolescents are more likely than male adolescents to experience low back

discomfort (Adegoke *et al.,* 2015; Smeets *et al.,* 2006). Several factors can contribute to the development of low back pain in adolescents, including poor posture, prolonged sitting or standing, carrying heavy backpacks, sports-related injuries, and stress (Moradi *et al.,* 2015). Adolescents who engage in activities such as gymnastics, diving, or weightlifting are at a higher risk of developing low back pain due to the repetitive motions and high physical demands of these activities (Perich *et al.,* 2011).

The use of gadgets such as smartphones, laptops, and tablets has become increasingly common in recent years, and this has been associated with an increased incidence of low back pain in adolescents (Alzahrani *et al.,* 2022). Prolonged use of these devices often leads to poor posture, particularly in the neck and back, which can cause strain on the muscles and joints and result in low back pain. In a study conducted on adolescent students, it was found that the majority of students spend more than 3 hours per day on electronic devices, and a significant proportion reported experiencing low back pain. The pain was more frequently reported by students who used electronic devices for long periods and in awkward positions (Mansell *et al.,* 2021).

To minimize the risk of low back pain associated with the use of gadgets, it is important for adolescents to take regular breaks, maintain good posture, and avoid prolonged use of electronic devices in awkward positions. Additionally, stretching exercises, physical activity, and regular exercise can help strengthen the muscles in the back and reduce the risk of low back pain. It is important for adolescents to maintain good posture, and engage in regular physical activity (Jellema *et al.*, 2001). Treatment options for low back pain vary depending on the underlying cause and can include physical therapy, pain medication, chiropractic care, and in severe cases, surgery (Harman *et al.*, 2009). In addition to medical treatment, lifestyle modifications such as exercise, proper posture, and stress management can also help alleviate symptoms (Gatchel and Mayer 2008).

Since knowledge of how to prevent low back pain is crucial, a questionnaire with 30 questions is designed to deal with knowledge because it is essential to have information about how to prevent low back pain. It includes questions regarding the lumbar vertebra's anatomy and physiology, general low back pain risk factors, causes, symptoms, and diagnosis, as well as management, prevention, and complications related to the condition.

Every question in the current questionnaire was researched in the literature before an expert's opinion was sought. A group of professionals also analysed and validated each item (Yaghmalef and Ct 2003). A content validation verifies whether an item accurately reflects the content domain of interest, whether the size and dimensions are in accordance with each proposed item, and whether it satisfies the precise objectives index (Ghazali *et al.,* 2020). A group of specialists with prior experience or present recognition of competence in the subject of study, typically evaluate the instrument items, classifying them according to their appropriateness, clarity, and comprehensiveness (Alamrani *et al.,* 2021; López *et al.*, 2014). In order to test the subject's knowledge of low back pain, a designed questionnaire was used in this study to validate its content.

METHOD

Planning, construction, quantitative analysis, and validation are the four main phases that constitute the development and validation of an instrument. The planning and building stages of the instrument, included a thorough study of the literature and expert input. The current study describes content validation.

Participants. Indian researchers were invited to take part in the current study in accordance with the protocol. These researchers had to have demonstrated scientific credibility in the field of physiotherapy dealing with patients with low back pain and have in-depth knowledge of the condition. The participants' experience ranged from 5 to 20 years, and of the 12 researchers who volunteered to take part, 11 had master's degrees and 1 had a doctorate in the field of study. Experts claimed to be quite knowledgeable about low back pain and how to treat it. Six experts responded during the allotted time during the first stage of content validation. The specialists worked with patients with low back pain in the hospitals, clinics, and outpatient physical therapy departments of their respective institutions.

Procedures. The questionnaire was validated using quantitative (content validity) techniques with a panel of 12 subject-matter experts using the Content Validity Index (CVI). The preliminary versions of this tool demonstrated a reasonable level of content validity for individual items, and those with lower scores (I-CVI.80) were sent for validation in a subsequent round (Ghazali *et al.*, 2020; Lawshe, 1975). The tool has 30 questions that test your understanding of anatomy and physiology, general facts, risk factors, causes, signs, and symptoms, as well as diagnosis, management, prevention, and complications (Mccarthy *et al.,* 1987).

The initial and modified versions of the instrument were subjected to content validity by a committee of 6 experts with representation and recognition in the area of interest of this study in two phases. As a result, an English content validation questionnaire was created, which evaluated the content organization, language that is simple and easy to understand, relevance to the topic, and adequacy and clarity of each item developed (Polit and Beck 2006). After obtaining their consent to participate in the study via telephonic call, the questionnaire was mailed to each expert on their respective email addresses. The end results revealed a structured questionnaire with 30 items and approved content validity with a CVI score of above.80 across the board (Natalio *et al.,* 2014). The questionnaire was created and validated using an iterative process, and results showed that it had strong item-content validity for gauging college students' knowledge of Low back Pain (van Stiphout *et al.,* 2022).

Statistical analysis. The content validity of the developed tools was statistically analyzed using the

Content Validity Index (CVI). To calculate the CVI, each item was scored on a two-point scale (1 = agree, 0 = disagree, consider neutral = 0). For each item, CVI was calculated by dividing the number of experts who gave a rank of 3 or 4 by the total number of experts. Kappa correction coefficients were used to determine the degree of agreement for CVI association and were calculated. Six experts participated in the first stage of content validation, with acceptable CVI values for each item ranging from 1.00 to 0.80 and modified kappa values ranging from 1.00 to 0.65. In Stage 2 those with CVI values ranging from 1.00 to 0.80 and modified kappa values ranging from 1.00 to 0.76 were considered acceptable.

RESULTS AND DISCUSSION

The first version of the instrument was developed with a total of 30 items divided into 4 areas. Anatomy and Physiology (3), General Information (3), Risk Factors, Causes, Signs and Symptoms (7),

Diagnostic Management, Prevention, and Complications (17).

The first stage of content verification- Development Phase. In the first domain, which consisted of three questions, questions 2, with CVI scores of 0.50 for adequacy, in the second domain, the results were very satisfying. This consists of his three questions, with no question showing his low CVI score. On the other hand, in the third domain, 4 out of 7 questions showed an inadequate CVI score, questions 7 and 8 for adequacy and clarity, 11 for clarity and language question 13 for content. In the fourth domain 7 questions out of 17 shows less CVI score, question 18 in content and language, question number 20 and 26 in relevancy, adequacy, and language; question 22 for adequacy, and language, question number 25 and 27 for adequacy; question number 29 in relevancy and adequacy.

Table 1.

Sr. No.	Question	Relevant to the topic of the study	Adequacy and clarity of contents	Content organization	Language is simple and easy understanding	Comments
1.	What is the total number of Lumbar Vertebrae?	.83	.83	.83	1	
2.	What is the main function of Lumbar vertebrae	1	0.50	.83	.83	Modified
3.	Why lumbar spine is highly prone to injury?	1	1	.83	.83	
4.	What is Lumbar Spondylosis?	1	1	1	1	
5.	What is the meaning of the term LBP?	1	1	.83	.83	
6.	Why LBP is common in women?	.83	.83	.83	.83	
7.	Which among the following is the risk factor of LBP?	.83	.67	1	.83	Modified
8.	What is the cause of LBP in young adult?	1	.67	1	1	Modified
9.	What are the main symptoms of LBP?	1	.83	1	.83	
10.	Which among the following leads to Lumbar Spondylosis?	1	1	1	1	
11.	If leg pain related to LBP, then it is present in which part of leg	1	0.5	1	.67	Modified
12.	Which clinical sign is associated with nerve damage?	1	.83	1	.83	
13.	How mental stress leads to LBP?	.83	.83	.67	.83	Modified
14.	Which among the following is the most effective diagnostic test for LBP?	1	1	1	1	
15.	Among the following which is the management for severe LBP?	1	.83	.83	1	
16.	Immobilization of back is achieved by	1	.83	1	1	
17.	Among the following which exercise is ideal for prevention of LBP?	1	.83	.83	.83	
18.	Among the following which is the most	1	.83	.667	.667	Modified

	effective measure in the prevention of LBP?					
19.	Which is the home remedy for mild back pain and stiffness due to LBP?	.83	.83	1	1	
20.	Diet of person suffering from LBP should contain	.667	.667	.667	.83	Modified
21.	A patient with LBP should avoid	1	1	1	1	
22.	Can LBP be reduced by the application of	1	.667	.83	.667	Modified
23.	When back is tilted regularly for prolonged period at one particular angle can lead to……….	1	.83	.83	1	
24.	What is the preferable average desk height while using computer?	1	.83	.83	.83	
25.	Which is the recommended position of monitor to prevent stress on back?	1	.667	.83	.83	Modified
26.	Which is the appropriate time of hot application for reducing LBP?	1	.667	.667	.83	Modified
27.	Which month is declared as correct posture month?	.83	.667	.83	1	Modified
28.	Which is the recommended position of sleep for LBP patients?	1	.83	.83	1	
29.	Name one related condition due to LBP?	.667	.667	.83	.83	Modified
30.	What is the complication of LBP?	1	.83	.83	1	

All questions above that did not achieve a respectable CVI score have been fixed and questions have been submitted for round 2.

Second stage of content verification. After modifying the questions according to the suggestions of the experts in the first evaluation round, the questionnaire was sent to 6 experts. The survey was sent via Google form to new team of six experts, with each expert being sent an email with their respective email ID.

Altogether, 30 questions were analyzed in the second phase of content validation and Table 2 shows that all items subjected to this phase were validated after the appropriate corrections.

Table 2.

Sr. No.	Question	Relevant to the topic of the study	Adequacy and clarity of contents	Content organization	Language is simple and easy understanding	Comments
1.	How many Lumbar Vertebrae are there?	1	1	1	1	Validated
2.	What is the function of Lumbar vertebrae.	1	1	1	1	Validated
3.	Why lumbar spine is highly prone to injury?	1	1	1	1	Validated
4.	What is Lumbar Spondylosis?	1	1	1	1	Validated
5.	What is the meaning of the term LBP?	1	1	1	1	Validated
6.	Why LBP is common in women?	1	1	1	1	Validated
7.	Which of the following is a risk factor for LBP?	1	1	1	1	Validated
8.	What Causes LBP in Young Adults?	1	1	1	1	Validated
9.	What are the main symptoms of LBP?	1	1	1	1	Validated
10.	Which among the following leads to Lumbar Spondylosis?	1	1	1	1	Validated
11.	If leg pain is associated with LBP, where is it located in the leg?	1	1	1	1	Validated

12.	Which clinical sign is associated with nerve damage?	1	1	1	1	Validated
13.	How can psychological stress lead to LBP?	1	1	1	1	Validated
14.	Which among the following is the most effective diagnostic test for LBP?	1	1	1	1	Validated
15.	Among the following which is the management for severe LBP?	1	1	1	1	Validated
16.	Immobilization of back is achieved by	1	1	1	1	Validated
17.	Among the following which exercise is ideal for prevention of LBP?	1	1	1	1	Validated
18.	Which of the following is the most effective measure for preventing LBP?	1	1	1	1	Validated
19.	Which is the home remedy for mild back pain and stiffness due to LBP?	1	1	1	1	Validated
20.	A person suffering from LBP's diet should include	1	1	1	1	Validated
21.	A patient with LBP should avoid	1	1	1	1	Validated
22.	Is it possible to reduce LBP by using	1	1	1	1	Validated
23.	When back is tilted regularly for prolonged period at one particular angle can lead to…………	1	1	1	1	Validated
24.	What is the preferable average desk height while using computer?	1	1	1	1	Validated
25.	What is the best monitor position to avoid back strain?	1	1	1	1	Validated
26.	Which is the best time for hot application to reduce LBP?	1	1	1	1	Validated
27.	Which month is marked as correct posture month?	1	1	1	1	Validated
28.	Which is the recommended position of sleep for LBP patients?	1	1	1	1	Validated
29.	What is one condition caused by LBP?	1	1	1	1	Validated
30.	What is the complication of LBP?	1	1	1	1	Validated

Validation. In the current study, two content validation phases were carried out for the final set of items in order to achieve expert consensus. When there is no absolute agreement on an item, it must be revised until a consensus is reached. However, despite several revisions, some items will never meet this standard and should thus be removed from the instrument.

In terms of relevance, clarity, simplicity, and ambiguity of the items, as well as the comprehensibility of the general features, the result demonstrated appropriate content validity. During the first round of content validation, approximately 60% of the questionnaire received a respectable CVI score. Only 40% failed to achieve a CVI score greater than 80. This feedback led to the revision and improvement of 12 items. The questions were modified in accordance with the expert suggestions, and they were then submitted for the second phase of validation. Even significant changes in the item wordings were made for better understanding, and thus the content validity was re-evaluated.

During the second validation phase, 100% of the items achieved acceptable levels (above 0.80) in all four domains: content organization, simple and easy-to-understand language, topic relevance, and adequacy and clarity.

CONCLUSIONS

The purpose of this study was to create and evaluate a questionnaire to test college students' understanding of low back pain. We started with a thorough study of the literature to identify existing questionnaires as well as essential topics and constructs linked to low back pain in college students. Through this procedure, we were able to construct a questionnaire that would accurately capture the key information regarding low back pain.

Assuring content validity is one of the biggest issues in questionnaire development. To overcome this difficulty, we invited input on the questionnaire's content from a group of professionals in the field of low back pain. The questions were examined by the panel for relevance, clarity, and completeness. The expert

panel's feedback was utilised to further improve the questionnaire, ensuring that it appropriately tested college students' understanding of low back pain. The experts acknowledged that the questions were comprehensible and relevant to college students, and that the questionnaire covered the appropriate subject areas.

An exhaustive and iterative procedure that included input from the literature and expert panels was used to construct a questionnaire to test college students' knowledge of low back pain. The findings of our study indicate that the questionnaire has strong content validity and is a viable and reliable tool for determining this population's knowledge of low back pain. In next studies and educational initiatives aimed at this community, we advise using this questionnaire.

FUTURE SCOPE

A longitudinal study that tracks the stability and consistency of the questionnaire over time.

Conflict of interest. None.

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