

Medical education: educational product to improve low back pain management in medical students

ARTICLE

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Abstract

Low back pain is gaining epidemiological importance. Despite this, general medical training faces challenges in the initial approach. This study sought to validate an educational product on chronic low back pain with the target audience. It was a methodological study of content validation by the target audience using a validation instrument. An 18-item educational content validation questionnaire was used, subdivided into 3 domains. For the quantitative analysis, a Likert scale was used, with a score of 0 to 2. The index score must be $\geq 80\%$. Three events were held to validate the video lesson “Chronic low back pain: training doctors for better practices and treatments”, with the participation of 28 students and teachers. The questionnaire had a content validation rate of 96%. It was concluded that the product developed can be a tool for students and general practitioners.

Keywords: Low back pain. Orthopedics. Undergraduate Medical Education. Training.

Educação médica: produto educacional para melhorar a gestão da lombalgia nos alunos de medicina

Resumo

A lombalgia ganha relevância epidemiológica. Apesar disso, a formação médica generalista enfrenta desafios na abordagem inicial. Este estudo buscou validar um produto educacional sobre a dor lombar crônica pelo público-alvo. Tratou-se de um estudo metodológico de validação de conteúdo pelo público-alvo por um instrumento de validação. Utilizou-se um questionário de validação de conteúdo educacional que possui 18 itens, subdivididos em 3 domínios. Para a análise quantitativa, foi usada a escala Likert, com pontuação de 0 a 2. O escore do índice deve ser $\geq 80\%$. Foram realizados três eventos para validar a videoaula “Dor Lombar crônica: capacitando médicos para melhores práticas e tratamentos”, com a participação de 28 discentes e docentes. O questionário apresentou um índice de validação de conteúdo de 96%. Concluiu-se que o produto desenvolvido pode ser uma ferramenta para discentes e médicos generalistas.

Palavras-chave: Lombalgia. Ortopedia. Ensino superior. Capacitação.

1 Introduction

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According to the International Association for the Study of Pain, pain is an unpleasant sensory and emotional experience associated with a potential or actual injury. It can be classified based on various criteria such as location, pathophysiology, duration and etiology. However, the most frequently used categories are duration and pathophysiology (Raja *et al.*, 2020).

Among the numerous causes of pain, low back pain stands out, as it affects a large proportion of the population and is considered the leading cause of disability worldwide, generating personal, social, occupational and economic impacts (Brasil, 2022; Vos *et al.*, 2017). According to the World Health Organization (WHO), it is estimated that around 60 to 80% of individuals in the world will have or have had low back pain (WHO, 2023).

Figure 1 shows the incidence of chronic back problems in individuals over the age of 18 in Brazil.

Figure 1 - People over 18 with chronic back problems in Brazil

Tabela 4642 - Pessoas de 18 anos ou mais de idade que referem problema crônico de coluna, por grupo de idade e situação do domicílio	
Variável - Pessoas de 18 anos ou mais de idade que referem problema crônico de coluna (Mil pessoas)	
Brasil	
Situação do domicílio - Total	
Ano - 2019	
Grupo de idade - Total	
	34.345,875

Source: IBGE (2019).

Low back pain can have a considerable economic impact, affecting people and the health system. Health-related costs include consultations with specialists, examinations, medication, physiotherapy and, as a last resort, surgical procedures. In addition, there are indirect costs such as lost productivity and reduced performance due to absenteeism, pain, disability and early retirement. Given this scenario, there is an urgent need to implement

effective strategies to reduce the burden on sufferers of this disease, as well as on health systems and society in general. It is important to invest in prevention, treatment and early intervention measures to reduce the economic impact of low back pain (Fatoye; Gebrey; Odeyemi, 2019). Table 1 lists the damages of low back pain.

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Table 1 - Damage caused by low back pain

Main damages	Costs
Hospitalization fees	Ranges from 13.4 to 18.7%
Cost of hospitalization	US\$ 2.2 billion (population) and US\$ 1,226.25 (patient)
Cost of absenteeism	US\$ 1.7 billion
Length of stay in hospital	3.8 to 7.4 days

Source: Adapted by the authors, data from Fatoye; Gebrey; Odeyemi (2019).

Treatment options for low back pain include conservative therapy, interventional pain procedures and surgical options. Initially, comprehensive health care should be emphasized, such as re-educating lifestyle habits, implementing physical activity, as well as prescribing oral medications to relieve pain, such as neuropathic pain medications, non-steroidal anti-inflammatory drugs (NSAIDs), common analgesics and, in some cases, opioids. The addition of physiotherapy and behavioral therapies in the treatment of low back pain are also important (Oliveira *et al.*, 2018).

Doctors play an important role in low back pain treatments, offering patient-centered care and incorporating evidence-based guidelines. Due to the nature of low back pain and the importance of evidence-based approaches from the outset of treatment, it is essential to infer that inadequate initial measures can potentiate the negative impact on disease control. When an initial intervention is inadequate, the result can worsen symptoms, progressing to disability and chronic pain, as well as possible complications

associated with unnecessary treatments, such as the use of surgery, excessive medication or unnecessary imaging tests (Foster *et al.*, 2018).

In primary care, health professionals need to focus on pain control, functional improvement and the prevention of future episodes of low back pain through multimodal strategies. In general, individuals' adherence to medical recommendations highlights the significant influence that doctors have in guiding the treatment of low back pain. According to local guidelines, in the event of a worsening condition, treatment failure or identification of warning signs, transfer and assessment at the secondary level is essential (Foster *et al.*, 2018).

In this context, it is important to highlight the difficulty in non-specialist medical training. Despite changes in teaching methodologies, advances in technology and ease of access to information, the subject of pain still does not have a robust presence in medical schools (Cesario *et al.*, 2019).

Despite being an extremely important disease from a public health point of view, it is clear that medical education is still lagging behind, which restricts effective treatment to specialists. In a systematic review carried out on the teaching of pain, the authors conducted a survey and found (Shipton *et al.*, 2018):

- The characteristics of pain medicine curricula, including the defined pain medicine curriculum;
- The specific learning objectives in pain medicine;
- Dedicated pain education modules;
- The central topics on the subject;
- The medical specialties that teach pain medicine;
- The elective study opportunities, hours allocated to teach pain medicine during the curriculum;
- The status of pain medicine in the curriculum (compulsory or optional); and
- The teaching, learning and assessment methods.

The article by Shipton *et al.* (2018) also discusses the need for transformative teaching and assessment methods that integrate professional practice and scientific

content. The selected articles found that pain medicine education was not a compulsory component of undergraduate medical education in most countries and that there was a lack of standardized learning objectives and curricula in pain medicine. A theoretical framework was proposed for teaching pain medicine in universities, including defined learning objectives, evaluation and integration of scientific content, transformative teaching methods and professional practice.

If, on the one hand, curricula need to be altered in order to address the issue of chronic pain and low back pain, on the other hand, there is concern about training in scientific research literacy. For medical students, knowledge related to research is very important, as understanding and using scientific methods are important components in training and practicing medicine (Santos *et al.*, 2023). There is also growing recognition of the importance of training doctors with skills and abilities in Evidence-Based Medicine (EBM). This is a practice that allows for the critical analysis of evidence found in scientific literature, with the aim of improving the quality of clinical decisions and, consequently, the support offered to patients (Bello; Grant, 2023).

In summary, it can be said that the scientific research process contributes effectively to improving the medical curriculum. EBM enables students to develop fundamental skills for their medical work, promoting opportunities for them to live experiences that make them reflect on the importance of humanistic, critical, ethical and reflective training, with commitment and social responsibility in defending the integral health of the individual, as mentioned in the National Curriculum Guidelines (DCN) of the Medicine course (Valentino *et al.*, 2024).

During the COVID-19 pandemic, there has been a major change in the way humanity interacts and lives. During this period, many educational, social and work activities were adapted to the new reality. Higher Education Institutions have had to adapt, together with students and teachers, using Information and Communication Technologies (ICT) to enable the continuity of educational activities. Despite the difficulties, in many areas it has been possible to continue students' education without too much pedagogical damage (Coqueiro; Sousa, 2021).

In general, the use of ICT in medical education has shown good results, as a complementary resource to face-to-face teaching and an alternative in times of social distancing (Brito; Portela; Campos, 2024).

In view of the above, this study validated an educational product on the best and most innovative treatment options for chronic low back pain, using didactic content that is easy to understand and scientifically based. This study differs from others in the literature in that it also proposes the validation of the content by the target audience of this scenario.

2 Methodology

This is a study of a methodological approach to content validation by the target audience. Methodological research is an essential component of scientific research, covering a wide range of methods and procedures adopted for the production, investigation, validation and evaluation in the development of new technologies. This type of scientific research is one of the pieces of a quadrilateral that also includes theoretical research, empirical research and practical research, as described by numerous authors (Teixeira, 2019).

Among the possible methodological studies found is the validation process, which plays a fundamental role in scientific research and is related to the development of technologies and instruments, which include measurement instruments and care, management and/or educational technologies. In addition, validation is used in translations or diagnostics (Teixeira, 2019).

Content validation is an excellent way of proving the quality of an educational product. This process can be carried out by the target audience or by expert judges. This evaluation is conducted using protocols that have generally already been validated, allowing for concordance analysis (Teixeira, 2019).

The integration of methodological studies and content validation is essential for the development and improvement of educational products aimed at health professionals,

ensuring the effectiveness and relevance of these resources in the clinical and academic context (Rocha *et al.*, 2023).

The research was approved by the Research Ethics Committee of the Universidade Municipal de São Caetano do Sul (CEP - USCS), under opinion number 6.675.393 and Certificate of Submission for Ethical Appraisal (CAAE) number 75994323.7.0000.5510.

In the first stage, to build the training, a systematic bibliographic survey was carried out using the following health descriptors: “Chronic Low Back Pain”; “Diagnosis”; “Therapeutics”; “Medical Education”; “Medical Students”; “Doctors”; “Health Education”; “Educational Program Validation”; “Teaching” and “Educational Evaluation”. These descriptors were combined using Boolean operators to refine the bibliographic search, carried out in the PubMed, ERIC and Scielo databases. In addition, the type of study, level of evidence and quality of evidence were taken into account when selecting the scientific texts to be used in the training.

For the second stage, the validation process with the target audience, medical students from the Universidade Municipal de São Caetano do Sul (USCS) and teachers were invited to take part in a seminar to discuss chronic low back pain. The seminar took place over three events at the university's Bela Vista campus, located at Rua Treze de Maio, n°681, Bela Vista, São Paulo, SP. At each meeting, participants attended a training session on the diagnosis and treatment of chronic low back pain. At the end, a debate was opened on the subject to build knowledge collectively. At the end of the seminar, the participants were invited to read the Informed Consent Form (ICF) and then answer the questions in a questionnaire to validate educational content in the health area.

For the questionnaire, an instrument validated in the specialized literature was used, developed by the authors Leite *et al.* (2018), which quantitatively measures three domains: the objectives, the structure/organization and the relevance of the training. The “objectives” domain covers the purpose, goals or aims, and contains five evaluative items. The “structure/organization” domain addresses the organization, structure, strategy, coherence and sufficiency of the training through ten items. Finally, the “relevance” domain

has three items that address the significance, impact, motivation and interest generated by the training. The items in each domain can be answered by selecting one of three options on a Likert scale, with zero being classified as “disagree”, one as “partially agree” and two as “totally agree”.

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All undergraduate medical students and non-specialist teachers at USCS were invited to take part in the training. The exclusion criteria were students who did not agree with the terms of the study and teachers who specialized in chronic low back pain, such as anesthesiologists, orthopedists, rheumatologists, neurosurgeons and pain medicine professionals.

As far as risks are concerned, as this is a methodological approach study with validation by the target audience, the risk to the research participant is minimal, and may be related to some discomfort when answering the questions in the proposed questionnaire. In order to minimize any risk of violating the confidentiality of the research participant, there are no questions in the questionnaire that could identify the research participant.

In terms of benefits, training future doctors in the treatment of pain, through a validated educational product, can promote improvements in care for the population, in the sense of updating professionals, presenting the best evidence and practices, as well as introducing new treatment possibilities to optimize health systems.

For data analysis, the objective parameters were computed and organized using the Content Validity Index (CVI). The sum of all the indices was calculated separately and divided by the number of items in the instrument. Items that obtained a minimum level of agreement of 70% in the positive responses were considered valid.

3 Results and Discussion

The educational product was conceived and designed based on the researcher's practical observation as a teacher, when he noticed that medical students had difficulties in developing the subject of low back pain and everyday medical life.

The expected impact of the product is real, due to the lack of educational tools aimed at this target audience, the little discussion of the subject in medical training and the high demand from patients in the routine of medical students and general practitioners looking for guidance and treatment in relation to low back pain.

In addition, the product is replicable and not limited to physical space, since the target audience can access it anywhere via social networks and the internet.

Despite the dense and extensive content, and the fact that the subject of low back pain is extremely complex, there was an attempt to simplify both the information and the language, since this is also one of the problems identified in the research.

Based on the research carried out, the main source of knowledge on the subject of low back pain is guides and guidelines. With this in mind, the product was designed in a language that was up-to-date, didactic and easily accessible to the target audience. In terms of knowledge, the product may not initially meet the criteria for innovation. However, a search was carried out for similar educational products dealing with the subject, in which we found several products aimed at patients, but none along these lines for medical education. One example is Escola da Coluna, an educational program that seeks to provide comprehensive information on the anatomy and function of the spine, factors that cause low back pain, proper postures to protect the spine, ergonomics in the workplace, among other aspects related to spinal health, aimed at patients (Silva *et al.*, 2020).

The profile of the participants, the results of the validation and the suggestions made by the participants are presented below.

With regard to the target audience, we had 28 students and teachers, 64% of whom were women and 36% men. In terms of training, 43% were specialist doctors, 39% students from the 1st to the 8th period, 14% students from the 9th to the 12th period and 4% general practitioners.

The specializations of the participating doctors included four paediatricians, two cardiologists, two geriatricians, one urologist, one public health doctor, one preventive and social medicine doctor, one psychiatrist, one obstetrician and one otorhinolaryngologist.

With regard to the length of time the doctors had been working, the minimum was 10 years and the maximum 44 years, with an average of 24 years. 40% of the participants work in both the private and public sectors, 33% in the private sector and 27% in the public sector.

In the validation stage, the domains of objectives, structure/presentation and relevance of the educational product were assessed.

With regard to the objectives (purposes, goals or aims) of the educational product, in the item “Clarifies doubts about the topic covered”, 94% responded that they totally agreed and 6% that they partially agreed. With regard to the items “Addresses the proposed topic”, “Suitable for the teaching-learning process”, “Provides reflection on the topic” and “Encourages a change in behavior”, 93% of respondents totally agreed and 7% partially agreed, as shown in Table 2.

Table 2 - Validation instrument - Objectives

OBJECTIVES: purposes, goals or aims	Disagree	Partially agree	Totally agree
1. Addresses the proposed topic	0	7%	93%
2. Suitable for the teaching-learning process	0	7%	93%
3. Clarifies doubts about the topic covered	0	6%	94%
4. Provides reflection on the topic	0	7%	93%
5. Encourages changes in behavior	0	7%	93%

Source: Elaborated by the authors - research data (2024).

The participants commented, in the objectives stage, that: “*The video is very didactic, addressing the proposed themes*”. There was also the following comment: “*The video helps to understand the topic*”.

In Structure and presentation (organization, structure, strategy, coherence and sufficiency), all the participants totally agreed with the items “language suitable for the

target audience”, “correct information”, “objective information”, “clarifying information”, “logical sequence of ideas” and “current topic”.

With regard to the item “language appropriate to the educational material”, 94% of the participants totally agreed and 6% partially agreed. For “necessary information” and “appropriate text length”, 93% totally agreed and 7% partially agreed. As for the item “interactive language, allowing active involvement in the educational process”, the result was that 86% of the participants totally agreed and 14% partially agreed, as shown in Table3.

Table 3 - Validation instrument - Structure and presentation

STRUCTURE/PRESENTATION: organization, structure, strategy, coherence and sufficiency	Disagree	Partially agree	Totally agree
1. Language suitable for the target audience	0	0	100%
2. Language appropriate to the educational material	0	6%	94%
3. Interactive language, allowing active involvement in the educational process	0	14%	86%
4. Correct information	0	0	100%
5. Objective information	0	0	100%
6. Clarifying information	0	0	100%
7. Necessary information	0	7%	93%
8. Logical sequence of ideas	0	0	100%
9. Current topic	0	0	100%
10. Appropriate text length	0	7%	93%

Source: Elaborated by the authors - research data (2024).

Some participants made important comments, such as: “*I think the structure was very good and organized*” and “*I think it's very good! Clarifying, coherent!*”. In addition, there were relevant suggestions for improving the product: “*Some slides have a lot of lines of text, I think it could be summarized a bit*” and “*Divide the content of the ‘clinical treatment’ slide into more than one slide. For example, a slide with just the topic ‘Patient education’*”.

When it came to the relevance of the educational product, 100% of the participants agreed with the item “contributes to knowledge in the area” and also with the item “raises interest in the topic”. With regard to the item “stimulates learning”, 93% of the participants totally agreed and 7% partially agreed, as shown in Table 4.

Table 4 - Validation instrument - Relevance

RELEVANCE: significance, impact, motivation and interest	Disagree	Partially agree	Totally agree
1. Stimulates learning	0	7%	93%
2. Contributes to knowledge in the area	0	0	100%
3. Raises interest in the subject	0	0	100%

Source: Elaborated by the authors - research data (2024).

Participants also commented: “*I really liked the video and it addresses very relevant aspects*”. There were also suggestions such as: “*Do the same course for knee pain*”, “*Suggest the video on the course's digital platforms*” and “*It would be a suggestion, to make a hook to be able to address other diseases that could also be related to back pain*”.

The participants' suggestions were important for the development of new educational products in the future, and no comment invalidated the product.

Given the results obtained in the validation of the educational product with the target audience, the CVI was 90.1%, considering the product validated, as cited by the authors Perdigão *et al.* (2019), who report that when an agreement number greater than or equal to 80% is obtained, it is considered an excellent result for the validation of a product.

4 Conclusions

There is a need to look at low back pain in a different way, because as we have seen, it is increasingly present in the daily lives of doctors, causing serious social and economic consequences for both patients and the public health system.

For doctors, there are numerous difficulties in the proper management of patients with low back pain, as observed in the survey. One of the points assessed is the abundance of information on the subject; another is the lack of teaching materials and specific educational products.

The development of the educational product in question was motivated by the researcher's professional experience as a teacher in which he found that, during his students' undergraduate studies, the teaching of low back pain is generally offered through elective classes and expository methodologies. This scenario can represent a significant challenge for learning the subject, even though it is a disease with a relevant theme and is present in the daily lives of health professionals.

In addition to the aforementioned issue, there is a wide availability of guidelines, protocols and scientific articles (Corp *et al.*, 2021). Although these protocols have common guidelines, there are some differences and even divergences, which makes it even more difficult for general practitioners and medical students to understand. A detailed analysis of the literature also revealed recurring difficulties in understanding and applying guides and protocols for the treatment of low back pain, highlighting the urgent need for greater simplicity and clarity (Corp *et al.*, 2021, McCabe *et al.*, 2019).

During the construction of the product, even though the content is complex, an attempt was made to simplify the information and language, as this was one of the difficulties identified in the research.

Faced with this challenge, the importance of developing validated educational products aimed at medical students and general practitioners became clear. It is worth noting that the product we have built is highly recommended. Another advantage is that it

can be replicated and is not limited to physical space, since the target audience can access it anywhere with internet access. The validation process was well accepted by the target audience, with positive comments and valid suggestions for future training.

Validating educational technologies is fundamental to strengthening the reliability of the teaching-learning process. This process guarantees the didacticism and quality of the guidance provided, as well as ensuring the reliability of the information based on the literature. In this context, validation becomes essential for applicability, guaranteeing the effectiveness of the proposed educational objectives. It is important to note that a product based on evidence goes through a rigorous validation process, in which both evidence and theories support the interpretation of the validation instruments (Rocha *et al.*, 2023).

Effectively managing the challenges associated with teaching about low back pain requires a multifaceted approach, analogous to clinical treatment. To combat this real epidemic, it is essential to improve medical training by introducing innovative educational resources. In addition, it is essential to promote a pedagogical approach that incorporates specific exercises on pain, aimed at changing prescriptive behaviors and practices. Robust psychological and social support also plays a crucial role in assisting the population, underlining the need for an integrated strategy involving multiple dimensions to deal effectively with teaching problems related to low back pain.

References

BELLO, J.O.; GRANT, P. A. systematic review of the effectiveness of journal clubs in undergraduate medicine. **Can Med Educ J**. v.14, n.4, p.35-46, 2023.

BRASIL. Ministério da Saúde. **Dor Lombar**. 2022. Disponível em:<https://linhasdecuidado.saude.gov.br/portal/dor-lombar/>. Acesso em: 14 de março de 2024.

BRITO, T. A.; PORTELA, N. M.; DE CAMPOS, A. S. As experiências e aplicações do ensino mediado por tecnologia digital na educação médica: uma revisão da literatura. **Revista Brasileira de Informática na Educação**, v. 32, p. 120-134, 2024.

CESÁRIO, R. R.; CESÁRIO, M.; SANTOS, C. G. Alvorecer do Paradigma Sistêmico na Educação Médica - Dawn of the Systemic Paradigm in Medical Education. **Rev. bras. educ. med.** 43 (1 suppl 1) 2019. Disponível em: <https://doi.org/10.1590/1981-5271v43suplemento1-20190116>. Acesso em: 05 de janeiro de 2024.

COQUEIRO, N. P. S.; SOUSA, E. C. A educação a distância (EAD) e o ensino remoto emergencial (ERE) em tempos de Pandemia da Covid 19 Distance education (Ed) and emergency remote education (ERE) in times of Pandemic Covid 19. **Brazilian Journal of Development**, v. 7, n. 7, p. 66061-66075, 2021.

FATOYE, F.; GEBRYE, T.; ODEYEMI, I. Real-world incidence and prevalence of low back pain using routinely collected data. **Rheumatology international**, v. 39, p. 619-626, 2019.

FOSTER, N. E.; ANEMA, J. R.; CHERKIN, D.; CHOU, R.; COHEN, S. P.; GROSS, D. P.; WOOLF, A. Prevention and treatment of low back pain: evidence, challenges, and promising directions. **The Lancet**, v. 391, n.10137, p. 2368-2383, 2018.

IBGE - Instituto Brasileiro de Geografia e Estatística. **Pesquisa Nacional de Saúde**. 2019. Disponível em: <https://sidra.ibge.gov.br/tabela/4642>. Acesso em: 16 de março de 2024.

LEITE, S. D. S.; ÁFIO, A. C. E.; CARVALHO, L. V. D.; SILVA, J. M. D.; ALMEIDA, P. C. D.; PAGLIUCA, L. M. F. Construction and validation of an educational content validation instrument in health. **Revista brasileira de enfermagem**, v.71, p.1635-1641, 2018.

MCCABE, E.; JADAAN, D.; MUNIGANGAIAH, S.; BASAVARAJU, N.; MCCABE, J. P. Do medical students believe the back pain myths? A cross-sectional study. **BMC medical education**, v.19, p. 1-6, 2019.

OLIVEIRA, C. B.; MAHER, C. G.; PINTO, R. Z.; TRAEGER, A. C.; LIN, C. W. C.; CHENOT, J. F.; KOES, B. W. Clinical practice guidelines for the management of non-specific low back pain in primary care: an updated overview. **European Spine Journal**, v. 27, p. 2791-2803, 2018.

RAJA, S. N.; CARR, D. B.; COHEN, M.; FINNERUP, N. B.; FLOR, H.; GIBSON, S.; VADER, K. The revised International Association for the Study of Pain definition of pain: concepts, challenges, and compromises. **Pain**, v.161, n.9, p.1976-1982, 2020.

ROCHA, S.L.; SOUZA, R.J.D.; TEIXEIRA, E.; LIMA, L.H.A. Validação de produtos educacionais em ensino saúde. **EduCapes**, 2023. Disponível em: <https://educapes.capes.gov.br/bitstream/capes/739793/2/Manual%20de%20Validac%CC>

[%A7a%CC%83o%20de%20produtos%20Educaacionais%20em%20Ensino%20em%20Sa u%CC%81de%20%20%281%29.pdf](#). Acesso em: 19 de março de 2024.

SANTOS, F. D. S. M.; CARVALHO, S. F. C. D.; FREITAS, L. R. C.; OLIVEIRA, I. A.; CUNHA, C. L. S.; AVENA, K. D. M. Ensino da pesquisa científica na graduação médica: há interesse e envolvimento dos estudantes?. **Revista Brasileira de Educação Médica**, v. 47, p. e092, 2023.

SHIPTON, E.E.; BATE, F.; GARRICK, R.; STEKETEE, C.; SHIPTON, E. A.; VISSER, E. J. Systematic review of pain medicine content, teaching, and assessment in medical school curricula internationally. **Pain and therapy**, v.7, p. 139-161, 2018.

SILVA, D. F. et al. Avaliação da dor e incapacidade funcional em pacientes com lombalgia crônica submetidos a um programa educativo de uma “escola de coluna”. **Revista Eletrônica Acervo Saúde**, v. 12, n. 11, p. e4317-e4317, 2020.

TEIXEIRA, E. Interfaces participativas na pesquisa metodológica para as investigações em enfermagem. **Rev Enferm UFSM**, v. 9, n. e1, p. 1-3, 2019.

VALENTINO, T. C.O.; MILANI, C.M., GOMES, C. C., MARQUES, N. B. N.; PACCA, F. C.; CURY, P. M.; FARIA, T. V. Planejamento e desenvolvimento da disciplina de pesquisa científica no curso de medicina: um estudo descritivo. **Brazilian Journal of Health Review**, v.7, n.1, p. 1106-1124, 2024.

VOS, T.; ABAJOBIR, A. A.; ABATE, K. H.; ABBAFATI, C.; ABBAS, K. M.; ABD-ALLAH, F.; CRIQUI, M. H. 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. **The Lancet**, v. 390, n.10100, p.1211-1259, 2017.

WHO. World Health Organization. **Low back pain**. 19 de junho de 2023. Disponível em: <https://www.who.int/news-room/fact-sheets/detail/low-back-pain>. Acesso em: 30 de março de 2024.

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