Development and validation of a guide for active methodologies in osteopathy education

Desenvolvimento e validação de guia de metodologias ativas no ensino da osteopatia

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Abstract

Introduction: In postgraduate osteopathy programs, the adoption of active learning methodologies faces challenges such as insufficient faculty training, student resistance, and a lack of structured materials to guide their implementation. **Objective:** To develop and validate a practical guide on active learning methodologies for postgraduate osteopathy faculty. **Methods:** This was a methodological study conducted in three stages. The first stage consisted of an integrative literature review to inform the guide's development. The second involved content validation by experts using the content validity index (CVI ≥ 0.80). Participants included faculty members holding at least a specialist qualification, experience with active learning methodologies in higher education, and scoring ≥ 8 on an adapted Fehring model scale. Experts evaluated clarity, pertinence, organization, logical sequence, suitability, applicability, and relevance. The third stage was semantic validation involving physio-therapist faculty members from the postgraduate osteopathy program at the Brazilian School of Osteopathy and Manipulative Physiotherapy, who assessed the guide's clarity, pertinence, and applicability. Both validation instruments utilized a 1-to-5 Likert scale. Data were analyzed using descriptive statistics. **Results:** All items in the content validation phase showed a CVI ≥ 0.90, with five items achieving a CVI of 1.00. In the semantic validation phase, all items exceeded the minimum criteria, confirming the guide's clear language and practical applicability. **Conclusion:** The guide demonstrated robustness and pedagogical relevance, serving as a structured tool to support faculty in implementing active learning methodologies.

Keywords: Postgraduate education. Study guide. Active learning. Osteopathy.

Resumo

Introdução: *Na pós-graduação em osteopatia, a adoção de metodologias ativas enfrenta desafios relacionados à insuficiente capacitação docente, resistência discente e ausência de materiais estruturados que orientem sua aplicação.* ***Objetivo:*** *Desenvolver e validar um guia prático de metodologias ativas para docentes de pós-graduação em osteopatia.* ***Métodos:*** *Trata-se de um estudo metodológico realizado em três etapas. A primeira consistiu em uma revisão integrativa da literatura para embasar a elaboração do guia. A segunda envolveu a validação de conteúdo por especialistas, utilizando o índice de validade de conteúdo (IVC ≥ 0,80). Foram incluídos docentes com titulação mínima de especialista, experiência com metodologias ativas no ensino superior e pontuação ≥ 8 em um modelo adaptado de Fehring. Os especialistas avaliaram clareza, pertinência, organização, sequência lógica, adequação, aplicabilidade e relevância. A terceira etapa foi a validação semântica com docentes fisioterapeutas de pós-graduação em osteopatia da Escola Brasileira de Osteopatia e Fisioterapia Manipulativa, que analisaram clareza, pertinência e aplicabilidade do guia. Ambos os instrumentos utilizaram uma escala Likert com pontuação de 1 a 5. Os dados foram analisados por estatística descritiva.* ***Resultados:*** *Todos os itens da validação de conteúdo apresentaram IVC ≥ 0,90, sendo cinco com IVC 1,00. Na validação semântica, todos os itens superaram o critério mínimo, confirmando linguagem clara e aplicabilidade prática.* ***Conclusão:*** *O guia demonstrou robustez e relevância pedagógica, configurando-se como ferramenta estruturada para apoiar docentes na implementação de metodologias ativas. Pretende-se ampliar sua validação para outras instituições reconhecidas pelo Conselho Federal de Fisioterapia e Terapia Ocupacional e realizar estudos longitudinais que avaliem seu impacto na aprendizagem e no desenvolvimento de competências profissionais.*

Palavras-chave: *Educação de pós-graduação. Guia de estudos. Aprendizagem ativa. Osteopatia.*

Introduction

Education is undergoing a period of transformation that seeks innovation, quality in teaching, and the development of new skills and new methodologies, aiming to make students co-participants in their own learning process.[1,2] Currently, the exclusive use of traditional teaching methods has limitations in promoting efficient learning; therefore, there is a growing need to apply active methodologies, developed through student-centered teaching strategies that account for students' individual characteristics.[3,4] In this scenario, the professor acts as a mediator of the learning process, standing in contrast to traditional methods, which rely on lecture-based instruction that can limit participatory and autonomous learning.[5]

According to Freire,[6] these methodologies are rooted in an educational concept that encourages the action-reflection-action process, in which students take an active stance in pursuing their own learning and are encouraged to develop concepts that were previously outside their field of knowledge, consolidating this understanding through the pursuit and sharing of knowledge. Berbel[7] reinforces Freire's thinking regarding active methodologies as a way of developing the learning process, potentially using real or simulated experiences to achieve more efficient learning and practical applicability in these students' future professional practice.

According to Silva,[8] active teaching methodology advocates for a partnership between professor and student in the pursuit of knowledge. The idea is to foster students' intellectual autonomy through activities planned by the professor to promote the use of multiple thinking skills, such as interpreting, analyzing, synthesizing, classifying, relating, and comparing. Schlichting and Heinzle[9] point out that active teaching methods should not focus specifically on content, but rather on situations that closely resemble real-world scenarios, since this allows students to connect the knowledge acquired across different disciplines in a way that provides a broader view of the setting in which they will eventually work. There is a recognized difficulty in implementing active methodologies in education, due to factors such as deficiencies in professor training in Brazil, a lack of interest in pursuing didactic-pedagogical training, and resistance from students toward active methodologies – since many are habituated to a banking model of education and are not encouraged to be active agents in their own learning process.[10,11]

Regarding the training of healthcare professionals – specifically in the field of physical therapy and, consequently, its specialties – the professor is regarded as the holder of knowledge, and students are instructed to mechanically absorb the content presented during classes and apply it in patient care, without developing their clinical reasoning and critical thinking skills.[12,13]

The field of study in physical therapy is vast. Osteopathy, in particular, can be defined as a healthcare system that draws on anatomical, physiological, and biomechanical knowledge, using manual techniques to make the adjustments necessary to diagnose and correct dysfunctions and promote the body's self-regulation mechanism.[14] Lato sensu postgraduate programs in osteopathy tend to have a strong practical focus, preparing graduates to apply what they've learned directly in the job market. One limiting factor in this learning process is that the curricular structure of these programs typically involves shorter total course hours, divided into monthly modules.

During the course of a postgraduate specialization, it becomes apparent that students often struggle to build their clinical reasoning skills. Given this reality, there is a clear need to incorporate real or simulated experiences — always contextualized — applying active methodologies aimed at bringing students closer to the everyday clinical practice of their profession. The goal is for future specialists to become more critical-thinking, proactive, and well-equipped to work in an interprofessional job market.[15]

Understanding the relevance of facilitating knowledge and developing the clinical reasoning required throughout osteopathic training through a more dynamic and active methodology, the studies by Korpi et al.[16] and Burgess et al.[17] report that students identified critical and creative reflection, clinical reasoning, and interprofessionalism as key strengths fostered by active methodologies. In light of these challenges, the objective of this study was to develop and validate a practical guide for graduate-level osteopathy professors.

Methods

This is a methodological study focused on validating educational material, specifically the development of a guide on active methodologies for teaching graduate-level osteopathy. The study was approved by the Research Ethics Committee of the Faculdade Pernambucana de Saúde (FPS)/Associação Educacional de Ciências da Saúde (AECISA), under protocol no. 5569.

The study began with an extensive literature review (stage 1), encompassing the analysis of scientific articles to establish a theoretical foundation for the guide's development. To identify the central problem of this research, the following guiding question was formulated: how can a set of active methodologies specific to graduate-level osteopathy education be developed to maximize student engagement and the effectiveness of integrated theoretical-practical learning?

The inclusion criteria were defined as articles on the application of active methodologies in undergraduate health science programs and graduate programs in osteopathy or related fields, available in full text and open access, in Portuguese, English, or Spanish, with no time restriction due to the scarcity of graduate-level studies. Studies from fields unrelated to osteopathy or the health sciences were excluded, except when they addressed active methodologies with high transferability to this context; editorials, protocols, letters, abstract-only papers, or works unrelated to the research topic were also excluded.

To guide the search and selection of studies, the PICO strategy was used, considering: P (Population) – graduate-level faculty; I (Phenomenon of interest) – development and validation of a guide on active methodologies; Co (Context) – graduate-level osteopathy education. Based on this methodological framework, the identified articles were screened and selected using the Rayyan platform, leading to the final sample of articles that served as the basis for developing the guide.[18]

After its development, the guide underwent a rigorous review of spelling and grammar, carried out by specialists in linguistics and technical writing, ensuring clarity, cohesion, and freedom from errors. In parallel, an instructional designer worked on refining the layout, making it visually appealing and easy to understand. These improvements involved formatting adjustments, reorganization of topics, and refinement of the graphic layout of information, to make the material more intuitive and accessible to its target audience.

The professors involved in the content validation (stage 2) and semantic validation (stage 3) processes were selected using the model proposed by Fehring.[19] The model was adapted for the present study, with a maximum possible score of 12 points, in which faculty members needed to reach a minimum of 8 points to be invited to participate. Table 1 describes the established criteria and the corresponding score for each item. The higher the score, the stronger the evidence that the professor is an expert on the topic being evaluated.

In the content validation stage, the aim was to assess the material's technical coherence, relevance, and potential for use in an academic context, through evaluation by specialists in active methodologies in the health field.

In the semantic validation stage, the focus was on assessing the clarity of the language, the organization of the material, and the appropriateness of the terms used in the guide, ensuring that the content was comprehensible and functional for its target audience.

Table 1 - Criteria for scoring specialists

Criteria	Score
Professors who are specialists in the use of active teaching methodologies	4
Professors with theoretical and practical experience in active methodologies at the undergraduate or graduate level	3
Professors specializing in osteopathy holding a Diploma in Osteopathy or recognized as a specialist in the field by the Federal Council of Physical Therapy and Occupational Therapy	2
At least two years of teaching experience in graduate-level education	2
At least two years of teaching experience in higher education	1

Note: Fehring model adapted by the authors.[19]

Development of the data collection instrument

The data collection instrument used in the 2nd and 3rd validation stages consisted of a structured questionnaire, developed based on theoretical foundations and best practices recommended by the specialized literature on the process of guide construction and validation. Response measurement was carried out using a Likert scale,[20] which allowed for assessment of participants' level of agreement with each item presented. Response options were organized into five levels: (1) strongly disagree, (2) partially disagree, (3) neither agree nor disagree, (4) partially agree, and (5) strongly agree.

In the second stage, the questionnaire consisted of seven objective questions aimed at assessing the clarity, relevance, organization, and applicability of the content, along with an open-ended section for feedback and suggestions for improvement. In the third stage, the questionnaire included five objective questions focused on the final evaluation of the practical guide, considering its suitability for the target audience, its potential for use in an educational context, and its coherence with the proposed objectives. This stage also included a space for open comments, allowing participants to offer constructive criticism, suggest adjustments, and provide general observations, thereby contributing to the continuous improvement of the material before its final version.

Questionnaire administration

Data collection for the second stage of content validation was carried out with 10 professors who specialize in the use of active methodologies and their respective classroom applications at FPS. For the third stage of semantic validation, 10 physical therapist-osteopath professors were selected from the Brazilian School of Manipulative Physical Therapy (Ebrafim, Escola Brasileira de Fisioterapia Manipulativa). The choice of a small sample was justified by the exploratory and qualitative nature of the research, which sought an in-depth analysis of participants' perceptions. The questionnaires were administered digitally through the Google Forms online platform, allowing faculty members to respond at their own pace within a five-day period established for each stage, thereby ensuring both confidentiality and participant comfort. Prior to the data collection, consent forms were signed, ensuring that all participants were fully informed about the study's objectives and their rights.

Data analysis

After data collection, the responses obtained in the 2nd (content validation) and 3rd (semantic validation) stages were reviewed and analyzed using descriptive statistics. In the content validation stage, absolute and relative frequencies were calculated for each response, allowing for the identification of the relevance and technical pertinence of the content presented.

For semantic validation, responses were treated similarly, with a focus on clarity, organization, terminological appropriateness, and ease of understanding of the material. In both stages, the results guided adjustments to the guide, ensuring its consistency, applicability, and alignment with the profile and needs of the target audience.

To scale this study, the content validity index (CVI) was used. The CVI score was calculated by summing the level of agreement for items that received ratings of 3 (relevant) and 4 (extremely relevant) from the specialists: CVI = number of responses rated 3 and 4/total number of responses. Items that received a score of 1 (not relevant) or 2 (slightly relevant) were eliminated.[20,21] Items that achieved a minimum of 80% agreement were considered valid.

Results

The search conducted to build the guide's content initially identified 676 articles from the LILACS (n = 21), MEDLINE (n = 183), and PubMed (n = 472) databases, selected based on the descriptors used (postgraduate education; active learning; osteopathy; and teaching) via the Health Sciences Descriptors (DeCS) database. No time restriction was applied to the article selection due to the scarcity of studies addressing the application of active methodologies in the context of graduate-level courses, particularly in the field of osteopathy. As a result, all studies meeting the inclusion criteria were considered regardless of publication year.

Initially, articles were identified (n = 676) and duplicate records removed (n = 238). This was followed by a careful screening of titles and abstracts according to the previously established inclusion and exclusion criteria. From this stage, 57 studies were read in full for a more in-depth assessment of their suitability to the research objective. As a result of this rigorous selection process (Figure 1), only seven articles fully met all inclusion criteria, specifically addressing the selected active methodologies and their application within the graduate education setting. These studies made up the final sample that formed the basis for developing the guide, ensuring that the content was grounded in robust scientific evidence aligned with the needs of faculty training in osteopathy (Table 2).

The seven studies included in the final sample presented varied approaches, with an emphasis on problem-based learning, case studies, flipped classrooms, team-based learning, and clinical simulation. All reported positive outcomes in student engagement, the development of clinical reasoning skills, and the ability to apply knowledge in practical situations – characteristics essential to osteopathy education. Additionally, some studies highlighted the importance of adapting methodologies to the available time and course workload, an aspect directly relevant to *lato sensu* graduate programs. Based on the synthesis of this evidence, the initial version of the active methodologies guide for graduate-level osteopathy education was structured, encompassing the five described methodologies in a systematized format, complete with step-by-step application instructions, learning objectives, required resources, and suggestions for formative assessment.

In the second stage, corresponding to content validation, ten specialists in active methodologies participated in the evaluation of the guide, considering criteria of clarity, relevance, organization, and applicability. The results indicated that all items achieved a CVI ≥ 0.80, the minimum value recommended by the literature for content validation. The item "Logical sequence of activities" had a CVI of 0.90 and received suggestions for adjustments to the organization of the steps, which were incorporated into the revised version of the guide. The remaining items achieved a CVI of 1.00, demonstrating absolute consensus among the specialists regarding their adequacy, as shown in Table 3.

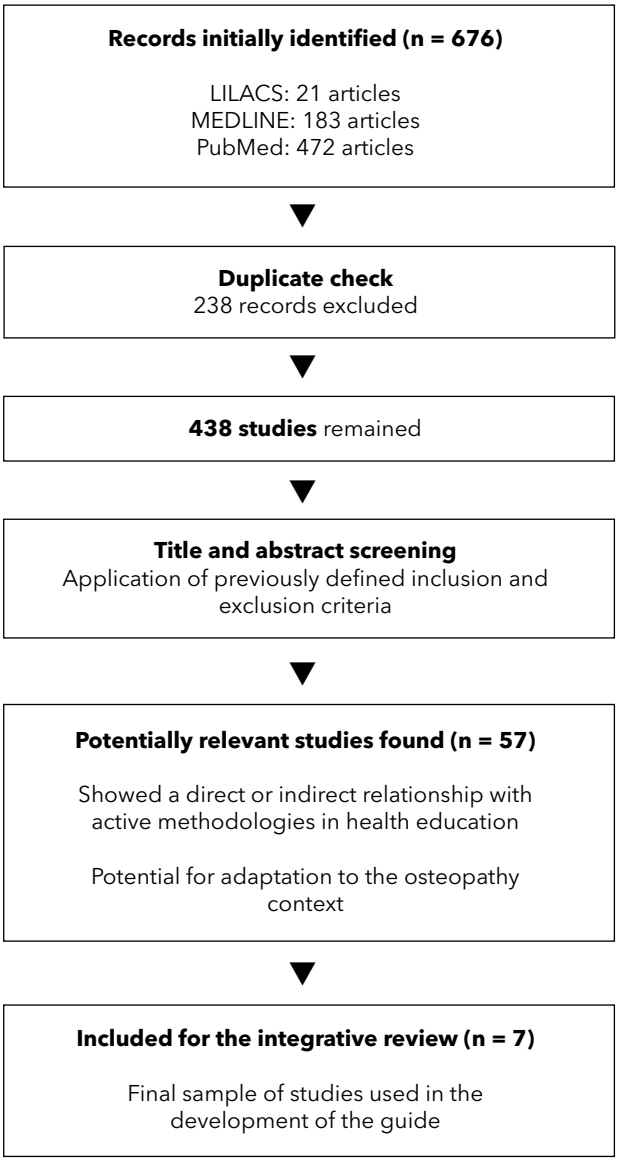

Figure 1 - Flowchart of the screening process for studies included in the integrative review.

Table 2 - Final sample of studies used in the development of the guide

Study and year of publication	Objectives	Results
Bi et al.,[34] 2019	Determine whether CBL is superior to traditional teaching methods in delivering a lung cancer curriculum to oncology students.	Complete data were obtained from participating students (n = 40 in CBL; n = 40 in traditional teaching). The CBL group performed significantly better on both the questionnaire and the exam compared to the traditional teaching group. Students in the CBL group showed high levels of satisfaction and problem-solving ability.
Blair et al.,[35] 2020	Evaluate the feasibility, acceptability, and outcomes of a flipped classroom instructional model in an internal medicine curriculum.	Graduating students preferred the flipped classroom, which also resulted in increased knowledge and self-reported changes in prescribing practices; however, the preparation time required may limit its feasibility in GME.
Currey et al.,[36] 2015	Evaluate the attitudes and engagement of postgraduate critical care nursing students toward team-based learning.	There were significant changes in students' attitudes toward learning within teams, including increases in overall satisfaction with the team experience, the team's impact on learning quality, clinical reasoning ability, and professional development.
Huang et al.,[37] 2024	Evaluate the effectiveness of TCLEBL methods in cultivating students' clinical and research skills compared to traditional LBL approaches.	Compared to the LBL approach, both professors and students were more satisfied with the TCLEBL model ($p < 0.001$ for both faculty and students). TCLEBL group performed significantly better on the theoretical test compared to the LBL group ($p = 0.009$).
McMullen et al.,[38] 2014	Evaluate the outcomes of the methodology compared to traditional teaching and provide practical guidance for educators specifically on implementing team-based learning to improve student engagement and performance.	Team-based learning has been shown to improve knowledge, teamwork, and interactivity in medical school settings.
Prego et al.,[39] 2014	Report firsthand experience with simulation involving high-fidelity emergency scenarios for diagnostic closure in the professional context of pediatric graduate trainees.	Teaching applied to pediatric emergencies proved to be a positive experience for graduate students and pediatric residents.
Rufer et al.,[40] 2011	Implement PBL in the postgraduate training curriculum for psychiatry and psychotherapy, and evaluate the program over a 12-month period using structured questionnaires.	Results from this pilot project suggest that PBL can be a useful component of multifaceted advanced training programs, strengthening their practical component and the applicability of knowledge to daily clinical routine.

Note: CBL = case-based learning; GME = Graduate Medical Education; TCLEBL= team-based, case-based, lecture-based, and evidence-based learning; LBL = lecture-based learning; PBL = Problem-Based Learning

In the third stage, corresponding to semantic validation, ten physical therapist professors specializing in osteopathy, active in graduate-level teaching in the field, took part. The goal of this phase was to assess the clarity, organization, technical coherence, and language appropriateness of the guide, ensuring the material was comprehensible and functional for its target audience. All items achieved a CVI ≥ 0.90, demonstrating a high degree of agreement among the evaluators: "Layout and organization" reached a CVI of 1.00, while "Clarity and comprehension," "Technical coherence," "Technical use of terms," and "Fluency and applicability" achieved a CVI of 0.90, with specific suggestions for linguistic improvement and precision of technical terms (Table 4).

The content validation (second stage) and semantic validation (third stage) demonstrated a high level of agreement among the specialists, with all items exceeding the CVI cutoff of ≥ 0.80. In the second stage, six items achieved the maximum CVI (1.00) and only one scored 0.90, demonstrating the relevance and applicability of the content. In the third stage, two items achieved a CVI of 1.00 and three achieved 0.90, with specific linguistic and organizational adjustment suggestions already incorporated.

During content validation, the specialists highlighted positive aspects such as the guide's clarity, objectivity, and practical applicability, with recurring feedback describing the material as "clear and practical" and "well-focused." Among the suggestions for improvement, there were recommendations to include more detailed explanations of the methodologies, add further practical examples, and expand the variety of activities included. It was also suggested that the guide include more specific evaluation indicators to measure outcomes.

In semantic validation (third stage), professors reinforced that the layout and organization of the material facilitate both reading and classroom application. However, some pointed out the need for adjustments to technical terminology to avoid ambiguity, and suggested creating appendices with ready-to-use work-sheets and clickable links to supplementary resources. These observations were incorporated into the final version, resulting in a more precise, functional, and pedagogically appealing material.

Table 3 - Results (%) of the guide's second content validation stage

Items evaluated	1	2	3	4	5	CVI	Result
1. The guide addresses the practical use of active methodologies within the context of graduate-level osteopathy	100	0	0	0	0	1.00	Valid
2. The practical guide presents a logical sequence of active methodology activities, with a step-by-step approach aligned with each module's course hours	60	30	0	10	0	0.90	Valid
3. The practical guide helps faculty apply active methodologies in teaching osteopathy	60	40	0	0	0	1.00	Valid
4. The practical guide adequately addresses pedagogical practice in the application of active methodologies.	70	30	0	0	0	1.00	Valid
5. The practical guide values the contexts and settings in which graduate-level osteopathy faculty work	90	10	0	0	0	1.00	Valid
6. The practical guide helps define measurable goals and objectives focused on practice, based on collected results.	80	20	0	0	0	1.00	Valid
7. The practical guide satisfactorily covers both measurable aspects and qualitative perceptions	80	20	0	0	0	1.00	Valid

Note: 1 = total agreement; 2 = partial agreement; 3 = neither agree nor disagree; 4 = partial disagreement; 5 = total disagreement; CVI = context validity index.

Table 4 - Results (%) of the guide's third content validation stage

Items evaluated	1	2	3	4	5	CVI	Result
1. The instrument presents good layout (organization of the material, distribution of items, and how they are presented)	70	30	0	0	0	1.00	Valid
2. The language is clear and easy to understand	80	20	0	0	0	1.00	Valid
3. The instrument is technically coherent with what it proposes to implement	70	20	10	0	0	0.90	Valid
4. The terms used were technical and well applied, with no possibility of ambiguity	50	40	10	0	0	0.90	Valid
5. The instrument shows fluency in the proposed active methodologies and presents activities that allow active methodologies to be applied in a simple and practical way in graduate-level osteopathy modules	80	10	10	0	0	0.90	Valid

Note: 1 = total agreement; 2 = partial agreement; 3 = neither agree nor disagree; 4 = partial disagreement; 5 = total disagreement; CVI = context validity index.

Discussion

The present study aimed to develop and validate, in both the theoretical content and semantic dimensions, a practical guide on active methodologies for graduate-level osteopathy education. The results obtained in the two validation stages demonstrated that the material has satisfactory quality and alignment with the proposed objectives. The use of rigorous validation methodologies, including psychometric analysis and expert feedback, is crucial to ensuring the effectiveness and reliability of educational materials in assessment contexts. The development and validation of educational guides for learning assessment, through processes of continuous review and user testing, is essential to improving the quality of assessments and ensuring their pedagogical relevance.[22] Active methodologies are grounded in repositioning the student as the protagonist of the teaching-learning process, shifting the focus away from professor-centered instruction. This approach requires students to take a participatory stance, with greater engagement in reading, research, questioning, and application of acquired knowledge, fostering the development of autonomy. Unlike the traditional model, in which the student is treated as a mere recipient of information, the adoption of active methods makes education more dynamic and encourages critical thinking.[23]

In this context, the development of an active methodologies guide stands out as a strategic tool for facilitating the learning process, serving as a structured reference that guides both faculty and students in the practical implementation of these approaches. By systematizing strategies, steps, and pedagogical resources, the guide acts as a mediating mechanism that enhances student autonomy, offering clear pathways for active engagement, critical thinking, and the practical application of knowledge.[24,25] Furthermore, by providing an integrated view of theory and practice, the guide contributes to the training of more reflective professionals, capable of making informed decisions, adapting to different contexts, and maintaining an autonomous and responsible stance when facing complex situations in their future professional practice.[26-28]

Regarding the second stage of theoretical content validation with specialists, all seven items evaluated achieved a CVI equal to or greater than 0.90, with six items (1, 3, 4, 5, 6, and 7) reaching a CVI of 1.00. One item (2) recorded a CVI of 0.90, still above the minimum adopted criterion (CVI ≥ 0.80), demonstrating a high level of consensus among the specialists regarding the clarity, relevance, and applicability of the guide's content. These results corroborate the study by Alexandre and Coluci,[21] which proposes that values above 0.80 indicate robustness and validity in the content presented.

Semantic validation with active professors in the field also yielded satisfactory results: all items achieved a CVI equal to or greater than 0.88, with most exceeding 0.90. This indicates that the guide was considered clear, understandable, and easy to apply by the target audience for which it was developed. This stage was essential to confirm that the language, organization, and presentation of the content are appropriate for practical use in the classroom setting, as recommended by Alexandre and Coluci[21] and Polit and Beck.[29]

The combined analysis of both stages reveals that the developed guide fulfills its role of providing clear, applicable guidance for implementing active methodologies in osteopathy education, both from a conceptual standpoint (theoretical content validation) and from the end-user perspective (semantic validation). This convergence of results aligns with the methodological recommendations described by Polit and Beck[29] and Lynn,[30] who emphasize the importance of dual verification with specialists and end users to ensure the effectiveness of educational instruments.

Another point worth considering is that the structure of the guide — organized into modules corresponding to the areas of specialization (structural, visceral, cranial, and psychobiological) — was highlighted by faculty during the validation stage as an aspect that supports practical application and instructional planning. This format was identified as facilitating the contextualization of active methodologies to the realities of the field, enhancing faculty engagement and adherence. Studies such as Burgess et al.[31] point out that contextualizing active methodologies to the realities of the field increases faculty adherence and enhances student learning outcomes.

The organization of the guide by specific areas of osteopathy also facilitates the transfer of knowledge into professional practice, as it brings pedagogical strategies closer to the clinical situations experienced by students. In this regard, Korpi et al.[16] observed that physical therapy students exposed to problem-based learning reported a greater ability to connect theoretical content with the demands of clinical practice, in addition to developing critical thinking and autonomy in decision-making.

Furthermore, the literature shows that active methodologies produce better outcomes when planned with attention to the participants' educational and professional context. In investigating the application of active methodologies in graduate-level health courses, Marin[15] found that integrating real work situations with learning strategies fosters the development of professional competencies, increases student participation, and strengthens the connection between theory and practice.

Despite the positive results, two items with a CVI of 0.90 in the theoretical validation point to potential opportunities for refinement. These aspects could be improved by including additional examples and adjusting the description of certain steps in the activities — an ongoing process that can take place as the guide is applied in practice. This approach aligns with what authors Borges and Alencar[32] advocate, who emphasize the need for periodic revisions of pedagogical materials to keep them updated and aligned with teaching demands.

From a practical standpoint, the technical product developed contributes to improving faculty training in the field of osteopathy, offering structured support for the integration of active methodologies and the development of essential competencies such as clinical reasoning, critical thinking, and theory-practice integration. This contribution aligns with the evidence presented by Roman et al.,[33] who link the adoption of these pedagogical strategies to increased student engagement and improved academic performance.

Regarding the study's limitations, the limited number of specialists and professors participating in the validation stages stands out; although methodologically acceptable for studies of this nature, it reduces the diversity of perspectives. Future research is encouraged to expand the sample size and conduct studies applying the guide in real teaching contexts, to assess its actual impact on learning.

Additionally, during the integrative review, no studies were found specifically addressing the use of active methodologies in graduate-level osteopathy education. This gap highlights the lack of pedagogical tools tailored to the particularities of the field, underscoring the importance of developing resources that support faculty in implementing innovative, student-centered strategies.

Thus, the findings of this research indicate that the practical guide on active methodologies for graduate-level osteopathy education has been validated in terms of content and semantic clarity, establishing itself as a pedagogical tool ready for application, with the potential to positively impact the quality of the teaching-learning process in the field.

It is recommended that the validation process be expanded to include other graduate-level osteopathy schools recognized by the Federal Council of Physical Therapy and Occupational Therapy (COFFITO) throughout the country, in order to assess the guide's applicability, adaptability, and effectiveness across different academic contexts. Such an initiative could serve as a foundation for the systematic implementation of the tool in teaching practice, promoting not only the standardization of active teaching strategies but also driving a restructuring of the pedagogical model for graduate-level osteopathy education. Furthermore, it is considered relevant to conduct longitudinal studies to measure the impact of the guide's use on learning indicators, the development of specific competencies, and the professional practice of graduates.

Conclusion

The active methodologies guide developed and validated in this study showed high indices of content validity and semantic clarity, demonstrating pedagogical robustness and relevance for graduate-level osteopathy education. The development of the material began with a rigorous integrative review, followed by the systematization of strategies aligned with the principles of active learning, and culminated in a process of theoretical and semantic validation conducted by specialists and faculty actively working in the field. This methodological path ensured that the guide included not only clear, applicable guidance but also flexibility for adaptation to different educational settings. It is, therefore, a structured resource that promotes the adoption of active strategies, enhancing student engagement, the integration of theory and practice, and the development of professional autonomy.

Authors´ contributions

The study was conceived by the first author (ACVS), who also carried out the literature review, data collection, analysis, and interpretation, developed the guide, and drafted the manuscript. SBL contributed to the me-

thodological design, supervised the research, and performed the critical review of the manuscript. FPMM participated in the methodological design, monitored the research, and performed the critical review of the manuscript. All authors approved the final version of the manuscript and take responsibility for its content.

Data availability statement

Data are available from the corresponding author upon reasonable request. The guide developed in this study is available at: https://periodicos.pucpr.br/fisio/article/view/35029.

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