

The Context of Teaching/Learning in Anatomy for Nursing Students: Systematic Review

O Contexto do Ensino/Aprendizagem em Anatomia para Graduandos de Enfermagem: Revisão Sistemática
El Contexto de Enseñanza/Aprendizaje en Anatomía para los Graduados en Enfermería: Revisión Sistemática

RESUMO

Objetivo: Analisar as metodologias utilizadas para o ensino da Anatomia Humana a nível de graduação em Enfermagem, vislumbrando metodologias mais eficazes de modo auxiliar na absorção de conteúdo. **Método:** A proposta de pesquisa caracteriza-se como uma revisão sistemática da literatura, conduzida segundo o checklist PRISMA 2020. O ponto de vista qualitativo justifica-se pela intenção de compreender as percepções e tendências relacionadas às metodologias de ensino-aprendizagem da Anatomia Humana, valorizando a complexidade do fenômeno e desafios educacional didático no contexto da formação do curso de enfermagem. **Resultados:** Na triagem foram excluídos 3 arquivos por se tratarem de dissertação de mestrado, 18 artigos científicos que mesmo após leitura completa não apresentaram relação direta com os descritores selecionados, restando 16 arquivos para serem aplicados no método prisma, sendo estes 7 documentos apresentaram pontuação menor que 15. Os documentos que serão incluídos no estudo somam 9 arquivos. **Conclusão:** As metodologias ativas têm ganhado cada vez mais espaço no meio acadêmico e aprovação dos alunos de medicina e enfermagem, ao utilizar a tecnologia para suprir a deficiência de aquisição de corpos humanos para ensino e pesquisa.

DESCRIPTORES: Anatomia; Metodologia; Educação.

ABSTRACT

Objective: To analyze the methodologies used for teaching Human Anatomy in undergraduate Nursing programs, aiming to identify more effective methodologies to assist in content assimilation. **Method:** The research proposal is characterized as a systematic literature review conducted according to the PRISMA 2020 checklist. The qualitative approach is justified by the intention to understand perceptions and trends related to Human Anatomy teaching-learning methodologies, valuing the complexity of the phenomenon and the educational and didactic challenges in the context of nursing education. **Results:** During the screening process, 3 records were excluded because they were master's dissertations, and 18 scientific articles were excluded because, even after full-text reading, they did not present a direct relationship with the selected descriptors. Sixteen records remained to be assessed using the PRISMA method, of which 7 documents scored lower than 15. A total of 9 documents were included in the study. **Conclusion:** Active methodologies have increasingly gained space in the academic environment and approval among medical and nursing students by using technology to compensate for the shortage of human bodies available for teaching and research.

DESCRIPTORS: Anatomy; Methodology; Education; Anatomy; Methodology; Education.

RESUMEN

Objetivo: Analizar las metodologías utilizadas para la enseñanza de la Anatomía Humana en el nivel de grado en Enfermería, con el fin de identificar metodologías más eficaces que ayuden en la absorción de contenidos. **Método:** La propuesta de investigación se caracteriza como una revisión sistemática de la literatura, realizada de acuerdo con la lista de verificación PRISMA 2020. El enfoque cualitativo se justifica por la intención de comprender las percepciones y tendencias relacionadas con las metodologías de enseñanza-aprendizaje de la Anatomía Humana, valorando la complejidad del fenómeno y los desafíos educativos y didácticos en el contexto de la formación en enfermería. **Resultados:** En el proceso de selección se excluyeron 3 documentos por tratarse de tesis de maestría y 18 artículos científicos que, incluso después de la lectura completa, no presentaron relación directa con los descriptors seleccionados. Quedaron 16 documentos para ser evaluados mediante el método PRISMA, de los cuales 7 obtuvieron una puntuación inferior a 15. Los documentos incluidos en el estudio suman un total de 9 archivos. **Conclusión:** Las metodologías activas han ganado cada vez más espacio en el ámbito académico y la aprobación de los estudiantes de medicina y enfermería, al utilizar la tecnología para suplir la escasez de cuerpos humanos destinados a la enseñanza y la investigación.

DESCRIPTORES: Anatomía; Metodología; Educación; Anatomy; Methodology; Education.

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Literature Review

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Gustavo Santos Melo do Nascimento

Undergraduate Nursing Student at Faculdade Santa Marcelina.

ORCID: <https://orcid.org/0009-0003-5614-1531>.



João Gregório Neto

Nurse. Master's Degree from the School of Nursing, University of São Paulo (USP).

ORCID: <https://orcid.org/0009-0003-8717-749X>



Ana Maria Itezerote

Biomedical Scientist. Postdoctoral Researcher in Anatomy at the USP.

ORCID: <https://orcid.org/0000-0002-7572-0788>



Luiz Henrique Da Silva

Nurse. Academic Consultant at MS Nursing Consultancy.

ORCID: <https://orcid.org/0000-0002-9001-6676>

INTRODUCTION

Teaching anatomy as history brings to our understanding a range of knowledge substantial enough to grasp the grandeur of anatomy as a science⁽¹⁻⁴⁾. Since ancient times, there have been historical records indicating that the earliest civilizations already possessed knowledge of anatomy; it is worth noting the inferential nature of this type of historical finding⁽¹⁻⁴⁾. In the mountainous region of the Sahara Desert, figures and fossilized skulls with perforations dating back to around 3,000 B.C. have been found, suggesting that even during this period, the technique of trepanation was used for mystical and therapeutic purposes⁽¹⁻⁴⁾. In antiquity, numerous works stood out in the field of anatomy; among them, the Hippocratic Corpus includes treatises dating from 600 BC to around 300 BC, while the writings of Aristotle (384 BC–322 BC), who, through notes and illustrations, paved the way for the field as we know it today, including comparative anatomy⁽¹⁻⁴⁾. Due to the disdain associated with manual labor at the time, textual descriptions were introduced into the teaching of anatomy alongside practical dissections guided by the anatomist⁽¹⁾. However, Leonardo da Vinci was responsible for transforming the initiatives of the past into a solid foundation for the teaching of anatomy, creating a fusion of painted imagery focused on the study of human anatomy⁽¹⁾. Anatomy is considered a fundamental pillar and a major foundation for the sciences that train profes-

sionals in the health and related fields, since an understanding of it is necessary for sound professional practice⁽²⁾. From this perspective, the teaching of human anatomy has not yet undergone significant changes, despite technological and pedagogical advances⁽²⁾. This contrasts with Freirean theory—widely used in the health field, especially in nursing—which holds that it is through dialogue between teachers and students that both learn and teach⁽²⁾. Often, this intrinsic nature of anatomy poses a challenge, particularly for students encountering its content for the first time and who have not yet engaged with it in its most in-depth form⁽²⁾. This reality ultimately requires the instructor to understand why this process occurs and, consequently, to rethink new teaching methodologies, acknowledging the academic limitations students have carried over from their K-12 education⁽²⁾. The research that gave rise to this article is justified by considering the elements of university pedagogy, in which educators develop their professionalism by reflecting on the pedagogical act of teaching and learning⁽²⁾. In general, universities have sought, through continuing education programs for their faculty, to encourage the use of more active methodologies and innovative teaching approaches to meet the demands of their students, thereby fulfilling the objective of this study, which is essentially to investigate academic perceptions of teaching and learning Human Anatomy⁽²⁾. Digital resources in the teaching of regional anatomy facilitate interactive learning through two- and

three-dimensional models⁽⁵⁾. Dissections of prepared anatomical specimens are also useful, but combining theoretical study with practical dissection enhances retention of the material⁽⁵⁾. Dissection allows students to observe, palpate, and progressively explore bodily structures. As William Hunter (1770) stated, “only dissection teaches with certainty where one may cut or examine the living body with freedom and precision”⁽⁵⁾.

With regard to teaching and learning, it is worth noting that a significant number of students have entered higher education with gaps in their knowledge, while at the same time the majority of professors working at the higher education level lack specific training in teaching. This combination directly affects the teaching and learning process, where we encounter students with basic educational gaps and professors without specific training—unless I am mistaken, when the student comes from a technical education background, that is, a qualification that provides academic experience, facilitating the absorption of content⁽²⁻³⁾. Consequently, the learning environment has seen technological advancements that help students retain content, such as multimedia classrooms, computers, virtual reality, and interactive games⁽³⁾. Technology serves as a pathway for knowledge transmission and contributes to new assessment methods that analyze student performance⁽³⁾. Based on this premise, teaching-learning methodologies stand out for their critical

and reflective approach, engaging students in the pursuit of knowledge, fostering their autonomy, developing social and ethical awareness as well as technical skills, and enabling students to address real-world problems in their daily work and/or research⁽³⁾. It is essential to analyze all learning methods for the subject, examining student interactions and study hours; that is, the more hours dedicated, the greater the engagement and absorption of the knowledge and content taught⁽³⁾. Consequently, the need for research becomes evident due to the complexity and importance of the Human Anatomy discipline, particularly in Nursing, as a means of analyzing learning methodologies⁽³⁾. Thus, the objective is to analyze the methodologies used to teach Human Anatomy at the undergraduate level in Nursing, with a view to identifying more effective methodologies to aid in the absorption of content⁽³⁾.

METHOD

This research proposal is a systematic literature review conducted in accordance with the PRISMA 2020 checklist. The qualitative approach is justified by the intention to understand perceptions and trends related to teaching and learning methodologies in Human Anatomy, highlighting the complexity of the phenomenon and the educational and didactic challenges within the context of nursing education. As in the quantitative domain, it aims to identify, evaluate, and synthesize the available and relevant scientific evidence on the methodologies used in teaching Human Anatomy, considering the context of Brazilian nursing. On November 27, 2025, using the DeCS/MeSH (Health Sciences Subject Headings) database, we employed English-language subject headings to ensure compatibility with the search platform.

Quadro 1 – Estratégia PICO utilizada para a elaboração da pergunta norteadora.

Subject Term	Link
Anatomy	"https://decs.bvsalud.org/ths?filter=ths_termall&q=Anatomy".
Methodology	"https://decs.bvsalud.org/ths?filter=ths_termall&q=methodology".
Education	"https://decs.bvsalud.org/ths?filter=ths_termall&q=education".
Anatomy	"https://decs.bvsalud.org/ths?filter=ths_termall&q=Anatomia".
Methodology	"https://decs.bvsalud.org/ths?filter=ths_termall&q=M%C3%A9todologia".
Education	"https://decs.bvsalud.org/ths?filter=ths_termall&q=Educa%C3%A7%C3%A3o".

Searches in PubMed—National Library of Medicine—identified 6,181 articles. After applying the following filters: full text, free access, and systematic reviews published within the last thirty days, 16 documents remained to be analyzed using the PRISMA methodology.

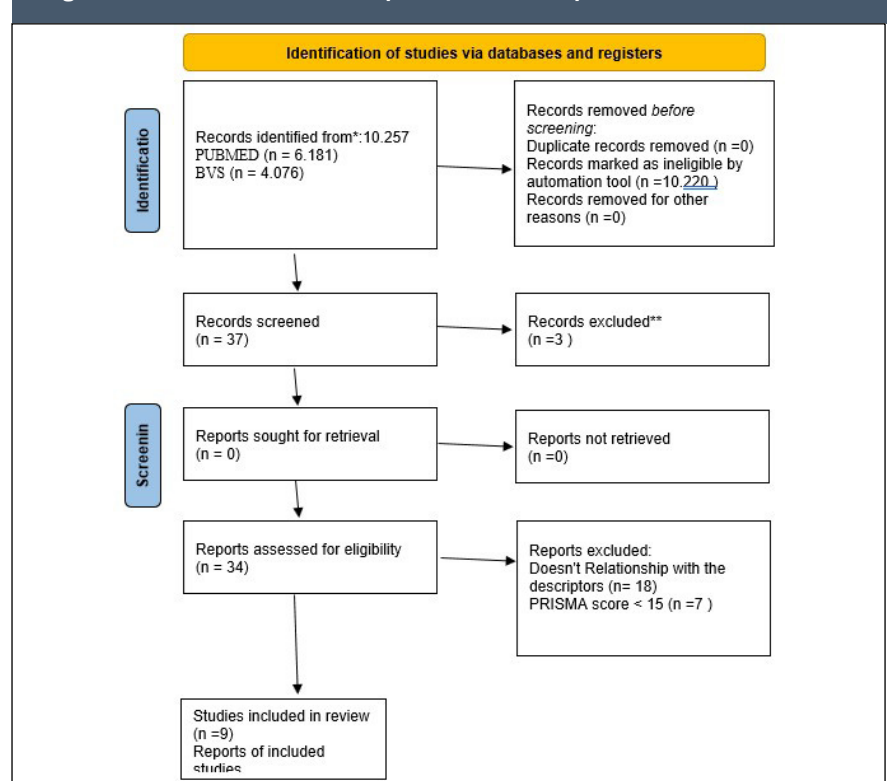
Searches in the BVS (Virtual Health Library) identified 4,076 articles. After applying the filters: full text in Portuguese from the last five years, 21 documents remained to be analyzed using the PRISMA methodology; the total number of articles eliminated by the automation tool of

the databases in the BVS and PubMed amounted to 10,220 files and 37 reports to be analyzed.

Document Screening

During the screening process, 3 files were excluded because they were master's theses, and 18 scientific articles were excluded because, even after being read in full, they showed no direct relationship to the selected keywords, leaving 16 files to be evaluated using the PRISMA method; of these, 7 documents scored below 15. A total of 9 documents will be included in the study, as summarized below:

Figure 1 – PRISMA flowchart, systematic search process.



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RESULTS

Table 1 - PICOT Review

Author/Year	P (Population)	I (Intervention)	C (Comparison)	O (Outcome)	T (Study Type)	PRISMA
(7)	Medical and Nursing students	Anatomy teaching through Virtual Reality	Traditional Anatomy Teaching	Improvement in anatomy learning	Systematic Literature Review	26
(8)	Undergraduate medical students	Use of QR codes in Anatomy teaching	Traditional Anatomy Teaching	Longer study/practice time	Experience Report	17
(9)	Medical students and residents	Body donation for scientific purposes	Traditional Anatomy Teaching	Greater effectiveness in anatomy learning	Systematic Literature Review	16
(10)	Medical teachers and students	Chest radiology for anatomy teaching	Traditional Anatomy Teaching	Core Curriculum with 43 structures relevant to teaching	Likert Scale Questionnaire	18
(11)	Medical and health students	Comparison of ultrasound (US) versus traditional anatomy teaching	Traditional Anatomy Teaching	Proven equivalence between US and traditional teaching	Systematic Literature Review	18
(12)	Medical students	Fetal dissection for anatomy teaching	Traditional Anatomy Teaching	Comprehensive and well-structured training	Neural system dissection	17
(13)	Medical students	Qualitative analysis and application of questionnaires	Traditional Anatomy Teaching	Preference for active teaching methodology	Qualitative Research	18
(14)	Health sciences students	Comparison of Kahoot-based teaching versus traditional anatomy teaching	Traditional Anatomy Teaching	Discussion: Kahoot® motivates students, creates a fun atmosphere, and promotes collaborative work	Systematic Literature Review	21
(15)	Medical students	Study of three-dimensional models, radiological images, dissection, and computerized environments	Traditional Anatomy Teaching	Computer-based teaching methods are an alternative to the traditional anatomy teaching model	Systematic Literature Review	17

Source: Author's own.

DISCUSSION

The study of anatomy in virtual reality enables a deeper theoretical understanding of the structures of the human body, eliminating the need to acquire and maintain cadavers⁽⁷⁾. With the reduction in the number of hours dedicated to human anatomy studies, various active teaching methodologies have been introduced into the academic environment, such as virtual reality itself, radiological images, ultrasound, and the use of QR codes to identify anatomical structures; this approach contributes to time savings in the learning process, optimizing the time it takes for a student to recognize an anatomical structure⁽⁸⁻⁹⁻¹⁰⁻¹¹⁾. Although the use of

human cadavers for anatomy instruction still exists—such as the use of fetuses to demonstrate structures of the nervous system—over time this practice is likely to decline to such an extent that it will render the study of human anatomy through traditional methods unfeasible. While the historical effectiveness of traditional anatomy teaching and learning remains valid, the scarcity of cadavers—driven by a lack of donations—compels the academic community to change its strategy regarding the teaching of anatomy in universities.

CONCLUSION

Active learning methodologies have been gaining increasing prominence in academic circles and approv-

al among medical and nursing students by using technology to address the shortage of human cadavers for teaching and research. In our society, cadaver donation remains a challenge to be overcome; alternatives such as the use of QR codes, ultrasound, and interactive games are well accepted in academic circles, although the nursing field has shown limited participation in research that contributes to knowledge in this area. More research is needed in this regard to evaluate the viability and efficiency of the new methods applied to health science students, as well as to generate relevant information that supplements the transmission of knowledge in nursing programs.

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