

ORIGINAL RESEARCH

Human anatomy and clinical nursing practice

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ABSTRACT

Introduction and Objective: Human anatomy is an essential component of the undergraduate nursing curriculum for learning the specific disciplines which deal with clinical practice. Anatomical knowledge provides assurance for the practice of clinical assessment and invasive procedures of legal competence of nurses. The aim of the study was to analyze the correlation of the content taught in the discipline Human Anatomy with the clinical practice of undergraduate nursing students in the discipline Semiology and Semiotics in Nursing and The Care Process, as well as their assurance to start it.

Methods: Quantitative descriptive study with the application of an online questionnaire to 66 undergraduate nursing students at a public education institution in the interior of São Paulo. Data analysis by number of occurrences and Chi-square test.

Results: There was partial agreement about the interdisciplinarity between human anatomy and disciplines of clinical nursing practice. The students agreed to be partially assured about the procedures to start the semiological practice of different devices and to perform nursing procedures. The predominance of the superficial approach to content related to the clinical practice of the disciplines Semiology and Semiotics in Nursing and The Care Process was predominant.

Conclusions: The teaching of human anatomy, along the lines offered, maintains an unsatisfactory correlation with clinical practice due to the students' experience, interfering with learning, acting in clinical teaching and professional training.

Key Words: Anatomy, Students, Nursing, Learning, Nursing care, Nursing education

1. INTRODUCTION

Nursing is a profession in the health area that specifically deals with the care of human beings in their individuality and collectivity.^[1] Thus, the Nursing Professionals Code of Ethics states: "the nursing profession is committed to the health and quality of life of the person, family and community".^[2-4]

In order to provide quality care, professionals must develop their skills through knowledge, skills and attitudes.

Knowledge supports attitudes and its applicability improves skills.^[4-7]

The knowledge to be acquired during graduation is guided by the National Curricular Guidelines for the Undergraduate Nursing Course in the training of professionals with a qualified profile for the practice of nursing, promoting the integral health of human beings based on scientific rigor and ethical principles.^[7]

The basic disciplines, especially human anatomy, are compo-

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nents of the undergraduate nursing curriculum as essential tools for learning specific disciplines that deals with the nurse's clinical performance.^[7,8]

Although a thorough understanding of human anatomy is essential in preparing competent nursing students for clinical practice, it is among the most conceptually confusing disciplines that nursing students will encounter throughout the course.^[9] Even though anatomy is important for the development of competence in nursing, understanding such a complex subject is also a challenge for many nursing students.^[10]

Among the factors that seem to have a significant influence on the learning process are passing exam scores, motivation, self-efficacy, study skills and age of entry.^[11,12] Most students who are starting a nursing course are under 20 years of age, moving directly from high school to nursing education, with no professional experience in the health field.^[13] Some of them may fail to realize the importance of anatomy in their skills development.^[14,15] If students are not motivated to acquire competence, they can spend little time studying the subject, resulting in lower grades.^[16,17] Study strategies, including the amount of time spent in independent studies, can be motivated by the objective of obtaining a nursing diploma, instead of acquiring nursing knowledge.^[17] The theory of learning points out that older students, more than adolescents, recognize the importance of acquiring the knowledge necessary to master future tasks.^[18] Consequently, a challenge for teachers is to convey the importance of knowledge of anatomy in the nursing profession in order to motivate students of all ages and learning styles.

Anatomical knowledge serves as principles for practice, as well as for raising criticisms and arguments regarding pre-established practices.^[19] Principles that base a detailed cranio-caudal clinical evaluation on physical examination and guide invasive procedures of legal competence of nurses, such as: venous and arterial puncture, intramuscular, subcutaneous and intradermal applications, bladder and nasogastric catheterization, endotracheal aspiration and enema.^[20-22]

These principles provide assurance to students in their performance during graduation and professional life, being the direction that allows to perform procedures with ease and skill, and the guarantee of protection to the patient, either in preventing injuries to noble structures during procedures or in early detection changes on physical examination.^[8,20-24]

Studies emphasize that the content of human anatomy, in current times, continues to be taught in an isolated way in the nursing course, failing to build a relationship with other disciplines and with professional reality, which interferes in the

learning and practical performance of students in supervised internships and clinical teaching of specific disciplines.^[8,22]

The evaluation of a discipline allows the assessment of the quality of learning achieved by students, as it highlights the facilities and difficulties of the teaching and learning process. It also allows a critical analysis of the discipline's teaching proposals in terms of achieving its objectives. Therefore, the primary objective of the evaluation is to guarantee a pedagogical intervention that improves the quality of teaching, a process that benefits the student, the teacher and the educational institution. Such interventions should seek to adapt the didactic situations according to the challenges that the undergraduate students will face during the undergraduate courses, always maintaining the prior knowledge of these students as a reference.^[25]

In view of the considerations, this work aims to analyze the correlation of the content taught in the discipline Human Anatomy (HA) with the clinical practice of undergraduate nursing students at a public college in the interior of São Paulo in the subjects Semiology and Semiotics in Nursing (SSN) and The Care Process (CP), regular subjects of the curricular structure of said course.

2. METHOD

2.1 Sample

The research individuals were 66 students regularly enrolled in the undergraduate nursing course at the Medical School of São José do Rio Preto - FAMERP and who have already worked in clinical teaching and had completed the subjects HA, SSN and CP, therefore students of the 3rd and 4th grades of that course.

2.2 Data collection

Data collection was carried out by applying an online questionnaire composed of closed (30) and semi-open (3) questions formulated by the researchers with 33 questions dealing with the existence of interdisciplinarity among the disciplines, the assurance that the content addressed in the HA discipline provided at the beginning of practice in clinical teaching, the content approach and its relationship among the disciplines, the facilitating and hindering aspects in the theoretical-practical learning process in the HA discipline and suggestions for improving the theoretical-practical learning process in the subject in question. Questions 1 to 30 were answered on a Likert scale of agreement (questions related to the existence of interdisciplinarity between disciplines, 16 questions) and of approach or not (questions related to the approach to content, 14 questions). The semi-open questions (3) brought some possibilities for specified answers and the "others" (they dealt with the facilitating and hindering

aspects and suggestions for improving the theoretical and practical learning process in the HA discipline). This was made available during the period from July 1 to August 31, 2018 through the Famerp Management System (FMS) to the sample components. Therefore, access to the questionnaire was individual through the academic record (AR), which allowed responses to be obtained free of interventions and a reliable sample.

2.3 Data analysis

After data collection, they were spreadsheet in Excel. Descriptive statistical analysis was performed by surveying the number of occurrences by simple frequency and the Chi-square test to obtain a p -value. In all analyzes, p -value $\leq .05$ was considered statistically significant. The program used was SPSS (version 24, IBM, 2015).

For analysis purposes, the answers “partially agree” and “partially disagree” collected in the questionnaire, in the ques-

tions that presented them, were added, since the relevance of the answer consists in the existence of partial acceptance of the proposed statement.

2.4 Ethical considerations

This project was approved by the Research Ethics Committee of the Medical School of São José do Rio Preto (CEP-FAMERP), under CAAE n. 44231315.0.0000.5415, with approval opinion 1.359.829. Participants signed the consent form^[26] before starting to fill it out.

3. RESULTS

Figure 1 shows the frequencies of answers regarding the questions about the existence of interdisciplinarity between the disciplines HA and SSN and AHA and CP, respectively, which shows a predominance of partiality in agreement with the statement about the existence of interdisciplinarity among the contents addressed in the HA and SSN (67%) and CP (75%).

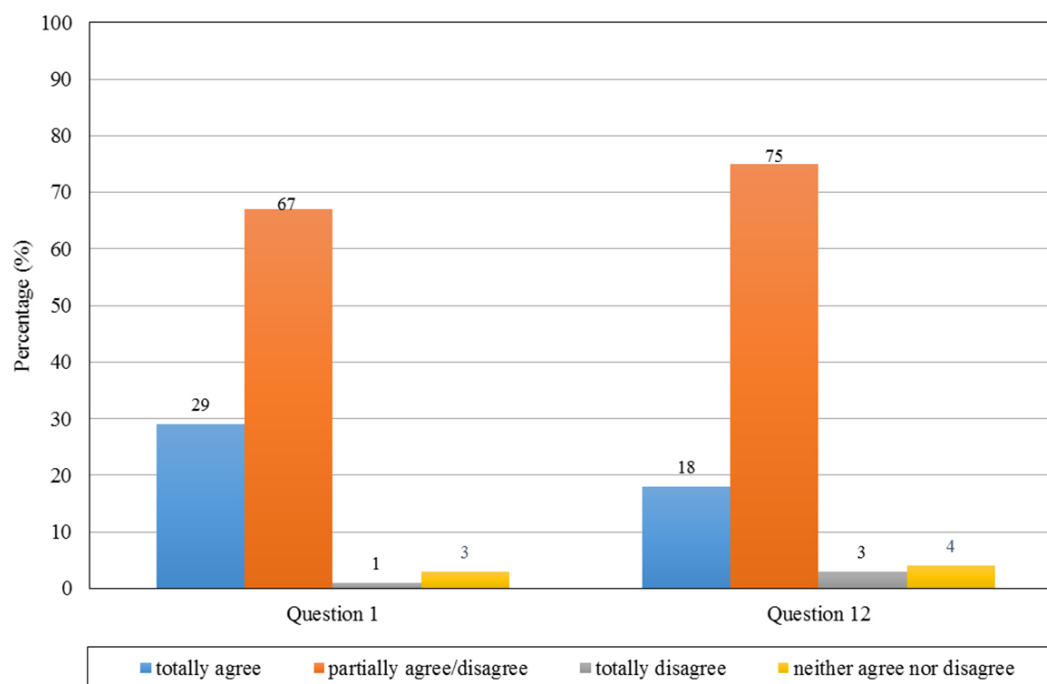


Figure 1. Frequency of responses regarding questions about the existence of interdisciplinarity between the disciplines of Human Anatomy and Semiology and Semiotics in Nursing (Question 1), and Human Anatomy and The Caring Process (Question 12)

For such an analysis, the p value collected showed that there was no significant difference between the answers given by the participating grades (see Table 1).

Figure 2 shows the frequency of responses regarding the assurance that the knowledge provided in the HA discipline provided to initiate the semiological practice of different de-

vices in the SSN discipline and for the execution of nursing procedures developed in the CP discipline, from which one can observe the clear evidence that students are not totally assured to start clinical practice only with the theoretical and practical knowledge acquired in HA classes, through the predominance of partiality in accepting the statement. When analyzing the percentage accumulated between the

variables partially agree/disagree and totally disagree about the contents covered in HA related to those of SSN indicated in Figure 2, the students' unassurance whether partial or total, to start the practical activity is clear, being 91% for the car-

diac auscultation procedure, 85% for pulmonary auscultation, 79% for liver palpation, 80% for intestinal loops auscultation and palpation, and 79% for lymph nodes palpation.

Table 1. Simple frequency and the Chi-square test for the questions with answers that contains “agree/disagree”

Questions	Totally agree	%	Partially agree	%	Partially disagree	%	Totally disagree	%	Neither agree nor disagree	%	Total	%	<i>p</i> value (*)
1	3rd	10	15	12	19	6	9	0	0	0	28	43	.4096
	4th	9	14	20	31	5	8	1	1	2	37	57	
	Total	19	29	32	50	11	17	1	1	2	65	100	
2	3rd	1	1	9	14	11	16	5	8	2	28	42	.4205
	4th	3	5	16	24	14	21	5	8	0	38	58	
	Total	4	6	25	38	25	37	10	16	2	66	100	
4	3rd	2	3	10	15	10	15	5	8	1	28	42	.3857
	4th	2	3	18	27	7	11	6	9	5	38	58	
	Total	4	6	28	42	17	26	11	17	6	66	100	
6	3rd	1	1	12	18	6	9	5	8	4	28	42	.2965
	4th	6	9	14	21	8	12	7	11	3	38	58	
	Total	7	10	26	39	14	21	12	19	7	66	100	
8	3rd	2	3	9	14	6	9	7	10	4	28	42	.0970
	4th	5	8	17	26	12	18	2	3	2	38	58	
	Total	7	11	26	40	18	27	9	13	6	66	100	
10	3rd	2	3	10	15	5	7	8	12	3	28	42	.6544
	4th	5	8	14	21	10	15	6	9	3	38	52	
	Total	7	11	24	36	15	22	14	21	6	66	100	
12	3rd	6	9	15	24	4	6	2	3	1	28	43	.1781
	4th	6	9	20	31	9	14	0	0	2	37	57	
	Total	12	18	35	55	13	20	2	3	3	65	100	
13	3rd	1	1	9	14	11	16	5	8	2	28	42	.3183
	4th	3	5	16	24	14	21	5	8	0	38	58	
	Total	4	6	25	38	25	37	10	16	2	66	100	
15	3rd	5	8	11	17	5	7	5	7	2	28	42	.6158
	4th	4	6	20	30	8	12	3	5	3	38	58	
	Total	9	14	31	47	13	19	8	12	5	66	100	
17	3rd	7	10	10	15	6	9	2	3	3	28	42	.8987
	4th	7	10	18	27	7	11	3	5	3	38	58	
	Total	14	20	28	42	13	20	5	8	6	66	100	
19	3rd	4	6	13	20	6	9	4	6	1	28	42	.0807
	4th	13	20	8	12	6	9	5	8	6	38	58	
	Total	17	26	21	32	12	18	9	14	7	66	100	
21	3rd	16	24	7	11	4	6	1	2	0	28	43	.1387
	4th	11	17	12	18	7	11	3	5	4	37	57	
	Total	27	41	19	29	11	17	4	7	4	65	100	
23	3rd	17	27	6	9	5	8	0	0	0	28	44	.0450
	4th	11	17	16	25	6	9	3	5	0	36	56	
	Total	28	44	22	34	11	17	3	5	0	64	100	
25	3rd	10	15	12	18	5	8	0	0	1	28	42	.4278
	4th	17	26	9	14	8	12	2	3	2	38	58	
	Total	27	41	21	32	13	20	2	3	3	66	100	
27	3rd	8	12	12	18	2	3	5	8	1	28	43	.8125
	4th	13	19	16	25	3	5	3	5	2	37	57	
	Total	21	31	28	43	5	8	8	13	3	65	100	
29	3rd	6	9	12	18	6	9	2	3	2	28	42	.9535
	4th	7	11	15	23	8	12	5	7	3	38	58	
	Total	13	20	27	41	14	21	7	10	5	66	100	

(*) Chi-square test

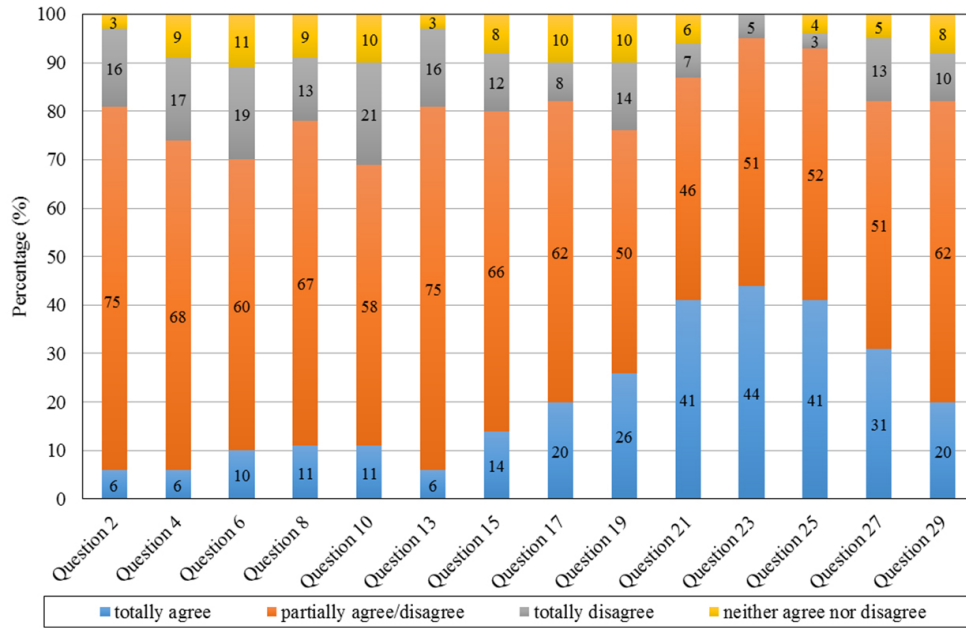


Figure 2. Frequency of responses related to questions about assurance that the content covered in the discipline Human Anatomy provided in the practice of the disciplines of Semiology and Semiotics in Nursing and The Caring Process: cardiac auscultation (Question 2), pulmonary auscultation (Question 4), liver palpation (Question 6), intestinal loops auscultation and palpation (Question 8), and lymph nodes palpation (Question 10); gastric sounding (Question 13), enema (Question 15), bladder sounding (Question 17), airway aspiration (Question 19), intradermal drug administration (Question 21), subcutaneous injection (Question 23) and intramuscular (Question 25), venipuncture (Question 27) and arterial puncture (Question 29)

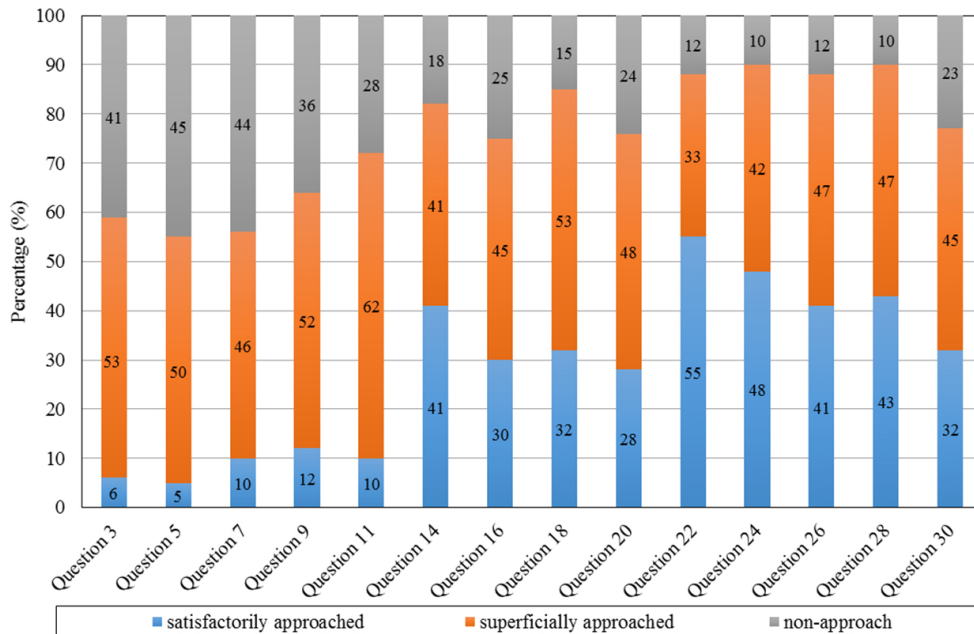


Figure 3. Frequency of responses related to questions about the approach to the contents of the Human Anatomy discipline related to the practice of the discipline Semiology and Semiotics in Nursing and The Care Process: cardiac auscultation (Question 3), pulmonary auscultation (Question 5), liver palpation (Question 7), intestinal loops auscultation and palpation (Question 9), and lymph nodes palpation (Question 11); gastric sounding (Question 14), enema (Question 16), bladder sounding (Question 18), airway aspiration (Question 20), intradermal drug administration (Question 22), subcutaneous injection (Question 24) and intramuscular (Question 27), venipuncture (Question 28) and arterial puncture (Question 30)

In the analysis of responses related to the procedures practiced in the CP discipline, there was a predominance of partiality of agreement. However, for the practice of drug administration procedures intradermally, subcutaneously and intramuscularly, there was an increase of approximately 20% in full agreement with the statement that the content covered in the HA discipline was sufficient to provide assurance for the practice when compared with the previous answers. The p value collected showed a significant difference ($p = .0450$, see Table 1) between the answers given by the grades in the question regarding the drug administration by the subcutaneous route, where for the 3rd grades there was an agreement that the knowledge about application by the subcutaneous route it provided total assurance to start its practice (27%) and for the 4th grade there was a predominance of partiality in the agreement (34%).

Figure 3 reflects the frequency of responses related to the approach to content in the HA discipline related to the practice of clinical assessment of the patient in different procedures in the SSN discipline and about the relationship of the theoretical approach with the practice of the different procedures developed in the CP discipline and its analysis allows the statement that the content approach related to clinical evaluation and physical examination was unsatisfactory and did not maintain any correlation with practice, given the predominance of superficiality in the content approach, the low percentages of occurrence of satisfactory approach and the high percentages of non-approach practice-related content.

It can be seen in Figure 3 that there is an increase in the percentage of occurrence of a satisfactory approach, with its predominance in drug administration procedures by intradermal and subcutaneous route regarding the nursing procedure techniques developed in the CP discipline. The p values collected showed a significant difference in the answers to the questions regarding the drug administration procedures by intramuscular route ($p = 0.0309$, see Table 2) and arterial puncture ($p = .0460$, see Table 2). For the first procedure, the 4th grades considered that the content approach was satisfactory with 27% of the answers and the 3rd grades considered that the approach was superficial (27%). As for the arterial puncture procedure, the 3rd grades considered that the content approach was superficial with 26% of the responses, while the 3rd grades maintained the percentage of 19% in all responses, with no predominance of opinion.

In relation to the respondents' opinions on elements that facilitate the theoretical-practical learning process in the HA discipline, the HA discipline precedes the SSN and CP disciplines in the institution under study (83%), the use of artificial models and illustrations (48%), the existence of peer learning

(monitoring) (55%); in relation to the elements that hinder the theoretical-practical learning process in the HA discipline, the use of traditional methodology appears (52%), the predominance of the use of artificial models and illustrations in practical classes (45%), the lack of content integration between anatomy, embryology and histology (58%), the lack of interdisciplinarity between the subjects HA, SSN and CP (58%), failure to address the applicability of anatomy knowledge in clinical teaching (56%), and as suggestions for improving the theoretical learning process -practice in the HA discipline the implementation of an active teaching methodology, that is, the student as an integral part of the process (70%), the use of cadaverous anatomical pieces mixed with artificial models in practical classes (77%), the integration of contents between anatomy, embryology and histology (67%), the interdisciplinarity of HA, SSN and CP (86%) and the approach to the applicability of anatomy knowledge in clinical teaching (76%).

The fact that the subject was taught by a teacher exclusively in the area of anatomy was not mentioned in the study as a complicating aspect by the students (27%). On the contrary, there was a survey that 32% of students stated that the fact that the discipline is taught by a professional anatomist is a facilitator of the theoretical-practical learning process, however it is necessary to take into account a frequency of 44% of the choice for the suggestion of the discipline being taught by a nurse teacher as an aspect to improve the theoretical and practical learning process of the HA discipline.

4. DISCUSSION

The anatomical knowledge related to the semiological techniques acquired by the students was clearly insufficient to provide their assurance to begin the practice of physical examination. This data raises the need to review the teaching methodology employed in both HA and SSN disciplines to better prepare the student before starting clinical practice, because in addition to unassurance due to lack of knowledge, there is the impact of students' incompetence in taking the physical examination which can generate psychological traumas, revolts and evasion of students from the institution in addition to discomfort to patients who are collaborating with the development of students' skills as to perform the physical examination the scientific knowledge of human anatomy and semiology must be known to the professional.^[27]

For the data collected, it is still appropriate to raise the hypothesis of unpreparedness of nursing teachers regarding the teaching of the physical examination. Patine et al.^[22] showed that of 26 FAMERP nursing teachers interviewed, 46% feel unprepared to teach the physical examination, whether in theory or in practice, reporting that it is necessary to study and

practice more, 92.3% reported having difficulties when performing cardiac and pulmonary auscultation due to lack of practice, and 61.5% considered having sufficient knowledge about anatomy to teach physical examination to students.

Table 2. Simple frequency and the Chi-square test for the questions with answers that contains “approach”

Questions		Satisfactorily approached	%	Superficially approached	%	Non-approach	%	Total	%	<i>p</i> value (*)
3	3rd	1	1	13	20	14	21	28	42	.3908
	4th	3	5	22	33	13	20	38	58	
	Total	4	6	35	53	27	41	66	100	
5	3rd	0	0	14	21	14	21	28	42	.2965
	4th	3	5	19	29	16	24	38	58	
	Total	3	5	33	50	30	45	66	100	
7	3rd	1	1	15	23	12	18	28	42	.2246
	4th	6	9	15	23	17	26	38	58	
	Total	7	10	30	46	29	44	66	100	
9	3rd	2	3	14	21	12	18	28	42	.4539
	4th	6	9	20	31	12	18	38	58	
	Total	8	12	34	52	24	36	66	100	
11	3rd	1	1	20	31	7	10	28	42	.1781
	4th	6	9	20	31	12	18	38	52	
	Total	7	10	40	62	19	28	66	100	
14	3rd	12	19	10	15	6	9	28	43	.6919
	4th	14	22	17	26	6	9	37	57	
	Total	26	41	27	41	12	18	65	100	
16	3rd	7	11	12	18	9	14	28	43	.4609
	4th	12	19	18	27	7	11	37	57	
	Total	19	30	30	45	16	25	65	100	
18	3rd	10	15	15	23	3	4	28	42	.6484
	4th	11	17	20	30	7	11	38	58	
	Total	21	32	35	53	10	15	66	100	
20	3rd	6	9	16	25	6	9	28	43	.4023
	4th	12	19	15	23	10	15	37	57	
	Total	18	28	31	48	16	24	65	100	
22	3rd	19	29	6	9	3	4	28	42	.1551
	4th	17	26	16	24	5	8	38	58	
	Total	36	55	22	33	8	12	66	100	
24	3rd	15	23	11	17	2	3	28	43	.6013
	4th	16	25	16	25	5	7	37	57	
	Total	31	48	27	42	7	10	65	100	
26	3rd	9	14	18	27	1	1	28	42	.0309
	4th	18	27	13	20	7	11	38	58	
	Total	27	41	31	47	8	12	66	100	
28	3rd	10	15	15	23	3	4	28	42	.6163
	4th	18	28	16	24	4	6	38	58	
	Total	28	43	31	47	7	10	66	100	
30	3rd	8	13	17	26	3	5	28	44	.0460
	4th	12	19	12	19	12	18	36	56	
	Total	20	32	29	45	15	23	64	100	

(*) Chi-square test

The significant difference between the answers given by the grades in the question regarding the drug administration via subcutaneous route with predominance of agreement for the 3rd grades and predominance of partiality in the agreement for the 4th grades allows for reflection and the suggestion of the hypothesis that the methodology of applied teaching in the approach to the contents on the tegumentary and muscular systems was differentiated between the grades, presenting greater interdisciplinarity between the contents and having a more efficient effect in the teaching-learning process and for the development of assurance in the practice of drug administration procedures via subcutaneous tissue for the 3rd grades.

Domingues et al.^[6] found in their research through an interview with nurses working in inpatient units that scientific knowledge gives the professional assurance in decision-making, both in relation to the patient and with his team, it is the necessary condition to assume conduct and scientifically correct and appropriate attitudes, it supports and helps to develop their skills and gives credibility to the team leadership. Therefore, it is necessary to have competence teaching for the competent exercise of the professional.^[2]

The significant differences in the answers to the questions regarding the procedures for drug administration via intramuscular route and arterial puncture between the grades show that the teaching methodology adopted was different for them, being more satisfactory and efficient for learning the approach taken for the 4th grades on the muscular system and the procedure for administering drugs intramuscularly.

Corroborating our findings are the data by Baptista et al.^[28] and Godoy et al.^[29] that demonstrate that the lack of competence of nursing professionals may be due to the lack of knowledge of applicability in human anatomy in practice. Anatomical knowledge influences the assurance of performing the invasive procedure for intramuscular application and can prevent the occurrence of complications resulting from errors. It is necessary, therefore, that there be a review of the teaching of human anatomy to undergraduate nursing students with the valuation of efficient teaching methodologies for learning and exclusion of ineffective methods.

The traditional expository methodology, even when structured in a satisfactory way, presents limitations in its efficiency, such as: vague or absent feedback from the students, passivity of the listeners, non-appreciation of individual differences in skills and experiences of the students^[30] and does not allow critical and reflective training of professionals.^[32,33] The variation in the use of teaching methods can also meet the need for individual work on the subject^[18] and the facilitation of collaborative learning.^[34]

The HA discipline preceding the SSN and CP disciplines making the teaching-learning process easier shows that FAMERP follows what is recommended by the National Curricular Guidelines,^[7] with the structuring of the undergraduate nursing curriculum with the basic disciplines related to science biological and health as human anatomy as a prerequisite for following the learning of specific disciplines related to the nursing sciences, among which SSN and CP stand out, aiming at training the professional with a qualified profile in the exercise of the profession.

The predominance of the frequency of responses in the choice for the suggestion of the discipline to be taught by a nurse teacher as an aspect to improve the theoretical-practical learning process of the Human Anatomy discipline may be associated with the occurrence of students' dissatisfaction with the superficial approach of the theoretical contents related to clinical practice already described in the results of Figure 3, as a strategy in search of a more complete approach, as the role of the teacher in learning human anatomy is considered very important in the teaching-learning process.^[30,31]

The use of anatomy as a base of common knowledge in different professional curricula promotes a respectful and equal exchange between students, in addition to allowing a better understanding of the professional roles, capacity and contribution of each one for the effective provision of health services, which places interprofessional education as an extremely viable alternative.^[35]

In learning human anatomy the illustrations help in the process of understanding and retaining the information presented and that the act of drawing and naming structures favors the memorization of details with greater precision.^[36] The synthetic models serve as aids in the theoretical and practical learning of human anatomy, but they do not replace the observation and handling of cadaveric anatomical pieces in practical classes, especially for the nursing course,^[37-39] consistent with the results of the current research.

Human anatomy classes with cadavers prepare the professional future to have emotional balance and to be more human and also makes it possible to learn how to deal with death and develop social skills.^[31,39] The process of theoretical and practical learning is the result of multisensory stimulation, with "the retention rate when hearing information is about 20%, after seeing information it is 30%, and seeing and hearing the information is 50%. However, if the individual sees, hears and touches the retention rate reaches 70%".^[31]

Peer learning as a facilitating aspect of the learning process was shown by Cardinot et al.^[30] in their study, as well as

small group tutorials have also been shown to be useful in learning anatomy.^[13]

The teaching of human anatomy integrated with disciplines that study the microscopy of the human body, in the case of cell biology, histology and embryology, allows better understanding of the students, generates motivation for the study and enthusiasm in the theoretical-practical learning of micro and macrosystemic relationships and through the dynamics of the construction and reconstruction of knowledge as a whole, the understanding of clinical practice occurs.^[8,40]

The lack of interdisciplinarity as a hindering factor is also evidenced by other authors who found that the teaching methodology of human anatomy that does not create interdisciplinarity between contents aimed at training health professionals according to their category, generates evasion of knowledge and deficit in the learning of patients students for professional performance.^[31,41]

Study carried out at the Medical School of São José do Rio Preto (FAMERP)^[22] corroborates the results of the present research, as it evidenced through interviews with teachers the evasiveness of anatomy learning by students and the need interdisciplinarity between basic and specific disciplines for better learning of the undergraduate: “Physical exam has

particularities, that is, many details that when the student goes to more specific disciplines he does not have enough time to approach them” and “he should follow along with anatomy, physiology and nursing techniques”.

5. CONCLUSION

The teaching of HA, along the lines offered, maintains an unsatisfactory and partial correlation with clinical practice from the point of view of the students’ experience for most of the contents covered, which interferes with learning, acting in clinical teaching and professional training. Therefore, the need for teaching methodologies with an anatomical knowledge approach linked to semiological techniques in the institution in question is notable. It is necessary that there is a review and a predisposition followed by the experience of modifying the methodologies for approaching the contents by the teachers in the institution under study, remaining as a suggestion of methodology to be adopted by the institution under study as an attempt to apply content interdisciplinarity theoretical-practical. We propose studies that consider the opinion of academic teachers, promoting spaces for exchange and collective construction of the training process.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

REFERENCES

- [1] Rocha SMM, Almeida MCP. O processo de trabalho da enfermagem em saúde coletiva e a interdisciplinaridade. *Rev Latinoam Enferm*. 2000 Dec; 8(6): 96-101. PMID:12041043 <https://doi.org/10.1590/S0104-11692000000600014>
- [2] Costa Moura LC. Ensino de competência e para competência na enfermagem. *Enferm Glob* [Internet]. 2005 May [cited 2020 May 13]; 4(1): 1-19.
- [3] Brasil. Ministério da Educação. Secretaria de Educação Superior [Internet]. Brasília (DF): MEC/SESu; 2010 [cited 2020 May 14]. Referências curriculares nacionais dos cursos de bacharelado e licenciatura. Available from: <https://www.dca.ufrn.br/~adelard/o/PAP/ReferenciaisGraduacao.pdf>
- [4] Conselho Federal de Enfermagem [Internet]. Rio de Janeiro (RJ): COFEN; 2012 [cited 2020 May 14]. Código de Ética. Resolução COFEN nº 564/2017. Aprova o novo Código de Ética dos Profissionais de Enfermagem; [about 16 screens]. Available from: <http://www.coren-sp.gov.br/node/35326>
- [5] Ruthes RM, Cunha ICKO. Entendendo as competências para aplicação na enfermagem. *Rev Bras Enferm*. 2008 Jan-Feb; 61(1): 109-12. PMID:18578318 <https://doi.org/10.1590/S0034-71672008000100017>
- [6] Domingues TAM, Moreira A, Chaves EC. O conhecimento científico como valor no agir do enfermeiro. *Rev Esc Enferm USP*. 2005 Dec; 39(Spec.): 580-8. PMID:16440951 <https://doi.org/10.1590/S0080-62342005000500011>
- [7] Brasil. Ministério da Educação. Conselho Nacional de Educação. Câmara de Educação Superior. Resolução CNE/CES nº 3, de 7 de novembro de 2001. Diretrizes curriculares nacionais do curso de graduação em enfermagem, medicina e nutrição [Internet]. Diário Oficial [da] República Federativa do Brasil. 2001 nov 09 [cited 2020 May 13]. Available from: <http://portal.mec.gov.br/dmdocuments/ces1133.pdf>
- [8] Oda JY, Castilho MAS, Castro SL. O ensino da anatomia humana e sua relevância para o curso de enfermagem. *EDUCERE Rev Educ* [Internet]. 2009 Jan/Jun; 9(1): 65-80.
- [9] Meedya S, Moroney T, Nielsen W, et al. Digital explanations and nursing students’ perception of learning science. *Nurse Educ Pract*. 2019 Nov; 41: 102636. PMID:31630047 <https://doi.org/10.1016/j.nepr.2019.102636>
- [10] Craft J, Hudson P, Plenderleith M, et al. Commencing nursing students’ perceptions and anxiety of bioscience. *Nurse Educ Today*. 2013 Nov; 33(11): 1399-1405. PMID:23182891 <https://doi.org/10.1016/j.nedt.2012.10.020>
- [11] McVicar A, Andrew S, Kemble R. The ‘bioscience problem’ for nursing students: an integrative review of published evaluations of year 1 bioscience, and proposed directions for curriculum development. *Nurse Educ Today*. 2015 Mar; 35(3): 500-9. PMID:25534183 <https://doi.org/10.1016/j.nedt.2014.11.003>
- [12] Barbosa J, Silva A, Ferreira MA, et al. The impact of students and curriculum on self-study during clinical training in medical school: a multilevel approach. *BMC Med Educ*. 2017 Jan; 17(1): 9.

- PMid:28086868 <https://doi.org/10.1186/s12909-016-0846-3>
- [13] Evensen AE, Brataas HV, Cui G. Bioscience learning in nursing: a cross-sectional survey of beginning nursing students in Norway. *BMC Nurs*. 2020 Jan; 19: 2. PMID:31956292 <https://doi.org/10.1186/s12912-019-0394-3>
- [14] Cho SH, Jung SY, Jang S. Who enters nursing schools and why do they choose nursing? A comparison with female non-nursing students using longitudinal data. *Nurse Educ Today*. 2010 Feb; 30(2): 180-6. PMID:19682773 <https://doi.org/10.1016/j.nedt.2009.07.009>
- [15] McVicar A, Andrew S, Kemble R. Biosciences within the pre-registration (pre-requisite) curriculum: an integrative literature review of curriculum interventions 1990-2012. *Nurse Educ Today*. 2014 Apr; 34(4): 560-8. PMID:24035012 <https://doi.org/10.1016/j.nedt.2013.08.012>
- [16] Lujan HL, DiCarlo SE. Physiology should be taught as science is practiced: an inquiry-based activity to investigate the "alkaline tide". *Adv Physiol Educ*. 2015 Dec; 39(4): 419-20. PMID:26628671 <https://doi.org/10.1152/advan.00089.2015>
- [17] Chapin TM. Associations between academic entitlement, learning approaches and awareness of future consequences in baccalaureate nursing students [dissertation]. [Ann Arbor (MI)]; Capella University, ProQuest Dissertations Publishing [Internet]; 2018. Available from: <https://search.proquest.com/openview/73b35e60b3a6452148a08bef5442096f/1?pq-origsite=gscholar&cbl=18750&diss=y>
- [18] Illeris K. *Adult education and adult learning*. Roskilde: Roskilde University Press; 2004. 245 p.
- [19] Kruse MHL. É possível pensar de outro modo a educação em enfermagem? *Esc Anna Nery Rev Enferm* [Internet]. 2008 Jun; 12(2): 348-52. <https://doi.org/10.1590/S1414-81452008000200023>
- [20] Da Silva OS, Vaz Vidal S. Las relaciones anatómicas involucradas en la administración de medicamentos por vía intramuscular: un campo de estudio de la enfermera. *Enferm Glob* [Internet]. 2013 Apr; 12(30): 156-69. <https://doi.org/10.6018/eglobal.12.2.143231>
- [21] Melo MV, Rolim FJ, Neto EJS. Aplicação clínica do conhecimento da osteologia na conduta de enfermagem. Paper presented at: Anais do XI Encontro de Iniciação à Docência; 2008 Apr 09-11; João Pessoa, PB.
- [22] Patine FS, Barboza DB, Pinto MH. Ensino do exame físico em uma escola de enfermagem. *Arq Ciênc Saúde* [Internet]. 2004 Abr/Jun [cited 2020 May 13]; 11(2): 113-9.
- [23] Arruda RM, Sousa CRA. Aproveitamento teórico-prático da disciplina anatomia humana do curso de fisioterapia. *Rev Bras Educ Med*. 2014 Jan/Mar; 38(1): 65-71. <https://doi.org/10.1590/S0100-55022014000100009>
- [24] Vavruk JW. A importância do estudo da anatomia humana para o estudante da área de saúde. *Anatomista*. 2012 Apr/Jun; 2: 4-35.
- [25] Brasil. Secretaria de Educação Fundamental. Parâmetros curriculares nacionais: introdução aos parâmetros curriculares nacionais. Brasília (DF): MEC/SEF; 1997. 126 p.
- [26] Brasil. Ministério da Saúde. Conselho Nacional de Saúde. Resolução n. 466, de 12 de dezembro de 2012. Aprova diretrizes e normas regulamentadoras de pesquisas envolvendo seres humanos [Internet]. Diário Oficial [da] República Federativa do Brasil. 2012 dec 12 [cited 2020 May 13]. Available from: <http://www.conselho.saude.gov.br/resolucoes/2012/Reso466.pdf>
- [27] Santos N, Veiga P, Andrade R. Importância da anamnese e do exame físico para o cuidado do enfermeiro. *Rev Bras Enferm*. 2011 Mar/Apr; 64(2): 355-8. PMID:21755222 <https://doi.org/10.1590/S0034-71672011000200021>
- [28] Baptista JS, Scardua A, Oliveira GB, et al. A influência das políticas brasileiras de expansão universitária no ensino da anatomia humana. *Anatomista* [Internet]. 2012 Jan/Mar [cited 2020 May 13]; 1: 15-24.
- [29] Godoy S, Nogueira MS, Mendes IAC. Aplicação de medicamentos por via intramuscular: análise do conhecimento entre profissionais de enfermagem. *Rev Esc Enferm USP*. 2004 Jun; 38(2): 135-42. PMID:15973971
- [30] Cardinot TM, Júnior OVP, Oliveira JR, et al. Importância da disciplina de anatomia humana para os discentes de enfermagem e farmácia da ABEU centro universitário de Belford Roxo/RJ. *Col Pesqui Educ Fís* [Internet]. 2014 Jan/Dec [cited 2020 May 13]; 13(2): 99-106.
- [31] Piazza BL, Chassot AI. Anatomia Humana, uma disciplina que causa evasão e exclusão: quando a hipótese principal não se confirma. *Ciênc Mov* [Internet]. 2012 Jan/Dec [cited 2020 May 13]; 14(28): 45-59. <https://doi.org/10.15602/1983-9480/cmedh.v14n28p45-59>
- [32] Madeira MZA, Lima MGSB. A prática pedagógica das professoras de enfermagem e os saberes. *Rev Bras Enferm*. 2007 Jul/Ago; 60(4): 400-4. PMID:18041522 <https://doi.org/10.1590/S0034-71672007000400008>
- [33] Montes MAA, Souza CTV. Inovações no processo ensino-aprendizagem no laboratório de anatomia humana: estratégias facilitadoras para a aprendizagem significativa. Paper presented at: Atas do V ENPEC Encontro Nacional de Pesquisa em Educação em Ciências; 2005; Bauru, SP.
- [34] Stensaasen S, Sletta O. *Grupprocesser* [Group processes]. Stockholm: Natur och Kultur; 2000.
- [35] Alfaro P, Larouche SS, Ventura NM, et al. Nursing and medical students near-peer activity in the anatomy laboratory: format for success. *Adv Med Educ Pract*. 2019 Sep; 10: 769-780. PMID:31565014 <https://doi.org/10.2147/AMEP.S209412>
- [36] Cardoso TSC, Montes MAA, Souza CTV. Utilização da prática de desenhar na construção de um atlas didático para estudo como instrumento facilitador de concentração e memorização nas aulas de anatomia humana. Paper presented at: Atas do V ENPEC Encontro Nacional de Pesquisa em Educação em Ciências; 2005 Nov 28 - Dec 3; Bauru, SP.
- [37] Aversi-Ferreira TA, Lopes BD, Reis SMM, et al. Practice of dissection as teaching methodology in anatomy for nursing education. *Int J Morphol* [Internet]. 2010 Jan/Feb [cited 2020 May 13]; 28(1): 265-72. <https://doi.org/10.4067/S0717-95022010000100039>
- [38] Smith CF, Martínez-Álvarez C, McHanwell S. The context of learning anatomy: does it make a difference? *J Anat*. 2014 Mar; 224(3): 270-8. PMID:23930933 <https://doi.org/10.1111/joa.12089>
- [39] Costa GBF, Lins CASA. O cadáver no ensino da anatomia humana: uma visão metodológica e bioética. *Rev Bras Educ Med*. 2012 Jul/Sept; 36(3): 369-73. <https://doi.org/10.1590/S0100-55022012000500011>
- [40] Santos MC, Leite MCL, Heck RM, et al. A anatomia humana para a enfermagem: diálogos interdisciplinares no currículo. *Rev Educ* [Internet]. 2010 Jan/Dec [cited 2020 May 14]; 13(151): 181-90.
- [41] Salbego C, Oliveira EMD, Silva MAR, et al. Percepções acadêmicas sobre o ensino e a aprendizagem em anatomia humana. *Rev Bras Educ Med*. 2015 Jan/Mar; 39(1): 23-31. <https://doi.org/10.1590/1981-52712015v39n1e00732014>