Level of ethical-legal knowledge of medicine graduants: cross-sectional study in the year of 2020

Nível de conhecimento ético-legal dos graduandos em Medicina: estudo transversal no ano de 2020

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ABSTRACT

Introduction: Complaints about medical malpractice are frequent. Therefore, investigating how the medical student formation is made concerning the ethical and legal aspects, can contribute to its improvement.

Objective: To evaluate and compare the level of knowledge of medical students from a university about ethical and legal aspects of the profession, based on their formation in the disciplines of the related axis (Medical Ethics and Bioethics; Legal Medicine and Deontology/Medical Forensics and Good Practice).

Method: Cross-sectional study carried out through the application of an online questionnaire (August-November/2020) based on the Code of Medical Ethics (CME) and the Code of Ethics for Medical Student– 10 sociodemographic and 12 objective questions (Topics: "Professional Confidentiality", "Medical student's Interpersonal Relations", "Medical Publicity", "Relations with Patients and Families", "Human Rights", "Fundamental Principles", "Medical Activity" and "Telemedicine"). A total of 116 students were evaluated at the start, middle and end of the medical course. The Kruskal-Wallis and Dunn tests were used for comparisons. The Chi-Square and Fisher's exact tests were used for the association of categorical variables.

Results: The performance increased throughout the course, with statistical significance between the average number of correct answers in the 1st, 6th and 10th/12th periods: 5.1; 6.7 and 7.8, (p-value <0.001). The analysis by thematic blocks, on the other hand, did not show a statistical association of correct answers with progress in the medical course (p-value >0.05) for broad-reaching topics and development of competences from the basic cycle, such as "Medical Publicity", "Relations with Patients and Families", "Telemedicine" and "Medical Student's Interpersonal Relations" - with emphasis on the student's limitations in providing care. As for topics that required competences inherent to the disciplines of the ethical-legal axis, this association was identified (p-value <0.05), as follows: "Professional Confidentiality", "Human Rights", "Fundamental Principles", "Medical Activity" and "Medical Student's Interpersonal Relations" - specifically on the use of electronics. Finally, the highest percentage of correct answers (95.7%) is associated with "Medical Student's Interpersonal Relations", with an emphasis on the student's limitations. While the lowest rates were found in "Professional Confidentiality" (18.1%), "Medical Activity" (33.6%) and "Human Rights" (25%)".

Conclusion: There is an association between the medical formation proposed by the ethical-legal axis, and the effective increase of the medical student's level of knowledge concerning the ethical-legal aspects of the profession.

Keywords: Bioethics; Ethics; Medical Ethics; Medical Students; Medical Education.

RESUMO

Introdução: A literatura refere como frequentes denúncias sobre má prática médica. Logo, a investigação de como é feita a formação do acadêmico de Medicina, no contexto ético-legal, pode contribuir para sua melhoria.

Objetivo: Este estudo teve como objetivos avaliar e comparar o conhecimento de acadêmicos de uma faculdade de Medicina sobre aspectos ético-legais da profissão, a partir de sua formação nas disciplinas do eixo relacionado ("Ética Médica e Bioética", "Medicina Legal" e "Deontologia/Perícia Médica e Boas Práticas").

Método: Trata-se de um estudo transversal com aplicação de questionário (agosto-novembro/2020) estruturado no Código de Ética Médica e Código de Ética do Estudante de Medicina – dez questões sociodemográficas e 12 objetivas (temas: "sigilo profissional", "relações interpessoais do estudante de Medicina", "publicidade médica", "relação com pacientes e familiares", "direitos humanos", "princípios fundamentais", "atividade médica" e "telemedicina"). Avaliaram-se 116 alunos: início, meio (durante curso do eixo ético-legal) e final da graduação. Para comparação, utilizaram-se os testes de Kruskal-Wallis e de Dunn. Para associação entre variáveis categóricas, adotaram-se o qui-quadrado e o teste exato de Fisher.

Resultado: Identificou-se desempenho crescente com o avançar dos períodos, com diferença estatística entre as médias de acertos do primeiro, sexto e décimo/12°: 5,1; 6,7; e 7,8, (valor-p < 0,001). Já a análise por blocos temáticos não apontou associação estatística dos acertos com avançar na graduação (valor-p > 0,05) para temas de amplo alcance e desenvolvimento das competências desde o ciclo básico, como "publicidade médica", "relação com pacientes e familiares", "telemedicina" e "relações interpessoais do estudante de Medicina" – com ênfase em limitações do acadêmico no atendimento. Já para temas que exigiam competências inerentes às disciplinas do eixo ético-legal, encontrou-se tal associação (valor-p < 0,05), sendo: "sigilo profissional", "direitos humanos", "princípios fundamentais", "atividade médica" e "relações interpessoais do estudante de medicina" – especificamente sobre uso de eletrônicos. Por fim, o maior percentual de acertos (95,7%) associa-se às "relações interpessoais do estudante de Medicina", com ênfase nas limitações do acadêmico. Já as menores taxas apresentaram-se em "sigilo profissional" (18,1%), "atividade médica" (33,6%) e "direitos humanos" (25%)".

Conclusão: Existe associação entre a formação proposta pelo eixo ético-legal e aumento efetivo do nível de conhecimento no acadêmico de Medicina sobre os aspectos ético-legais da profissão.

Palavras-chave: Bioética; Ética; Ética Médica; Estudantes de Medicina; Educação Médica.

INTRODUCTION

Since the higher education reform of 1968, a model of medical education centered on technical-scientific teaching has been adopted in Brazilian universities, based on the hypertrophy of basic sciences and practical training, predominantly in hospitals[1,2]. This process, added to the rapid transformations in the health field resulting from globalization and scientific advances, implied deficient training of professionals in the areas of human, social and ethical sciences, which can result in difficulties in dealing with everyday issues and in the practice of humanized Medicine. This translates as professional practice that meets the expectations of medical care quality, regarding communication, availability, permanent care and, essentially, the strengthening of the doctor-patient relationship. In this scenario, ethical-legal teaching shows to be crucial to face this conflict, since it develops on the pillars of humanist education - Philosophy, History and Literature principles –, allowing critical reflection on the reality and anticipation of the new issues imposed in the lives of those who deal with health, extrapolating the technical nature of care[3,4].

This deficiency identified in medical training generates user dissatisfaction with the health system, being one of the main criticisms to the service mentioned in the literature [1,5]. Reports of malpractice are also frequent, as well as ethical-professional suits, resulting from the discrepancy between the ethics prescribed by the codes and those practiced in daily life[1,5]. In this context, the study by Almeida et al. (2008) demonstrated a clear association between reading the Code of Medical Ethics and a higher level of knowledge about the practical application of its principles[3]. Similarly, ethical-legal teaching has transformative potential, by allowing reflections and guidance on the responsibilities and moral precepts included in the code itself and enabling a transdisciplinary approach to the medical aspects in health, contemplating the fundamental principles of good medical practices and their norms[1,5].

Given this situation, in recent years, several countries have adopted changes aimed at strengthening this teaching. In Brazil, ethical-legal education is supported by the National Curriculum Guidelines (DCN, *Diretrizes Curriculares Nacionais*), which establish that "the structure of the undergraduate medical course must include ethical and humanistic dimensions, developing in the student attitudes and values focused on citizenship"[4,5]. Despite this, an increase in the number of punishments for transgressing the deontological norms advocated by the Code of Medical Ethics has been identified, evidencing the failure of professionals and students to master the norms that rule their profession and the ethical concepts that constitute its foundations[6,7].

Taking into account this dissociation between the norms prescribed by the codes and professional practice, the investigation of how the formation of the future medical professional is taking place within this context in medical schools is important to elucidate and face this situation[5]. It is also worth noting that there is a scarcity of studies in this regard. For instance, the study by Almeida et al. (2008), who, used two questionnaires, one for students and another for teachers, seeking to assess interest and knowledge about medical ethics and bioethics in undergraduate medical school, and also the study by Godoy et al. (2014), who evaluated the medical students' knowledge of medical ethics at a given medical school and attained unsatisfactory results. This scarcity is also found in the international literature, as demonstrated in the review by Eckles et al. (2005), who identified a lack of research in several segments of the area - from studies on the objectives and outcomes of education in medical ethics to studies on teaching methods and their effectiveness[8].

Bringing these premises to a practical application, the present study was conducted at a School of Medicine in the southeastern region of Brazil. The aim was to assess the medical students' knowledge of relevant issues in professional practice within good practice. Moreover, the objective was also to analyze the degree to which the students' levels of knowledge, distributed in three different moments of the course, differed. The established hypothesis was that, as the students completed the workload of the ethical-legal axis and showed improvement of their training in these disciplines, there would be an effective increase in their level of knowledge about good practices applied to professional performance.

METHOD

This prospective cross-sectional study was developed at a medical school in the southeastern region of Brazil. For that purpose, the ethical-legal aspects of Resolution n. 466/12 of the National Health Council, which recommends secrecy and confidentiality of information, were contemplated. This research was approved by the Research Ethics Committee, according to CAAE number 18970519.0.0000.5134.

The research universe consisted of 116 students. The sample calculation was defined using the GPower software, version 3.1.9.2. Aiming to compare the students' knowledge of ethical-legal aspects of the profession, based on their training in the disciplines of the related axis, a significance level of 5%, power of 80% and an estimated difference of 0.5 between the average grades were considered. The sample was distributed into three classes over the undergraduate periods:

A total of 42 students who had not yet had contact with the disciplines of the axis (first period), 41 who were having

their first contact with them and, at the time of the research, were studying Ethics and Bioethics (sixth period) and 33 who had already concluded these disciplines and were more advanced in the course (Medical Internship: tenth and twelfth period) were assessed.

At the time of this study, the ethical-legal axis described in the sample was based on three disciplines, with a workload of 160 theoretical and practical hours: "Medical Ethics and Bioethics", "Legal Medicine" and "Deontology, Medical Forensics and Good Practices", between the 6th and 8th periods. The faculty consisted of three teachers, coordinated by the researcher in charge of this study, while the student body had 120 students/ period. Currently, there is a new curriculum in effect (2021), with a department called: "Ethical-Legal and Professional Practice", encompassing disciplines from the 1st to the 8th periods: "Personal Management", "Humanization and Integrality", "Health Management", "Professional Practice I" (Ethics and Bioethics), "II" (Medical Forensics I) and "III" (Medical Forensics II and Good Practices). The proposal is that this longitudinal axis be responsible for the humanistic, critical, ethical and deontological training of undergraduate students. The DCN (2014) competences are included, especially in the "Health Care Competence Area", which aims that students always consider the multiple aspects that comprise human diversity, as well as in the "Health Management Competence Area", which aims at understanding the principles, guidelines and policies of the health system and participation in management actions. Moreover, as described by Franco et al. (2014), the targets of the axis comprise: Health care; Decision-making; Communication; Leadership; Administration and management; Recognizing health as a right and acting in a way to guarantee the integrality of preventive and curative care, both individual and collective; Critically dealing with the dynamics of the labor market and health policies; Working in the hierarchical health system, obeying the technical and ethical principles of referral and counter-referral; Being aware of the physician's social role and willingness to act in health policy and planning activities; Keeping up-to-date with legislation relevant to health[9].

To assess the level of knowledge of undergraduates on ethical-legal content, a structured questionnaire was created based on topics from the 2019 Code of Medical Ethics and the 2018 Code of Ethics for Medical Students, comprising 10 sociodemographic and 12 objective questions. These references contain deontological norms associated with fundamental principles that govern the daily practice of Medicine[6,7,10]. The first identified the variables: year/period; sex; age; religion; monthly family income; other undergraduate courses (enrollment; which course; contact with the discipline "Ethics and Bioethics"); current level of contact with this discipline and previous completion of an extracurricular course in Medical Ethics. The objective questions were classified according to the addressed topics: "Professional Confidentiality" (1); "Medical Student's Interpersonal Relations", specifically on the student's responsibilities and limitations during the supervised internship (2 and 7), or, on rules for the use of electronics and social networks (8); "Medical Publicity" (3); "Relations with Patients and their family members" (4 and 5); "Human Rights" (6 and 12); "Fundamental Principles" (9); "Medical Activity" (10) and "Telemedicine" (11). Based on this classification, the existence of an association between the classes and the number of correct answers in each topic was analyzed.

An anonymous questionnaire, treated with a unique identifier, associated with the participant's registration number, was used to certify their link as a student at the institution and ensure a single submission. It was made available through Google Forms between August and November 2020 and an invitation to participate was made via electronic messages in the academic community, as well as dissemination in the classroom, among all students who met the inclusion criteria. The responses needed to meet the sample quota of the research project were used, totaling 209 responses. A total of 116 were considered for analysis, while the remainder was discarded due to inconsistencies with the inclusion and/or exclusion criteria. It should be noted that only volunteers over 18 years of age were accepted to participate in the study.

Inclusion criteria

Volunteer students, duly enrolled in the institution's medical course, who met one of the following criteria:

- 1st period students;
- 6th period students studying ethics and bioethics;
- Students attending the 10th and 12th periods (Internship), who had already completed the entire course load and had been approved at the ethics and bioethics discipline.

Exclusion Criteria

Students attending the first (1st) period, sixth (6th) period or Internship students of the medical course who had already had contact with the discipline of ethics and bioethics in extracurricular or undergraduate courses.

Statistical analysis

For data analysis, the categorical variables were presented as absolute and relative frequencies and the numerical variables as mean ± standard deviation and median (1st quartile – 3rd quartile). The comparison of the three classes was performed using the Kruskal-Wallis test with multiple comparisons using

Dunn's test. The association between categorical variables was assessed using the Chi-square and Fisher's exact tests, when appropriate. The analyses were performed using the R software, version 4.0.3, considering a significance level of 5%.

RESULTS

Of the 116 students participating in the study, 85 (73.3%) were female and 31 (26.7%) male. Regarding attending previous undergraduate courses, the vast majority of the participants denied it. Of the 116 academics, 105 (90.5%) had a medical course as their first degree, while 11 (9.5%) stated that they had already taken another course (Table 1). The declared family income of 80 participants, 69% of the sample, was greater than 15 minimum wages. The other 31% of students stated that their family income ranged from 1 to 15 minimum wages. The prevailing religion was Catholic, with 55 (47.4%) students. Then, 36 (31%) students declared they had no religion, followed by the Spiritist and Protestant religions, as the 2nd and 3rd most often mentioned by the participants, respectively.

The variable level of contact with the discipline was evaluated by the student period in the course. Those in the 1st period had not yet had contact with the axis subjects, the students in the 6th period were taking the Ethics and Bioethics course and, therefore, having their first contact with the subject and those in the 10th or 12th periods had already completed these disciplines. Finally, in relation to the students' period in the course, it can be observed that 42 (36.2%) were in the 1st period, 41 (35.3%) in the 6th and 33 (28.4%) in the 10th or 12th periods; and that the average of the participants' total correct answers was 6.4 (standard deviation of 2) with a median of 7.0 (5.0 - 8.0) (Table 1).

The average number of correct answers for 1st period students was 5.1, with a standard deviation of 1.6 and a median of 5.0 (4.0 - 6.0). The 6th period students reached an average of 6.7, with a standard deviation of 1.7 and a median of 7.0 (6.0 – 8.0). Internship students, in turn, obtained an average of 7.8 correct answers, with a standard deviation of 1.9 and a median of 8.0 (7.0 – 9.0). (Table 2). The Kruskal-Wallis Test resulted in a p value <0.001 for the comparison of the total number of correct answers for each class and Dunn's test (multiple comparisons test) confirmed a significant difference between all classes.

Also noteworthy are the results obtained by comparing the classes using the standard deviation. The best result of the 1st period (6.7) is higher than the worst result of the 6th period (5), as well as the highest grade of this period - 6th - (8.4) is higher than the lowest grade of the Internship (5.9). This observation is repeated in the comparison between the upper limit of performance of the 1st period students and the lower limit of the Internship students, being: 6.7 vs. 5.9.

The individual analysis of the questions showed a p value <0.05 and, thus, a significant difference between the classes, in relation to the topics: "Professional Confidentiality" (1), "Human Rights" (6; 12), "Fundamental principles" "(9), "Medical Activity" (10) and "Medical Student's Interpersonal Relations" - specifically on the use of electronics (8). On the other hand, a p value >0.05 was obtained, showing no significant difference between classes, in relation to the topics: "Medical Student's

Table 1. Sociodemographic profile of the study participants carried out with medical students from a private institution in the year 2020.

Variable	Result Statistics
Sex, n (%)	
Female	85 (73.3)
Male	31 (26.7)
Age, mean ± standard deviation median (1st quartile – 3rd quartile)	21.3 ± 2.5 21.0 (20.0 – 23.0)
Have you ever taken another undergraduate course? n (%)	
Yes	11 (9.5)
No	105 (90.5)
Income, n (%)	
From 1 full minimum wage to 3 incomplete minimum wages	6 (5.2)
From 3 full minimum wages to 6 incomplete minimum wages	7 (6.0)
From 6 full minimum wages to 9 incomplete minimum wages	5 (4,3)
From 9 full minimum wages to 12 incomplete minimum wages	8 (6.9)
From 12 full minimum wages to 15 incomplete minimum wages	10 (8.6)
More than 15 full minimum wages	80 (69.0)
Religion, n (%)	
None	36 (31.0)
Agnostic	1 (0.9)
Atheist	1 (0.9)
Buddhist	1 (0.9)
Catholic	55 (47.4)
Spiritist	15 (12.9)
Protestant	7 (6.0)
School period, n (%)	
1st period	42 (36.2)
6th period	41 (35.3)
10th or 12th period	33 (28.4)
Total of correct answers, mean ± standard deviation median (1st quartile – 3rd quartile)	6.4 ± 2.0 7.0 (5.0 – 8.0)

Source: The authors.

Table 2. Comparison of correct answers per question, considering three different periods of the medical course at a private institution in the year 2020.

	Topic	Correct answers to the questions	1st period	6th period	10th/12th periods	p-value
			n (%)	n (%)	n (%)	
Question 1	Professional confidentiality					0.003[Q]
Correct		21 (18.1)	1 (2.4)	10 (24.4)	10 (30.3)	
Wrong		95 (81.9)	41 (97.6)	31 (75.6)	23 (69.7)	
Question 2	Medical Student's Interpersonal Relations (Student's limitations in the internship)					0.528[F]
Correct		111 (95.7)	41 (97.6)	38 (92.7)	32 (97.0)	
Wrong		5 (4.3)	1 (2.4)	3 (7.3)	1 (3.0)	
Question 3	Medical Publicity					0.070[Q]
Correct		60 (51.7)	16 (38.1)	23 (56.1)	21 (63.6)	
Wrong		56 (48.3)	26 (61.9)	18 (43.9)	12 (36.4)	
Question 4	Relations with Patients and Families					0.927[Q]
Correct		77 (66.4)	27 (64.3)	28 (68.3)	22 (66.7)	
Wrong		39 (33.6)	15 (35.7)	13 (31.7)	11 (33.3)	
Question 5	Relations with Patients and Families					0.243[Q]
Correct		59 (50.9)	18 (42.9)	25 (61.0)	16 (48.5)	
Wrong		57 (49.1)	24 (57.1)	16 (39.0)	17 (51.5)	
Question 6	Human Rights					<0.001[Q]
Correct		81 (69.8)	19 (45.2)	31 (75.6)	31 (93.9)	
Wrong		35 (30.2)	23 (54.8)	10 (24.4)	2 (6.1)	
Question 7	Medical Student's Interpersonal Relations (Student's limitations in the internship)					0.157[Q]
Correct		43 (37.1)	16 (38.1)	11 (26.8)	16 (48.5)	
Wrong		73 (62.9)	26 (61.9)	30 (73.2)	17 (51.5)	
Question 8	Medical Student's Interpersonal Relations (Use of electronic devices)					0.003[Q]
Correct		75 (64.7)	19 (45.2)	29 (70.7)	27 (81.8)	
Wrong		41 (35.3)	23 (54.8)	12 (29.3)	6 (18.2)	
Question 9	Fundamental Principles					<0.001[Q]
Correct		72 (62.1)	18 (42.9)	25 (61.0)	29 (87.9)	
Wrong		44 (37.9)	24 (57.1)	16 (39.0)	4 (12.1)	
Question 10	Medical Activity					0.001[Q]
Correct		39 (33.6)	6 (14.3)	15 (36.6)	18 (54.5)	
Wrong		77 (66.4)	36 (85.7)	26 (63.4)	15 (45.5)	
Question 11	Telemedicine					0.927[Q]
Correct		77 (66.4)	27 (64.3)	28 (68.3)	22 (66.7)	
Wrong		39 (33.6)	15 (35.7)	13 (31.7)	11 (33.3)	
Question 12	Human Rights					0.044[Q]
Correct		29 (25)	6 (14.3)	10 (24.4)	13 (39.4)	
Wrong		87 (75)	36 (85.7)	31 (75.6)	20 (60.6)	

Abbreviations: [Q] – Chi-square test / [F] – Fisher's Exact test
Source: The authors.

Interpersonal Relations" - specifically on the responsibilities of the student during medical care (2; 7), "Medical Publicity" (3), "Relationship with Patients and Families" (4; 5) and, "Telemedicine" (11) - Table 2.

Finally, there is a comparison between the rates of correct answers for the questions (Table 2). The highest rate was identified in question 2 (95.7%). In the descending analysis of these percentages, the following showed a percentage of correct answers greater than 50%: 6, 4, 11, 8, 9, 3 and 5. Of the remainder, questions 7, 10, 12 and 1 represent the lower limit, with 18.1% of correct answers.

DISCUSSION

Regarding the evaluation of ethical-legal teaching in medical undergraduate schools in Brazil, the study by Dantas et al. (2008) evaluated the situation of the teaching of medical ethics in the country. When reviewing studies published in the last 20 years, a relative stagnation can be observed in the educational and organizational structure of ethics and bioethics courses in medical schools, which reflects the situation of teaching professional practice in keeping with the good practice principles. During this period, no significant increase was observed in the number of disciplines dedicated exclusively to medical ethics and bioethics, nor in teachers with specific functions or in the workload. Therefore, the need to assess the level at which medical schools have adopted measures consistent with the scenario of recognition of academic training importance in the ethical-legal context, and how this has been carried out, is reinforced[5].

This need to evaluate ethical-legal teaching in medical schools is also evident in the international literature. Studies such as the one by Lehmann et al. (2004), which evaluated the organization and relevance of ethical education in medical undergraduate school in 91 medical schools in the United States (n=85) and Canada (n=06) through questionnaires answered by the deans of the course and by the department directors, are highlighted. The authors concluded that, despite the growing need to strengthen ethical-legal teaching, its main deficits in the assessed schools were due to the lack of time allocated to these subjects in the curriculum and on the faculty work schedule, as well as the insufficient number of qualified teachers[11]. Correspondingly, Campbell et al. (2008) emphasized the importance of multidisciplinary and multiprofessional teaching in this department, based on research and integrated into the medical curriculum[12].

By incorporating this demand for analysis of medical student training in the ethical-legal context to the reality of the assessed institution and carrying out the present study, a statistically significant difference was found between the total number of correct answers for the three sample classes. The progress increased from the 1st period towards the 6th period and in relation to the medical internship (last periods). Therefore, the possibility of determining a learning curve based on the ethical-legal axis was verified.

However, the comparison between classes through the standard deviation stands out as a possible challenge to the consolidation of this learning curve. This occurs because, when comparing the highest grades of the less advanced classes in the course with the lowest grades of the more advanced ones, a pattern of superiority of the results in the beginner classes is observed. To resolve this conflict and detail the evaluation, comparative statistical analysis of correct answers was used based on the grouping of questions by topic.

In this context, the analysis of areas of knowledge in which there was no significant association between the number of correct answers and the classes led to the creation of hypotheses that would justify this lack of relationship. Among such topics, starting from the questions that addressed "Medical Student's Interpersonal Relations", with emphasis on their duties and limitations, it was verified that the competences required for their resolution involved knowledge disseminated among the students since the beginning of the course, when they already have supervised practical classes and contact with patients. Therefore, the mastery of these skills is worked on from the basic cycle in subjects such as Public Health Practices I, II and III and Social Anthropology, for instance. Regarding "Telemedicine", there is a bias related to the fact that, with the Covid-19 pandemic, online consultations have become routine and the subject has gained visibility and accessibility. As for the issues that addressed the topic "Relationship with Patients and their Families", the idea of patient autonomy and basic contents were required, such as the acknowledgement of the non-existence of euthanasia in Brazil. Finally, regarding the topic "Medical Publicity", it is necessary to emphasize that this is a subject with wide access and extreme relevance in the media, especially, regarding the exposure of the patient's image, as it was addressed in this item. Therefore, the existence of plausible justifications for the uncertainty in the construction of a learning curve regarding these specific questions is verified, associating this finding with the broad scope and/or mastery of the addressed contents.

Still in relation to these previous results (non-statistical association), it is highlighted that the analysis of the last topic, "Medical Publicity", fosters a relevant discussion on the interpretation of data. Although there was no statistically significant loss regarding the rate of correct answers by the students who did not have or had less contact with the axis, the importance of teaching and strengthening these competences cannot be overstated.

This observation is evidenced by the fact that, even when dealing with an accessible subject and constantly highlighted in the media, easily demonstrated by a search in medical or non-medical websites, in fact, an inconsistent reality is found. It is common for professionals to record and disseminate images of patients for various purposes, including medical records and even inadvertent promotion of their own work. It is, therefore, a divergent conduct from the CME, as well as a violation of constitutional rules of privacy and confidentiality[8]. These data show that, even for topics of broad scope and/or domain, an important dissociation between theory and professional practice is identified. Based on these findings, the importance of intensifying the investigation of the origin of this divergence and studying alternative solutions is perceived. One of the possibilities is to allocate more hours to the subject within the ethical-legal axis. Another point of reflection and, a warning sign, is that the subject might be addressed by other disciplines of the basic cycle, by teachers without full and effective theoretical mastery of a subject that involves specific knowledge of norms and resolutions that rule the subject. If this is the case, it is necessary to promote specific training for these teachers, since deontological rules are inserted in the field of dogmatics, not the zetetic approach.

On the other hand, when analyzing the topics which showed a statistical association between the number of correct answers and the classes, hypotheses were generated that reinforced the strict relationship between ethical-legal teaching and success in answering the questions. This can also be confirmed by the analysis of the competences involved in these items. Starting with the questions about "Human Rights", it was necessary to be aware of the exceptions in which the physician must intervene without the consent of the patient/ legal guardian. Regarding "Professional Confidentiality", specific knowledge was required on how to assess and proceed in relation to the breach of confidentiality. In the "Fundamental Principles" approach, a full understanding was required of the medical right to refuse performing procedures under certain conditions, when these do not match their values. Regarding the topic "Medical Activity", updating on the Medical Act (Law N. 12,842/13) was necessary, which legally deals with the practice of Medicine, and, specifically, in Articles 4 and 5, which define the profession's private activities. Finally, regarding "Medical Student's Interpersonal Relations", with emphasis on the use of electronic devices, the recognition of a principle that, in addition to challenging common sense, it opposes the trivialization of the indiscriminate recording and dissemination of contents obtained from theoretical classes, laboratory, outpatient and hospital practices.

Therefore, it is observed that, for the contents in which an association was identified between the variables class and number of correct answers (p-value <0.05), it was necessary to master and update knowledge that was specifically studied through the ethical-legal axis. That is, concepts inherent to the disciplines that constitute it and the students' retention of knowledge when studying these subjects along the axis. This analysis reinforces the difference identified between the classes in the global assessment and then allows defining a solid learning curve. There is evidence of the emergence and effective reinforcement of the competences involved in ethical-legal training throughout the assessed classes.

Additionally, the evaluation of the number of correct answers to the questions reiterates the conclusions of the previous comparative analysis. In this sense, regarding question 2, related to "Medical Student's Interpersonal Relationships" (specifically about the student's responsibilities in care) and part of the topics in which there was no association between classes and correct answers, a greater rate of correct answers (95.7%) was shown, as well as a large percentage difference compared to the others. This result strengthens the idea that public and broad-reaching topics were required, as well as in the descending analysis of the percentages of correct answers, although questions 6, 8 and 9 - on "Medical Student's Interpersonal Relations" and "Fundamental Principles" (last) - occupy the first half of the ranking (69.8%, 64.7% and 62.1%), and the rest of the topics in which there was an association between the variables of concern maintain the last positions, with rates below 50% of correct answers. This fact occurred in a single topic among those that did not show this association. Therefore, the results of questions 1, 10 and 12 - about "Professional Confidentiality" (18.1%), "Medical Activity" (33.6%) and "Human Rights" (25%) – are in agreement with the idea that thematic blocks that showed an association between classes and correct answers required specific competences to improve the ethical-legal axis.

These conclusions also imply an evaluation of the sample teaching parameters. For this purpose, some issues relevant to ethical-legal education in Brazil were raised and the main difficulties identified in the training of students with a satisfactory level of knowledge on the subject were sought in the literature. Despite the progressive recognition of the crucial role of the ethical-legal axis in medical education, some studies have identified that Brazilian medical schools maintain a conservative model of deontological teaching, ignoring the importance and need to adapt teaching to social transformations[13]. Moreover, another aspect identified as an obstacle to be overcome is the difficulty in transforming the teaching of medical ethics into a longitudinal model, in all

periods[5,13-15]. Still regarding the difficulties found in improving the teaching and research in this area, there is a need to transform generic objectives, such as training more humane professionals, into cognitive and affective objectives that can guide the learning process and the evaluation of results[14]. It is also worth mentioning that teaching the norms that critically rule the daily life of the medical profession is identified as a challenge, with a reflection on its roots and foundation[5,14].

In view of this context, considering these as the main difficulties in improving ethical-legal teaching, it can be inferred that the students assessed in the present study were submitted to satisfactory educational parameters. This is due to the fact that the program in which they are inserted has 160 hours of exclusive workload distributed into disciplines of the ethical-legal axis. Furthermore, these subjects are taught by teachers with specific functions in this section of the curriculum and who have accumulated professional experience in different areas. These aspects are precisely some of the key points mentioned in the literature as alternatives to the problems discussed in this study[5,13-15]. In this regard, the experience of educators who teach ethical-legal content stands out as one of the pillars of this teaching in medical education, even in the case of those who teach the basic cycle and go through fundamental principles when teaching their disciplines. As previously mentioned, this is a potential premise to expand the investigation of a possible teaching deficit within this context.

In this scenario, it is also worth noting that the disciplines taught in the assessed institution have teaching plans that determine specific competences to be developed, as well as theoretical and practical activities, which include realistic simulation, aiming to foster the students' critical view of the content and work on its practical application. It is noteworthy that this teaching model has proved to be efficient in building a solid learning curve.

Finally, the relevance of this study is emphasized through the contribution with original data on ethical-legal teaching in medical undergraduate school, as well as, by complementing other studies. The study of Almeida et al. (2008) showed that, although the importance of this teaching is recognized by the academic community, there is a lack of interest, updating and mastery of this knowledge. Godoy et al. (2014), concluded that the teaching of these contents in only one undergraduate period was ineffective, asking for a longitudinal education. Therefore, the relevance of the existence of an ethical-legal axis across several periods of the undergraduate medical school can be observed. Therefore, this research contributes to the development of other studies, as it exposes the potential success of teaching models that seek to correct the deficit identified in the literature.

However, it is necessary to recognize some limitations of the present study, among which is the fact that the adoption of a longitudinal axis of ethical-legal teaching in undergraduate medical school is unusual, as well as the limited availability of validated instruments to measure this knowledge. Moreover, the comparison of different groups in a single moment, as well as the use of exclusively quantitative techniques, can limit a deeper interpretation of the results. Longitudinal studies are proposed for future research, which should follow a single group of students throughout the course and which can be complemented with research techniques that are also qualitative, such as interviews, aiming to increase the understanding of the ethical and moral perceptions of future medical professionals during the ethical-legal undergraduate process. Therefore, it is expected that the considerations presented herein will inspire not only new studies, but also the implementation of similar axes in other undergraduate courses, as their skills and abilities are inextricable from good medical practice.

CONCLUSION

There was a significant association between the course of disciplines that comprise the ethical-legal axis and the effective increase in the medical students' level of knowledge about good practices in their professional performance.

This relevance found in the present study demonstrates the inseparability between this content in undergraduate medical school and the training of medical professionals capable of understanding reality and anticipating the new issues that continually arise in health practices. Therefore, ethical-legal teaching is an indispensable aspect of the quality of education in medical schools.

It is also noteworthy that the analysis of the teaching parameters of the sample indicates satisfactory levels of retention of specific knowledge, covering the main difficulties reported in the literature and efficiency in building a solid ethical-legal learning curve.

It should be recalled that there are still other factors associated with the changes observed in the ethical and moral perceptions of future medical professionals during the different stages of training, which deserve more in-depth future qualitative studies.

AUTHORS' CONTRIBUTION

Leandro Duarte de Carvalho: supervised the study, gave support in the design and planning of the study, guided the data collection, and supported the data analysis and writing of the manuscript. Luisa Medeiros Soares: participated in the design and planning of the study and worked in data collection,

interpretation and analysis, as well as in the writing of the manuscript. Fernanda Cambraia Ferreira: participated in the study planning and development, worked in data collection and supported the interpretation and analysis of data and the writing of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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