

# The perceptions of Pharmacy and Medicine students about the development of clinical competencies

*As percepções de estudantes de Farmácia e de Medicina sobre o desenvolvimento de competências clínicas*

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## ABSTRACT

**Introduction:** The active role of the medical professional together with the pharmacist can help to guarantee an effective, safe, and convenient pharmacotherapy. For these professionals to work collaboratively, it is necessary that, during the training process, Pharmacy and Medicine students develop skills to ensure a quality clinical service, with respect for their performance and adequate coexistence with other professionals.

**Objective:** This study aimed to describe a self-assessment of the Medicine and Pharmacy records in relation to their technical skills, their differences and similarities, as well as to assess their development during a program.

**Method:** Educational study carried out remotely between August 2020 and August 2021. The participants were Pharmacy and Medicine students from a public teaching institution. Individual interviews were carried out and instruments for self-assessment of clinical competences were applied.

**Result:** A total of 39 students participated in the research: 18 (46.2%) from Pharmacy and 21 (53.8%) from Medicine. Pharmacy students evaluated themselves positively regarding activities related to clinical competences, except for the implementation of a care plan and the identification of patients at risk of prevalent diseases. As for the curriculum, the evaluated course has three subjects that address the development of clinical competences. Of these, the students reported having developed scientific knowledge, updated scientific knowledge and effective communication. Medical students evaluated themselves positively in relation to their clinical competences, apart from those related to differential diagnosis, discussion with the health team and identification of failures in the health system. The course curriculum features 11 disciplines focused on care, and the students' associated disciplines of a social nature with person-centered care. The most outstanding skills developed were empathy, compassion, integrity and respect, effective communication and anamnesis and obtaining sociocultural information. In addition, students from both courses reported little contact with other health professionals.

**Conclusion:** The evaluated students have several insecurities, mainly related to clinical skills that require practice. Despite this, medical students showed greater apprehension of soft skills, which can facilitate the creation of bonds with patients and result in the quality of care.

**Keywords:** Clinical Competence; Education, Pharmacy; Education, Medical; Patient-Centered Care; Professional Competence.

## RESUMO

**Introdução:** A atuação ativa do profissional médico em conjunto com o farmacêutico pode auxiliar na garantia de uma efetiva, segura e conveniente farmacoterapia. Para que esses profissionais atuem de maneira colaborativa, é necessário que, durante o processo formativo, os estudantes de Farmácia e Medicina desenvolvam competências clínicas para assegurar um serviço clínico de qualidade, com respeito pela atuação e adequada convivência com outros profissionais.

**Objetivo:** Este estudo teve como objetivos descrever a autoavaliação dos discentes de Medicina e Farmácia em relação às suas competências clínicas, compreendendo suas diferenças e similaridades, e avaliar o desenvolvimento destas durante a graduação.

**Método:** Trata-se de um estudo educacional realizado de maneira remota entre agosto de 2020 e agosto de 2021. Os participantes eram discentes de Farmácia e Medicina de uma instituição pública de ensino. Realizaram-se entrevistas individuais, e aplicaram-se instrumentos de autoavaliação de competências clínicas.

**Resultado:** Participaram da pesquisa 39 discentes: 18 (46,2%) de Farmácia e 21 (53,8%) de Medicina. Os estudantes de Farmácia avaliaram-se positivamente quanto às atividades relacionadas às competências clínicas, salvo a implementação de um plano de cuidado e a identificação de pacientes em risco de doenças prevalentes. Quanto ao currículo, o curso avaliado possui três disciplinas que abordam o desenvolvimento de competências clínicas. Dessas, os discentes relataram ter desenvolvido conhecimento científico, atualização do conhecimento científico e comunicação efetiva. Os estudantes de Medicina avaliaram-se positivamente em relação às suas competências clínicas, com exceção daquelas relacionadas ao diagnóstico diferencial, à discussão com equipe de saúde e à identificação de falhas no sistema de saúde. O currículo do curso apresenta 11 disciplinas voltadas para o cuidado, e os alunos associaram disciplinas de cunhos sociais ao cuidado centrado na pessoa. As competências desenvolvidas destacadas foram empatia, compaixão, integridade e respeito, comunicação efetiva e anamnese, e obtenção de informações socioculturais. Ademais, os estudantes de ambos os cursos relataram contato escasso com outros profissionais de saúde.

**Conclusão:** Os discentes avaliados apresentam diversas inseguranças, principalmente relacionadas às habilidades clínicas que exigem prática. Apesar disso, os estudantes de Medicina demonstraram maior apreensão de soft skills, o que pode facilitar a criação de vínculos com os pacientes e resultar na qualidade do cuidado.

**Palavras-chave:** Competência Clínica; Educação em Farmácia; Educação Médica; Assistência Centrada no Paciente; Competência Profissional.

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## INTRODUCTION

Medications are technologies widely used in the treatment of health conditions. On the other hand, although the use of medication is the most common intervention in health practice, it is associated with a high rate of morbidity and mortality, thus representing a public health problem. Considering this problem, the active role of the medical professional, together with the pharmaceutical professional, can help to guarantee an effective, safe and convenient pharmacotherapy for the patient<sup>1-5</sup>. Considering that the physician is the most frequent prescriber, it is observed that this interprofessional collaboration can provide the optimization of patient care and therapeutic results<sup>6,7</sup>.

Interprofessional collaboration effectively occurs when a professional's clinical service complements that of the other in an environment that allows mutual respect and performance of their professional actions<sup>8</sup>. The 'Pharmacotherapy Workup' and 'The patient-centered clinical method' have similarities in the process that guides the clinical practice of these two professionals. Both are in line with the reasoning approach applied to problem-oriented medical records, developed by Lawrence Weed in 1960<sup>2,9,10</sup>.

For these professionals to work in a collaborative way, it is necessary that, during the training process, Pharmacy and Medicine students develop the necessary skills to ensure a quality clinical service, with respect for their work and adequate coexistence with other professionals. Hence, research gaps are observed during the undergraduate course of these two professions to understand the training of skills for clinical practice<sup>11-19</sup>. In view of the above, the present study aimed to describe the self-assessment of Medicine and Pharmacy students in relation to their clinical skills, understanding their differences and similarities, as well as evaluating their development during undergraduate school.

## METHOD

This is an educational study with a quantitative-qualitative approach, carried out remotely between August 2020 and August 2021<sup>20</sup>. The participants were students of Pharmacy and Medicine at the Federal University of Juiz de Fora - Governador Valadares campus (UFJF/GV), Minas Gerais, who were invited to participate in the study through the course coordination. These courses follow the traditional teaching method and their activities started in 2012. The sample was obtained by convenience and students who declared themselves to be regularly enrolled at the university were included in the study, with Pharmacy students who have taken a mandatory course on the pharmacist's role in health care, and medical students from the sixth semester onwards, when they already have had contact with patients.

The first stage of the study consisted of analyzing the sociodemographic profile of the participants, as well as the self-assessment of their clinical skills, similarly to the study by Pittenger et al. (2019)<sup>21</sup>. Pharmacy and Medicine students, separately, had their clinical skills assessed based on Entrustable Professional Activities (EPAs)<sup>22</sup>, through a case study and description of specific professional activities, which were evaluated by the student through a three-point Likert scale, where (1) represents 'I feel well prepared to perform the proposed activity'; (2) 'I feel moderately prepared to perform the proposed activity' and (3) 'I feel little prepared to perform the activity'. This instrument was translated and adapted by the authors of this study. The competencies considered were described by the Association of Colleges of Pharmacy (ACCP) and by the Accreditation Council of Graduate Medical Education (ACGME)<sup>23-25</sup>. Both collections were carried out with the help of Google Forms<sup>®</sup>. The evaluated activities can be seen in Table 1.

In the second stage of the study, individual semi-structured interviews were carried out, which had audio and video recorded and the speeches were fully transcribed.

**Table 1.** Entrustable Professional Activities (EPA) Statements for Pharmacy and Medicine.

EPA	FARMÁCIA	MEDICINA
1	Collect information to identify DRP and health needs reported by the patient	Gather the patient's medical history and perform a physical examination
2	Analyze information to determine the effects of pharmacotherapy, identify DRP and prioritize health-related needs	Prioritize a differential diagnosis during medical investigation
3	Establish patient-centered goals and create an evidence-based, cost-effective plan of care collaboratively with the patient, caregiver, and other healthcare professionals	Perform diagnostic tests and triage on patients
4	Implement a care plan in collaboration with the patient, caregivers, and other healthcare professionals	Type and discuss orders and prescriptions with the healthcare team, caregivers and the patient

Continue...

**Table 1.** Continuation.

EPA	FARMÁCIA	MEDICINA
5	Follow and monitor the care plan	Document a clinical meeting
6	Collaborate as a member of an interprofessional team	Give an oral presentation of a clinical meeting to the healthcare team
7	Identify patients at risk for prevalent diseases in a population	Develop clinical questions to improve patient care
8	Minimize drug-related adverse events and medication errors	Give or receive patient transference
9	Maximize appropriate drug use in a population	Collaborate as a member of an interprofessional team
10	Ensure that patients have been immunized against vaccine-preventable diseases	Recognize an urgency or emergency situation
11	Educate patients and professional colleagues on the adequate use of medications	Obtain informed consent from the patient
12	Use evidence-based information to advance patient care	Perform a physician's general procedures
13	Supervise pharmacy operations for a designated work shift	Identify failures in the safety system and culture
14	Comply with a medication order	
15	Create a written plan for ongoing professional development	

Abbreviations: EPA: Entrustable Professional Activities; DRP: Drug-Related Problems

Haines et al., 2018<sup>23</sup>; Prediger *et al.*, 2020<sup>26</sup> yet challenging goal for medical educators to provide constructive alignment between undergraduate medical training and professional work of physicians. Therefore, we designed and validated a performance-based 360-degree assessment for competences of advanced undergraduate medical students. Methods: This study was conducted in three steps: 1.

These aimed to capture the students' individual perceptions related to the clinical competencies of their profession, their level of preparedness and the strengths and gaps regarding the teaching of the development of competencies. Thematic content analysis was performed using the NVivo® software<sup>27</sup>. It should be noted that the interviews were carried out remotely due to the limitations imposed by the COVID-19 pandemic. In the third and final stage, a documental analysis of the curricula of the assessed courses was carried out. For this purpose, we considered the disciplines offered by the Pharmacy and Medicine courses, either mandatory or elective, which allow the development of clinical competencies focused on person-centered care. The present study was approved by the Research Ethics Committee of the Federal University of Juiz de Fora, according to resolution number 466/12, under Opinion number 4.078.003/2020.

## RESULTS

A total of 39 students participated in the study, 18 (46.2%) from the Pharmacy and 21 (53.8%) from the Medicine courses. The EPA instrument used to assess clinical competencies was applied to 32 of the 39 participants. Of these, 18 were students of Pharmacy and 14 of Medicine. Of the 32 students who carried out the self-assessment, 21 participated in the qualitative stage, and accepted to be interviewed, of which 11 were from the Pharmacy and 10 from the Medicine courses.

Of the Pharmacy students, 15 (83.3%) were women and three (16.7%) were men, with a mean age of 27 years; ten (55.6%) of these students live in the region where UFJF/GV is located. Moreover, the year of the participants' admission to the University ranged from 2014 to 2018, and on average, they entered in 2015. In addition, 16 (88.9%) of the Pharmacy participants had been involved in academic projects, such as undergraduate research, extension projects and monitoring.

Regarding the medical students, 16 (76.2%) were women and five (23.8%) were men, with a mean age of 23.1 years. Most of the students are not from the region where UFJF/GV is located, with only five (23.8%) come from Governador Valadares – Minas Gerais. As for the year of admission to the University, the participants of the medical course started between 2015 and 2017 (average: 2015). Additionally, all of them had taken part in academic projects. The participants' information can be seen in Table 2.

### Pharmacy students and their impressions

#### *Feeling of confidence in the pharmacist's role*

Of the 18 Pharmacy students who answered the EPA instrument, 13 (72.22%) felt they were well prepared to use evidence-based information to advance patient care (EPA 12), while 12 (66.67%) said they were able to ensure that patients were immunized against vaccine-preventable diseases (EPA 10) and 11 (61.11%) felt they were well prepared in relation to

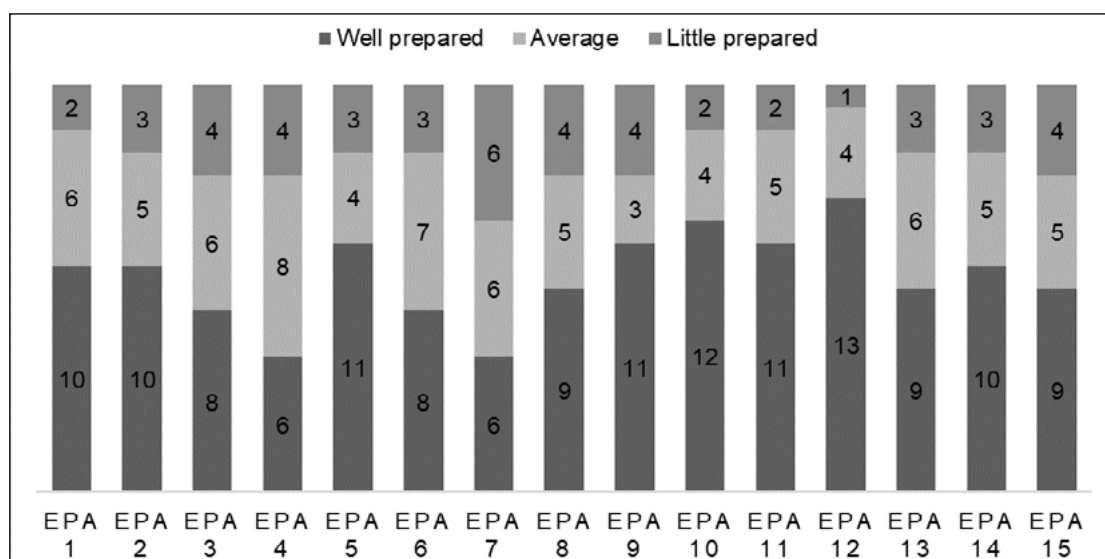
the statements in APCs 5, 9 and 11. Overall, students evaluated themselves positively; however, six (33.33%) students stated they were unprepared for statements in APCs 4 and 7. Of these, the statement “identifying patients at risk of prevalent diseases in a population” (EPA 7) had a higher number of students who felt little prepared, totaling six (33.33%) (Figure 1), while the statement “implement a care plan in collaboration with the patient, caregivers and other health professionals” (EPA 4) showed the highest number of students who were felt moderately prepared, totaling eight (44.44%).

When interviewed, the Pharmacy students reported insecurity regarding their clinical competencies due to the lack of practice in the area during undergraduate school, as observed in the speech of Pharmacy Student (PS) 1: “It is being and not being ready, because of knowledge I know, but I don’t have the practice”, which was complemented by PS2: “As far as the theoretical basis, the university gave me everything, it tells me where to look for it; but as practice goes, I need more, I will not leave university fully qualified to care for the patient”. Despite that, students demonstrated to be open to continuous

**Table 2.** Data from evaluated students from the Pharmacy and Medicine courses at Federal University of Juiz de Fora - Governador Valadares campus, Minas Gerais, Brazil, 2020.

		Pharmacy students n = 18 (46.2%)	Medicine students n = 21 (53.8%)	TOTAL n = 39 (100%)
Gender	Female	15 (83.3%)	16 (76.2%)	31 (79.5%)
	Male	3 (16.7%)	5 (23.8%)	8 (20.5%)
Age	Minimum	21	21	21
	Maximum	49	26	49
	Average	27.0	23.1	24.9
Birth place	Governador Valadares	10 (55.6%)	5 (23.8%)	15 (38.5%)
	Another	8 (44.4%)	16 (76.2%)	24 (61.5%)
Year of admission at University	Minimum	2014	2015	2014
	Maximum	2018	2017	2018
	Average	2015.6	2015.8	2015.7
Participation in academic projects	Yes	16 (88.9%)	21 (100%)	37 (94.9%)
	No	2 (11.1%)	0	2 (5.1%)

**Figure 1.** Self-assessment of Pharmacy students on Entrustable Professional Activities statements, Federal University of Juiz de Fora - Governador Valadares campus, Minas Gerais, Brazil, 2021.



Abbreviation: EPC: Entrustable Professional Activities.

learning, as PS3 stated:

*"I think that if I see that some competency is missing, I'll try to look for it and improve to get there. The basics I already know I have. When I get there, to the practice, what I don't have, I will have the basis to achieve".*

### Person-Centered Care during Undergraduate School

During the research, the Pharmacy course followed the National Curriculum Guidelines (DCN, *Diretrizes Curriculares Nacionais*) published in 2002<sup>28</sup>. Regarding Person-Centered Care, the course pedagogical plan does not encompass the concept. However, it can be observed that there are three disciplines that address the development of clinical competencies and care. The Oriented Activity V discipline addresses concepts and the application of pharmaceutical care to patients, as well as its follow-up methodology. The Internship in Health Care discipline enables supervised practice in pharmaceutical care and technical-managerial activities in outpatient services. Finally, the Deontology and Legislation discipline allows contact with the specific legislation of the pharmaceutical profession, as well as the Code of Ethics and the pharmacist's civil accountability. The abovementioned disciplines are mandatory and add up to 240 hours of student training, which represents 8.44% of the total hours.

Regarding the disciplines focused on person-centered care, all Pharmacy students reported that Oriented Activity V allows the development of clinical competencies, as reported by PE4:

*"Through Oriented Activity V, we can understand the medication use, the medication action, what the patient who uses the medication can feel and how we should interact with the patient who uses the medication".*

Other disciplines mentioned as important theoretical bases for care were Pharmaceutical Pharmacology I and II, which address drug action in the body, drug interactions and adverse reactions, and Pharmaceutical Chemistry, which deals with the relationship between chemical structure, physical-chemical properties and biological drug activity.

Overall, Pharmacy students stated that the pedagogical plan of the course does not sufficiently encompass person-centered care, as stated by PS5: "The curriculum needs to be reformulated, because I feel that it is too focused on the industry or the laboratory area and that part of care is lost".

### Development of clinical competencies

When asked about the clinical skills developed during their academic career, considering the disciplines and extracurricular activities, eight (72.73%) of the interviewees

mentioned scientific knowledge and six (54.55%) mentioned updating their scientific knowledge. Additionally, four (36.36%) highlighted effective communication. On these points, PS2's speech on the subject Oriented Activity V stands out:

*"It is great to learn, because you see different points of view with a scientific theoretical basis, so it is not just any information that you are reading, and then you are adding up the information, putting it together, and that, for you to make an intervention or give your opinion on something, will help you a lot, you will have in mind several points of view and situations that will help you choose the best therapy or non-therapeutic treatment, as well".*

### Medical students and their impressions

#### Feeling of confidence in the face of medical duties

When asked about their current level regarding the statements, nine (64.29%) of the 14 medical students rated themselves as being well prepared to gather medical history and perform physical examination (EPA 1) and ask clinical questions to improve patient care (EPA 7). Ten (71.43%) students thought they were able to document the clinical meeting (EPA 5). Despite that, seven (50.00%) reported feeling unprepared to prioritize a differential diagnosis during the medical investigation (EPA 2), perform diagnostic tests and patient screening (EPA 3), type and discuss orders and prescriptions with the health team professionals, caregivers and the patient (EPA 4) and identify flaws in the safety system and culture (EPA 13) (Figure 2).

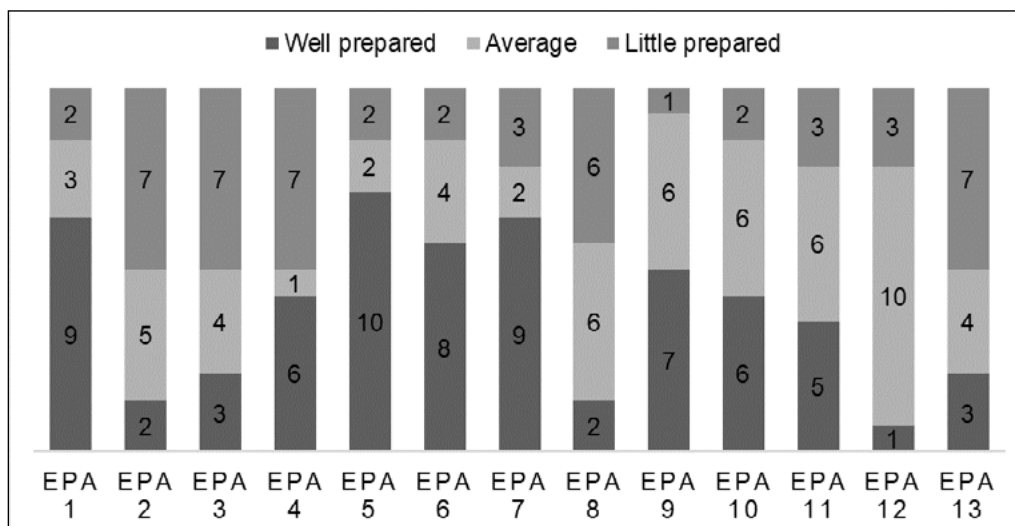
When interviewed, the students stated feeling insecure about medical practice and were willing to undergo continuous training, as seen in the speech of Medical Student (MS) 1: "Feeling safe, having learned everything and mastering all techniques, certainly not, but I undergo training during the care activities". Still, there was an ambition on the part of the student to act independently, as reported by MS2:

*"I really value the experience I'm going to have as an autonomous physician, because today I'm not an autonomous professional, I'm still receiving training from a preceptor, I end up having to do the things they want, the competencies they want, the way they deem to be correct. Sometimes I cannot be 100% my version of a doctor because of that."*

### Person-Centered Care during Undergraduate School

The pedagogical plan of the Medicine course has 11 disciplines focused on the "Medicine: Science and Profession" axis, present in the 2014 National Curriculum Guideline, which is currently being used in the course<sup>29</sup>. In these disciplines, students are trained in patient care, namely: (a) Laboratory of Clinical Competencies I, II and III, which address the development of skills and knowledge related to patient anamnesis, such



**Figure 2.** Self-assessment of medical students on the Entrustable Professional Activities statements.

Abbreviation: EPA: Entrustable Professional Activities.

as approaching the patient, performing the physical exams and interpretation of imaging exams; (b) Semiology I, II and III, which include the construction of the doctor-patient relationship, as well as the development of skills related to the anamnesis, physical examination of the patient and skills for interprofessional teamwork; (c) Pediatric Semiology, where the concepts and bases of child and adolescent care are studied, as well as anamnesis and physical examination of this type of patient; (d) Psychosocial Bases of Work in Health I and II, which address psychology, subjective relationships in health and disease processes and communication skills, as well as the understanding of social relationships and health and disease processes; (e) Medicine: Science and Profession, which includes the development of communication skills, posture and attitudes of medical practice; and (f) Integrative Health Training, which explains interprofessionality and collaborative practices in care. Of these, only the last one is an elective course. These disciplines total 630 hours of student training, which represents 8.13% of the total hours of the course.

The medical students associated the social disciplines with Person-Centered Care. MS2 highlighted the importance of what they learned in Clinical Skills Laboratory I: "We do not learn to diagnose, examine, however much the objective may be, but how to perform the initial patient management, asking for permission, these minimal skills that bring a whole fluency to the clinical interview. This Laboratory was very important".

As a limiting factor, the students understood that there is no integration between theory and patient care, as reported by MS3: "There is a lack of integration of knowledge, we study each thing in a very fragmented way, so it turns out there is no way to integrate it". MS4 added: "The disciplines that bring out

this human aspect of us are only taught at the beginning of the course and at the end we kind of lose it".

### Development of clinical competencies

The students reported the importance of extracurricular activities to develop clinical competencies, as seen in the speech of MS5:

*"We start to realize that it is not just what I am learning in the classroom, this is of great importance, but we still require more 'baggage', which we learn by visiting patients, going to the Family Health Strategy, doing events, really knowing who is in there".*

When asked about the clinical competencies developed during their academic career, considering disciplines and extracurricular activities, nine students (90%) mentioned empathy, compassion, integrity and respect, eight (80%) mentioned effective communication and five (50%) highlighted anamnesis and obtaining sociocultural information.

Regarding the "Scientific knowledge" competency, MS4 stated: "I think the University gave me a lot of technical knowledge", speech complemented by MS6: "There is a lot of knowledge, it will never be enough, there will always be more and more and that is why it is important to always be up to date to provide the patient with the best possible treatment". As for effective communication, MS7 commented:

*"In the beginning, I was very narrow-minded about doing everything right, saying things in the right way, you can't be disrespectful and all that. Over time you see how far you can talk to the patient, how you can joke with the patient, after about three months you already know how to create a bond".*

Regarding empathy, compassion, integrity and respect, MS6 reported:

*"You have to know that you are a professional and you have to act professionally, you cannot be too emotional, but at the same time you cannot be stone-hearted and not see the other's side, you must have the middle ground."*

In addition, students were asked about the challenges they observed at the University where they study for the complete development of clinical competencies. The most frequently mentioned challenges were the lack of practice scenarios and inadequate infrastructure, outdated curriculum, as well as little contact with students from other health courses and with health professionals.

MS8 said: "We don't have this kind of space and we don't have a teaching hospital, having a hospital where you can act as your teaching hospital, where people are there to welcome you and not to look down on you". To which MS9 stated:

*"I think that having your own campus would help a lot because we could have more space divided between the courses, more quality spaces for practicing, for discussions, meetings. I think the fact that we don't have practice fields and our own campus is a factor that limits us a lot"*

When comparing the competencies mentioned between Medicine and Pharmacy students, it was observed that Medicine students more frequently described competencies related to direct patient care, whereas Pharmacy students mentioned technical-scientific competencies (Figure 3). It is noteworthy that, for this comparison, the data were analyzed in percentages, so there was the same proportion among the

students of the assessed courses.

### The view of Pharmacy and Medicine students on interprofessional teaching

As for the contact with students from other courses and with health professionals, the students reported that it was scarce, as demonstrated by the speeches of PE5 and MS9, respectively:

*"We talk all the time about a multidisciplinary team out there, but during undergraduate school, it is very fragmented, Medicine over there, Pharmacy over here... I think this is a flaw, because if it is health-related, there should be a way to join them, because out there I will not work by myself"*

*"You will always be working with other professionals, so this means that the patient is treated in a more holistic way, from all sides. At the same time that they are being treated by the psychologist, they are being treated by the nutritionist and by the clinician and they talk to each other, they reach better conclusions for that individual. It is an important competency for the comprehensive care, the individual is being treated from many different perspectives and is being understood in many different ways, so that a consensus can be reached. And I see this competency is not very well explored during professional training"*

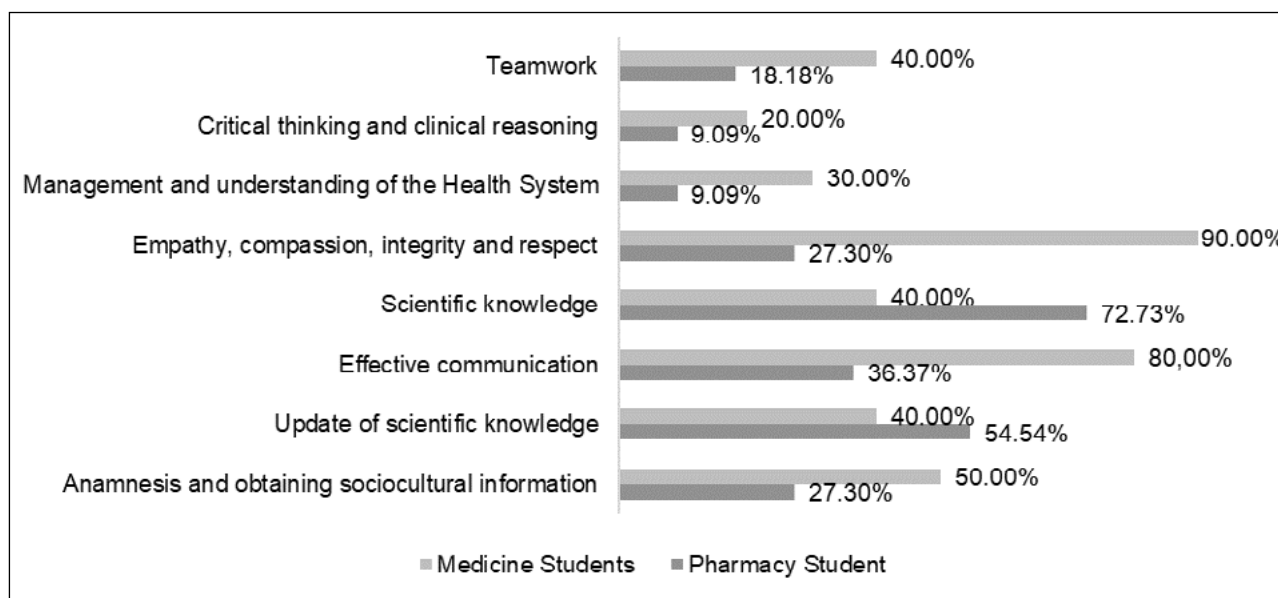
## DISCUSSION

### Pharmacy students and their impressions

#### Feeling of confidence in the pharmacist's role

The EPAs consist of dividing professional practice into activities, aiming to allow the student to develop the necessary competencies<sup>30-32</sup>. In this context, Haines et al. state that a newly

**Figure 3.** Comparison between the competencies mentioned by Medicine and Pharmacy students, respectively (in percentages).



graduated pharmacist should be able to perform EPA activities without the supervision of a preceptor<sup>23,33</sup>.

The work by Cipolle, Strand and Morley allowed the understanding that it is necessary to reformulate the philosophy of the pharmaceutical professional practice, aiming to centralize the patient and their pharmacotherapy<sup>9,34</sup>. In Brazil, the change in the profile is still taking place, so that only in 2017 the Ministry of Education recognized the need to change the DCN to meet this demand<sup>35</sup>. These guidelines had not been implemented at the time the study was carried out, which may explain the students' insecurity regarding EPAs 4 and 7, which deal with the implementation of the care plan and identification of patients at risk of prevalent diseases in a population, respectively. In this context, a study identified that Pharmacy students had difficulties in applying the theoretical knowledge developed in undergraduate school during the reasonable decision-making process in pharmacotherapy<sup>12</sup>.

Although the pedagogical plan of the course does not comply with the new curricular guidelines, most students felt able to follow and monitor the care plan, maximize the appropriate use of medication in a population and educate patients and colleagues on the appropriate use of medications. These findings may be the result of academic projects in which these students participated, as well as mandatory internships, since contact with patients allows greater student confidence and development of competencies related to these EPAs. In 2019, Lounsberry et al. observed that the greater the number of meetings with patients, the more confident the students felt about their skills<sup>36</sup>.

Regarding EPAs 10 and 12, which concern ensuring that patients were immunized and using evidence-based information, respectively, students demonstrated greater confidence. This finding may reflect the scientific profile advocated by the 2002 DCN<sup>28</sup>. Additionally, Pittenger et al. observed that as the undergraduate student progresses in the course, aiming to gain experience and knowledge, the more confident they feel in relation to the performed activity<sup>21</sup>.

### Person-Centered Care in Undergraduate School

In the evaluated Pharmacy course, the disciplines focused on the development of clinical competencies and care represent less than 10% of the total course workload. This finding is not unique to the studied university, since Rios et al. (2017) noted that most HEIs did not have essential items for clinical practice. Thus, they found in their study the presence of gaps in theoretical transfer, knowledge and interpersonal communication. It also showed that, in the evaluated HEI, there were no key disciplines and practice was scarce, as well as poorly prepared professors<sup>19</sup>. In another study, it was also

observed that Pharmacy students had deficiencies in previous training on pathophysiology, semiology and pharmacotherapy, disciplines that are crucial for the provision of high-quality clinical service<sup>12</sup>.

In the present study, it was observed that the students sought to correlate the disciplines studied with care, even if there was no direct connection. This may be associated with teachers who seek to add their knowledge to the practice of care, as well as the exposure of these students to scenarios that enabled their development, such as internships and academic projects with meetings with patients.

### Development of clinical competencies

Saseen et al. uphold that the clinical pharmacist should be competent in six domains: direct patient care, knowledge about pharmacotherapy, evidence-based health, epidemiology, communication, professionalism and continuous professional development. That is, in addition to understanding pharmacotherapy and its optimization, the pharmacist must develop soft skills, which enable the clinical practice. Moreover, the authors comment that, currently, clinical pharmacists seek to obtain these competencies after graduation<sup>37</sup>. Based on these findings, it seems that the assessed students do not see themselves as having the six domains necessary for clinical performance. The main competency described is in terms of theoretical knowledge, which is the result of the pedagogical plan aimed at intellectual and scientific rigor<sup>28</sup>.

Some students mentioned the development of effective communication, which goes against the findings of another Brazilian study that observed, among the assessed students, little dedication in the acquisition of competencies related to interpersonal communication<sup>19</sup>. In addition, Araújo et al. identified, through document analysis, gaps in undergraduate Pharmacy curricula in Brazil in relation to the development of communication skills<sup>38</sup>.

### Medical students and their impressions

#### *Feeling of confidence in the physician's role*

In the medical profession, EPAs constitute activities that represent the professional's everyday life, as well as situating skills and milestones in the current clinical context. In addition, it turns the practical assessment of students and interns into meaningful activities and increases perceptions of confidence and supervision during the assessment<sup>39-41</sup>. Regarding the EPAs, the students felt well prepared in activities that involve soft skills. These are behavioral, cultural and socioemotional skills, which allow the development of collaborative, integrative and creative competencies<sup>42</sup>. That is, they are competencies that facilitate relationships and bonding, such as activities



related to obtaining the patient's medical history, clinical questions and documentation of the clinical meeting. It is believed that disciplines that foster the creation of bonding and understanding of human beings in a holistic manner, such as the Clinical Skills Laboratory, facilitated the improvement of these competencies by the assessed students.

On the other hand, students feel unprepared in EPAs that involve hard skills, that is, motor, technical and technological skills that are specific to each area of expertise<sup>42</sup>. In this sense, insecurity can originate from scarce practice and inadequate infrastructure for the development of competencies related to these skills. The study by Brinkman et al. corroborates these findings, since in these studies the students did not feel well prepared for the hard skill related to prescribing medications<sup>15,43,44</sup>. Also, the authors stated that students have deficiencies in preparation, confidence, knowledge and skills related to drug prescription. In the present study, the findings were similar and it is believed that a strategy for developing confidence when prescribing is the possibility of greater contact between medical students and pharmaceutical professionals.

### Person-Centered Care in Undergraduate School

Person-centered care is not mentioned in the course's pedagogical plan; however, it highlights eleven disciplines that involve the development of skills for patient care. Despite this, these disciplines are concentrated at the beginning of the course and represent a low total workload when compared to specific areas. Prado et al. observed that medical students who experience this curriculum from general education to emphasis on specialization and specific training are less likely to engage in collaborative activities with other health professionals<sup>7</sup>. Regarding the emphasis on specialization, the students complained about the fragmentation of knowledge, since the disciplines that integrate the knowledges are present in the first years of the course

### Development of clinical competencies

Regarding the challenges for the complete development of competencies, the students highlighted the lack of practice scenarios, inadequate infrastructure, outdated curriculum and little interprofessional contact. Regarding the scenario and infrastructure, the campus where the assessed medical course is located is a new one, having been founded in 2012. Also, there are gaps in terms of physical space, and many performance scenarios and practical classes depend on university agreements with the City Hall and hospital entities. However, it is known that a teaching hospital facilitates teaching and clinical experience, and also provides students with a greater sense of responsibility, in addition to stimulating intrinsic motivation<sup>45</sup>.

As for the curriculum, many of the participants attended the course during the transition from the pedagogical plan of the previous course to the current one, which may justify the statements in relation to outdatedness.

### The view of Pharmacy and Medicine students on interprofessional teaching

Interprofessional collaboration can optimize patient care, as well as improve pharmacotherapeutic results<sup>6-8,46</sup>. The assessed students reported a lack of interaction with students from other health courses, as well as with health professionals. This finding is not restricted to the analyzed scenario, since there are national and international reports on the same topic. In 2016, Shelvey et al. researched medical students' impressions of interactions with pharmacy students. What they found was that 17 (94.4%) students found the relationship a positive one, making learning more effective; they also identified positive points in the colleague from the future multidisciplinary team, emphasizing that they had a logical and structured approach to problem-solving. Moreover, they pointed out that they changed their perspectives on the pharmacist's role in the team<sup>47</sup>.

Cunha et al. noted that there is a gap in the physician-pharmacist relationship, which must be filled by developing attitudes of mutual respect between professionals. Furthermore, they found that there is an emerging need for interdisciplinary education and interprofessional collaboration during undergraduate Pharmacy and Medicine schools<sup>8</sup>. Prado et al. found that the more the medical student advances towards graduation, the lower their positivity is in relation to collaborative attitudes. This occurs due to the emphasis on specialization, as well as the influence of preceptors who encourage the professional's isolated performance. Furthermore, they observed that the Pharmacy student has a better viewpoint of the Medical student, while the latter does not fully understand the pharmacist's role<sup>7</sup>.

The lack of collaboration between students can lead to health professionals not being able to integrate a health team. Mercer et al. carried out a qualitative research with pharmacists and physicians and observed that when they work in the same environment, the pharmacist tends to seek a professional relationship with the physician, due to the familiarity and easy access. Through the relationship, it is possible for the pharmacist to demonstrate their knowledge, which makes the doctor have a good relationship with this pharmacist; however, collaboration is not enough for physicians to transfer their good impression to other professionals<sup>6</sup>.

When compared to the competencies mentioned by Pharmacy students, it is observed that Medicine students showed greater development in competencies related to

patient care and soft skills; in parallel, Pharmacy students mentioned competencies associated with hard skills, that is, technical-scientific competencies applied to the area of Pharmacy. It is understood that extracurricular activities allow a greater acquisition of clinical competencies, since it requires from the student: knowledge, skills and attitudes that go beyond the theory-practice required for approval at the disciplines. Also, the students' contact with the community in which they are inserted fosters the development of soft skills, such as empathy, compassion, integrity, respect and effective communication. In addition, the search for scientific knowledge lays the groundwork for hard skills, such as carrying out anamnesis and technical knowledge.

## FINAL CONSIDERATIONS

The study demonstrated that the assessed Medicine and Pharmacy students had several insecurities, mainly related to clinical skills that require practice. Despite this fact, medical students showed greater acquisition of soft skills, which can facilitate bonding with patients and result in quality of care. Both courses showed challenges in relation to practice scenarios, a fact that can compromise the training of health professionals.

The present investigation was the first qualitative and quantitative study to be carried out at the evaluated HEI and allowed us to understand the profile of Pharmacy and Medicine students, aiming to encompass facts and subjective experiences. With the obtained results, it becomes possible to discuss the teaching and training these students have received. Study limitations include the format in which data were collected due to the COVID-19 pandemic, as well as the small number of participants from each course. Future studies are needed to evaluate the formation of clinical competencies after the implementation of the new DCNs in these courses.

## AUTHORS' CONTRIBUTION

Letícia Guedes Morais Gonzaga de Souza: research project design and performance; survey, tabulation and analysis of data; interpretation of results; writing of the article and approval of the version to be published. Isadora Lulio and Lucas Ferreira Escala: research project performance; data analysis; interpretation of results and approval of the version to be published. Simone Araújo Medina Mendonça and Carina Carvalho Silvestre: research project design and performance, study conception; study design; interpretation of results; critical review of the article and approval of the version to be published.

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The authors declare no conflicts of interest.

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