

Students' perception of learning in an internship in community pharmacies

Percepções de estudantes sobre a aprendizagem em um estágio em farmácias comunitárias

Percepciones de los estudiantes sobre el aprendizaje en una pasantía en farmacias comunitarias

Received: 07/12/2022 | Reviewed: 07/26/2022 | Accept: 07/28/2022 | Published: 08/06/2022

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Abstract

Objective: The aim of this study was to evaluate the perception of pharmacy undergraduate students about the learning developed in an internship in community pharmacies designed based on experiential learning theory. **Methods:** This was an observational study. Data were collected through a questionnaire with pharmacy internship students (n=129), including items about the student's perception of the achievement of learning objectives and methods. Quantitative and qualitative analysis of the data were performed. **Results:** Most undergraduates agreed that the internship increased their understanding of the current profile of pharmacists and their responsibilities in the community pharmacy, prepared them for patient care and fostered critical assessment and ability to propose improvements. Students supervised by preceptors who performed clinical services were more likely to agree that the internship achieved the learning objective of preparing them for care. **Conclusion:** The majority of students agreed that the learning outcomes were achieved. The findings can contribute to improvements in internship programs, such as qualifying the practice sites.

Keywords: Community pharmacy services; Education, Pharmacy; Problem-based learning; Teaching.

Resumo

Objetivo: O objetivo deste estudo foi avaliar a percepção de graduandos de farmácia sobre a aprendizagem desenvolvida em um estágio em farmácias comunitárias delineado com base na teoria da aprendizagem experiencial. **Métodos:** Trata-se de um estudo observacional. Os dados foram coletados por meio de um questionário com alunos do estágio de farmácia (n=129), incluindo itens sobre a percepção do aluno sobre o alcance dos objetivos e métodos de aprendizagem. Foi realizada análise quantitativa e qualitativa dos dados. **Resultados:** A maioria dos graduandos concordou que o estágio ampliou sua compreensão sobre o perfil atual do farmacêutico e suas responsabilidades na farmácia comunitária, preparou-o para o cuidado ao paciente e promoveu avaliação crítica e capacidade de propor melhorias. Alunos supervisionados por preceptores que realizavam atendimentos clínicos foram mais propensos a concordar que o estágio atingiu o objetivo de aprendizagem de prepará-los para o cuidado. **Conclusão:** A maioria dos alunos concordou que os objetivos de aprendizagem foram alcançados. Os resultados podem contribuir para melhorias nos programas de estágio, como a qualificação dos cenários de prática.

Palavras-chave: Serviços de farmácia comunitária; Aprendizagem baseada em problemas; Educação em farmácia; Ensino.

Resumen

Objetivo: El objetivo de este estudio fue evaluar la percepción de estudiantes de farmacia sobre el aprendizaje desarrollado en una pasantía en farmacias comunitarias diseñada con base en la teoría del aprendizaje experiencial. **Métodos:** Este fue un estudio observacional. Los datos fueron recolectados a través de un cuestionario con estudiantes de pasantía de farmacia (n=129), que incluyó ítems sobre la percepción del estudiante sobre el logro de los objetivos de aprendizaje y los métodos de aprendizaje. Se realizaron análisis cuantitativos y cualitativos de los datos. **Resultados:** La mayoría de los estudiantes coincidieron en que la pasantía aumentó su comprensión del perfil actual de los farmacéuticos y sus responsabilidades en la farmacia comunitaria, los preparó para la atención al paciente y fomentó la evaluación crítica y la capacidad de proponer mejoras. Los estudiantes supervisados por preceptores que realizaron servicios clínicos tenían más probabilidades de estar de acuerdo en que la pasantía logró el objetivo de aprendizaje de prepararlos para el cuidado. **Conclusión:** La mayoría de los estudiantes estuvo de acuerdo en que se lograron los objetivos de

aprendizaje. Los resultados pueden contribuir a mejoras en los programas de pasantías, como calificar los sitios de práctica.

Palabras clave: Servicios de farmacia comunitarios; Aprendizaje basado en problemas; Educación en farmacia; Enseñanza.

1. Introduction

Community pharmacy is considered a health establishment with wide access by the population and where most of the pharmacists are concentrated. According to a survey carried out in 2017 by the International Pharmaceutical Federation, with the participation of 74 countries, around 75% of the 2.3 million active pharmacists worked in community pharmacies (International Pharmaceutical Federation, 2017). Based on this premise, it is necessary to provide solid training to pharmacy undergraduates, introducing students to the skills for their professional performance in community pharmacy (Oliveira *et al.*, 2017).

Professional practices are part of pharmaceutical education in several countries, such as internship in the United Kingdom and Australia (Marriott *et al.*, 2008; Sosabowski *et al.*, 2008) and Advanced Pharmacy Practice Experiences (APPE) in the United States of America (USA) (American College of Clinical Pharmacy, 2012). In Brazil, according to the National Curriculum Guidelines for the Pharmacy program reformulated in 2017, internships should represent at least 20% of workload of the course (Ministry of Education of Brazil, 2017). In the context of internships or practical experiences, learning can be developed following the precepts of experiential learning.

Experiential learning, according to Kolb (Kolb, 1984; Kolb, 2015), is a holistic and integrative perspective, combining experience, perception, cognition and behavior. In this theory, the interaction of theoretical and experimental knowledge is necessary for the development of professionals (Kolb, 1984; Kolb, 2015). Kolb proposed an experiential learning model, based on four steps: (1) concrete experience - learning through experimentation, practical situations; (2) reflective observation - learning through observation and reflection of experienced situations; (3) abstract conceptualization - an association, through reasoning, between assimilated theory and lived experience; (4) active experimentation - learning that occurs through real practice, with applying of knowledge (Kolb, 1984; Kolb, 2015). These four stages are involved in a continuous cycle of learning (Pimentel, 2007). The internship or professional practice is based on experiential learning when students reflect about their concrete experiences, associate them with theory, formulate knowledge and take decisions and solve problems applying the acquired knowledge and skills (Dubón *et al.*, 2021).

In addition, practical experiences carried out by students enable an integration between teaching, service and community, leading to a humanized formation (Santos *et al.*, 2021). The Teaching-Service-Community Integration Practices (PIESC) aim to connect the student to the community, with the purpose of developing a critical view of the place of work and, with this, enabling the establishment of empathy between the involved ones (Santos *et al.*, 2021; Brandão *et al.*, 2013). Therefore, it is relevant for formulation of educational policies and teaching practices, as well as for improving the knowledge related to educational training.

Studies highlighted the learning and the development of skills through practical experiences in community pharmacies (Wallman *et al.*, 2011a; Wallman *et al.*, 2011b; Romani, 2020; Kim *et al.*, 2019; Alnajjar & Mohammed, 2020). However, these studies didn't evaluate in depth students' perception of learning through quantitative and qualitative methods and they didn't present practical experiences designed on the basis of the Kolb's experiential learning theory.

The aim of this study was to evaluate the perception of pharmacy undergraduate students about the learning developed in an internship in community pharmacies developed based on experiential learning. As a secondary objective, it was intended to analyze the factors associated with the achievement of the learning outcomes perceived by the students.

2. Methodology

The present study is defined as an observational and descriptive study with a quantitative and qualitative approach, carried out through questionnaires applied to undergraduates in the last year of the Pharmacy course at the Federal University of Minas Gerais (UFMG), enrolled in a mandatory internship in community pharmacy. The descriptive observational study aims to authentically present the phenomenon or population group studied, often using standardized data collection through questionnaires (Gil, 2017). In order to assess the student's perception in greater detail, it was decided to analyze the results found both by the quantitative approach, with pre-established variables in the questionnaires, and by a qualitative evaluation of the comments made by the undergraduates in the questionnaires.

Study context

The study was developed in the undergraduate Pharmacy program at the Federal University of Minas Gerais (UFMG), Brazil. The program spans 10 semesters for the day course and 13 semesters for the evening course. The community pharmacy internship (Pharmacy Internship I) is a mandatory curricular component in the final year of the course, with a workload of 375 hours, which can be completed in public or private community pharmacies.

The learning outcomes established by the professors for the internship in community pharmacy since 2016 are: 1) the development of understanding of the pharmacists' current profile and their responsibilities in community pharmacies; 2) critical assessment and ability to propose improvements; and 3) the development of skills for patient care in the community pharmacy. The learning activities in the internship were designed according to four steps of Kolb's experiential learning theory and were described in the Table 1.

Table 1 - Internship`s learning activities and their relationship with steps of experiential learning.

Step of experiential learning	Learning activity
Concrete experience	<ul style="list-style-type: none"> ➤ Observation by interns of the pharmaceutical activities in the practice site, such as acquisition, storage, distribution, dispensing, provision of clinical pharmaceutical services and counseling to patients on the use of medicines ➤ Performing pharmaceutical tasks by the students under preceptor`s supervision in the practice site
Reflective observation	<ul style="list-style-type: none"> ➤ Discussion about the internship experience with students and professors ➤ Report by the interns of the activities performed during the internship, with reflection about competencies developed
Abstract conceptualization	<ul style="list-style-type: none"> ➤ Feedback of preceptor about student`s performance on pharmaceutical tasks ➤ Critical analysis of storage conditions in the practice site, with a comparison between the situation observed and technical and legal requirements ➤ Critical analysis of the profile of medicines most dispensed in the practice site, with a description of epidemiological and social factors that can influence the use of medicines ➤ Critical analysis of process of stock control and dispensing of controlled medicines, with a comparison between the situation observed and technical and legal requirements ➤ Critical analysis of process of interchangeability between branded and generic medicines in the practice site, with a comparison between the situation observed and technical and legal requirements ➤ Discussion about clinical cases accompanied during the internship, with a critical analysis of the clinical conditions and context of the patient and of the pharmaceutical intervention performed to address patient`s needs ➤ Description and critical analysis of the pharmaceutical activities in the practice site (selection of medicines, acquisition, storage, distribution, dispensing, provision of clinical pharmaceutical services and counseling to patients on the use of medicines)
Active experimentation	<ul style="list-style-type: none"> ➤ Proposition by the students of improvements for pharmaceutical services in the practice site ➤ Performing by the students of improvements for pharmaceutical services in the practice site

Source: Authors.

Study sample

All undergraduate students enrolled in the first semester (March to June) of 2017 and 2019 in the Pharmacy Internship I subject were included. The number of students who met these inclusion criteria was 66 students in 2017 and 77 students in 2019, totaling 129 interns.

Data collection

The instrument used in the research was a self-administered questionnaire developed by a pharmacist with experience in community pharmacy. Two professors responsible for the internship in community pharmacy evaluated and reviewed the instrument. The questionnaire consisted of questions divided into three parts: characterization of the student (sex and age); characterization of the practice site (performance of clinical pharmaceutical services by the preceptor and number of patients attended per day in the pharmacy); and assessment of the student's perception of learning outcomes of the internship. Clinical services considered in the current study were the ones listed in legislation from Brazilian National Health Surveillance Agency, such as pharmaceutical care and measurement of physiological and biochemical parameters (Brazil, 2009).

The assessment of the student's perception of learning was carried out by three items, corresponding to each of the three learning outcomes established by the professors for the internship. In the measurement, a 5-point Likert scale was used, which ranged from "strongly disagree" to "strongly agree". For all items of the instrument, there were fields for students to make any comments they considered relevant.

The application of questionnaires to the undergraduate students was carried out in the first semester (March to June) of 2017 and 2019. The questionnaires were delivered printed to the students after one face-to-face meeting that took place at the end of the internship.

Data analysis

The collected data were entered into a Microsoft Excel spreadsheet and analyzed using Epi Info 7 software. To guarantee the quality of the data, these were entered twice by two researchers. The analysis of data obtained in the questionnaires was performed using descriptive statistics with frequencies for the nominal and ordinal variables and measures of central tendency (mean and median) and variation (standard deviation) for the numerical variables.

The factors associated with the perception of the achievement of each of the three learning outcomes were assessed through multivariate binary logistic regression, with calculation of odds ratio (OR) values. In this analysis, the students' statement about the scope of each of the three learning objectives was considered as a dependent variable, with the answers "I agree" or "I strongly agree" receiving a value of 1 and the other answers, a value of zero. Independent variables included gender (female or male), age group (with two options: less than median, equal to or above median), clinical services performed by the preceptor pharmacist (yes or no) and patients per day attended (value 1 for more than 100 patients and value 0 for 100 or less patients). The multivariate binary logistic regression model was chosen because the dependent variable (achievement of learning outcome) was binary and the researchers intended to analyze the association of each independent variable with the learning outcome, controlled for other independent variables. A 95% confidence interval (95% CI) and a significance level of 5% were considered.

Student comments on items on the Likert scale were grouped into themes according to Bardin's content analysis (Bardin, 2011). Content analysis of the transcribed text was conducted by two independent coders. Disagreements between the coders were discussed and solved by consensus.

Ethical aspects

The project was approved by the ethics committee of the institution of the study.

3. Results

At the end of the semester, questionnaires were applied to students who completed the Internship in Pharmacy course. It is worth noting that there was no obligation for undergraduates to participate in the research.

During the data collection period, 143 students attended the internship and of these 129 (90.2%) answered the questionnaires. Thirty and seven undergraduates filled comments about the items of the questionnaire. Sixty-three students participated in 2017 and 66 in 2019. The age of the students ranged from 21 to 44 years, with an average of 25.6 years (standard deviation: 4.1) and a median of 25.0 years. One hundred and one students (78.3%) were female.

Regarding the practice site, in 66 (51.2%) pharmacies the daily number of patients attended per day was over 100. It was observed that 94 (72.9%) students were supervised by pharmacists who performed clinical services.

Through content analysis of the comments from 37 students, three themes of perceived learning and three themes of learning activities emerged. Some students pointed the benefits of the learning activities, such as the preparation of an activity report and discussions about the internship experience and clinical cases. The themes were summarized in Table 2 with examples of quotes.

Table 2 - Themes emerged from comments of pharmacy students.

Themes	Examples of quotes
Themes of perceived learning	
Comprehension of the pharmacist's current profile	`My pharmacy did not offer clinical services and I believe that this is necessary for that understanding` [Student 20] `We go to the internship without much knowledge of our role, making the internship a relevant tool` [Student 36] `It was impactful for me. It really changes my view of pharmacist's performance` [Student 61]
Lack of preparation for patient care	`To perform the internship in a drugstore compromised the aim (of prepare to care), because of need of dealing with market and commercial issues` [Student 57] `Not only because of the internship. I think there should be more focus on care during the course` [Student 27A] `The internship's workload allows the acquisition of new knowledge and skills, but it does not allow them to be consolidated` [Student 7A]
Proposals for improvements	`For all clinical services in which I had critics, I had the opportunity to meet with pharmacist and owner and present my point of view` [Student 17A] `Despite I had proposed improvements, pharmacy staff was not interested in updates and changes` [Student 20A]
Learning activities	
Preparation of the internship report	`During the internship, I performed theoretical searches and could reassure my knowledge` [Student 27A] `Through the report, I could acquire knowledge in activities that I had less contact` [Student 36]
The analysis of clinical cases	`The clinical case let us to search in websites or books about the conduct for the clinical situation, and this develops knowledge` [Student 36]
The face-to-face debate on the internship experience	`The change of experiences is very enriching. It develops knowledge` [Student 21A] `I could know situations that I did not live during my internship` [Student 50]

Source: Authors.

Table 3 shows the proportions of responses to statements related to students' perceptions of learning in the internship. It was observed that 126 (97.7%) students agreed or strongly agreed that the internship increased their understanding of the,

current profile of the pharmacists and their responsibilities. In the qualitative analysis of the comments related to this statement, some students commented that they changed their view of the pharmacist's role in community pharmacy. However, in one report, limitations were identified for this comprehensive understanding of pharmaceutical performance, due to the lack of provision of clinical services in the practice site.

Table 3 – Students' perception of learning outcomes in an internship in community pharmacies (N = 129).

Learning outcomes	1	2	3	4	5
	Strongly disagree	Disagree	Do not agree nor disagree	Agree	Strongly agree
	N (%)	N (%)	N (%)	N (%)	N (%)
The internship increased my understanding of the pharmacists' current profile and their responsibilities in community pharmacies.*	0 (0.0)	0 (0.0)	1 (0.8)	34 (26.8)	92 (72.4)
During the internship, I performed a critical analysis of the pharmacy activities and I am able to propose measures to improve their execution. †	0 (0.0)	3 (2.3)	9 (7.0)	62 (48.4)	54 (42.2)
The knowledge and skills developed through the internship prepared me for patient care in the community pharmacy.*	0 (0.0)	10 (7.9)	16 (12.6)	57 (44.9)	44 (34.7)

*2 participants did not respond the item. The proportion in this item was calculated considering 127 participants as the denominator. The sum did not totalize 100% because of the rounding

† 1 participant did not respond the item. The proportion in this item was calculated considering 128 participants as the denominator. The sum did not totalize 100% because of the rounding
Source: Romani (2020).

Regarding the preparation for patient care, ten students (7.9%) disagreed that the internship could lead to the development of this skill. According to the reports, this may have occurred due to limitations of the undergraduate course in Pharmacy or of the internship. In relation to the pharmacy, one report indicated that the development of clinical skills during the internship was compromised due to the different management and commercial activities that the preceptor pharmacist develops. Some students argued that the internship's workload in pharmacy was not enough to develop clinical skills. One intern reported that the undergraduate course in Pharmacy did not provide opportunities to build clinical competences.

During the internship, 116 (90.0%) students agreed or strongly agreed that they performed a critical analysis of the pharmacy activities and were able to propose measures to improve their execution. However, one intern pointed that professionals of pharmacy were not interested in performing changes in pharmacy's services.

In Table 4, it was observed that none of the characteristics of the student and the internship showed a statistically significant association with the students' perception of the achievement of two learning objectives: an objective related to increasing the understanding of the pharmacist's role and responsibilities and another objective about critical analysis and proposal of improvements. However, the performance of clinical services by the preceptor pharmacist showed a positive and significant association with the student's perception of achieving the learning objective related to the preparation for patient care. Students supervised by pharmacists who performed clinical services were 3.25 times more likely to agree or strongly agree that the internship achieved the learning objective of preparing them for care, compared with those who did not have this supervision profile.

Table 4 – Factors associated with students' perception of learning developed in an internship (N=129).

	The student agreed or strongly agreed that the internship provided...								
	...an increased understanding of the pharmacists' profile and their responsibilities in the community pharmacy			...preparation for patient care in the community pharmacy			...critical analysis of pharmacy activities and proposals for improvements		
	N(%)‡	Total	OR* (95% CI); p-value	N(%)‡	Total	OR* (95% CI); p-value	N(%)‡	Total	OR* (95% CI); p-value
Sex									
Male	27(96.4)	28		19(67.9)	28		28(100.0)	28	
Female	99(98.0)	101	2.02 (0.16-25.43); p=0.585	82(81.2)	101	2.56 (0.94-6.96); p=0.066	88(87.1)	101	0.00(0.00-infinity); p=0,973
Age									
Less than 25 years	60(96.8)	62		48(77.4)	62		56(90.3)	62	
25 years or older	66(98.5)	67	2.46 (0.21-28.25); p=0.471	53(79.1)	67	1.27 (0.53-3.05); p=0.591	60(89.6)	67	0.94(0.29-3.10); p=0.923
Clinical services performed by e by preceptor pharmacist									
No	34(97.1)	35		23(65.7)	35		29(82.9)	35	
Yes	92(97.9)	94	1.67 (0.13-20.91); p=0.691	78(83.0)	94	3.25(1.27-8.33); p=0.014	87(92.6)	94	2.16 (0.65-7.15); p=0.209
Attendance of more 100 patients per day in the practice site†									
No	59(96.7)	61		45(73.8)	61		53(86.9)	61	
Yes	65(98.5)	66	2.25 (0.20-25.80). p=0.516	54(81.8)	66	1.64 (0.68-3.94); p=0.274	61(92.4)	66	1.97 (0.59-6.59); p=0.270

* The odds ratio (OR) was calculated by comparing the students who agreed or strongly agreed with the statement about achieving the learning objective with the other students. For example, students supervised by pharmacists who performed clinical services were 3.25 more likely to agree or strongly agree that the internship achieved the learning objective of preparing them for care, compared to those who did not have this supervision profile.

† The sum of participants that answered this question was 127

‡ Absolute number and percentage of students who agreed or strongly agreed with the statement about achieving the learning objective, considering each independent variable. For example, 27 (96.4%) male students of 28 men agreed or strongly agreed that the internship provided an increased understanding of the pharmacists' profile and their responsibilities in the community pharmacy

Source: Romani (2020).

4. Discussion

The internship increased the student's understanding of the pharmacist's role in the community pharmacy, a statement with which 97.7% respondents agreed or strongly agreed. Swedish studies pointed to an increased understanding of the pharmacist's role after an internship experience in community pharmacies (Wallman *et al.*, 2011a; Wallman *et al.*, 2011b). According to a survey conducted in South Korea with students who participated in practical experiences in community pharmacy, 93.9% agreed or strongly agreed that the activity provided experience and understanding of the roles and responsibilities of pharmacists (Kim *et al.*, 2019).

With regard to conducting a critical analysis of pharmacy activities and developing proposals to improve their performance, in the perception of the students, the internship was positive. These findings are in agreement with studies conducted in Brazil that, after exposing the student to learning practical settings, they were able to formulate proposals for the qualification of pharmaceutical services (Mendes *et al.*, 2014; Dubón *et al.*, 2021; Tabosa *et al.*, 2021). An APPE experience in United States was reported in the literature, in which students acted as facilitators of transformations in community pharmacy (Smith *et al.*, 2020). Students in the present study experienced the active experimentation step of Kolb's experiential learning model (Kolb, 2015) and tested their accumulation of concrete experience, reflection and conceptualization in the context of the community pharmacy.

The students' perception regarding the preparation for patient care was pointed out as a gap in the internship, with 101 (78.3%) agreeing or strongly agreeing with the statement related to this item. A similar situation was found in a study in South Korea, in which 64.4% students agreed or strongly agreed that they can provide adequate counseling and education on pharmacotherapy and non-pharmacotherapy (Kim *et al.*, 2019). As demonstrated in a study carried out in Brazil, in an analysis of the perception of the student, the course provided them with education as a researcher at the expense of the development of clinical skills (Coelho *et al.*, 2022). In other countries, the profile of pharmaceutical education is different. For example, in Australia and the United States, undergraduate pharmacy programs focus on the effective development of advanced clinical skills for pharmaceutical care (Marriott *et al.*, 2008; Knoer *et al.*, 2016).

As a limitation to the preparation for care throughout the internship, the undergraduates in the current study highlighted the lack of clinical performance of the preceptor pharmacist. These results suggest that in these situations the internship was not considered to be experiential learning in the students' perception. Experiential learning, according to Kolb (Kolb, 2015), demands that the students emerge in an environment that provides them with a concrete experience of professional practice. The preceptor and the practice site are essential elements in this learning. A Swedish study emphasized that the support of the pharmacy team and the performance of the preceptor were fundamental to the learning process in the internship (Wallman *et al.*, 2011b).

Some students pointed the benefits of the learning activities, such as the preparation of an activity report and discussions about the internship experience and clinical cases. These activities provided students with the establishment of connections between acquired theoretical knowledge and professional practice, which are fundamental in an experiential learning process (Kolb, 2015). In the discussions, students could share experiences and give their opinion on different issues. A Swedish study pointed out that discussing their experience with colleagues was one of the student's ways of learning during the internship in community pharmacy (Wallman *et al.*, 2011b).

The performance of clinical pharmaceutical services by the preceptor was associated with the students' perceptions that the internship prepared them for patient care. Observation and reflection on the clinical services performed by the preceptor pharmacist may have increased the students' perception that they are prepared to care for the patient. This situation is an example of how the performance of the preceptor is important to the learning process in an internship.

The present study has some limitations. As data depend on the students' perception, one of the restrictions inherent to this method includes differences in personal factors in relation to the participants' personalities. On the other hand, it is worth

highlighting the potential of this study, such as the use of qualitative and quantitative methods to evaluate of an internship designed based on experiential learning theory, what is addressed by few studies.

5. Conclusion

The majority of students agreed that the learning outcomes of the internship were achieved, increasing their understanding of the current profile of pharmacists and their responsibilities in the community pharmacy, preparing them for patient care and fostering critical assessment and ability to propose improvements. Based on the results, actions are suggested for the qualification of internship programs so that they are effectively experiential learning initiatives and that provide students with the development of professional skills. It is recommended to encourage active learning methods throughout the undergraduate course, including internship programs or professional practice experiences. The change in the selection of practice sites is also recommended, prioritizing those in which the preceptor develops clinical activities.

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