



## The pharmaceutical professional activity of graduated from Universidade Federal de Minas Gerais over time

*Atividade profissional do farmacêutico egresso da Universidade Federal de Minas Gerais ao longo do tempo*

**Cristina M Ruas<sup>1\*</sup>; Edmilson A Pereira Junior<sup>2</sup>**

1 Social Pharmacy Department, Pharmacy Faculty, Federal University of Minas Gerais, Belo Horizonte, Brazil.

2 Postgraduate Program in Education, Education Faculty, Federal University of Minas Gerais Belo Horizonte, Brazil.

**Corresponding author:** Departamento de Farmácia Social, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil. Avenida Presidente Antônio Carlos, 6627. Belo Horizonte/ Minas Gerais. CEP: 31270-901. Phone: +55(31) 3409-6906 / 98559-1706

**Citar:** Ruas C M; Pereira Junior E A. The pharmaceutical professional activity of graduated from Universidade Federal de Minas Gerais over time. **Brazilian Journal of Health and Pharmacy**, v. 3, n. 3, p. 18-27, 2021. DOI: <https://doi.org/10.29327/226760.3.3-3>

*Data de Submissão: 31/05/2021; Data do Aceite: 21/09/2021*

---

### ABSTRACT

The objective is to verify changes in the professional performance of pharmacists over time, taking into account the work area, the graduation period, the professional relationship and continuing education. We used data obtained from an online interview responded by 491 pharmacists graduated from the UFMG Pharmacy course. In the four graduation periods analyzed, the public health area was the most prevalent among those graduated until 1989, and in the 2000-2009 period, the community pharmacy or drugstore was the largest category among graduates from 1990 to 1999 and the hospital pharmacy was the central area of activity among graduates in the 2010-2017 period. While public workers represented almost all of the public health worker category, CLT contract prevailed in most of the pharmacists in the industry and pharmacies or drugstores. The highest rate of pharmacists who attended masters or doctorates degrees was obtained from those trained in the 2000-2009 period. The proportion of masters'/doctors' degrees among those working in teaching or research institutions was much higher than the other areas. It is necessary to monitor professional performance change. Thus, the education institutions should foster actions in relevant areas, such as public health, and not only the private market. The objective is to verify changes in the professional performance of pharmacists over time, taking into account the work area, the graduation period, the professional relationship and continuing education. We used data obtained from an online interview responded by 491 pharmacists graduated from the UFMG Pharmacy course. In the four graduation periods analyzed, the public health area was the most prevalent among those graduated until 1989, and in the 2000-2009 period, the community pharmacy or drugstore was the largest category among graduates from 1990 to 1999 and the hospital pharmacy was the central area of activity among graduates in the 2010-2017 period. While public workers represented almost all of the public health worker category, CLT contract prevailed in most of the pharmacists in the industry and pharmacies or drugstores. The highest rate of pharmacists who attended masters or doctorates degrees was obtained from those trained in the 2000-2009 period. The proportion of masters'/doctors' degrees among those working in teaching or research institutions was much higher than the other areas. It is necessary to monitor professional performance change. Thus, the education institutions should foster actions in relevant areas, such as public health, and not only the private market.

**Palavras-chave:** Pharmacy; Education, Pharmacy; Continuing Education.

## RESUMO

O objetivo deste artigo é verificar mudanças na atuação profissional do farmacêutico ao longo do tempo, levando em consideração a área de atuação, o período de graduação, a relação profissional e a formação continuada. Foram utilizados dados obtidos em entrevista online respondida por 491 farmacêuticos graduados pelo curso de Farmácia da UFMG. Nos quatro períodos de graduação analisados, a área de saúde pública foi a mais prevalente entre os formandos até 1989 e, no período de 2000-2009, a farmácia comunitária ou drogaria foi a maior categoria entre os formandos de 1990 a 1999 e a farmácia hospitalar foi a área central de atuação dos diplomados no período 2010-2017. Enquanto os servidores públicos representavam quase todos os trabalhadores da saúde pública, o contrato de CLT prevalecia na maioria dos farmacêuticos da indústria e nas farmácias ou drogarias. O maior índice de farmacêuticos com mestrado ou doutorado foi obtido entre os formandos no período 2000-2009. A proporção de mestres/doutores entre os que atuam em instituições de ensino ou pesquisa era muito maior do que nas demais áreas. É necessário monitorar a mudança de desempenho profissional. Assim, as instituições de ensino devem fomentar ações em áreas relevantes, como a saúde pública, e não apenas no mercado privado.

**Keywords:** Farmácia; Educação, Farmácia; Educação continuada.

---

## INTRODUCTION

Higher education and the labor market should articulate in the different professional fields. In practice, there is still a gap between the two poles: on the one hand, the academy is not attentive to the needs of the labor market. Thus, this study aimed to elucidate aspects of the labor market and higher education based on the perception of graduates of the Pharmacy course at the Federal University of Minas Gerais (UFMG).

The performance of the pharmacist dates back to the apothecaries, especially those that existed from the end of the 19th century until the middle of the following century. At the time, these establishments were extremely important to urban communities, since their social practices were developed and sometimes prescription, manipulation, and sale of medicines occurred. However, apothecaries suffered profound changes during the Second World War, when large-scale production of drugs started. In recent times, in Brazil, specifically in the late twentieth century, the distancing between the pharmacist

and the individual attended was observed. The pharmacist assumed administrative tasks instead of pharmaceutical care (Rezende, De, 2015).

When investigating the teaching of Pharmacy in Brazil, we identified the influence of the minimum curriculum established in the 1960s and the studies target training areas, such as clinical analysis, industry, or foods. In 2002, a reform established the Brazilian National Curricular Guidelines (NCG) of the Undergraduate Pharmacy Course, which indicates a generalist training of pharmacists, enabling them to work at all levels of health care, in activities related to drugs and medicines, clinical and toxicological analyses and the control, production and analysis of foods (BRASIL, 2002). Recently, a new NCG of the Pharmacy courses was approved, with a period of implementation of up to two years (BRASIL, 2017). The guidelines emphasized pharmaceutical care, the orientation of curriculum based on competencies, and the use of active teaching methodologies.

At UFMG, the course of pharmacy annually offers 132 vacancies for the day shift and 80 for the night shift, with a duration of 5 and 6 years, respectively, with a total workload of 4,005 hours for both shifts.

While focusing the analysis on graduates of the UFMG Pharmacy course, the study investigates the inclusion of pharmacists in the labor market, considering the area, the graduation period, and the professional, and aims to verify the change in the field of professional performance of pharmacists over time, and to evaluate continuing education by pharmacists.

## **MATERIAL AND METHODS**

This is a descriptive study of the evaluation of the Pharmacy course and the labor market by the graduates of the UFMG. The data was collected online from April 16 to May 2, 2018. The contacts of the professionals were obtained from the Regional Pharmacy Council of Minas Gerais.

The population of respondents comprises 3,042 pharmacists, whose contacts were provided by the Regional Council of Pharmacy of Minas Gerais (CRF-MG) to the Structuring Teaching Nucleus (NDE) of this college. All were contacted by email, requesting participation in the research, in addition to the dissemination on the Faculty of Pharmacy website, on social media of the Academic Directory of the institution, and by sending an email to the professors requesting the direction to the former students. The study population, comprised of professionals who completed the online form, totaled 491 graduates of the UFMG Pharmacy course. The study is part of the project entitled "Avaliação do ensino e da aprendizagem na Farmácia", submitted and approved by the Research Ethics Committee (Presentation Certificate for Ethical Assessment - CAAE - at Plataforma Brasil

nº 63329416.7.0000.5149) from UFMG. Data was analyzed by the IBM SPSS Statistics 22 software.

The analysis developed included only data on professional pharmacy professionals, and retirees were, therefore, excluded. Regarding the characteristics of the graduates, variables related to the conclusion of the Pharmacy course, the area of performance, the professional relationship, and the continuing education were analyzed.

The conclusion of the graduation was measured through the year of completion, and was categorized into four periods: until 1989; from 1990 to 1999; from 2000 to 2009; and from 2010 to 2017. The professional relationship, which is the employment relationship between the worker and the employer, included the classifications: public servant; Consolidated Labor Laws (CLT) contract; self-employed; and provisional/temporary contract. Continuing education - considering the academic activities carried out after graduation - considered the following categories: a course of up to 359 hours; another graduation; residence/specialization; master's degree (professional or academic); doctorate; and did not perform any activity. Regarding the work area of the pharmacist, the data collection instrument admitted 14 denominations, which were reclassified into six summarized categories: Community pharmacy (Pharmacy or drugstore; Compounding pharmacy; Homeopathic pharmacy or other area related to alternative complementary therapies; Herbal Medicine); Hospital pharmacy (Hospital pharmacy; Health services: clinics of Oncology, Hemodialysis, Home Care and others); Industry (Food industry; Cosmetics industry; Medicine industry; Health products industry (medical and hospital equipment and other equipment); Teaching or research institutions; Public Health; and Clinical and toxicological analyses.

## RESULTS

The survey was conducted with 491 graduates of the UFMG Pharmacy course. The highest number of respondents was observed among those who graduated in the last period, 31.4% (2010 to 2017); 10.4% graduates until 1989; and 18.5% from 1990 to 1999. The most frequent areas of activity among the graduates were public health (22.6%), hospital pharmacy (18.1%), and community pharmacy (15.3%). Three other areas showed close percentages: teaching or research institutions (10.8%), clinical and toxicological analyses (10.6%) and industry (10.4%). The proportion of graduates who did not work professionally in Pharmacy accounted for 12.2% of the respondents.

Different behaviors were revealed over time associating the professional performance and the graduation period. In the area of pharmacies or drugstores, the share of pharmacists increased from 19.6%, among those graduated until 1989, to 22.0% in the following decade. However, in the first decade of the 2000s, this rate fell to 9.7%. The last decade evidenced a high proportion of professionals – and was the most recurrent category in this period – in the area of hospital pharmacy (22.6%). In the

industry, the proportion of graduates working was 4.4% among those graduated in the 1990-1999 period, rising to 9.1% among the graduates of 2000 to 2009, reaching 15.4% among those who completed graduation in the 2010-2017 period. The incorporation of pharmacists into teaching or research institutions reached the apex through professionals graduated between 2000 and 2009, covering 14.9% of graduates. Public health was the most recurrent area among study participants; however, over time, irregular trends were identified in the participation rate of pharmacists. The proportion of graduates up to 1989 who worked in public health covered 27.5% of graduates, and dropped by half (13.2%) among graduates in 1990-1999. In the early 2000s, this rate increased to almost one third (31.8%) of those trained in public health work. The rate fell again in recent years, comprising 18.5% of pharmacists graduated from 2010-2017. The insertion of pharmacy graduates in the area of clinical and toxicological analyses declined over the years. The share of 21.6% of graduates up to 1989 who worked in the area decreased to as low as 5.1% among those who graduated in the 2010-2017 period (Table 1).

**Tabela 1-** Percentage of graduates of Pharmacy by professional performance and period of graduation - UFMG, 1969-2017.

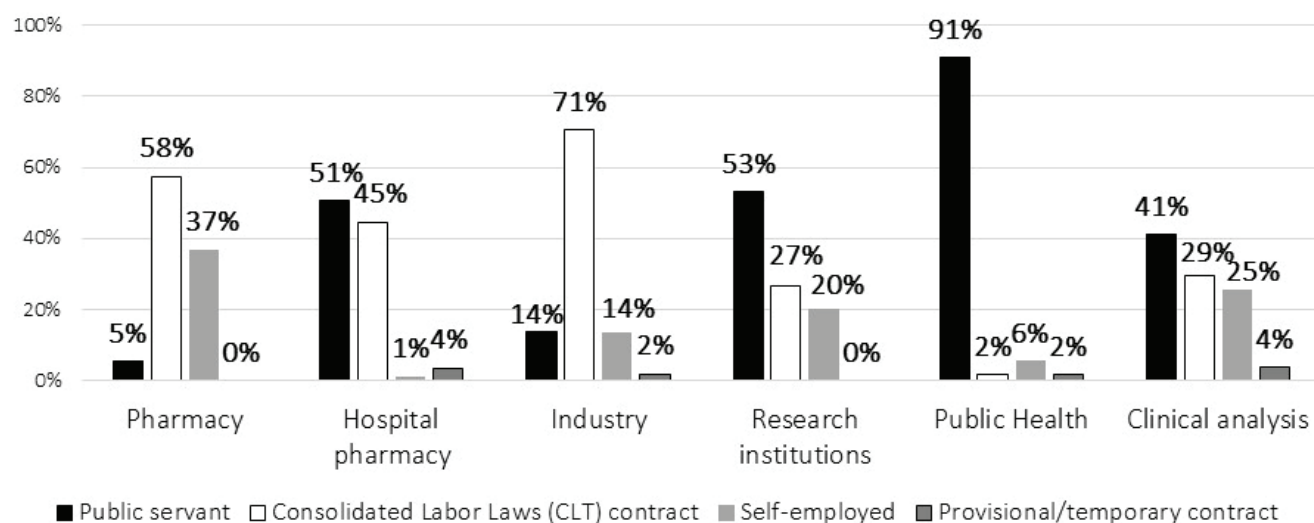
Occupation area	Total	Up to 1989	1990 - 1999	2000 - 2009	2010 - 2017
Community pharmacy	75	19.6	22.0	9.7	15.4
Hospital pharmacy	89	9.8	19.8	14.3	22.6
Industry	51	5.9	4.4	9.1	15.4
Scholar and/or research institutions	53	5.9	12.1	14.9	8.2
Public health	111	27.5	13.2	31.8	18.5
Clinical and Toxicological Analysis	52	21.6	16.5	10.4	5.1
Does not act professionally	60	9.8	12.1	9.7	14.9
<b>Total</b>	<b>491</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

**Source:** Elaboration of the authors, based on the database of the research Evaluation of the profile of the graduates of the undergraduate course in Pharmacy at the Federal University of Minas Gerais (NDE, 2018) (17).

When associating the area of activity and the type of professional relationship of the graduates we verified that the group of public health professionals, as the category itself points out, consisted of 91% of public servant. The industry was the area with the highest rate of professionals with a CLT contracts (71%). In the teaching or

research institutions, 20% of the professionals were self-employed, which includes postgraduate fellows (masters, doctorates, and postdoctorate). Even more self-employed participation was observed in pharmacies or drugstores category, as it covers the owners of these establishments (Graph 1).

**Graph 1** - Percentage of Pharmacy graduates by area of activity and type of professional relationship - UFMG - 1969-2017.



**Source:** Elaboration of the authors, based on the database of the research Evaluation of the profile of the graduates of the undergraduate course in Pharmacy at the Federal University of Minas Gerais.

The association between the graduation period and the performance of continuing education activity showed increasing rates of Ph.D. over time, except those graduated between 2010-2017. The highest proportions of masters and Ph.D. are among the graduates working in educational or research institutions (83.9%) and public health (39.6%). On the other hand, the highest rates of pharmacists who did not attend any continuing education refer to those in pharmacies and drugstores (26.7%) and those who do not work (26.8%) (Table 2).

## DISCUSSION

The time aspect of the professional performance of pharmacists who graduated from UFMG was evaluated. The highest number of respondents was observed among those who graduated in 2010 to 2017, possibly due to the high number of graduates after the creation of Pharmacy night shift in 2010 at UFMG. Results over time were observed among pharmacists nationwide, with 8% graduating until 1989, 41.7% graduating in 2000-2009, and 38.5% graduating after 2009.

**Tabela 2-** Percentage of pharmacy graduates by continuing education and period of completion of the course and area of activity - UFMG - 1969-2017 (n=491).

	Not done	Course up to 359h	Other graduation	Residency / Postgraduation	Master (professional or academic)	PhD
Course completion						
Up to 1989	2.0	13.7	9.8	52.9	5.9	15.7
From 1990 to 1999	5.5	12.1	0.0	48.4	17.6	16.5
From 2000 to 2009	5.8	8.4	3.2	36.4	26.6	19.5
From 2010 to 2017	26.2	21.5	1.0	22.6	23.1	5.6
Occupation area						
Community pharmacy	26.7	24.0	5.3	36.0	5.3	2.7
Hospital pharmacy	12.4	13.5	0.0	47.2	23.6	3.4
Industry	21.6	19.6	3.9	29.4	17.6	7.8
Scholar and/or research institutions	3.6	1.8	0.0	10.7	26.8	57.1
Public health	5.4	11.7	1.8	41.4	29.7	9.9
Clinical and toxicological analysis	1.9	19.2	1.9	46.2	19.2	11.5
Without information	0.0	0.0	0.0	0.0	100.0	0.0
Does not act professionally	26.8	16.1	5.4	19.6	21.4	10.7

**Source:** Elaboration of the authors, based on the database of the research Evaluation of the profile of the graduates of the undergraduate course in Pharmacy at the Federal University of Minas Gerais (NDE, 2018) (17).

Among Brazilian pharmacists, 18.4% were active in public health and 9.5% in teaching or research institutions (also considering master and Ph.D. student) (SERAFIN, CORREIA JR, 2015). On the other hand, the national level recorded a high rate of performance in pharmacies and drugstores (52.2%), compared to 15.3% of UFMG graduates working in this sector, present in this work.

While public servant consisted almost all (91%) of public health workers, CLT contracts prevailed in pharmacists of the industry (71%) and pharmacies or drugstores (58%). Noteworthy are the similarities observed between the profile of Brazilian pharmacists and graduates of the UFMG regarding

the performance in public health and teaching or research institutions.

In the four graduation periods analyzed, public health was the most prevalent among those graduated until 1989, and in the 2000-2009 periods, the community pharmacy was the largest category among graduates from 1990 to 1999, and the hospital pharmacy was the main area of activity among the graduates in the 2010-2017 period. Specifically, concerning professionals of pharmacies and drugstores, a study showed that approximately 66% of the participants had graduated at most five years ago (Oliveira, de et al., 2017). Intuitively, this area should absorb more recent graduates by not

requiring specific knowledge or prior experience.

A high proportion of professionals – the most recurrent category in this period – in the area of hospital pharmacy (22.6%) has been observed in the last decade. It emphasizes the appreciation recently given in undergraduate courses to the activities of patient care, as occurs in this area of performance. The perspective is not to limit the pharmacist's work to pharmacotherapeutic care, expanding it to detect drug interactions, identify drug-related problems, reduce iatrogenies, and promote prevention and health promotion measures.

The growth of the pharmaceutical industry seems to slide in the constantly increasing demand for professionals to act in the sector from the decade of 1990, due to the opening of the Brazilian market to foreign trade. The Brazilian pharmaceutical market is characterized by the production and quality control of drugs, especially generic and similar drugs, unlike the international market, which focuses on research and development of new drugs.

The incorporation of pharmacists into teaching or research institutions reached the apex with professionals graduated between 2000 and 2009, covering 14.9% of graduates. This period coincided with the policy of expanded higher education, especially with the implementation through the Restructuring and Expansion of Federal Universities (Reuni) (BRASIL, 2006). This increased the number of vacancies for students and the establishment of new courses throughout the country, which required new teachers and researchers. After 2010, more than 30% of UFMG Faculty of Pharmacy's professors were admitted through the Reuni, unlike that of Saudi Arabia's licensed pharmacists and pharmacy technicians, whose share of professionals in academic institutions comprises only 1.75% of these professionals (AlRuthia et al., 2018).

Public health was the most recurrent area among study participants; however, over time, irregular trends in participation rates of pharmacists were identified. The high incorporation of pharmacists graduated in the 2000-2009 period in the area of public health coincides with the sedimentation of public policies initiated in 1988, with the creation of the Brazilian Unified Health System (SUS). The SUS demanded an enormous amount of health professionals to work in the pharmaceutical services (BRASIL, 1990; BRASIL, 1998), in health surveillance, after the creation of National Health Surveillance Agency (ANVISA), in 1999 (BRASIL, 1999); and Primary Health Care, of the action geared to the Family Health Program Support Center (NASF) (BRASIL, 2008).

The inclusion of pharmacy graduates in the area of clinical and toxicological analyses decreased over the years. If prior to clinical and toxicological, analyses were exclusive to pharmacists and physicians, it has become increasingly recurrent that professionals from other areas, such as biomedicine, biology, veterinary medicine, and chemistry perform such activities. A study conducted among Saudi's pharmacy students has found that 51.6% of students prefer hospital pharmacies as practice area; 24.8% academia and research centers; 7% pharmaceutical industry; and only 2% prefer community pharmacies (Alhomoud et al., 2019).

An author found that 86% of graduates from 10 research-intensive U.S. colleges of pharmacy over 5 years had postgraduate placements (i.e., jobs (44.7%), residencies (35.4%), fellowships (3.4%)) at the time of graduation (Kelley et al., 2019).

The proportion of graduates who did not work professionally in the Pharmacy area totaled 12.2% of the respondents. This result may indicate the difficult incorporation of new professionals into the labor market, mainly due to the current scenario

of higher unemployment rates. In the U.S., the proportion of graduates that reported difficulty finding a job five years after the graduation was 15.7% (Kelley et al., 2019). Lebovitz & Eddington (2019) showed that the supply of pharmacists in the U.S. labor market is rapidly outpacing demand due to consolidation of retail chains and lower labor costs, and pharmacy schools are expanding. Such a situation may result in higher rates of professionals working in other professions or unemployed (Lebovitz e Eddington, 2019).

When associating the area of activity and the type of professional relationship of the graduates of the UFMG Pharmacy course, we find that the group of professionals in public health, as shown by the category, consisted of mainly of public servant. The industry was the area with the highest rate of professionals with a CLT contract. In the teaching or research institutions, one in five professionals was self-employed, which includes postgraduate fellows. A higher self-employed participation was observed in community pharmacies, as it covers the owners of these establishments. According to the Brazilian Pharmacy Federal Council report, 16.7% of pharmacists owned establishments (SERAFIN, CORREIA JR, 2015).

The performance of continuing training activity was different concerning the several Pharmacy course completion periods. The highest rate of pharmacists who performed masters or doctorates was obtained from those trained in the 2000-2009 period. On the other hand, graduates of the most recent period (2010-2017) had the highest rate of pharmacists who did not perform any continuing training activities. As it is the group of more recent graduates, possibly some of these professionals will continue with the studies.

The area of activity was also associated with the continued training of pharmacists. The percentage

of masters and doctors' degrees among those working in teaching or research institutions and public health was much higher than the other areas. On the other hand, the highest rates of pharmacists who did not carry out any continuing education refer to those in community pharmacies and those who do not work in the pharmaceutical area. An author observed a loss of motivation of Dutch pharmacists for Continuing Education in the Dutch CE system in a period of 21 months (Sharon et al., 2018).

Evaluating the performance of professionals in the labor market should raise the interest of educational institutions, as it can influence students' choice of a course and the definition of the field of action and curriculum training by university students. In the US, changes in educational standards have been implemented to ensure that pharmacy students are highly trained and prepared for labor market transformation, as well as going beyond market needs<sup>14</sup>. Indeed, institutional action oriented towards the training of human resources directed at public health, for example, could supply the workforce aimed at improving the quality of life of the population. Thus, it would meet the social demand directed to health care. An author demonstrate investment in pharmacy education yields favorable financial return (Chisholm-Burns, Gatwood e Spivey, 2015).

Another point of reflection is on the relationship between the pharmacist's performance in the public sector and the private sector. The study showed the movements occurring in the market of pharmacies and drugstores and public health. After the creation of the SUS and the investment in Primary Health Care, that is, the 2000-2009 period, the proportion of pharmacists in the public sector increased. However, the recent decline in public health investments has favored an increased performance of professionals in private establishments. Currently, the presence of large pharmacies with high



capillarity – in the line of “a pharmacy at every corner” – is now absorbing more labor. However, the possible weak labor relationships should be emphasized, with longer journeys, double shifts, and the incorporation of strictly administrative work unrelated to health. Such situations are easier to find after the implementation of the public policies of flexible employment relationships.

## CONCLUSION

The time aspect of the professional performance of pharmacists who graduated from UFMG - the central aim of the study - was attested. In the four graduation periods analyzed, the public health area was the most prevalent among those graduated until 1989, and in the 2000-2009 period, the community pharmacy was the largest category among graduates from 1990 to 1999, and the hospital pharmacy was the central area of activity among the graduates in the 2010-2017 period.

The professional bond was shown to be associated with the pharmacist's area of activity. While public workers represented almost all of public health workers, CLT contract prevailed in pharmacists of the industry and community pharmacies.

The performance of continuing training activity was different concerning the several periods of completion of the Pharmacy course. The highest rate of pharmacists who performed masters or doctorates degrees was obtained from those trained in the 2000-2009 period. On the other hand, graduates of the most recent period (2010-2017) had the highest rate of pharmacists who did not perform any continuing training activities.

The area of activity was also associated with the continued training of pharmacists. The percentage of masters and doctors' degrees among those working in teaching or research institutions was much higher than other areas.

The responsibility of pharmacy's educators is to continue to monitor changes, prepare our graduates for this dynamic profession, and show the many opportunities the pharmacy profession has to offer, and other relevant areas, such as public health, should be promoted.

## ACKNOWLEDGMENTS

We are grateful to the Structure Teaching Center of the Faculty of Pharmacy of UFMG. The project was supported indirectly by Capes (Coordination for the Improvement of Higher Education Personnel), CNPq (National Council for Scientific and Technological Development) and Fapemig (Foundation for Research Support of Minas Gerais).

## REFERENCES

- ALHOMOU, F. K. *et al.* Career Choices and Preferences of Saudi Pharmacy Undergraduates: A Cross *et al.* Sectional Study. **Saudi Pharmaceutical Journal**, v. 27, n. 4, p. 467-474, 2019.
- ALRUTHIA, Y. *et al.* The status of licensed pharmacy workforce in Saudi Arabia: A 2030 economic vision perspective. **Human Resources for Health**, v. 16, n. 1, p. 1-8, 2018.
- BRASIL. MINISTÉRIO DA EDUCAÇÃO. CONSELHO NACIONAL DE EDUCAÇÃO. CÂMARA DE EDUCAÇÃO SUPERIOR. Resolução CNE/CES nº 2, de 19 de fevereiro de 2002. Institui as Diretrizes Curriculares Nacionais do Curso de Graduação em Farmácia. Diário Oficial da União, 4 mar 2002. Seção 1, p. 9.
- BRASIL. MINISTÉRIO DA EDUCAÇÃO. Resolução nº 6, de 19 de outubro de 2017. Institui as Diretrizes Curriculares Nacionais do Curso de Graduação em Farmácia e dá outras providências. Diário Oficial da União, 20 out. 2017. Seção 1, p. 30.
- BRASIL. MINISTÉRIO DA SAÚDE. Portaria nº 154, de 24 de janeiro de 2008. Cria os Núcleos de Apoio à Saúde da Família - NASF. Diário Oficial da União, 4 mar. 2008. Seção 1, p. 38.

BRASIL. MINISTÉRIO DA SAÚDE. Portaria nº 3.916, de 30 de outubro de 1998. Política Nacional de Medicamentos. Diário Oficial da União, 10 nov 1998. Seção 1, p.18.

BRASIL. MINISTÉRIO DA SAÚDE. Portaria nº 8.080, de 19 de setembro de 1990. Dispõe sobre as condições para promoção, proteção e recuperação da saúde, a organização e o funcionamento dos serviços correspondentes e dá outras providências. Diário Oficial da União, 20 set. 1990. Seção 1, p. 1.

BRASIL. PRESIDÊNCIA DA REPÚBLICA. Decreto nº 6.096, de 24 de abril de 2007. Institui o Programa de Apoio a Planos de Reestruturação e Expansão das Universidades Federais - REUNI. Diário Oficial da União, 25 abr 2007. Seção 1, p. 7.

BRASIL. PRESIDÊNCIA DA REPÚBLICA. Lei nº 9.782, de 26 de janeiro de 1999. Define o Sistema Nacional de Vigilância Sanitária, cria a Agência Nacional de Vigilância Sanitária, e dá outras providências. Diário Oficial da União, 27 jan 1999. Seção 1, p. 1.

CHISHOLM-BURNS, M. A.; GATWOOD, J.; SPIVEY, C. A. Economic analysis of obtaining a PharmD degree and career as a pharmacist. **American Journal of Pharmaceutical Education**, v. 79, n. 8, 2015.

KELLEY, K. A. *et al.* Employment trends for doctor of pharmacy graduates of research-intensive institutions, 2013-2017. **American Journal of Pharmaceutical Education**, v. 83, n. 2, p. 148-152, 2019.

LEBOVITZ, L.; EDDINGTON, N. D. Trends in the pharmacist workforce and pharmacy education. **American Journal of Pharmaceutical Education**, v. 83, n. 1, p. 4-11, 2019.

OLIVEIRA, N. V. B. V. DE *et al.* Atuação profissional dos farmacêuticos no Brasil: Perfil sociodemográfico e dinâmica de trabalho em farmácias e drogarias privadas. **Saude e Sociedade**, v. 26, n. 4, p. 1105-1121, 2017.

REZENDE, I. N. DE. Literatura, história e farmácia: Um diálogo possível. *Historia, Ciências, Saude - Manguinhos*, v. 22, n. 3, p. 813-828, 2015.

SERAFIN C, CORREIA JR D, V. M. **Perfil do farmacêutico no Brasil**: relatório, 2015.

SHARON, S. L. *et al.* A longitudinal approach to changes in the motivation of dutch pharmacists in the current continuing education system. **American Journal of Pharmaceutical Education**, v. 82, n. 2, p. 135-143, 2018.