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Original Article

PHARMACY PRACTICE EXPERIENTIAL PROGRAMS IN THE CONTEXT OF CLINICAL EDUCATION

SIMONE DE ARAÚJO MEDINA MENDONÇA[a*], BEATRIZ LEAL MEIRELES[a], ERIKA LOURENÇO DE FREITAS[b], DJENANE RAMALHO DE OLIVEIRA[a]

[a]Social Pharmacy Department, College of Pharmacy, Federal University of Minas Gerais, Belo Horizonte, Brazil, [b]School of Pharmacy, Regis University, Denver, Colorado, United States of America
Email: simoneamm@gmail.com

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ABSTRACT

Objective: To identify studies describing and/or assessing pharmacy practice experiential programs focusing on clinical education.

Methods: A systematic literature review was carried out. The databases searched included Lilacs, Medline/Pubmed, Eric and Scopus. The search strategy was devised based on a combination of subject headings related to pharmacy practice experiential programs, pharmacy education, and clinical practice in pharmacy. Two reviewers independently performed article selection, applying eligibility criteria defined. The level of agreement between the reviewers (Kappa coefficient) was calculated. Information about the clinical practice and settings used, description of pharmacy practice experiential model and type of evaluation study performed was collected from the articles selected using a pre structured form.

Results: Of the 474 items retrieved in the initial search, 31 articles met the eligibility criteria. An increase in the number of publications in the 2000s was noted, predominantly (n=22, 71.0%) from North America. *Pharmaceutical care* was the most commonly used term to denote clinical practice in pharmacy. The practice sites ranged from hospitals (n=13, 41.9%), outpatient clinics (n=12, 38.7%), community pharmacies (n=7, 22.6%) and other community institutions (n=10, 32.3%), whereas some experiences involved a combination of these settings. The most common organizational arrangement involved pharmacists from the healthcare service as preceptors supervising students in the field, and teachers as educators, tutors and researchers within universities. In some situations, however, teachers and more advanced students acted as preceptors. Educational outcomes and/or results related to the service delivered by students and preceptors were assessed, where the quantitative method was the most frequently employed approach in both cases.

Conclusion: The studies revealed that the partnership among university, health services and community is a promising initiative for improving the quality of pharmaceutical services offered to society and of pharmaceutical education.

Keywords: Pharmacy practice experience, Pharmaceutical care, Systematic literature review

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INTRODUCTION

Worldwide, albeit at different times and pace, the pharmacy profession is being redesigned according to an approach underpinned by patient-centered care and the achievement of patients´ drug therapy needs at different levels of healthcare [1–4]. Pharmaceutical care-based services have shown positive clinical, economic and humanistic results, justifying their expansion and consolidation within healthcare systems [5–14].

The challenge of changes in the practice calls for and drives changes in education [15, 16]. Guidelines and recommendations on a new model for degree courses in pharmacy have guided many experiences of innovation in pharmaceutical education [14–18]. These documents define practice experiences as essential components for developing the competencies necessary for clinical practice of pharmacists. This educational strategy facilitates the training of professionals engaged with social health needs. This brings universities and healthcare services closer together, enhancing the potential contribution of the two institutions to society.

It is important for teachers and managers of educational institutions to regularly update pharmacy degree curricula and incorporate pedagogic innovations that further contribute to improving the clinical education of students [16, 17]. Keeping abreast of advances in the scientific literature regarding pedagogic innovations involving clinical education in pharmacy is a first step in this process. Knowledge of successful experiences allows their subsequent adaptation to the local context for implementation and assessment [18, 19].

Therefore, in light of educational recommendations emphasizing the importance of practical experiences in the education of pharmacists, the aim of this systematic review was to identify and describe pharmacy practice experiential programs focusing on clinical education.

MATERIALS AND METHODS

The method employed was a systematic literature review, according to the criteria recommended by Moher *et al.* [20] in the document *Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement.* The criteria, as applied to the present study, are outlined below:

Search strategy

This was devised based on the definition of key words, identification of corresponding headings (MeSH/DeCs; English, Portuguese and Spanish) and application of Boolean operators and quotation marks for compound terms. No filters were applied.

Information sources

The Eric, Lilacs, Medline/Pubmed and Scopus databases were used. The search was conducted in June 2015.

Organization of data

The reference lists obtained from the different databases were pooled in the EndNote® references management program, available free to research institutions via the Capes Periodicals Portal (provided by the Brazilian government). Duplicate references were removed.

Study selection

Two reviewers independently performed article selection based on reading of: 1) titles; 2) abstracts; and 3) full articles. A form was

used to record each stage, allowing the level of agreement (Kappa coefficient) between reviewers to be defined [21].

Eligibility criteria

Studies describing and/or assessing results of pharmacy practice experiential programs in the clinical area involving pharmacy degree students were included. The results extracted included the characteristics of the educational programs and type of evaluation conducted.

Exclusion criteria

Articles written in languages other than English, Portuguese or Spanish, articles not available via the Capes Periodicals Portal or not free of charge were excluded. Official documents (guidelines, guides and educational recommendations), reviews, editorials and comments were also excluded.

Data collection

General data was collected (year of publication, journal and country of origin), along with specific data on the clinical practice and settings used, description of pharmacy practice experiential model and type of evaluation study performed.

RESULTS

The results obtained at each stage of the article selection process are depicted in fig. 1. The 31 studies selected by both reviewers were included [22–52] and had a Kappa coefficient of 0.94, indicating excellent agreement [21].

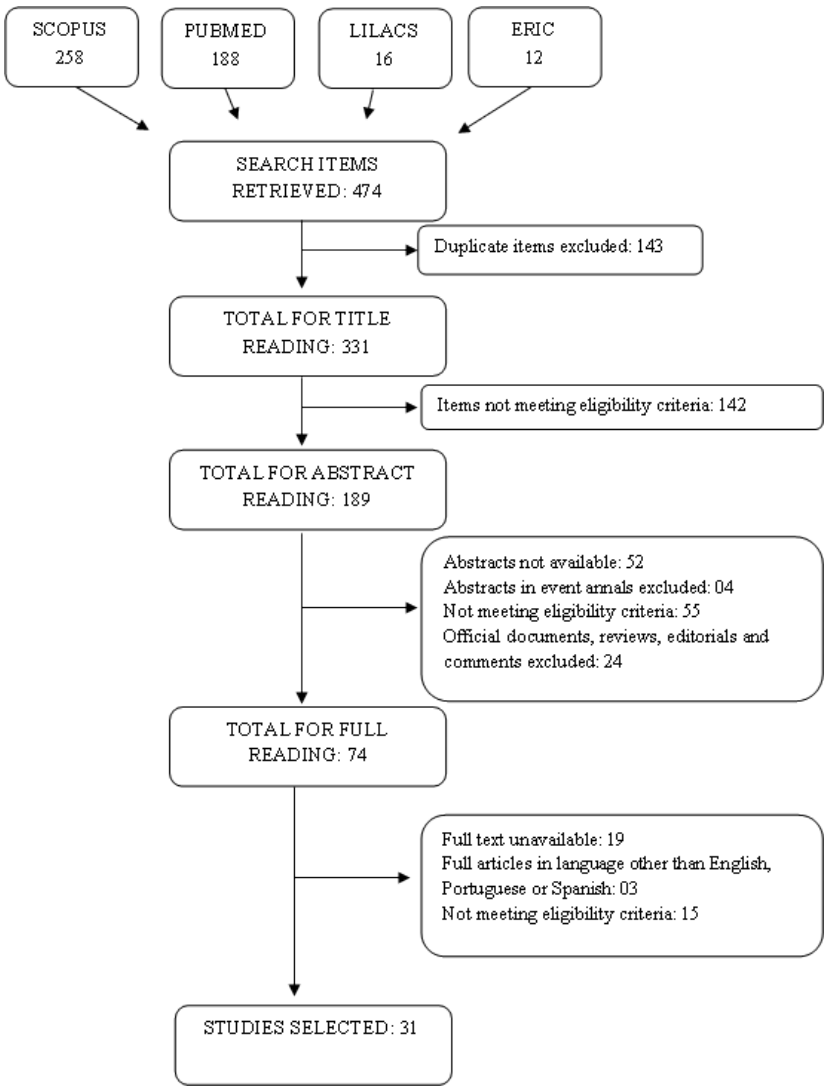

Fig. 1: Flow chart of article selection process

Four journals accounted for publication of 23 (80.7%) of the total articles, with 17 articles (54.8%) published in the *American Journal of Pharmaceutical Education*, four (12.9%) in *Currents in Pharmacy Teaching and Learning* and two (6.5%) in both *Advances in Medical Education and Practice* and *International Journal of Pharmacy Practice.* Most articles were from North America (n=22, 71.0%), comprising 19 (61.3% of total) from the United States of America and three from Canada. The other publishing continents were: Europe (n=3, 9.7%) with articles from Germany and Denmark; Asia (n=2, 6.5%) with contributions from Lebanon and Taiwan; Africa (n=2, 6.5%) with studies from Nigeria and Ethiopia; and Latin America and Oceania with Chile and Australia each contributing one article (n=1, 3.2%).

The articles retrieved were published between 1998 and 2015, with publication periods distributed as follows: one (3.2%) in the 1990s, nine (29.0%) between 2000 and 2009; and 21 (67.7%) between 2010 and 2015. No restriction was placed on year of publication during the search process.

The most widely used term for specifying clinical practice resulting from the practice experiential programs was "*pharmaceutical care*".

Thirteen articles (41.9%) used this term without specifying its theoretical-methodological bases, four of which concerned different activities involving direct patient contact early in training with the aim of preparing students to subsequently deliver "*pharmaceutical care practice*". Three studies (9.7%) made reference to "*patient-centered care*", an important characteristic of the professional philosophy of pharmaceutical care [3]. Others associated the term "*pharmaceutical care*" with specific services and activities, such as "*medication therapy management*" (n=7, 22.6%), "*medication review*" (n=2, 6.5%), "*medication reconciliation"* and *"counseling*", both with n=1, 3.2%. It is noteworthy that the search strategy was made more sensitive by incorporating the clinical pharmacy and pharmaceutical care subject headings. In article selection, the researchers also included studies on any clinical pharmacy practice, given that relevant organizational arrangements or practice experiential program models could be developed despite the concept of professional practice adopted by the authors. The sites where the pharmacy practice experience took place encompassed different levels of healthcare, where some studies involved different practice settings concomitantly. The hospital environment predominated, being the site of 13 studies (41.9%). Primary or secondary care outpatient clinics were the focus in 12 studies (38.7%), although it was not possible to distinguish between these two different healthcare levels in many articles. Community pharmacies were the practice setting in seven articles (22.6%). The healthcare network was the setting for 17 studies (54.8%), whereas 03 studies (9.7%) cited university-run services. Some studies were conducted at long-term care institutions or community centers for the elderly (n=4, 12.9%), as well as at other social/community institutions (n=6, 19.4%).

Regarding support of universities in the implementation and/or provision of the service where students undertake their learning, 19 articles (61.3%) reported that students were responsible for providing clinical services not hitherto available, or for increasing the number of consultations/quality of the service delivered, both within the health system and in services provided directly to the community (university-run services or within community-based institutions). Four articles (12.9%) cited the provision of formal processes of education to preceptors.

The main characteristics of the pharmacy practice experiences were reported in different ways in the articles and are summarized in table 1.

Table 1: Summary of characteristics of pharmacy practice experiences reported in articles selected

First author, year of publication (country)		Characteristics of pharmacy practice experiential programs			Specificities of the program described
		Partici- pants	Duration	Organizational arrangement	
Development of the preceptor and the practice scenario	Ackman *et al.*, 2011 (Canada)	4th year pharmacy students	6 w	122 preceptors with students in the field	Virtual community of practices for the development of pharmacists in pharmaceutical care and as preceptors
	Kassam *et al.*, 2012 (Canada)	[a]	[a]	Preceptors with students in the field	Online course for the development of pharmacists in pharmaceutical care and as preceptors
	Kassam *et al.*, 2013 (Canada)	4th year pharmacy students	8 w	Preceptors with students in the field, and faculty member at the university	Preparatory course for preceptors and students
	Sørensen *et al.*, 2008 (Denmark)	[a]	6 mo	Preceptors with students in the field, and faculty member at the university	Action research cycles for the development of practice scenarios (clinical pharmacy services)
Preparatory course for practice experience	Galal *et al.*, 2012 (USA)	2nd year pharmacy students	2 w (15 h)	33 students; 4 faculty members as preceptors in the field; volunteer community pharmacists preceptors in the field	Preparatory studies before field activities (10 w in class, 3 h/week)
	Galal *et al.*, 2014 (USA)	6th year pharmacy students	1 y	5 faculty members e 181 students (for 6 y)	Preparatory studies before field activities
	Hasan *et al.*, 2013 (Australia)	4th year pharmacy students	9 w	Preceptors with students in the field, and faculty member at the university	Previous experience in providing clinical skills
	Johnson *et al.*, 2014 (USA)	1st and 2nd years pharmacy students	1 w	08 students in the field, 1 faculty member at the university and in the field	Previous studies on the main clinical condition of patients treated at the health service
	McGivney *et al.*, 2011 (USA)	1st and 4th years pharmacy students	2 mo	Groups of 10 1st year pharmacy students with a faculty member and one or two 4th year pharmacy students in the field	Preparatory course for the field activity
	Schellhase *et al.*, 2013 (USA)	[a]	8 w	36 students annually (171 students since 2004); 2 faculty members at the university; faculty members, clinical pharmacists and residents in the field	Preparatory course on clinical activities and cultural issues
	Schorr *et al.*, 2014 (Germany)	[a]	6 mo	27 students and 7 clinical pharmacists as preceptors in the field, 1 monitor who made bimonthly visits to the fields of practice	Two-day preparatory training for students and preceptors

	Skledar *et al.*, 2006 (USA)	[a]	3 y (full-time on vacations and 10-12 h during school year)	24 students (since 1998) with faculty member and clinical pharmacist in the field	Training offered by the faculty member, researchers and clinical pharmacists supporting the project
	VanTyle *et al.*, 2011 (USA)	[a]	1 mo	23 students with medical director as preceptor	Preparatory courses related to the Mexican culture, language and health for field experience
University activities concomitant with pharmacy practice experience	Agness *et al.*, 2011 (USA)	3rd year pharmacy students	1 y	2 faculty members at the university and in the field for first appointment; 01 pharmacist in the selection of patients; teams of 2-3 students for each of the 57 patients	Parallel to pharmacotherapy courses
	Brown *et al.*, 2002 (USA)	1st, 2nd and 3rd year pharmacy students	6 mo	15 faculty members; 315 students in 86 teams, each with one patient; 10 preceptors (faculty members, residents or other post-graduates students)	Parallel classes at the university for orientation and studies
	Kearney *et al.*, 2013 (USA)	1st year pharmacy students	10 w (2 h/week)	Students in the field, faculty members at the university	Weekly seminars parallel to the experience (1 h/week)
	Nichols-English *et al.*, 2002 (USA)	3rd year pharmacy students	1 y	2-5 students in the field, teacher at the university	Preparatory course (15 wly classes) and classes parallel to field activities
	Ruiz *et al.*, 2002 (Chile)	Final year pharmacy students	12 w/210 h	Students in the field with preceptors and faculty members at the university	Classroom discussions and presentation at end of experience
	Ubaka *et al.*, 2012 (Nigeria)	Final year pharmacy students	8 w	Students in the field with preceptors and faculty members at the university	4 w of classroom discussions, parallel to field activities
	Walker *et al.*, 2010 (USA)	4th year pharmacy students	4 w	Students in the field with preceptors	5-hour weekly meetings for discussions with preceptor
	Yeh *et al.*, 2014 (Taiwan)	4th year pharmacy students	4 w (40 h/week)	Students in the field with preceptors and faculty members at the university	Software for eLearning to support activities in the field, substituting face-to-face activities
Other	Dalal *et al.*, 2010 (USA)	3rd and 4th years pharmacy students	6 w	Students with pharmacists preceptors in the field	[a]
	Dy *et al.*, 2013 (USA)	[a]	[a]	Students with volunteer pharmacists as preceptors; a faculty member assists students in the organization of activities	[a]
	Gerdemann *et al.*, 2007 (Germany)	[a]	36 mo (6 mo per student, comprising 3 mo of clinical activities)	17 students in 6 different hospitals accompanying doctors and nurses and supervised by a pharmacist. One faculty researcher was in the field with each student twice during the study period	[a]
	Meierhofer *et al.*, 2013 (USA)	[a]	14 mo	36 students for different periods in the field; 1 faculty member at university; 3 pharmacists as preceptors (2 faculty member and 1 resident)	[a]
	Roche *et al.*, 2007 (USA)	[a]	*Not described*	15 students and 1 pharmacist as preceptor	[a]
	Schumann *et al.*, 2004 (USA)	1st, 2nd and 4th year pharmacy students	6-8 w (2 h/week)	50 pharmacy students and students from other courses; 1 pharmacist teacher and 1 social work teacher	[a]
	Tsega *et al.*, 2015 (Ethiopia)	5th year pharmacy students	1 y	69 students with supervision by different preceptors in the various practice venues (rotation between 09 sites)	[a]
	Turner *et al.*, 2007 (USA)	[a]	6 w	Teams of 8 students with a preceptor in the field	[a]
	Vrahnos *et al.*, 1998 (USA)	1st and 2nd year pharmacy students	14 w (6 h/week)	Students with faculty members as preceptors and final year students and/or resident as co-preceptor	[a]

Zeitoun *et al.*, 2014 (Lebanon)	1st year pharmacy students	4 w (8 h/day)	Students with preceptors in the field, faculties at the university and as preceptors in the field	[a]

[a] Not described in the study.

Some studies cited activities within the university simultaneously with activities in the healthcare service, to increase reflective practice while supporting students in their practical activities. Service-learning and experiential learning were the two most-cited pedagogic approaches in the articles selected. With regard to organizational arrangement, a wide variety in both composition and proportion of the different participants involved was evident. In most studies, pharmacy students were directly supervised by pharmacists in healthcare services whereas faculty members oversaw activities within universities. However, there were some situations in which no preceptor was present in the field or where faculty members and more advanced students (final year of pharmacy degree or post-graduate students) took on the role of preceptor.

The pharmacy practice experiential programs addressed by the articles included in this review had been evaluated from different perspectives. Some articles used the method of experience report, describing the characteristics of the educational program in great detail. Nine articles (29.0%) evaluated the impact of the clinical appointments provided by students and preceptors. Indicators studied included increases in the number of appointments, drug therapy problems identified, interventions performed, achievement of therapeutic goals, user satisfaction and acceptance by the healthcare team.

Educational outcomes were the focus of study in 27 articles (87.0%), most of which employed the quantitative approach. The most used data collection methods were structured questionnaires for self-assessment of students on the development of competencies and the analysis of educational instruments (such as structured observation records produced by preceptors). Only 7 articles used a qualitative approach for assessing educational outcomes, revealing a gap in the literature on understanding of the subjective aspects involved in these experiences. Participant observation and interview methods were employed in the qualitative studies conducted, as well as analysis of students´ reflective journals. Student perception on the development of competencies or achievement of learning objectives was the main topic investigated in two types of educational studies.

DISCUSSION

The emergence of publications in the 1990s, and the increase observed in the 2000s, may have been influenced by the concept of pharmaceutical care proposed by Hepler and Strand in 1990 [1] and the incorporation of this concept in the US educational recommendations during the 2000s [53]. These recommendations stipulate a requirement for practical experience in pharmaceutical education. Both these events took place in the United States of America, the country accounting for most of the publications included in this review. These results highlight the role of different social actors–academia, representative councils and institutions–in implementing changes to pharmaceutical education.

This study highlighted the tendency for use of the term *pharmaceutical care* to denote the clinical practice of pharmacists in the countries where the studies were conducted.

The predominance of hospitals as the practice setting reflects the challenge posed in reforms of health systems and teaching models, involving a shift from the biomedical and hospital-centric paradigm to the bio-psychosocial paradigm, based on primary healthcare [54, 55]. In addition, the higher number of experiences in hospitals and outpatient clinics, relative to those run within community pharmacies, may be related to the perception of better integration of pharmaceutical care at sites where, traditionally, other professionals perform their clinical practice and provide patient care, unlike pharmacies that are culturally associated with dispensing medicines [56, 57].

The large proportion of studies in which universities promote partnerships with healthcare systems and communities, relative to the number of experiences within education institutions, reflects a tendency not only in pharmacy courses but in health courses in general: partnerships among community, healthcare system and university [58–60].

Some studies described direct benefits of the partnership for pharmacists and for the healthcare services. Furthermore, the presence of students, the role of preceptor and constant relationship with the university, give rise to lifelong learning in the everyday practice of the professionals, conferring great benefits to all those involved [61].

The presence of practice experiential programs for students in the first years of the pharmacy degree indicates recognition of the need for early exposure to the healthcare service, with gradual increase in direct patient care up to the end of the course [35, 62].

The connection between practice and theory present in some studies is known to potentiate learning, avoiding the unapprised performance of activities by students while furnishing them with a critical perspective on their practice [63].

The need for more advanced teachers or students to assume the role of preceptors of students within healthcare services might be related to the fact that clinical pharmacy services were still considered an innovation and had not been implemented in all healthcare services. It is assumed that the faculty member heads up the planning, provision and maintenance of the clinical service, with this function adding to the roles of educator and researcher. None of the articles explored this issue.

The studies investigating the impact of services delivered by students and preceptors are an important product of the university's partnership with the healthcare service. Such knowledge can be of benefit not only to the management of the clinical-pharmaceutical service, but may also help promote dialogue and negotiations with managers and users with a view to expanding the service within the healthcare system.

The knowledge produced by the educational studies are important to aid the replanning of the experience and also as input for other faculties and education institutions in their processes of planning, operating and assessing similar experiences.

Limitations

The limitation on languages in the article selection process resulted in the exclusion of two articles in German, two in French, and one in Japanese. In addition, the non-inclusion of the European database Embase as a research source (not available free) may have prevented access to further articles.

CONCLUSION

This systematic literature review led to the identification of many articles describing and/or assessing practice experiential programs for clinical education of pharmacists. The most commonly used term to denote this practice was "*pharmaceutical care*", and an increase in publications was noted in the 2000s with a large number of experiences on the North American continent.

The practice settings ranged from hospitals, outpatient clinics, community pharmacies and other community institutions. Partnerships among university, health services and the community predominated, with scant studies involving university-run services. A host of different organizational arrangements in the structuring of experiences was found, predominantly involving pharmacists from the health service acting as preceptors supervising students in the field, and faculties performing teaching and research activities related to the experience within universities.

Educational outcomes and/or results related to the service provided by students and preceptors were assessed. The quantitative

approach was the most frequently employed method, entailing application of structured questionnaires among study participants before and after the pharmacy practice experience and data collection based on records of clinical services delivered by students and preceptors.

The studies revealed that the partnership among university, health services and community is a promising initiative for improving the quality of pharmaceutical services offered to society and for creating a conducive environment for training future pharmacists. The knowledge produced in this study can be of value to universities, health services and other sectors of society in the planning, operation, assessment and reorganization of educational processes in pharmacy.

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CONFLICTS OF INTERESTS

Declared none

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