

# Pharmaceutical Care: a teaching experience

P. FRESCO<sup>1\*</sup>, C. SILVA<sup>1</sup>

*1Serviço de Farmacologia, Faculdade de Farmácia da Universidade do Porto, Rua Aníbal Cunha, 164, 4050-047 Porto*

## Abstract

Pharmaceutical care is regarded as the primary mission of pharmacy practice. To ensure this can be fulfilled, students need clinical knowledge and skills. The Faculty of Pharmacy, University of Porto, includes a course entitled “Pharmaceutical Care”, in the curriculum’s fifth year. This work aims to describe the structure, organization and functioning and present the results of a survey on student’s interest, satisfaction and perception of utility of the course.

Theoretical classes concern pharmaceutical care services. Laboratory classes include case studies and visits to real practice environments. Teaching methods: in-class lectures, brainstorming, clinical case solving and role-plays. Evaluation: clinical cases solving and a final written exam. Course contents, bibliography and internet links were available through UP e-learning platform, also used to encourage discussion on course topics. On-line forums attained high participation. Students regarded the course as very useful for future practice and the majority considered teaching and evaluation methods as adequate.

**Keywords:** *Pharmaceutical care; teaching; pharmacy education; pharmacy curriculum*

## Introduction

Significant changes in national health care systems worldwide are fuelling the critical examination of how health professionals are educated and trained, what they learn and how they learn it. It is essential that all health professionals be appropriately and adequately prepared to support a global policy framework for health (WHO, 2006). Sufficient background information exists to provide guidance to pharmaceutical educators regarding the preparation of students for contemporary and future careers (World Health Organization (WHO), 1988; 1993); WHO and International Pharmaceutical Federation (FIP) (WHO, 2006), International Pharmaceutical Students Federation (IPSF) and European Pharmaceutical Students' Association (EPSA and IPSF, 1999), among others.

The provision of pharmaceutical care has been recognized, by these organizations, as the most important role that pharmacists can provide in health systems, today. Pharmaceutical care describes a model of practice in which the patient is the primary focus and in which the pharmacist accepts responsibility for ensuring appropriate outcomes from drug therapy, improving the patient quality of life (Hepler & Strand, 1990). In Portugal, as in other European countries, pharmaceutical care represents a more broad concept, understood as “the professional practice focused on the improvement of the process of drug use and reduction of negative clinical outcomes, through individualized drug dispensing, pharmacotherapy follow-up and related services such as pharmacovigilance, non-prescription drug indication and education for health” (SPCFar, 2007). Despite the recognition of fundamental differences in countries health systems, experts believe that pharmaceutical care should, and can, be applied in all countries, regardless of their socio-economical development, responding to the social need of

reducing morbidity and mortality associated with drug use (Hepler & Strand, 1990).

In order to prepare future pharmacists for this new model of practice and related responsibilities, the FIP and the EAFP recommend that pre-graduate education should provide pharmacy students the knowledge, skills and competencies required to fulfil those different roles, and that pharmaceutical care teaching should integrate the obligatory curriculum of pharmacy schools (EAFP, 1999; FIP, 2000). The need for patient-oriented and practice-based education has also been recognized by community pharmacists as a high priority facilitator for practice change towards pharmaceutical care implementation (Gastelurrutia et al., 2009).

In an attempt to follow these recommendations and respond to pharmacists and society needs, the Faculty of Pharmacy of Porto University (FFUP) offers, since 2006, an elective course on pharmaceutical care to their fifth year’s students.

This paper describes the structure, organization and functioning of the course and presents data on student’s interest, satisfaction with contents and teaching/evaluation methodologies and perception of usefulness for individual future practice and for evolution towards a patient-focused pharmacy practice.

## Methods

We present a description of the course syllabus, type of lectures, teaching and evaluation methods employed and the use of the University of Porto (UP) e-learning platform. Figures on pre-inscriptions were gathered, as a measure of student’s interest in attending the course.

A survey was designed to measure student’s satisfaction with course contents and appropriateness of teaching/evaluation

\*Correspondence: Paula Fresco, *Serviço de Farmacologia, Faculdade de Farmácia da Universidade do Porto, Rua Aníbal Cunha, 164, 4050-047 Porto. Email: pfresco@ff.up.pt*

course for individual future practice and for evolution of pharmacist roles towards a patient-focused practice was also evaluated. In order to seek for similar surveys, previously used, PubMed and Internet searches were performed. Questions were constructed according to the course objectives and survey purposes.

The questionnaire was anonymously filled. The questionnaire and a simple text, informing students of the aims of its appliance, were made available through the UP e-learning platform, at the end of the 2008/2009 course. A five point Likert scale was used. A descriptive statistical analysis of the results was performed.

## Results

### *Course Attendance*

Despite being an elective course, the number of students interested in attending pharmaceutical care classes (115 pre-inscriptions of a total of 127 fifth year graduate students) largely exceeded the vacancies available (60, distributed in 3 practical classes). Afterwards, on student's request, 6 more vacancies were opened.

### *Course Functioning and Contents*

The course includes, weekly, two hours of theoretical concepts and two hours of training classes. For detailed course contents see Table I.

**Table I – Course contents and its distribution in theoretical and training classes.**

Course Contents	
Theoretical classes	Training classes
Pharmaceutical care: general aspects and development of the concept of pharmaceutical care; current challenges to the	Debate / brainstorming on difficulties, opportunities and concepts in pharmaceutical care.
Drug Related Problems (PRM, <i>Problemas Relacionados com os Medicamentos</i> ) and Negative Outcomes associated with Pharmacotherapy (RNM, <i>Resultados Negativos associados à Medicação</i> ).	Exercises on PRM and RNM.
Tools for pharmaceutical care practice: communication and	Case studies with "Role-Play" using medical prescriptions; class discussions.
Drug dispensing as a patient-centered service.	Design of pharmacist indication protocols on several minor
Pharmacist Indication	Pharmacotherapy follow-up group case studies with class
Pharmacotherapy follow-up. The Dáder method.	Contact with real practice environments: community pharmacy with redesigned structure for clinical dispensing; community pharmacy with pharmacist intervention in the community in cooperation with other healthcare professionals.
Pharmacovigilance	
Education for health	

### *Teaching Methods*

For theoretical contents, in-class lectures were used. In training classes, more interactive and dynamic teaching methods were employed: brainstorming, role-play and clinical case discussion, with the purpose of improving student's communication, counselling and problem-solving skills.

### *Evaluation Methods*

In the last week of training classes, students were required to individually solve two clinical cases: one concerning drug dispensing and another concerning pharmacotherapy follow-up. Theoretical concepts comprehension was evaluated through a final written exam. Student's participation on on-line discussion forums was the third evaluation component.

### *Use of the e-Learning Platform*

The Moodle e-learning platform is being used in Porto University for the last two years. It is very user-friendly and interactive and allows engaging students on various tasks such as discussion forums or essays. We used Moodle to provide students with bibliography used for discussion (e.g. reference and opinion articles on different aspects of pharmaceutical care) and several links of interest.

Additionally, two discussion forums on topics we considered relevant in the context of pharmaceutical care were placed on the platform, namely: the importance of drug dispensing activity as an integrant part of the patient-centered pharmaceutical services and the barriers/difficulties expected for future pharmaceutical care practice versus strategies to overcome those. Student's participation was high and contributed positively to the course final grade.

### *Questionnaire results*

Twenty three (23) students filled the questionnaire (35% respondents). Table II presents the mean of results obtained for each question. Concerning teaching methods, only 3 respondents were not satisfied (score of 2), particularly with lectures in theoretical classes. In relation to evaluation methods, 5 students classified at least one of them as poorly or not adequate (scores of 1 and 2), namely evaluation through online forum participation; in opposition, 15 students considered the use of individual clinical case solving and 20 the final written exam as very adequate (scores of 4 or 5).

The majority of respondents regarded the course as very useful (5, n=15) and greatly support the active role of the pharmacist in drug dispensing (5, n=20) and in pharmacotherapy follow-up (5, n=17). In general, student's motivation for including pharmaceutical care in future practice is high (4 or 5, n=22). Twenty students considered the course as important or very important to their perception of the pharmacist as an essential element of the healthcare team.

**Table II – Results of the questionnaire.**

Question	Results (mean ± SD)
<b>Satisfaction with the course</b>	
Teaching methods *	4,1 ± 0,2
Evaluation methods**	3,8 ± 0,6
<b>Course usefulness</b>	
For future individual professional practice	4,6 ± 0,6
For pharmacy practice improvement	4,5 ± 0,5
<b>Perception of pharmacist roles at the end of course</b>	
Active role as drug dispenser	4,9 ± 0,2
Pharmacotherapy follow-up activity	4,6 ± 0,4
Motivation to practice pharmaceutical care as a future pharmacist	4,6 ± 0,7
Essential element of the healthcare team	4,3 ± 0,7

\* Teaching methods used: in-class lectures, brainstorming, role-play and clinical case discussion.

\*\* Evaluation methods used: individual clinical cases solving, final written exam, participation in discussion forums.

## Discussion

On the behalf of EAFP, the Task Force for implementing Pharmaceutical Care into the Curriculum published, in May 1999, its report, proposing changes in the pharmacy undergraduate curriculum. The main conclusions of this document were that Pharmaceutical Care modules should: be mandatory for all pharmacy students; focus on certain disease states or patient groups; integrate knowledge and skills and be taught both in classroom and in practice settings (EAFP, 1999). This document also reported that the process of curriculum change varies in different countries according to the entities in charge (University, Health/Education Ministry or professional/scientific associations).

Literature regarding pharmaceutical care inclusion on pre-graduate teaching is scarce. We found no published data on pre-graduate pharmaceutical care teaching in our country although we are aware that, in some Portuguese universities, courses on the subject of pharmacy practice are offered. European countries like The Netherlands, Germany and Spain have developed programs for undergraduate teaching pharmaceutical care (Martin-Calero MJ et al., 2004). Latin America is also progressively implementing university pharmaceutical care education (Ruiz et al., 2002; Bertoldo et al., 2003; Martinez-Sanchez 2003). In North America and United Kingdom, the pharmacist training programmes are one step ahead, including experiential learning since the late 20th century (Hudson et al., 2007; Caldwell et al., 2001).

Delivery of pharmaceutical care requires a number of different attributes other than the ability to recall factual knowledge: problem-solving skills and a holistic appreciation of the patient are essential. Therefore, innovative teaching strategies are needed to prepare students for practice in the “real world” (Caldwell et al., 2001).

In general, education in health degrees has evolved towards a problem solving learning strategy (problem-based learning). Pharmacy curricula totally based on this strategy have been

introduced in several countries including the UK, Australia, Holland and South Africa (WHO, 1997).

When implementing this course we have tried to base the learning process in solving problems related to individual patient’s pharmacotherapy and developing practical skills and clinical competences for providing pharmaceutical care (communication, information management, identification, prevention and solving of PRM/RNM and counselling in minor ailments).

Despite this effort, the course does not entirely follow the previously referred international recommendations: it is still an elective course and is only offered at the curriculum final year. These aspects are difficult to change due to constraints in human resources and curriculum organization and structure. Furthermore, it does not include real student-patient interaction (experiential learning). Although we managed that students had some contact with practice settings, this is an aspect we wish to improve.

Concerning teaching methods we tried to develop problem-solving skills and clinical competences by using mock prescriptions, pharmacotherapy case studies, discussion groups and “role-plays”. This is in line with experiences in other pharmaceutical care teaching settings (Robert Gordon University, 2000) and EAFP and FIP proposals (EAFP, 1999; FIP, 2000). Nevertheless, some students evaluated teaching methods as poorly or not adequate, especially regarding lectures in theoretical classes. It is our aim to modify these classes, introducing seminars, given by practising pharmacists, and practice workshops.

In relation to evaluation methods, the items most favourably rated by students were the use of a written exam for theoretical concepts evaluation and the solving of clinical cases for training classes’ evaluation. Therefore, these two evaluation methods will be continued. Since we did not find, in the literature, any assessment instrument considered adequate to our purposes, we designed an original survey (questionnaire available upon request to authors), which was not, however, validated. We intend to do so by using the data collected in the 23 questionnaires.

It is rewarding to notice that students rated the course as very useful and important for future practice. Moreover, most students are highly motivated for pharmaceutical care practice and realized the importance of both dispensing and pharmacotherapy follow-up activities. Despite current policy changes concerning pharmacy property and the general view of the pharmacist as an outsider of the healthcare system, in Portugal, students improved their vision on the importance of the pharmacist as an essential member of the healthcare team.

## Conclusions

The “Pharmaceutical care” course was prepared to present concepts and training on the services included on the Portuguese Society of Pharmacist Care model of practice.

Teaching methods intend to engage students in this new philosophy and prepare them for real practice, fomenting their practical skills and clinical competences, although there is still room for improvement.

Students demonstrated great interest on attending this elective course and regarded it as determinant for future engagement in pharmaceutical care practice.

## References

Bertoldo P., Huespe C., Ascar G., Welter A., Mainardi C. (2003) Pharmaceutical Care education by application of tutorial teaching. *Pharm Care Es.* **5**: 170-72.

Caldwell N.A., Sexton J.A., Green C.F., Farrar K. (2001) Sowing the Seeds for Pharmaceutical Care: developments in undergraduate clinical teaching at Liverpool School of Pharmacy. *Pharm J*; **267**: 721-23.

EPSA and IPSF. European Pharmaceutical Students' Association (EPSA) and the International Pharmaceutical Students' Federation (IPSF). (1999) Pharmacy Education: a Vision of the Future; July 1999.

European Association of Faculties of Pharmacy. Report of the Task Force for Implementing Pharmaceutical Care into the Curriculum, 1999.

FIP (International Pharmaceutical Federation). FIP Statement of Policy on Good Pharmacy Education Practice. FIP Vienna Council, 2000.

Gastelurrutia M.A., Benrimoj S.I., Castrillon C.C., Casado de Amezua M.J., Fernandez-Llimos F., Faus M.J. (2009) Facilitators for practice change in Spanish community pharmacy. *Pharm World Sci*; **31**: 32-39.

Hepler C.D., Strand L.M. (1990) Opportunities and Responsibilities in Pharmaceutical Care. *Am J Hosp Pharm*; **47** (3): 533-43.

Hudson S.A., McAnaw J.J., Johnson B.J. (2007) The Changing Roles of Pharmacists in Society. *International e-Journal of Science, Medicine & Education* [serial online][cited 2009 July]; **1**: 22-34. Available from: [URL http://www.imu.edu.my/ejournal/](http://www.imu.edu.my/ejournal/)

Martín-Calero M.J., Machuca M., Murillo M.D., Cansino J., Gastelurrutia M.A., Faus M.J. (2004) Structural Process and Implementation Programs of Pharmaceutical care in Different Countries. *Curr Pharm Design*; **10**: 3969-85.

Martinez-Sánchez A.M. (2003) Pharmaceutical Care: a challenge to curricula design in Pharmacy careers. *Pharm Care Esp*; **5**: 94-7.

Robert Gordon University (2000) Enhancing the performance of graduates: the new pharmaceutical care centre at the Robert Gordon University, Aberdeen [editorial]. *Pharm J*; **264**: 513-517.

Ruiz I., Jirón M., Pinilla E., Paulos C., Pezzani M., Rubio B., Chávez H., Pineda R., Mellado R. (2002) Pharmaceutical care Education at the University of Chile. *Am J Pharm Educ*; **66**: 144-47.

SPCFar (Portuguese Society of Pharmacist Care) 2007 Statutory of SPCFar. Lisbon.

WHO and FIP. World Health Organization and International Pharmaceutical Federation. (2006). Developing pharmacy practice: a focus on patient care.

WHO. (1988) WHO Consultative Group. Report on the role of the pharmacist in the health care system. New Delhi, India.

WHO. (1997) WHO Consultative Group. Report on the role of the pharmacist in the health care system. Preparing the Future Pharmacist: Curricula development. Vancouver, Canada.

WHO. (1993) WHO Second Meeting. The Role of the Pharmacist: Quality Pharmaceutical Services - Benefits for Governments and the Public. Tokyo, Japan.