



## Review article

# The changing face of pharmacy practice and the need for a new model of pharmacy education

Hale Zerrin Toklu<sup>a,b,\*</sup>, Azhar Hussain<sup>c,\*\*</sup>

<sup>a</sup>Department of Pharmacology, Marmara University School of Pharmacy, Tibbiye Cad, 34668 Haydarpaşa, Istanbul, Turkey

<sup>b</sup>Department of Pharmacology, Near East University Faculty of Pharmacy, Nicosia, Turkish Republic of Northern Cyprus, Turkey

<sup>c</sup>Hamdard Institute of Pharmaceutical Sciences, Hamdard University, Islamabad, Pakistan

## ARTICLE INFO

## Article history:

Received 1 June 2012

Accepted 28 September 2012

Available online 30 March 2013

## Keywords:

Pharmacist

Pharmaceutical care

Rational use of medicine

Pharmacy education

Rational pharmacotherapy

## ABSTRACT

Pharmacy profession has evolved from its conventional and traditional drug focused basis to an advanced patient focused basis over the years. In the past century the pharmacists were more involved in compounding and manufacturing of medicines, but this role has significantly reduced over time. This advancement in the role of pharmacist calls for them to be the part of the broader health care team working for providing better health care for the patients, thus contributing in achieving the global millennium development goals. To match up, the role of today's pharmacists needs to be expanded to include pharmaceutical care concepts, making the pharmacist a health care professional rather than a drug seller in a commercial enterprise. Therefore, pharmacy schools should prepare a program that has competence with the changing role of the pharmacist. The education should provide ability for critical thinking, improve problem-solving skills and decision making during pharmacotherapy. The student should be trained to create, transmit, and apply new knowledge based on cutting-edge research in the pharmaceutical, social, and clinical sciences; collaborate with other health professionals and learn to enhance the quality of life through improved health for the people of local society and as well as the global community.

Copyright © 2013, InPharm Association, Published by Reed Elsevier India Pvt. Ltd. All rights reserved.

## 1. Pharmacy profession

In the past century, the pharmacy profession covered mainly compounding. As the compounding functions were significantly reduced in the past decade, it became mainly consisted of dispensing. However, only dispensing does not fulfill the needs and recently a new role had to be developed for the profession.<sup>1,2</sup> The role of today's pharmacist needs to be expanded to include pharmaceutical care concepts, making the pharmacist a health care professional rather than a drug seller in a commercial enterprise.<sup>3</sup> The mission of the pharmacy practice is to provide medication as well as other health care products and services, and to help people and the society to make the best use of them.<sup>4</sup> It involves identifying, preventing, and resolving drug-related problems, as well as encouraging proper use of medication, and general health

promotion and education, thus helping in achieving better therapeutic outcome, by their patient focused interventions.<sup>5</sup> A lack of integration of practice standards across different settings indicates for a need to review the standards for relevance. Moreover, pharmacists need to reevaluate workflow models and the delegation of tasks in the light of new roles and responsibilities.<sup>6</sup> Different models of practice are (1) the drug information practice model, (2) the self-care practice model, (3) the clinical pharmacy practice model, (4) the pharmaceutical care practice model, and (5) the distributive practice model.<sup>7</sup> These models are practiced across the continents alone or in combination based on the understanding of the local pharmaceutical needs, expertise of pharmacist, and their recognition of role.

## 2. Pharmacists' responsibilities for providing rational use of medicine

To promote rational drug use the pharmacist requires to be part of all the decisions regarding medicines and their use. The changing role of the pharmacist as patient counselor/educator and as an intermediate to improve patient outcome in the ambulatory settings is essential for promoting rational use of drugs (RUD).<sup>8</sup> The way

\* Corresponding author. Department of Pharmacology, Marmara University School of Pharmacy, Tibbiye Cad, 34668 Haydarpaşa, Istanbul, Turkey.

\*\* Corresponding author.

E-mail addresses: [haletoklu@yahoo.com](mailto:haletoklu@yahoo.com) (H.Z. Toklu), [azhar\\_26@yahoo.com](mailto:azhar_26@yahoo.com) (A. Hussain).

drugs are procured, stored, distributed, and dispensed and the information given by the pharmacist/dispensers dictates the quality of their use, thus in terms influencing the rational use of medicines.<sup>9</sup> According to World Health Organization (WHO), RUD requires that the patients receive “medicines appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community”.<sup>10</sup> Thus to promote rational drug use, pharmacist requires to dispense right drug to the right patient in right dose, route and time of administration.<sup>11</sup> One of the ways to achieve this is the training of pharmacist and allied health professionals during their academic training. Different countries have taken such initiatives like Pakistan where WHO rational drug module has been incorporated in final year Doctor of pharmacy curriculum.

### 3. Pharmacy ethics

Only general principles, based on accepted values in Western society, lead to guidelines for ethical behavior. The ethical problem appears to be the unequal access to the health care system. An analysis of pharmaceutical care in the light of ethics can help to formulate the pharmacist’s responsibilities. The principle of non-maleficence is strongly connected to the pharmacy profession. Pharmacists should focus more on possible negative outcomes of pharmacotherapy. Monitoring the patient’s medication, identification and prevention of possible adverse effects, medication surveillance, proper communication and information about the use of medicines are therefore priority items within the pharmacy profession. A definition of target groups for pharmaceutical care will facilitate this task.<sup>12</sup> Pharmacists should obey the code of ethics guidelines.

### 4. Pharmaceutical care

The concept of pharmaceutical care evolves through a systematic comprehensive approach, which requires that the pharmacist should work in collaboration with the health care team and identify and resolve the actual and potential drug-related problems and prevent the patients from the potential harm of medicines.<sup>13,14</sup> The pharmaceutical care concept was first introduced in the US by Hepler and Strand in the 1990s.<sup>15</sup> The process revolves around the patient, and is continuous in its delivery with the strategy to anticipate and improve the patient outcome of the drug therapy as compared with the traditional pharmacy where the focus is usually the order (prescription/OTC), which is fulfilled on demand, and the pharmacist, who is oriented to the drug product, obeys the order that he/she receives. The concept of care emphasizes on establishing the pharmacist–patient relationship and putting an additional value of the clinical outcome by being actively involved in the treatment procedure. The delivery of pharmaceutical care by the pharmacist is a hub around process known as pharmacist’s workup of drug therapy (PWDT), which starts by collecting relevant information of the patient, developing CORE pharmacotherapy plan, identifying PRIME pharmacotherapy problems of the patient, and formulating the FARM (F = Finding, A = Assessment, R = Regimen and M = Monitoring) progress notes. With the emergence of this concept the academics and training programs are promoting the philosophy of pharmaceutical care in all areas of pharmacy practice.<sup>16</sup> For delivery of pharmaceutical care the training of the pharmacist should be in line for the development of skills in patient assessment, education and counseling, in the development of patient-specific pharmacist care plans, treatment protocols, dosage adjustments, selection of therapeutic alternatives, and preventive therapies. However, the concept is new to many of the community

pharmacists working in many of the developing countries.<sup>17</sup> Moreover, there are many barriers to adoption/adaptation of pharmaceutical care concept in practice including lack of understanding of pharmaceutical care concept in professionals, lack of training, resource constraints, and above all the political will to implement. At times, the curriculums are not sensitive toward the new developments in the field of pharmacy practice. Every region and country will have to come up with their own model of practice while considering their local scenario, and identifying the clear steps and actions required for having a start so as to help their nations in improving their millennium development goals and commitments through pharmacists’ contributions.

### 5. Evidence-based pharmacy

Moving from perception to evidence in pharmacy practice is mandatory in providing optimal pharmaceutical care.<sup>4,18</sup> The concept of evidence for clinical decision making got recognition in the early 1990s and poses a major challenge for its introduction and implementation of clinical guidelines in daily practice in most of the settings including the pharmacy.<sup>19</sup> Evidence suggests that the patients receive unnecessary and harmful care, which is at times beyond the scope of the providers.<sup>2,20–22</sup> One of the challenges is to keep oneself abreast with the latest developments in the field of medical science with so many new specialties and sub specialties. The basic principle of evidence-based practice is to make all practical decisions based on research studies, which are selected according to the specific standards pertaining quantitative, qualitative, and theoretical studies.<sup>23</sup> It is believed that the evidence-based medicine is difficult to practice and one of the ways is to bridge the gaps in the knowledge of the practitioners by enhancing information systems in order to provide decision support, which will help in preventing decision errors.<sup>24</sup> There is a need to develop a curriculum that is sensitive to the skill development in the area of evidence-based pharmacy.<sup>25</sup>

### 6. Pharmacy education

For the intents and purposes of the Taskforce, when using the term pharmacy education, it is to be understood that this refers to the educational design and capacity to develop the workforce for a diversity of settings (e.g., community, hospital, research and development, academia) across varying levels of service provision and competence (e.g., technical support staff, pharmacists, and pharmaceutical scientists) and scope of education (e.g., undergraduate, postgraduate, lifelong learning).<sup>26</sup>

The duration and content of pharmacy education differs among countries.<sup>27,28</sup> Although the basic pharmaceutical courses are similar, the pharmaceutical care concept has variations with regard to the practice applied in the region/country.<sup>29–35</sup> Recently, it has been demonstrated that simulation centers for health professional schools may offer a novel method of teaching and evaluating health care processes at the microlevel.<sup>36</sup>

### 7. Interventions in teaching in pharmacy schools

The need for the qualified pharmacy services enforces improvement of teaching methods in pharmacotherapy. Pharmacotherapy courses are generally given as lectures by the pharmacologists in the medical and pharmacy schools. However, pharmacy students often face problems in implementing theoretical pharmacotherapy knowledge to practice. Thus, novel methods (e.g., Groningen model) are developed for pharmacotherapy teaching in medical schools. Recently a novel model based on dispensing scores was developed by the ‘Turkish Pharmacological Society’,<sup>37</sup> and

rational pharmacotherapy courses based on “problem solving methods” are given in Turkey and Northern Cyprus.<sup>34,38,39</sup>

## 8. Pharmacy Education Action Plan

Because of their knowledge of medicines and clinical therapeutics, pharmacists are suitably placed for task shifting in health care and could be further trained to undertake functions such as clinical management and laboratory diagnostics. Indeed, pharmacists have been shown to be willing, competent, and cost-effective providers of what the professional literature calls “pharmaceutical care interventions”; however, internationally, there is an under use of pharmacists for patient care and public health efforts. A coordinated and multifaceted effort to advance workforce planning, training, and education is needed in order to prepare an adequate number of well-trained pharmacists for such roles.

However, health care needs and practice standards vary among countries as well as the education. Thus, Pharmacy Education Taskforce of the WHO, United Nations Educational, Scientific, and Cultural Organization and the International Pharmaceutical Federation Global Pharmacy and the Education Action Plan 2008–2010 was developed. The action plan aims to develop a vision, frameworks, guidelines, and case studies; build evidence and advocacy; accelerate country action; and establish a global platform for dialog, which is required to achieve/ensure the competence. The Action Plan is dedicated to four domains of action: quality assurance, academic and institutional capacity, competence, and vision for pharmacy education. It was developed and refined during two global pharmacy education consultations convened by FIP (International Pharmaceutical Federation). It will be actively and continuously monitored by the Taskforce to assess progress toward the overreaching goal; that is, disseminating evidence-based guidance and frameworks that facilitate the development of pharmacy education (and higher education capacity) to enable sustainability of a pharmacy workforce appropriately skilled to provide pharmaceutical services.<sup>26</sup>

## 9. Conclusion

The changing face of pharmacy practice requires that the pharmacy schools should intervene with their programs with the competence to take up the challenge of changing role of the pharmacy profession. The education should provide ability for critical thinking, improve problem-solving skills, and decision making during pharmacotherapy. The student should be trained to create, transmit, and apply new knowledge based on cutting-edge research in the pharmaceutical, social, and clinical sciences; collaborate with other health professionals and to enhance the quality of life through improved health for the people of our society and as well as the global community.

## Conflicts of interest

All authors have none to declare.

## References

- Caamaño F, Ruano A, Figueiras A, Gestal-Otero JJ. Data collection methods for analyzing the quality of the dispensing in pharmacies. *Pharm World Sci.* 2002;24:217–223.
- Toklu HZ, Akici A, Oktay S, Cali S, Sezen SF, Keyer-Uysal M. The pharmacy practice of community pharmacists in Turkey. *Marmara Pharm J.* 2010;14:53–60. Available at: [http://www.marmarapharmaceuticaljournal.com/pdf/pdf\\_MPJ\\_242.pdf](http://www.marmarapharmaceuticaljournal.com/pdf/pdf_MPJ_242.pdf).
- van Mil F. Pharmacy and health care. *Pharm World Sci.* 2002;24:213.

- Stone L. *Good Pharmacy Practice in Developing Countries: Recommendations for Step-wise Implementation.* Hague: FIP Congress Report; 1998.
- Nkansah N, Mostovetsky O, Yu C, et al. Effect of outpatient pharmacists' non-dispensing roles on patient outcomes and prescribing patterns. *Cochrane Database Syst Rev.* 2010;7. CD000336.
- Hattingh HL, King MA, Smith NA. An evaluation of the integration of standards and guidelines in community pharmacy practices. *Pharm World Sci.* 2009;31:542–549.
- Wiedenmayer K, Summers R, Mackie C, Gous A, Everard M, Tromp D. *Developing Pharmacy Practice “A Focus on Patient Care Handbook.* 2006th edn. Geneva/The Hague, The Netherlands: World Health Organization, Department of Medicine Policies and Standards/Switzerland and International Pharmaceutical Federation; 2006.
- Caamaño F, Alvarez R, Khoury M. The community pharmacists and their practice as health care providers. *Gac Sanit.* 2008;22:385.
- Role of Dispensers in Promoting Rational Drug Use. *International Network of Rational Drug Use.* World Health Organization; 2000.
- The Role of Education in the Rational Use of Medicines. *International Network of Rational Drug Use.* World Health Organization; 2006.
- Benjamin DM. Reducing medication errors and increasing patient safety: case studies in clinical pharmacology. *J Clin Pharmacol.* 2003;43:768–783.
- Dessing RP. Ethics applied to pharmacy practice. *Pharm World Sci.* 2000;22:10–16.
- Strand LM, Cipolle RJ, Morley PC. *Pharmaceutical Care: An Introduction.* Michigan: Upjohn Co; 1992:14–29.
- Strand LM, Morley PC, Cipolle RJ, Ramsey R, Lamsam GD. Drug-related problems; their structure and function. *DICP.* 1990;24:1093–1097.
- Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm.* 1990;47:533–543.
- Farris KB, Fernandez-Llimos F, Benrimoj SI. Pharmaceutical care in community pharmacies: practice and research from around the world. *Ann Pharmacother.* 2005;39:1539–1541.
- Azhar S, Hassali MA, Ibrahim MI, Ahmad M, Masood I, Shafie AA. The role of pharmacists in developing countries: the current scenario in Pakistan. *Hum Resour Health.* 2009;7:54.
- Good Pharmacy Practice In Community and Hospital Pharmacy Setting.* Geneva: World Health Organization; 1996.
- Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. *Lancet.* 2003;362:1225–1230.
- Hussain A, Ibrahim MI. Medication counselling and dispensing practices at community pharmacies: a comparative cross sectional study from Pakistan. *Int J Clin Pharm.* 2011;33:859–867.
- Gokcekus L, Toklu HZ, Demirdamar R, Gumusel B. Dispensing practice in the community pharmacies in the Turkish Republic of Northern Cyprus. *Int J Clin Pharm.* 2012;34:312–324.
- Hussain A, Ibrahim MI. Qualification, knowledge and experience of dispensers working at community pharmacies in Pakistan. *Pharm Pract (Internet).* 2011;9:93–100.
- Hjorland B. Evidence based practice: an analysis based on the philosophy of science. *J Am Soc Inf Sci Technol.* 2011;62:1301–1310.
- Bates DW, Kuperman GJ, Wang S, et al. Ten commandments for effective clinical decision support: making the practice of evidence-based medicine a reality. *J Am Med Inform Assoc.* 2003;10:523–530.
- Wiffen P. *Evidence-based Pharmacy.* Abingdon: Radcliffe Medical Press; 2001.
- Anderson C, Bates I, Beck D, et al. The WHO UNESCO FIP Pharmacy Education Taskforce. *Hum Resour Health.* 2009;7:45.
- Al-Wazaifiy M, Matowe L, Albsoul-Younes A, Al-Omran OA. Pharmacy education in Jordan, Saudi Arabia, and Kuwait. *Am J Pharm Educ.* 2006;70:18.
- Kheir N, Zaidan M, Younes H, El Hajj M, Wilbur K, Jewesson PJ. Pharmacy education and practice in 13 middle eastern countries. *Am J Pharm Educ.* 2008;72:133.
- Bourdon O, Ekeland C, Brion F. Pharmacy education in France. *Am J Pharm Educ.* 2008;72:132.
- Marriott JL, Nation RL, Roller L, et al. Pharmacy education in the context of Australian practice. *Am J Pharm Educ.* 2008;72:131.
- Sosabowski MH, Gard PR. Pharmacy education in the United Kingdom. *Am J Pharm Educ.* 2008;72:130.
- Kehrer JP, Schindel TJ, Mann HJ. Cooperation in pharmacy education in Canada and the United States. *Am J Pharm Educ.* 2010;74:142.
- Basak SC, Sathyanarayana D. Pharmacy education in India. *Am J Pharm Educ.* 2010;74:68.
- Sánchez AM. Pharmacy education in Cuba. *Pharm World Sci.* 2010;32:696–700.
- Demirdamar R, Toklu HZ, Gumusel B. Pharmacy education in Turkish Republic of Northern Cyprus. *Educ Res.* 2012;3:1–6.
- Nickman NA, Haak SW, Kim J. Use of clinical simulation centers in health professions schools for patient-centered research. *Simul Healthc.* 2010;5:295–302.
- Toklu HZ, Ayanoglu-Dulger G, Gumusel B, Yaris E, Kalyoncu NI, Akici A. Developing a model checklist for the evaluation of the dispensing scores in the pharmacy. *Basic Clin Pharmacol Toxicol.* 2010;107(suppl 1):617–618.
- Toklu HZ, Dulger G, Yaris E, Gumusel B, Akici A. First impressions from a short training course in rational use of drugs for the pharmacologists in the pharmacy schools in Turkey. *Value Health.* 2009;12:A249.
- Toklu HZ. Problem based pharmacotherapy teaching for pharmacy students and pharmacists. *Curr Drug Deliv.* 2013;10:67–70.