

## LETTERS

### **Broader Perspective Needed on the PharmD Degree in Pakistan**

*To the Editor.* The design and need of a doctorate of pharmacy (PharmD) degree in Pakistan has been heavily criticized in the published letters.<sup>1,2</sup> We would like to share the bigger picture with the readership of the *Journal*. Pakistan is home to more than 160 million people with an overall annual healthcare budget of 6484 million Pakistani rupees (approximately US \$78.1 million).<sup>3</sup> PharmD degree, a 5-year program, was introduced as the basic degree in pharmacy in 2003-2004, replacing the 4-year traditional bachelor of pharmacy (BPharm) degree. We agree with Shazia et al that the curriculum should be designed in alignment with the national priorities first, followed by regional and global needs. Without doubt, the PharmD degree in Pakistan lacks sufficient clinical pharmacy components, but it is also true that the clinical pharmacy component has been notably increased in comparison with the earlier BPharm curriculum. Broadly, there are 2 justifications for not offering a PharmD degree with a predominantly clinical emphasis. First and foremost is the lack of experienced clinical pharmacy academics in Pakistan. Facing the same problem is the United States, where clinical pharmacy services are well established, yet approximately 56% of faculty positions are vacant primarily due to lack of candidates with suitable academic qualifications.<sup>4</sup> Second, is the fact that the biggest job market for pharmacists in Pakistan is the pharmaceutical industry. Therefore, a highly clinically-oriented PharmD degree is inappropriate.

The need for initiating a clinical-industrial hybrid PharmD degree instead of the traditional BPharm degree is quite debatable. In our opinion, the 5-year program is justified for the following reasons. In Pakistan, unlike USA and Canada, the pharmacy profession is still in transition from industrial based to clinical services oriented, and the current PharmD program is serving as a bridge facilitating this transition. In an attempt to ensure a smooth transition, provisional governments in Pakistan have hired a broad range of pharmacists in all major public hospitals. This act has given pharmacists an unprecedented opportunity to demonstrate their skills through establishing and delivering clinical pharmacy services to their patients. In addition, these hospitals may serve as training hospitals for future PharmD students. Proper, targeted, and well-constructed small scale training programs will be of immense value in training these hospital

pharmacists to become outcome-oriented pharmacists and good clinical preceptors over time. Being realistic, such professional transformation will not happen overnight, rather it will occur slowly over time.

We found it difficult to agree on some of the issues raised in the earlier letters.<sup>1,2</sup> On the basis of interviews conducted, the authors found that pharmacy students were uncertain of their future and the reason concluded was the new curriculum.<sup>2</sup> It is difficult to comment on the conclusion without knowing how well the study was conducted, but to share with the readers, this kind of uncertainty is common in underdeveloped countries, especially those confronted with war for almost a decade. Putting the blame solely on the PharmD curriculum may not be justified. We also strongly disagree with the statement that there was a “forced conversion” from BPharm to PharmD without informed consent. Being a former student (MAH) of a pioneer BPharm cohort, who were offered to undertake 1 year condensed course to upgrade to the PharmD degree at the University of Punjab, Lahore, Pakistan, I would like to clarify that there were no forced conversions. In fact, the 1-year condensed course was advertised in all the leading national newspapers and new admissions were made, which ruled out any possibility of forced conversions. I still hold a BPharm degree, which is evidence of informed consent. If any other university has imposed forced conversions, which is highly unlikely, then this can be challenged in a court of law and through Pakistan’s pharmacy board.

In our opinion, clinical pharmacy being under the department of pharmaceuticals within the university is not an issue as highlighted by Shazia et al.<sup>2</sup> It may simply be a matter of university policy or perhaps a lack of sufficient clinical pharmacy academics to set up an independent department. The introduction of the PharmD degree is just the beginning of change in academic pharmacy in Pakistan, and the possibility of an independent clinical pharmacy department cannot be ruled out in the near future. Like many other developing countries, Pakistan is an exporter of human recourse as well, and makes a significant contribution to building up foreign currency exchange in Pakistan. Therefore, changing global trends should be considered when mapping out policies. To us, in addition to serving the needs of the Pakistani population, if the new PharmD program can enable the graduates to work in the United States, Gulf region, or in other countries, it should be commended rather than criticized. In summary, without doubt there is room for improvement in the current PharmD curriculum design; however, failure to move forward in education will not benefit the pharmacy profession either inside or outside Pakistan.

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## The Importance of Including Topics Related to Pharmacogenetics, Pharmacogenomics, and Medical Genetics in the Pharmacy Curriculum

*To the Editor.* The literature contains a body of evidence documenting variations in drug response among individuals. This includes differences in the extent of adverse drug reactions as well as efficacy of the drug therapy. In addition to physiological and environmental factors, genetic makeup has a profound impact on an individual's response to drugs. This has given rise to the field of personalized molecular medicine, which uses genetic information along with other biomarkers to predict an individual's response to drugs and determine the accurate dosage of several drugs based on the individual's genotype.

Pharmacists are experts in pharmacotherapy who provide pharmaceutical care to patients. Over the past several years, the scope of pharmacy practice has evolved to meet the requirements of the patient-centered care environment. In addition to dispensing prescriptions, pharmacists also are involved in patient-care actions, such as making decisions related to the pharmacotherapy of patients, counseling patients on their diseases, treatments, and medications, as well as promoting health. Pharmacogenomics is an emerging field that impacts many, if not all, of these aspects of the pharmacy practice. Knowledge of pharmacogenomic principles will prepare pharmacists to interact more effectively with other health care practitioners to further optimize pharmacotherapy for patients based on their specific genotype. Increasing evidence in the literature clearly shows that variations exist as a result of poly-

morphic expression of genes involved in metabolizing enzymes, transporters, and drug targets. The clinical application of such knowledge can consequently reduce the risk of side effects and improve the efficacy of the drugs.

Virtually all disciplines within the pharmacy curriculum will be affected to some degree by basic understanding of drug response through pharmacogenomics and pharmacogenetics.<sup>1</sup> The view that pharmacists can be trained for new roles as experts in pharmacogenomics is widely discussed.<sup>2,3</sup> The American Council on Pharmacy Education has asserted that “The College or School's professional degree program curriculum must prepare graduates with the professional competencies to enter pharmacy practice in any setting to ensure optimal medication therapy outcomes and patient safety, satisfy the educational requirements for licensure as a pharmacist, and meet the requirements of the university for the degree.”<sup>4</sup> This requires pharmacy schools to provide sound training in pharmacogenomics to prepare pharmacy students to fulfill their numerous responsibilities as first-line health care practitioners. According to a report published in 2005, however, 40% of pharmacy schools surveyed did not provide any pharmacogenomic instruction in their curriculum.<sup>5</sup> In another report, pharmacogenomics was not taught in over 20% of 41 responding US pharmacy schools.<sup>6</sup> Many schools did not implement topics related to the genetic basis of disease, and the ethical, social, and economic implications, as has been recommended by the American Associations of Colleges of Pharmacy Academic Affairs Committee. Among 85 accredited pharmacy schools, only 5 had basic genetics as a course requirement for entering pharmacy school or as a part of the pharmacy curriculum<sup>7</sup>.

During the 2008 American Association of Pharmaceutical Scientists (AAPS) annual meeting, academic members of the pharmacogenomics (PGx) focus group expressed concern over the lack of pharmacogenomic education in pharmacy schools.<sup>5,6</sup> PGx members agreed that pharmacogenomics should be taught in pharmacy schools to provide future pharmacists with a thorough understanding of the genetic component of patient variability in drug response. Furthermore, they suggested that a basic genetics course should be considered a prerequisite for this course, which would provide a solid foundation for pharmacogenomic concepts. When developing a pharmacogenomics course, the following topics should be covered: principles of genetics, the human genome project, genetic variability, inheritance, genetic basis of the human diseases, pharmacogenetics of drug absorption, distribution and elimination, biopharmacy, pharmacogenetics and clinical pharmacokinetics, genetic differences in pharmacodynamics, drug targets and transporters, polymorphic

genes of clinical significance, pharmacogenomics and the future of therapy, cost effectiveness and quality of life, and ethics and medical implication of genetic testing. Additional case studies may be used to highlight the current application of PGx information in cancer, cardiovascular, psychiatry, infectious disease, organ transplantation, hematology and the drug discovery process.

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## Introducing Pharmacovigilance to Postgraduate Pharmacy Students in Nepal

*To the Editor.* Pharmacovigilance is the science and activities related to the detection, assessment, understand-

ing, and prevention of adverse effects or any other drug-related problems.<sup>1</sup> Pharmacovigilance programs can play an important role in early detection and prevention of adverse drug reactions (ADRs). Healthcare professionals should be aware of the existing pharmacovigilance programs in their country and should report (ADRs) as a part of their professional obligation. The pharmacist can promote the development, maintenance, and ongoing evaluation of a program to reduce the risks of ADRs by detecting, reporting, and assessing any suspected ADRs. A pharmacist can educate the staff (physicians, nurses, etc.) and encourage compliance with the ADR reporting program. Studies from both developed<sup>2</sup> and developing countries document a poor knowledge of, attitude toward, and practice of pharmacovigilance among pharmacists.<sup>3</sup>

Developed countries have incorporated pharmacovigilance teaching in the pharmacy curriculum.<sup>4</sup> In Nepal, the pharmacy curriculum trains students to work in an industry and there is less emphasis on pharmacy practice and social pharmacy-related issues. Pharmacoepidemiology and drug safety are one of the neglected areas. The Kathmandu University in Nepal conducts a 2-year masters in pharmacy (MPharm) program in pharmaceutical care. During the 2-year course, the students are posted in teaching hospitals and participate in ward rounds with the clinicians. Pharmacovigilance is not being taught to these students.

The regional pharmacovigilance center of Western Nepal is the pioneer in introducing the concept of pharmacovigilance in Nepal. The first year MPharm students of Kathmandu University visited the Manipal Teaching Hospital, a tertiary care teaching hospital attached with the regional pharmacovigilance center, for their 1-week hospital orientation program in June 2008. During their 1-week program, an education module in pharmacovigilance was conducted for them.

The objectives of the module were to introduce the present national pharmacovigilance program of Nepal to the students, emphasize the importance of pharmacovigilance programs, and also familiarize them with a few operational aspects of pharmacovigilance programs. To start with, students were divided into 3 groups. The module had 4 parts.

**Part I: Sketching out the current National Pharmacovigilance programme.** The students were asked to sketch out the National Pharmacovigilance programme of Nepal.

**Part II: Designing an adverse drug reaction reporting form.** Students were encouraged to design an ADR reporting form by themselves. They were divided into small groups of 5 students each. They were instructed that the form should be brief, concise, and have all the essential information required for an ADR reporting form.

**Part III: Carrying out the causality assessment.**

Students were asked to carry out the causality assessment of 4 ADRs that were reported to the pharmacovigilance center. The Naranjo algorithm was provided to the students to carry out the causality assessment.

**Part IV: Carrying out the severity assessment.** Students were also asked to carry out the severity assessment of 4 ADRs that were reported to the pharmacovigilance center. Modified Hartwig and Siegel scales were provided to the students to carry out the severity assessment. These 4 ADRs were the same used for the causality assessment.

Upon completion of the sessions, feedback was obtained from the students via a questionnaire consisting of 20 questions rated on a Likert-type scale.

Altogether 11 students participated in the program (6 females and 5 males). Except for 1, the students were Nepalese citizens. The overall median (interquartile range) of scores of the students was 82 (79-83); with a maximum possible score of 100. A high number of respondents agreed that the sessions made them aware of the concept of pharmacovigilance (5, range 4-5) and all the respondents stated that they would welcome similar sessions in the future (5, range 5-5). However, a poor rating was obtained in response to the statement "Pharmacovigilance program in Nepal is successful," (2, range 1-3).

On the whole, we found that the students were interested in knowing about pharmacovigilance and enjoyed the session. We are also in the process of having similar sessions for the undergraduate pharmacy students, nursing students, and medical students in Western Nepal.

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