

Inclusion of Pharmacoeconomics course in the Undergraduate Pharmacy Education: A Global Trend Review

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ABSTRACT

Objective: Although pharmacoeconomics was recognized as a sub-discipline of health economics for over 25 years, its diffusion into pharmacy education has been gradual. The purpose of this review was to describe the global trend of inclusion of pharmacoeconomics course in the undergraduate pharmacy education. **Methods:** Published literatures were searched and information on the inclusion of pharmacoeconomics course in the undergraduate pharmacy curriculum was collected and collated. Pub Med, Google Scholar, and Google databases were used for the search in October and December 2015. Both compulsory and elective pharmacoeconomic courses in the undergraduate pharmacy curriculum (BS, B. Pharm, Pharm.D) were considered. We have organized and summarized the information by countries and time period. **Trends:** Out of 13 surveys reviewed, 4 surveys from the US have provided the key baseline for documenting trends in inclusion of pharmacoeconomics course in the pharmacy curriculum. As per a 2011 survey, pharmacoeconomics course was included in almost all colleges/schools of pharmacy in the US. Other than surveys from the US, 6 were conducted or published in the last 3 years. Many of the surveys identified that the contents in pharmacoeconomic course vary to different extent. Information from many countries was not available, especially in Africa and Asia. **Conclusion:** The pharmacoeconomics course was very much part of the undergraduate pharmacy programs in the US. Even though the diffusion of pharmacoeconomics course to the rest of the world was slow; it has picked up the pace in this decade. Standardization of pharmacoeconomics education shall be necessary. Further surveys from countries other than the US are required to comprehend the implications of the trend.

Key words: Pharmacoeconomics, Pharmacy curriculum, Pharmacy education, Education trend review, Survey, Course

INTRODUCTION

Pharmacoeconomics has been defined as the description and analysis of the costs of drug therapy to healthcare systems and society.¹ Pharmacoeconomic evaluations identify, measure, and compare the costs and consequences of health technology products and services.² It is a sub-discipline of health economics for over 25 years. International Society for Pharmacoeconomics and Outcomes Research (ISPOR) has been in operation since 1995 and is the leading professional society in pharmacoeconomics. Learning pharmacoeconomics improve the knowledge, skill, and competence to value pharmaceutical interventions.³ Pharmacists are expected to use pharmacoeconomic

evaluations in the selection process of medicines to hospital formulary.⁴ Pharmacoeconomics has patient, provider, payer, and societal perspectives.

Inclusion of pharmacoeconomics course in the undergraduate pharmacy curriculum (BS, B.Pharm, PharmD) is a trend worldwide.⁵ In some countries, PharmD is a post graduate program. Pharmacoeconomics course was either in compulsory or elective mode. To date, to our knowledge no global review was published to compile surveys on inclusion of pharmacoeconomics course in pharmacy education. One of the interesting articles compared topics taught in undergraduate pharmacy edu-

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cation in the US. The researcher commented that the course was taught on par with current pharmacoeconomics literature.⁶ The purpose of this review was to describe the global trend of inclusion of pharmacoeconomics course to pharmacy education.

METHODS

Published reports were searched and information on inclusion of pharmacoeconomics course in the undergraduate pharmacy curriculum was collected and collated. Pub Med, Google Scholar, and Google databases were used for the search in October and December 2015. Both compulsory and elective pharmacoeconomic courses in the undergraduate pharmacy curriculum (BS, B.Pharm, PharmD) were considered. We did organize and summarize the information by countries/continent and time period.

TRENDS

Overall, we found 13 papers with potential information regarding inclusion of pharmacoeconomic courses in the undergraduate pharmacy curriculum. They are listed in chronological order in Table 1.

Surveys by Dr. Karen L. Rascati and colleagues provided a key baseline for documenting trends in inclusion of pharmacoeconomics in the US and rest of the world.⁷

Other than surveys from the US, 6 out of 9 were conducted or published in the last 3 years.

US

A series of surveys conducted by Rascati and colleagues document the gradual adoption of pharmacoeconomics in the US. The most recent survey in 2011 stated that pharmacoeconomics education was provided in almost all US colleges and schools of pharmacy. The survey also found a variation in the number of teaching hours and topics covered in the PharmD curriculum.⁸ In 2008 survey, among the 90 institutions of pharmacy that completed the survey, 7 had no teachers for pharmacoeconomics.⁹ Their earliest survey performed in 1997 showed that sixty-three (80 percent) schools offered pharmacoeconomics education at the BS and/ or PharmD level.¹⁰

Rest of World Experience by a US study

Rascati and colleagues carried out a 2004 survey that was aimed to assess the extent of pharmacoeconomics education in colleges outside the US. Ninety colleges and schools from 43 countries responded among which, 52% of them provided pharmacoeconomics education

(Europe, n=19; Asia, n=10; North America, n=7; Oceania, n=6; and other, n=5).¹¹

Brazil

A survey in 2013 observed insufficient pharmacoeconomics education at pharmacy schools in Brazil. Only 16 out of 55 colleges responded. All the 16 colleges agreed the importance of pharmacoeconomics education, but only six schools were providing formal education.¹²

Europe

A survey was conducted in students of European Pharmaceutical Student Association (EPSA) member associations in 2002. Out of 781 students replied, 63.6% had insufficient awareness about the term pharmacoeconomics. Among those who studied pharmacoeconomics in their curriculum, 64.4% had the subject compulsory and it was optional for the rest.¹³

Turkey

Pharmacoeconomics was included in the curriculum by two faculties by 2014. The survey conducted in students showed a demand to include pharmacoeconomics in pharmacy curriculum.¹⁴

Russian Federation

As per a survey conducted in 2012; 80% of pharmacy schools in Russian Federation were offering Pharmacoeconomics. The survey was conducted in 47 schools of pharmacy, of which 44 responded; among them 35 were offering pharmacoeconomics. In 26 schools pharmacoeconomics was offered as a required course and in 9 schools, it was an elective course.¹⁵

In another survey, 13 universities were reviewed in the Ukraine, of which 10 were providing pharmacoeconomics education by 2009.¹⁶ Another study team observed that by 2013, only one pharmacy school in Bosnia and Herzegovina introduced pharmacoeconomics as a course in undergraduate pharmacy program.¹⁷

UAE

In the UAE, five out of seven colleges with B.Pharm and or PharmD programs were providing a pharmacoeconomics course in their curriculum.¹⁸⁻²²

Egypt

As per survey to schools of pharmacy in 2013, pharmacoeconomics was not common in the pharmacy curriculum. Only 4 schools offered pharmacoeconomics courses in undergraduate pharmacy education. An additional 8 schools expressed interest in teaching pharmacoeconomics in the near future. The respondents observed

Table 1: Timeline of surveys published on pharmacoeconomics education.

| US | Europe | US study on rest of the world | US | Ukraine | US | Russian Federation | Bosnia & Herzegovina | Brazil | Egypt | Turkey | Pakistan | Eastern Mediterranean Region |
|------|--------|-------------------------------|------|---------|------|--------------------|----------------------|--------|-------|--------|----------|------------------------------|
| 1997 | 2002 | 2004 | 2008 | 2009 | 2011 | 2012 | 2013 | 2013 | 2013 | 2014 | 2015 | 2015 |

a deficiency of well-trained teaching staff in pharmacoeconomics.²³

India

All pharmacy schools with PharmD have pharmacoeconomics in their curriculum since 2008.²⁴ No formal publication was available on our search about inclusion of pharmacoeconomics course in B.Pharm. Courses vary greatly in B.Pharm than PharmD (relatively new) in India. Even though the basics of pharmacoeconomics were included in some courses of B.Pharm curriculum, it was unusual to be included as a course or a major component in a course.

Pakistan

Pharmacoeconomics was commonly included in the PharmD program, but the extent of pharmacoeconomics in the curriculum was perceived by senior students as insufficient by a survey in 2015.²⁵

Taiwan

No formal survey was conducted; however, among 8 schools of pharmacy only 3 had the PharmD program. Only 3 schools had a pharmacoeconomics course in the BS and/or PharmD program.²⁶

Eastern Mediterranean Region

A survey in 22 Eastern Mediterranean countries had 41 (31%) responding schools, of which 28 (68%) from 12 countries were providing pharmacoeconomics education in 2012. There was significant variation in the number of hours and topics covered in pharmacoeconomics.²⁷

DISCUSSION

The US is the forerunner in adoption of pharmacoeconomics training in pharmacy education. Pharmacoeconomics was not common in the pharmacy graduate curriculum before 1990s in the US. This uptake began in the 2000s, but surveys from the US revealed that some schools included pharmacoeconomics in their curriculum only by the last decade. The trend of including pharmacoeconomics in the undergraduate pharmacy curriculum picked up its space even later in the rest of the world.²⁸ There are many institutions in different countries that included pharmacoeconomics in this decade. While some institutions were enthusiastic for the future

inclusion, the information of inclusion of pharmacoeconomics course was not available from many countries or there were reports of insufficient inclusion.²³

The possible reasons for inclusion of pharmacoeconomics courses could be three. First, national regulatory requirements of health technology assessment are a major factor. The trend of this inclusion is based on the needs of listing new drugs in the national health insurance program. It was mandatory in many countries that health technology assessment should include pharmacoeconomics study reports.^{4,29,30} Second, promotion of the science of pharmacoeconomics by the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) could be a significant factor leading to inclusion of pharmacoeconomics course in schools of pharmacy. Many countries made national pharmacoeconomic guidelines, and it was under development in many else.^{31,32} Local and international influences shall contribute to the inclusion of pharmacoeconomics education. Third, the availability of the trained faculty in pharmacoeconomics as another factor in developing countries.

Many health regulators in the world have revised their health technology assessment.^{31,32} For marketing approval, it was focusing on safety and efficacy of newer interventions. However, for listing and reimbursement of new drugs the assessment was focusing on cost-effectiveness and budget impact in addition to comparative quality, safety and efficacy.³³ As pharmacoeconomic analyses became part of drug reimbursement and pharmacy practice, the relevance of including pharmacoeconomics in the pharmacy curriculum has become clearer.³⁴

Advantages and disadvantages

The main advantage of including pharmacoeconomics course in graduate pharmacy programs is the production of local pharmacoeconomics expertise.²⁶ Pharmaceutical regulation is important in the capacity building. The regulatory transformations happening globally need pharmacoeconomics research as part of health technology assessment. So inclusion of pharmacoeconomics course is empowering pharmacists to contribute meaningfully to national health policy and healthcare delivery.³⁵ Learning pharmacoeconomics has also applications in individual patient care, which is microeconomics.³⁶ Healthcare is a cost-sensitive business.³⁷ Hospitals

run with limited resources and many patients face difficulty in paying their healthcare bills. Applying pharmacoeconomics principles in patient care could improve affordability and clinical outcomes.^{4,38} Learning pharmacoeconomics has advantages in improving micro and macro level of healthcare.³⁹

Limited access to educational resources is one of the disadvantages in low income countries.^{35,38} The healthcare focuses mainly on cost-minimization rather than cost-effectiveness to reduce pharmaceutical expenses.⁴⁰ Even though the resources required for cost-minimization analysis is lesser than other sophisticated analyses, it is advisable to have some level of pharmacoeconomics education in low income countries too.

It is important; of course, that the pharmacoeconomics course content is not poorly planned or implemented.⁴¹ Major pitfalls in implementation of pharmacoeconomics education were lack of standardization in research, practice, and education. From some of the references cited above; it was evident that in some institutions, the pharmacoeconomic courses did not meet its course learning objectives. One of the leading reasons for that was lack of expert facilitators.

Guidelines for implementation

ISPOR is a leading organization that makes good research practice guidelines in pharmacoeconomics research. We could not find any formal guidelines for pharmacoeconomics education. But there are pharmacoeconomic guidelines on research and practice. The regional pharmacoeconomic guidelines could be developed by any national agencies or by the university itself. Preferably all teachers of pharmacoeconomics need formal training. They could be involved in pharmacoeconomics research and continuous professional development in collaboration with leading organizations or pharmacy schools. It is important to integrate pharmacoeconomics content to pharmacotherapy textbooks.⁴²

CONCLUSION

In summary, pharmacoeconomics has been included as a course either compulsory or as elective in schools or colleges of pharmacy in many countries. The pharmacy programs we considered in this review were BS, B.Pharm, and or PharmD. Inclusion of pharmacoeconomics course in the undergraduate pharmacy program is a trend in most of the regions except the US. In the US pharmacoeconomics is already a part of the curriculum in the schools/colleges of pharmacy. Universally, many studies suggest that the content in pharmacoeconomic courses vary to different extent. Information from many other

countries with established pharmacy education was lacking. Further surveys from countries other than the US are required to comprehend the implications of the trend.

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CONFLICT OF INTEREST

Authors Dixon Thomas and Yen Huei Tarn are having affiliations to ISPOR. No conflicts of interest reported.

ABBREVIATION USED

BS; Bachelors of Science
 B.Pharm; Bachelors of Pharmacy
 PharmD; Doctor of Pharmacy
 ISPOR; International Society for Pharmacoeconomics and Outcomes Research
 US: United States
 UAE; United Arab Emirates
 EPSA; European Pharmaceutical Student Association

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