CONTINUING PHARMACEUTICAL EDUCATION FOR COMMUNITY PHARMACISTS IN THE EASTERN PROVINCE OF SAUDI ARABIA

Mastour S. Al-Ghamdi, PhD, College of Medicine, King Faisal University, Dammam, Saudi Arabia

Background: Community pharmacists in Saudi Arabia very often make decisions that affect patient outcome. Previous studies have indicated that they have access to limited sources of information. Therefore, structured continuing pharmaceutical education (CPE) is necessary to improve their standards and attitudes.

Aims: Identify the most important topics for CPE as well as the most significant barriers to conducting CPE successfully.

Correspondence to:
Dr. Mastour S. Al-Ghamdi, Department of Pharmacology, College of Medicine, King Faisal University, P.O. Box 2114, Dammam 31451, Saudi Arabia
Methods: A questionnaire was distributed to 120 pharmacists working in 88 community pharmacies in the Eastern Province of Saudi Arabia. The survey contained five sections: general background, topics for CPE that could be of great interest to community pharmacists, possible obstacles to attending CPE, method of instruction, and the most suitable time and day of the week for conducting CPE.

Results: One hundred and five (87.5%) pharmacists answered the survey questionnaire. The rank order of the five most selected topics for CPE were: drug interaction (81.9%), drug use during pregnancy (77.1%), use of anti-microbial agents (62.5%), pharmaceutical ethics (53.3%), geriatric and pediatric pharmacology (45.7%). For pharmacists, the most important obstacles to attending CPE were lack of time (96.2%), distance from practice (74.2%), and lack of programs or information about these programs (54.3%). Interestingly, 47.6% of the pharmacists recommended credentialing CPE and stated that knowing the lecturer was not considered an important factor.

Conclusion and recommendations: The findings of this study demonstrated that pharmacists are willing to participate in CPE programs. However, the working conditions of pharmacists would be a major barrier to their attendance. Therefore, improvement of the working conditions of community pharmacists, development of credited CPE programs in each region, as well as improving communication between the Saudi Pharmaceutical Association and community pharmacists are highly recommended.

Key Words: Continuing pharmaceutical education, pharmaceutical care, community pharmacists, community pharmacies, Saudi Arabia.

INTRODUCTION
In Saudi Arabia, patients tend to seek direct medical advice from community pharmacists who do not always adhere to the pharmaceutical laws and dispense prescription drugs over the counter. In addition, community pharmacists are involved in dissemination of drug information to both consumers and physicians. Previous research, however, has shown that the drug information resources of community pharmacists are inadequate. Therefore, structured Continuing Pharmaceutical Education (CPE) programs would be extremely important to promote the knowledge and attitude of pharmacists working in the Kingdom in order to fulfill their duties towards patients and the community.

CPE programs could be defined as the lengthiest phase of pharmacists’ education. CPE usually starts after graduation and continues for life in order to improve the knowledge, technical performance, communication skills and professional standards of pharmacists, and ultimately, pharmaceutical services. The type of courses and training programs differ in different institutions and countries. For instance, in Australia, educational programs have been conducted to improve the prescribing of antibiotics. In the USA some programs have been introduced to increase the knowledge of pharmacists about herbal medicine and to optimize the use of new technologies for improving cost effectiveness of the services. Other programs have also been conducted for training pharmacists to document interventions in patients’ medical records.

This study, however, is an attempt to help CPE planners by identifying the most...
important topics required by community pharmacists for continuing education. It also aims at determining the most significant factors that will attract pharmacists to educational activities, and at highlighting the major obstacles facing trainees in their participation in such programs. The aims were also extended to identify the most suitable method, time and day of the week to conduct such programs.

**METHODOLOGY**

A questionnaire was distributed to the attending pharmacists working in 88 out of 101 community pharmacies in three major cities in the Eastern Province of Saudi Arabia (namely: Dammam, Khobar and Thogbah). These community pharmacies were either known directly to the investigator or were located on the main roads. Of 167 community pharmacists working in these cities, all 120 pharmacists who were working at the time of the visit received the questionnaire forms. Pharmacists were requested to return their completed questionnaires to the investigator within 24 hours.

The survey (Table 1) contained five sections, the first concerned with the general background of the participant, namely nationality, year of graduation, and experience as a community pharmacist in the Kingdom of Saudi Arabia. The second section was a list of ten selected topics for CPE that could be of great interest to community pharmacists. Participants were asked to rank these topics according to their importance. The third section was about 10 possible reasons, which would prevent pharmacists from attending CPE. Participants were asked to rank these obstacles according to their importance. In the fourth section pharmacists were requested to indicate the most suitable method of instruction while the fifth was concerned with identifying the most suitable time and day of the week for conducting CPE activities.

The responses were computed and analyzed using SPSS software.

**Table 1: Survey for continuing pharmaceutical education**

| Section (1): General Information |
|----------------------------------|
| Name (optional)                  |
| Nationality                      |
| Year of graduation               |
| Experience in Saudi community pharmacies |

| Section (2): Rank in order (from 1-10) |
|----------------------------------------|
| the best topics for CPE               |
| Geriatric and pediatric pharmacology  |
| Communication in pharmacy practice    |
| Use of antimicrobial agents           |
| Drug-drug interaction                 |
| Management of diabetes mellitus      |
| Management of hypertension            |
| Anti-cancer drugs                     |
| Pharmaceutical ethics                 |
| Over-the-counter drugs                |
| Drug use during pregnancy             |

| Section (3): Rank in order (from 1-10) |
|----------------------------------------|
| the greatest obstacles to attending CPE |
| Lack of interest in CPE topics         |
| Lack of CPE credentialing              |
| Distance from practice                 |
| Lack of time (day of the week/time of the day) |
| Long duration of CPE programs         |
| Objection of the pharmacy owner or director |
| Amount of registration fee             |
| Known lecturer                        |
| Vacation potential                    |
| Lack of CPE programs                  |

| Section (4): Rank in order (from 1-3) |
|---------------------------------------|
| the most suitable method for conducting CPE |
| Symposia and workshops                |
| Distribution of Saudi national formulary |
| Distribution of copies articles       |

| Section (5a): What is the most suitable day for conducting CPE? |
|---------------------------------------------------------------|
| Monday             |
| Wednesday          |
| Thursday           |

| Section (5b): What is the most suitable time of day for conducting CPE? |
|---------------------------------------------------------------------|
| Morning                |
| Afternoon              |

*Weekend days are Thursdays and Fridays, Monday is selected as the middle day in the week. †The daily working hours in the private sector in Saudi Arabia is usually divided over two periods (8:00 AM – 12:00 Noon and 4:00 – 11:00 PM).*
RESULTS
One hundred and five pharmacists (87.5%) working in community pharmacies in the Eastern Province of Saudi Arabia answered the survey questionnaire (Table 2). They graduated from 28 universities and were of seven nationalities, including one Saudi, 50 (47.8%) Egyptians, 23 (21.9%) Jordanians and 13 (12.4%) Indians. Thirty-six (34.3%) pharmacists had graduated before 1990 and 60 (57.14%) obtained their bachelor degrees by the end of 1994. Most of the pharmacists (40%) had been in Saudi Arabia for a maximum of two years while 20% had been in the Kingdom for 3-4 years.

Rank order for the five most-selected topics for CPE was: drug interaction (81.9%); drug use during pregnancy (77.1%); use of antimicrobial agents (62.5%); pharmaceutical ethics (53.3%); geriatric and pediatric pharmacology (45.7%) (Table 3).

However, with respect to topics in the first rank alone, pharmaceutical ethics and communication in pharmacy practice were selected as second and third choices with rates of 22.9% and 12.4%, respectively. The lowest ranking order was that of anti-cancer drugs (6.9%), followed by management of hypertension (29.5%), and management of diabetes mellitus (34.4%) (Table 3).

Lack of time (96.2%), distance from practice (74.2%), lack of programs or information about these programs (54.3%), and the long duration of such activity (50.4%) ranked as the most important obstacles preventing pharmacists from attending educational activities (Table 4). On the other hand, knowing the lecturer was the least important factor (11.5%), followed by lack of interest (11.6%).

Symposia and workshops were selected by 51.4% of the participants as the most suitable method for conducting CPE programs. Then followed copying articles and mailing them to pharmacists (24.6%), and distribution of an updated copy of the Saudi national formulary (20%).

Table 2: Characteristics of the sample (n=105)

| Factors                          | No (%) |
|----------------------------------|--------|
| Nationality (No. of universities)|        |
| Saudi (1)                        | 1 (1)  |
| Egyptian (7)                     | 50 (47.6) |
| Jordanian (9)                    | 23 (21.9) |
| Indian (7)                       | 13 (12.4) |
| Sudanese (3)                     | 8 (7.6)  |
| Syrian (1)                       | 6 (5.7)  |
| Yemeni (*)                       | 1 (1)   |
| Unknown                          | 3       |
| Years of graduation              |        |
| Before 1990                      | 36 (34.3) |
| 1991-92                          | 12 (11.4) |
| 1993-94                          | 12 (11.4) |
| 1995-96                          | 18 (17.1) |
| 1997-98                          | 23 (21.9) |
| 1999-2000                        | 3 (2.9) |
| Unknown                          | 2 (1.9) |
| Experience within the Kingdom    |        |
| 1-2 years                        | 42 (40) |
| 3-4                              | 21 (20) |
| 5-6                              | 10 (9.5) |
| 7-8                              | 14 (13.3) |
| 9-10                             | 6 (5.7) |
| >10 years                        | 8 (9.8) |
| Unknown                          | 1 (1.0) |

*degree obtained from King Saud University

Sixty-eight (64.8%) of the pharmacists indicated that Thursday was the most suitable day to conduct CPE activities, followed by Monday (12.4%) and Wednesday (8.6%). About 13% indicated that they were busy every day and would not be able to find a suitable day. Mornings were preferred by 43% of the respondents followed by afternoons (41%). Although, midday was not one of the given options, 16% indicated that it was more suitable.

DISCUSSION
Each day, community pharmacists in Saudi Arabia make many recommendations...
that may have a great impact on patient outcome. The present study documented the varied backgrounds of community pharmacists. The majority were non-Saudis of varied nationalities who graduated from different universities. In addition, most pharmacists (57.4%) obtained their degrees more than six years ago. This finding stresses the need for continuing educational programs for community pharmacists in order to optimize pharmaceutical care in the Kingdom. In other countries, structured educational programs have been successful in improving the standards and attitudes of pharmacists toward their patients.\textsuperscript{7,10,11} In this study, the top three topics of interest to pharmacists were drug interaction, drug use during pregnancy and antimicrobial agents. This may reflect the type of information pharmacists should provide to concerned physicians in the community. Indeed, lethal adverse drug reactions as well as lethal drug interactions are well-documented.\textsuperscript{12-14} The risk increases in the elderly due to many factors, such as aging-related changes in renal and hepatic functions, body mass and polypharmacy.\textsuperscript{13} However, in this

### Table 3: Most selected topics for continuing pharmaceutical education (rank order 1-5, expressed as %)

| Topics                                      | Rank 1 | Rank 2 | Rank 3 | Rank 4 | Rank 5 | Cumulative |
|---------------------------------------------|--------|--------|--------|--------|--------|------------|
| Drug-drug interaction                        | 27.6   | 16.2   | 16.2   | 12.4   | 9.5    | 81.9       |
| Drug use during pregnancy                    | 6.7    | 17.1   | 16.2   | 18.1   | 19.0   | 77.1       |
| Use of anti-microbial agents                 | 9.5    | 9.5    | 14.3   | 18.1   | 11.4   | 62.5       |
| Pharmaceutical ethics                        | 22.9   | 13.3   | 7.6    | 7.6    | 1.9    | 53.3       |
| Geriatric and pediatric pharmacology         | 4.8    | 5.7    | 9.5    | 11.4   | 14.3   | 45.7       |
| Communication in pharmacy practice           | 12.4   | 15.2   | 6.7    | 2.9    | 7.6    | 44.8       |
| Over-the-counter drugs                       | 7.6    | 9.5    | 13.3   | 7.6    | 3.8    | 41.8       |
| Management of diabetes mellitus             | 3.8    | 4.8    | 4.8    | 4.8    | 16.2   | 34.4       |
| Management of hypertension                  | -      | 4.8    | 7.6    | 11.4   | 5.7    | 29.5       |
| Anti-cancer drugs                            | 1      | -      | -      | 1.9    | 3.8    | 6.7        |

### Table 4: Most selected obstacles to attending continuing pharmaceutical educational activities (rank order 1-5, expressed as %)

| Obstacles                                      | Rank 1 | Rank 2 | Rank 3 | Rank 4 | Rank 5 | Cumulative |
|------------------------------------------------|--------|--------|--------|--------|--------|------------|
| Lack of time (day of the week and time of the day) | 61.9   | 13.3   | 14.3   | 4.8    | 1.9    | 96.2       |
| Distance from practice                         | 2.9    | 23.8   | 15.2   | 19.0   | 13.3   | 74.2       |
| Lack of CPE programs                           | 12.4   | 9.5    | 12.4   | 9.5    | 10.5   | 54.3       |
| Long duration of CPE programs                  | 3.8    | 11.4   | 7.6    | 17.1   | 19.5   | 50.4       |
| Objection of the pharmacy owner or director    | 3.8    | 21.0   | 6.7    | 6.7    | 9.5    | 47.7       |
| Lack of CPE accreditation                      | 5.7    | 5.7    | 8.6    | 12.4   | 15.2   | 47.6       |
| Vacation potential                             | 1.0    | 3.8    | 17.1   | 15.2   | 7.6    | 44.7       |
| Amount of registration fee                     | 4.8    | 6.7    | 10.5   | 5.7    | 16.2   | 43.9       |
| Lack of interest in CPE topics                 | 1.9    | 2.9    | 2.9    | 1.0    | 2.9    | 11.6       |
| Known lecturer                                 | 1.0    | -      | 1.9    | 4.8    | 3.8    | 11.5       |
study the topic of geriatric and pediatric pharmacology ranked fifth, which shows the importance of pharmacists becoming more aware of the subject.

Under some conditions drug interaction increases the clearance of other drugs, leading to failure of treatment. For example, a recent report documented that long-term treatment with anti-convulsant agents considerably reduced the efficacy of anti-leukaemic agents.12

Drugs used during pregnancy was another important topic, so that pharmacists avoid dispensing drugs that may cause adverse fetal effects.16,17 However, differences among the US Food and Drug Administration (FDA), Australian Drugs Evaluation Committee (ADEC) and Swedish Catalogue of Approved Drugs (FASS) in category allocation of safety for the same drug were recently reported.18 Such differences could be a source of great confusion among users as well as those who require information regarding the risk of drug use during pregnancy.18

Anti-microbial agents ranked third in importance for community pharmacists in Saudi Arabia. This is due to the fact that most patients seek direct medical advice for treatment of infectious diseases from pharmacists.2,4 The high rate of microbial resistance to antibiotics19 is also important to pharmacists and may have contributed the high ranking order.

Pharmaceutical ethics and communication in pharmacy practice ranked fourth and sixth, respectively among the most important five topics. However, considering only the topics selected as first choice, these ranked second and third, reflecting the desire of pharmacists to improve their professional skills in communication and their attitudes. These topics are important for the implementation of the concept of pharmaceutical care wherein pharmacists become able to evaluate a patient’s drug therapy and health status. Therefore, they need to become active listeners and good interviewers, learn critical thinking, and be able to document patient care activities.20

Despite the relatively high prevalence of diabetes mellitus21 and hypertension22 in Saudi Arabia, they were ranked among the survey topics as eighth and ninth. This may be due to pharmacists not being involved in the diagnosis, initiation or evaluation of treatment of these diseases, and that most patients come to pharmacists for refill medication. However, both are chronic diseases and the involvement of trained community pharmacists in the pharmaceutical care concept could improve the quality of management by minimizing the risk of long-term complications and reducing the cost of treatment.23

The rank order of major barriers that may prevent pharmacists from attending CPE programs were: lack of time, distance from practice, lack of CPE programs in the region, and duration of the activity. This is not surprising since all of these factors are related to the difficult working conditions of community pharmacists who may work up to 12 hours a day seven days a week. Indeed, Al-Arifi et al 19975 had reported that 59% of the community pharmacists in Riyadh City work 51-100 hours per week, while 23% work more than 100 hours weekly. This may explain the high turn over of pharmacists in the private sector which was observed in this study, since only 9.8% of the participants had been in the Kingdom for more than 10 years, as compared to 40% who had been here for two years or less. However, improving the working conditions as well as better communication between the Saudi Pharmaceutical Association and community pharmacists outside the city of Riyadh could solve these obstacles.

It is very interesting that lack of CPE credentialing was pointed out by 47.6% of the pharmacists as one of the five most
important barriers to attending CPE. It may indicate that credentialing would increase the commitment of pharmacy owners to sponsor and permit pharmacists to attend CPE programs. Although credentialing and other certification programs in the USA are causing significant interest among pharmacists, the results of this study are in agreement with the findings of Hart et al 1999 who reported that credit for continuing medical education was the second most important consideration among residents of physical medicine. Knowing the lecturer was not considered an important barrier by a majority of pharmacists. This again is in full agreement with the opinion of physical medicine residents. With regard to the most reliable methods of conducting CPE programs, pharmacists preferred symposia and workshops. However, taking into consideration their working conditions, this method may not be ideal, and the planners of CPE programs may need to adopt other methods, such as those available with computer software programs. This has been done in various education programs by practicing pharmacists across Canada and has been reported to be reliable.

In conclusion, the findings of this study have demonstrated the willingness of pharmacists to participate in CPE programs, especially on subjects such as drug interactions, drug use during pregnancy, use of anti-microbial agents, and pharmaceutical ethics. However, there were great concerns about working conditions as a major barrier to attending such activities. Therefore, the improvement in working conditions for community pharmacists, development of local CPE programs in each region, accreditation, and better communication between the Saudi Pharmaceutical Association and the community pharmacists are highly recommended.

ACKNOWLEDGMENTS
My sincere thanks go to Mr. Abdul-Rahman Al-Fakki for his technical assistance and to Dr. E.B. Larbi for reviewing the manuscript.

REFERENCES
1. Al-Freihi H, Ballal SG, Jaccarini A, Young M S, Abdul-Cader Z, El-Mouzan M. Potential for drug misuse in the eastern province of Saudi Arabia. Anal Saudi Med 1987;7:301-5.
2. Bawazir SA. Prescribing pattern at community pharmacist in Saudi Arabia. International pharmacy Journal 1992;6(5):222-3.
3. Alkhawajah AM, Eferakeya AE. The role of pharmacists in patients’ education on medication. Public Health 1992;106:231-7.
4. Al-Ghandi MS. Empirical treatment of uncomplicated urinary tract infection by community pharmacist in the Eastern Province of Saudi Arabia. Saudi Medical Journal 2001; 22(12):1105-8.
5. Al-Arifi MN, Gubara OA, Korashy HM. Drug information centers in Saudi Arabia: Evaluation of community pharmacists’ services in Riyadh City. Saudi Pharmaceutical Journal 1997; 5(4): 183-9.
6. Peterson GM, Stanton LA, Bergin JK and Chapmann GA. Improving the prescribing of antibiotics for urinary tract infection. J Clin Pharm Ther 1997;22(2):147-53.
7. Chang ZG, Kennedy DT, Holdford DA, Small RE. Pharmacist’s knowledge and attitudes toward herbal medicine. Ann Pharmacother 2000;34 (6): 710-5.
8. Young JH. Pharmaceutical services in the United States Air Force. Am J Health Syst Pharm 1997; 54 (7):783-6.
9. Lacy CF, Saya FG, Shana RR. Quality of pharmacists’ documentations in patients’ medical records. Am J Health Syst Pharm 1996;53(18): 2171-5.
10. Reutzel TJ, DeFalco PG, Hogan M, Kazerouni PV. Evaluation of a pharmaceutical care education series for chain pharmacists using the focus group method. J Am Pharm Assoc (Wash) 1999; 9 (2):226-34.
11. Kroger E, Mosian J, Gregoire JP. Billing for cognitive services: understanding Quebec pharmacists’ behavior. Ann Pharmacother 2000; 34(3):309-16
12. Drezowski J, Kopff B. Clinically important effects of oral antidiabetic drug interactions. Pol Merkur Lek 2000;9(51):605-7.
13. Relling MV, Pui CH, Sandlund JT, Rivera GK, Hancock ML, Boyett JM, et al. Adverse effect of anticonvulsants on efficacy of chemotherapy for
14. Zoppi M, Braunschweig S, Kuenzi UP, Maibach R, Hoigne R. Incidence of lethal adverse drug reactions in comprehensive hospital drug monitoring, a 20 year survey, 1974-1993, based on the data of Brene/St. Gallen. Eur J Clin Pharmacol 2000;56(5):427-30.

15. Hantratty CG, McGlinchey P, Johnston GD, Passmore AP. Differential pharmacokinetics of digoxin in elderly patients. Drugs Aging 2000; 17(5):353-62.

16. Ives, Tepper. Drug use in pregnancy and lactation. Prime Care 1990;17(3):623-45.

17. Halawa B. Treatment of cardiac arrhythmia in pregnant women. Pol Mark Lek 2000; 9(50): 513-8.

18. Addis A, Sharabi S, Bonati M. Risk classification systems for drug use in pregnancy: are they a reliable source of information? Drug Saf 2000; 23(3):245-53.

19. Al-Ghamdi MS, El-Morsy F, Al-Mustafa ZH. Patterns of resistance to antibiotics at King Fahad Hospital of the University. Journal of Family and Community Medicine 1999; 6(2):43-9.

20. McDonough RP. Interventions to improve patient pharmaceutical care outcomes. J Am Pharm Assoc (Walsh) 1996;36(7):453-65.

21. Abu-Zeid HA, Al-Kassab AS. Prevalence and health-care features of hyperglycemia in semi-urban-rural communities in southern Saudi Arabia. Diabetes care 1992;15(4):484-9.

22. Soyannwo MA, Kurashi NY, Gadallah M, Hams J, El-Essawi O, Khan NA, et al. Blood pressure pattern in Saudi population of Gassim. Afr J Med Sci 1998;27(1-2):107-16.

23. Van Veldhuizen-scott MK, Widmer LB, Stacey SA, Popovich NG. Developing and implementing a pharmaceutical care model in an ambulatory care setting for patients with diabetes. Diabetes Educ 1995;21(2):117-23.

24. Gourley DR, Fitzgerald WL and Davis RL. Competency, board certification, credentialing, and specialization: Who benefits? Am J Manag Care 1997; 3 (5): 795-1.

25. Hart KA, Kevorkian G, Rinalt DH. Continuing medical education, interests of former and current residents of a physical medicine and rehabilitation residency program. Am J Phys Med Rehabil 1999;78(6):561-70.

26. Winslade NE, Bajcar JM, Bombassaro AM, Caravaggio CD, Strong DK, Yamashita SK. Pharmacist’s managements of drug-related problems: a tool for teaching and providing pharmaceutical care. Pharmacotherapy 1997; 17(4):801-9.