

## Ideal Content in Pharmacy Practice

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### ABSTRACT

*The objective of this study was to elicit the opinions of Chiang Mai University (CMU) pharmacy preceptors regarding the ideal content of a pharmacy curriculum in the area of pharmacy practice. A mail survey of 476 preceptors currently practising in pharmacy practice settings was conducted during March 1, 2002 and June 15, 2002. After two follow-up mailings, a total of 342 pharmacists completed and returned questionnaires, yielding a response rate of 71.8%. The items asking about the ideal content had the Cronbach's alpha coefficient of 0.9289. Data were analyzed using descriptive statistics. Most respondents were pharmacy graduates of CMU. The ten topics rated highest for ideal emphasis by the preceptors were "Pharmacy counseling," "Professional values and ethics," "Professional job training," "Pharmacists' roles and functions in pharmaceutical care," "Pharmacotherapy," "Pharmaceutical care for high-risk patients," "Principle of diseases," "Outpatient/Ambulatory care," "Adverse drug reaction monitoring" and "Drug use evaluation." The pharmacy respondents believed that schools of pharmacy should produce pharmacy graduates who possessed good personal and working characteristics as well as professional knowledge and skills. The results from this study could serve as an input for improving the quality of content being taught in the area of pharmacy practice or pharmaceutical care.*

**Key words:** Pharmacy practice, Pharmacy care, Pharmacy curriculum

### INTRODUCTION

Pharmacy profession has undergone a dramatic change from a product-oriented profession to a patient-oriented one. In other words, the profession has moved from a pharmaceutical technology era to a pharmacy practice era. Under the new framework of practice, a pharmacist practitioner takes responsibility for a patient's drug-related needs and is held accountable for this commitment. Preparing pharmacy students to serve society in this capacity requires a different conceptual framework from that used to prepare pharmacists currently in practice. A revised model for pharmacy teaching and learning is needed to meet the challenges of producing graduates who are providers of pharmaceutical care.

Pharmacy schools in Thailand have been responding to this change in practice environment. The curriculum has been revised, and some pharmacy schools are offering a Doctor of Pharmacy (Pharm.D.) program which emphasizes responsibilities and care for patients. Besides continuing revision of Bachelor of Pharmacy (B. Pharm.) curriculum, Faculty of Pharmacy at Chiang Mai University (CMU) has a plan to offer the Pharm.D. program as well, and is in a process of developing the curriculum. Based on a set of assumptions to guide

the developing of a new framework for the curriculum to prepare students proposed by Cipolle et al., (1998), the content of the program must “reflect practice as described by actual patient care experience and data generated by practitioners providing pharmaceutical care.” In addition, the educational program must have “relevant and complete” content. Therefore, this study was conducted in order to elicit the experience and opinion of current pharmacist practitioners regarding what should be the “ideal” or “relevant and complete” pharmacy practice content in pharmacy curriculum. The insights obtained would be used as the guidance for revising a B. Pharm. program as well as developing a Pharm.D. program.

## MATERIALS AND METHODS

A mail survey to all 476 preceptors of Faculty of Pharmacy, CMU, currently practising in pharmacy practice settings, was conducted during March 1, 2002 and June 15, 2002. The preceptors’ practice sites included hospitals, community pharmacies and provincial health offices. The preceptors were considered appropriate for sharing their insights in the issue because of their known proactive practice characteristics and interests in being a part of pharmacy education. Up to two follow-up postcards were sent to non-respondents in an attempt to encourage the participation.

A questionnaire was developed from a review of relevant literatures (Anonymous, 1995; Bootman et al., 1997; Vecchione, 1997; Graber et al., 1999) and used in data collection. The questions were grouped into three parts: (1) demographics, (2) ideal content in pharmacy practice area and (3) suggestions for revision of pharmacy curriculum and opinions on desirable characteristics of pharmacy graduates. For ideal content, pharmacists were asked to rate the necessity of individual 47 topics relevant to pharmacy practice on a scale from 5 (the most necessary) to 1 (the least necessary). Pharmacy practice content was defined as an area emphasizing pharmaceutical care knowledge and skills, involving diseases and treatments, as well as community, social and administrative pharmacy.

Content validity of the instrument was assessed by three experts who are university lecturers in pharmacy practice area. After revising some questions as suggested by the experts, a pilot study was conducted by sending a mail survey to a purposive sample of 30 pharmacist practitioners known to the investigators as progressively-practising pharmacy. Twenty-six pharmacists participated in the pilot study. Cronbach’s alpha coefficient, a measure of the instrument’s internal consistency reliability, was 0.6974 for ideal content set of questions. Then, the questionnaire was revised based on the results from the pilot study before being used in a large-scale study. Data were analyzed descriptively using SPSS version 10.0.

## RESULTS

A total of 342 pharmacists responded to the mail survey, yielding a response rate of 71.8%. The respondents were almost equal between male and female. Most of them were hospital pharmacists (70.2%), the rest were community pharmacists (16.7%), pharmacists working in provincial health offices (11.7%) and pharmacists in other practice settings (1.5%). The majority of respondents received a B.Pharm. degree from Faculty of Pharmacy, CMU, and graduated between 1988–1998. Sixty-six respondents (19.4%) hold a Master’s or Doctorate degree. The majority of pharmacists (87.3%) have served as preceptors for pharmacy schools for longer than a year.

A set of questions on ideal content provided a Cronbach’s alpha coefficient of 0.9289. Almost all topics (46 topics) were considered moderately to highly necessary to be empha-

sized in pharmacy practice education and training, with an average necessity scores ranged from 3.26 to 3.99 and most of these topics had the scores higher than 3.50 (Table 1). Only the topic of “Pharmacy history” was rated considerably low in the necessity to be taught (mean: 2.62). Ten topics rated highest (mean: 4.67–4.05), were “Pharmacy counseling,” “Professional values and ethics,” “Professional job training,” “Pharmacists’ roles and functions in pharmaceutical care,” “Pharmacotherapy,” “Pharmaceutical care for high-risk patients,” “Principle of diseases,” “Outpatient/Ambulatory care,” “Adverse drug reaction monitoring,” and “Drug use evaluation” , respectively.

**Table 1.** Necessity of individual pharmacy practice topics in pharmacy education.

Topic (n)	Necessity to be taught in the curriculum <sup>1,2</sup>					
	5 (%)	4 (%)	3 (%)	2 (%)	1 (%)	X (SD)
Pharmacy counseling (342)	71.6	23.4	5.0	0.0	0.0	4.67(.57)
Professional values and ethics (342)	60.5	28.4	9.9	1.2	0.0	4.48(.72)
Professional job training (341)	55.4	33.7	9.1	1.8	0.0	4.43(.73)
Pharmacists’ roles and functions in pharmaceutical care (341)	53.4	36.1	9.4	1.2	0.0	4.42(.71)
Pharmacotherapy (339)	52.8	34.5	11.5	1.2	0.0	4.39(.74)
Pharmaceutical care for high-risk patients (339)	49.3	40.4	8.8	1.2	0.3	4.37(.72)
Principle of diseases (339)	46.9	39.8	12.4	0.9	0.0	4.33(.72)
Ambulatory care (338)	49.1	35.5	14.5	0.6	0.3	4.33(.76)
Adverse drug reaction monitoring (341)	45.5	39.6	13.8	1.2	0.0	4.29(.74)
Drug use evaluation (338)	42.3	44.1	12.7	0.6	0.3	4.28(.73)
Communication skills (339)	44.5	34.5	19.2	1.5	0.3	4.22(.82)
Pharmaceutical care in community pharmacies (331)	42.0	37.8	17.8	2.4	0.0	4.19(.81)
Hospital administration (343)	39.9	33.9	23.4	2.4	0.3	4.11(.86)
Computer skills (341)	29.6	49.6	19.9	0.6	0.3	4.08(.74)
Patient compliance assessment and enhancement (340)	30.9	45.9	22.1	1.2	0.0	4.06(.76)
Drug abuse (340)	29.7	47.6	20.6	1.8	0.3	4.05(.77)
Pharmacists’ roles in primary health care, health promotion and disease prevention (338)	24.9	50.9	22.8	1.5	0.0	3.99(.73)
Pharmacoeconomics (339)	28.3	44.8	23.0	3.8	0.0	3.98(.82)
Social manners and leadership (341)	30.8	38.4	27.0	3.5	0.3	3.96(.86)
Planning and evaluation of project and pharmacist activities (335)	25.7	42.7	29.6	1.8	0.3	3.92(.80)
Consumer health protection (341)	21.7	45.5	29.9	2.6	0.3	3.86(.79)
Pharmacoepidemiology (336)	24.4	42.6	27.7	5.1	0.3	3.86(.86)
Assessment of patients’ quality of life (334)	24.0	40.7	29.9	5.4	0.0	3.83(.85)
Organization behavior and management (340)	24.4	37.6	33.8	3.5	0.6	3.82(.86)
Pharmacokinetics and biopharmaceutics (335)	25.4	38.8	26.3	8.7	0.9	3.79(.95)
Nutrition, vitamins and healthy food (341)	21.4	39.6	34.9	2.9	1.2	3.77(.86)
Health insurance system (337)	21.4	37.1	34.7	6.2	0.6	3.72(.89)
Drug and chemical toxicity (337)	17.8	41.5	35.0	4.7	0.9	3.71(.85)
Health behaviors (338)	14.2	45.3	37.0	3.0	0.6	3.70(.77)
Community pharmacy management (329)	19.5	38.6	34.3	6.7	0.9	3.69(.89)
Research methodology (340)	21.5	36.8	31.5	8.5	1.8	3.68(.96)

Topic (n)	Necessity to be taught in the curriculum <sup>1,2</sup>					
	5 (%)	4 (%)	3 (%)	2 (%)	1 (%)	X (SD)
Statistics and data analysis (340)	14.4	41.5	36.8	6.5	0.9	3.62(.84)
Pharmacy laws (337)	16.6	36.2	36.8	9.5	0.9	3.58(.91)
Therapeutic drug monitoring (333)	16.2	33.6	38.7	9.3	2.1	3.53(.94)
Drug development (333)	14.1	34.5	30.0	8.7	2.7	3.49(.93)
National drug policy and essential drugs (335)	10.4	36.7	43.6	8.1	1.2	3.47(.83)
Roles of professional organizations and council (336)	11.6	33.9	44.3	8.6	1.5	3.46(.86)
Thai alternative medicines (336)	10.4	36.9	41.1	10.4	1.2	3.45(.86)
Pharmacy education (305)	8.5	35.7	16.9	8.2	0.7	3.43(.79)
Bioquality control for drugs, food, cosmetics and biological products (334)	10.5	34.7	42.5	10.2	2.1	3.41(.89)
First aids (342)	9.9	31.6	45.6	10.2	2.6	3.36(.89)
Total parenteral nutrition (328)	10.7	30.2	43.6	12.5	3.0	3.33(.93)
Medical sociology (322)	9.3	28.3	46.9	14.3	1.2	3.30(.87)
Drug marketing (329)	7.6	29.5	46.5	14.6	1.8	3.26(.87)
Health care systems in Thailand and other countries (333)	7.5	28.2	49.2	13.2	1.8	3.26(.85)
Pharmacy history (332)	3.6	10.2	41.6	34.0	10.5	2.62(.93)

<sup>1</sup>Percentage may not be added up to 100.0 because of round-off effect.

<sup>2</sup>5 = most necessary, 4 = very necessary, 3 = moderately necessary, 2 = less necessary, 1 = least necessary.

More than a half of respondents (271 pharmacists) responded to the third part of questionnaires which was presented as open-ended questions inquiring about the desirable characteristics of pharmacy graduates and suggestions for revising a pharmacy curriculum. The pharmacists believed that desirable graduates must be well-behaved and efficient in professional knowledge and skills. Desirable behavior and efficiency cited were good human relationship; open-minded; stick to seniority system; leadership; creativity; good communication skills; diligent; being responsible, honest, and patient; adherence to codes of ethics and patient rights; being adaptable; and being a scholar and a problem solver. When asking about the content that should be strictly emphasized in pharmacy education in order to produce desirable graduates, the respondents cited a number of topics with the first ten presented in Table 2.

**Table 2.** Content that should be strictly emphasized in pharmacy education to produce desirable graduates (n = 271).

No.	Topic of content	Number of respondents <sup>1</sup> (%)
1	Diseases and treatments	81 (30.0)
2	Pharmaceutical care	48 (17.7)
3	Professional values and ethics	44 (16.2)
4	Organization management	21 (7.7)
5	Professional job training	14 (5.2)
6	Social manners and leadership	12 (4.4)
7	Pharmacy counseling	8 (3.0)
8	Medical sociology	7 (2.6)
9	Communication skills	7 (2.6)
10	Pharmacists' roles in primary health care	6 (2.2)

<sup>1</sup>The remaining 23 respondents suggested the other 18 topics, such as Pharmacoeconomics, Pharmacoepidemiology, Drug information service, Computer skills, Interpretation of clinical laboratory data, Differential diagnosis, Research skills, etc.

For the revision of pharmacy curriculum in general, the respondents' suggestions included the following. First, training quantity and quality must be increased. The training should be multidisciplinary and semi-specialized, and held in actual settings for a total period of time longer than four months. Thai pharmacy students should be provided an opportunity to observe professional practice as early as they were in the first or second academic year. Second, pharmacy instructors and preceptors must be educated and trained systematically and continuously. Third, pharmacy schools should participate in the process of defining and developing of professional roles. Furthermore, both instructors and students must be encouraged to get involved in professional activities and community/society services. Fourth, pharmacy curriculum must be revised continuously, and this must be carried out in collaboration with pharmacist practitioners and experts in relevant areas. Finally, the process of teaching and learning must aim at enabling the students to be effective self-learners, and problem analyzers and solvers. Most teaching should involve with a research process.

### DISCUSSION AND CONCLUSION

The questions on ideal content yield the Cronbach's alpha coefficient of 0.9289. The coefficient that is greater than 0.70 indicates the very satisfactory level of instrument's reliability (Nunnally, 1978). Furthermore, the response rate of this study (71.8%) is quite impressive for a mail survey which generally suffers from low responses (Salant and Dillman, 1994). Therefore, the nonresponse and nonrepresentative biases may not be of concerns in this study. However, the readers of the study should be aware that the majority of respondents were CMU graduates. Their experiences with B. Pharm. program at CMU might affect their opinions and responses.

The content in pharmacy practice area considered necessary for pharmacy education by pharmacy preceptors in this study, particularly the top ten topics, was generally consistent with the top ten ideal topics for Pharm.D. curriculum in the survey among pharmacy educa-

tors conducted by Graber et al., (1999) in U.S.A. This implies that the pharmacists in Thailand have perceived and faced with the changes in professional practice, the movement from product-oriented to patient-oriented, which have occurred globally. Therefore, they realized the necessity to emphasize more on a number of related topics in preparing pharmacy graduates for the new roles and functions.

The results showed that the topic of "Pharmacy history" was considered by the preceptors comparably less necessary in teaching pharmacy students. This topic may be viewed as irrelevant to pharmacy practice, compared to the other topics. Alternatively, the respondents may believe that "Pharmacy history" content is currently taught in pharmacy schools appropriately and sufficiently for those in the area of pharmacy practice.

Most respondents cited specific personal and working characteristics to be more important than knowledge and skills as the desirable features of pharmacy graduates. They also mentioned professional values, good manners, leadership and communication skills as among those topics which were highly recommended to be included in the curriculum in order to produce a desirable graduate. The preceptors may believe that pharmacy schools have already focused on building necessary knowledge and skills for the students. However, the development of certain personal and working characteristics is equally important, and should not be ignored in education process.

The results of this study could serve as a basis in building a framework for revising and/or developing a pharmacy curriculum appropriate and consistent with changes in practice environment of pharmacy. The topics cited frequently by the preceptors progressively practising pharmacy should be incorporated into the curriculum. Besides knowledge and skills, pharmacy schools should provide their students the environment that will help them to become ethical and competent pharmacists.

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