RESEARCH

Addressing the Academic Gap Between 4- and 6-Year Pharmacy Programs in South Korea

Sujin Yoo, BS,^{a,b} Seungyeon Song, BS,^c Sangmi Lee, BS,^b Kwangil Kwon, PhD,^a and Eunyong Kim, PharmD, PhD^c

^aCollege of Pharmacy, Chungnam National University, Daejeon 305-764, South Korea

^bDepartment of Pharmacy, Eulji University Hospital, Daejeon 302-799, South Korea

^cCollege of Pharmacy, Chung-Ang University, Seoul 156-756, South Korea

Submitted September 2, 2014; accepted January 29, 2014; published October 15, 2014.

Objective. To address the academic gap (or lack of adequate training and programs) between 4- and 6-year pharmacy programs and suggest methods for reducing this gap and to evaluate pharmacists' perceptions of preceptorship.

Methods. We surveyed a convenience sample of 200 community pharmacists who graduated from a 4-year program who were participating in a continuing education program for clinical pharmacy as organized by the Daejeon branch of the Korea Pharmaceutical Association in 2011. Twenty-one questions were asked about the academic gap, needs for an education program, preceptorship, and medication therapy management services. International precedents were examined through a literature review to glean ideas of how to bridge the academic gap between the 4- and 6-year programs.

Results. In total, 132 pharmacists answered the survey (return rate=66.0%). The survey findings included problems caused by the academic gap, high need for an adequate education program, low acceptability of preceptorship, and the possibility of medication therapy management services. US-based, non-traditional PharmD programs and new curriculum-support training in Japan provided examples of how the academic gap has been successfully bridged.

Conclusion. Nationwide efforts and government support are urgently required to close the academic gap, and experiential education should be included in transitional programs for 4-year pharmacy program pharmacists.

Keywords: academic gap, survey, preceptorship, transitional program, South Korea

INTRODUCTION

In South Korea, in order to improve the pharmacy sector and increase its base in academia, a long-desired reorganization of the pharmacy program was undertaken by the Ministry of Education and Human Resources Development in August 2005. This reform was fully implemented as a 6-year, 2+4 pharmacy program in 2009.¹ The 2+4 program consists of 4 years within the pharmacy major for students who have passed the eligibility test after completing 2 years in an undergraduate program in a major other than pharmacy.² Prior to this reform, pharmacy programs were 4 years long. The Korean Association of Pharmacy Education (KAPE) was established to organize the Pharmacy Education Eligibility

Test (PEET) and to research pharmacy schools' education programs.² Subsequently, in 2010, the PEET was conducted for the first time and, in 2011, the first freshmen were enrolled in pharmacy schools under the new system and would graduate in 2015.³

A major change of the 6-year pharmacy program is the inclusion of an experiential rotation, an element that is already included in education programs for other health professions.⁴ The experiential rotations include 1,400 hours of practical training with 800 hours (20 weeks) of common practice and 600 hours (15 weeks) of advanced elective practice.^{4,5} For successful experiential education, the KAPE emphasized the role of the preceptor, who teaches, coaches, and supervises students in a practical setting. Expected characteristics of successful preceptors are presented as below:

Passion: Passionate about contributing to the future of pharmacy

Role model: Is a role model and mentor.

Corresponding Author: Eunyong Kim, PharmD, PhD, Clinical Pharmacotherapy Lab, College of Pharmacy, Chung-Ang University, 84 Heukseok-Ro, Dongjak-gu, Seoul, 156-756, South Korea. Tel: 82-2-820-5791. Fax: 82-2-823-6566. E-mail: eykimjcb777@cau.ac.kr

Enthusiasm: Has enthusiasm for continually improving as a clinical specialist.

Collaboration: Collaborates consistently with the practice faculty.

Enjoy: Enjoy himself/herself and has pride in teaching future excellent pharmacists.

Participate: Participates actively in educational programs related to preceptorship.

Teach by example: Teaches by example for effective experiential education.

Organized: Provides feedback and evaluates students using well-organized methods.

Review of self: Reviews himself/herself regarding personal motivation and educational philosophy in pharmaceutical care.

If qualified pharmacists are capable of undertaking good-quality pharmacy practice, they can become preceptors, whereby they serve as role models and mentors to students.^{6,7} Guidelines for Good Pharmacy Practice (GPP) were devised by the International Pharmaceutical Federation/World Health Organization (updated in 2011) to serve as recommendations regarding the qualifications for good pharmacy practice. These guidelines were organized into 4 categories: the pharmacists' role in medical products, medication therapy management (MTM), professionalism, and improvement of health and medical care.⁸ MTM services were first introduced in the United States in 2003, to optimize therapeutic outcomes through interactions between pharmacists and patients by providing teaching and counseling regarding medicines.⁹⁻¹¹ However, MTM services are not generally conducted by pharmacists in South Korea.¹⁰

Most previous studies related to the 6-year pharmacy program focused on the preparation status or improvement plan for experiential education for students pursuing preceptorships, but little attention was given to currently practicing pharmacists, who will serve as future preceptors.^{1,5,6,12,13} Currently practicing pharmacists who graduated from a 4-year pharmacy program and their concerns about the academic gap between 4- and 6-year pharmacy programs have thus far been overlooked. This study was designed under the assumption that there is currently such an academic gap and we investigated the extent of the gap between 4- and 6-year pharmacy programs and other related concerns of practicing pharmacists to determine if there is a need for a transitional program to address the needs of pharmacists who graduated from 4-year programs. We also investigated experiences in other countries where 6-year programs had been implemented to find successful means of reducing the academic gap between 4- and 6-year pharmacy programs.

METHODS

We conducted a questionnaire survey that targeted 200 community pharmacists using a convenience sample. In 2011, these pharmacists had participated in a continuing education program for clinical pharmacy in Daejeon organized by a branch of the Korea Pharmaceutical Association (KPA), which is similar to the American Pharmacists Association. Pharmacists registered in the KPA are required to complete 8 hours of continuing education programs per year. One professor and one clinical pharmacy researcher initially developed the survey instrument, and 5 practicing pharmacists helped with pretesting and reviewing the questions to evaluate their utility. After several rounds of discussion and modification, the final survey instrument was confirmed. The questionnaire was designed to address the detailed objectives briefly and clearly. Specifically, we wanted respondents to address the following points: current methods of acquiring clinical pharmacy information, satisfaction with those methods, and whether there is a period of proficiency in clinical practice for 4- and 6-year-program pharmacists. Subsequently, assuming there was an academic gap (meaning that there would be desire for adequate education programs), we devised questions assessing pharmacists' perceived needs and reasons for using educational programs to acquire additional clinical pharmacy practice knowledge to overcome this academic gap, and the types of programs that would most benefit pharmacists.

The questionnaire was divided into 4 sections: respondents' demographic characteristics, their understanding of the clinical rotation course in the new 6-year pharmacy program, their role as a preceptor, and respondents' educational needs to overcome the academic gap. The questionnaire consisted of 21 questions (excluding demographic characteristics), organized as follows: how to obtain current clinical pharmacy information (7 questions), perceptions about preceptorship (5 questions), adoption of preceptorship and clinical training programs (7 questions), limiting factors about participating in preceptorship (1 question), and attitudes toward implementation of MTM services as a part of GPP (1 question). Questions were designed using a variety of answer formats, including multiple-choice, yes/no, or open-ended to obtain various opinions. After listening to a brief explanation of the survey objectives and content, pharmacists voluntarily decided whether to participate. Consenting pharmacists completed and submitted the questionnaire to the investigator. The survey was anonymous—that is, to protect the respondents' privacy, no identifiable information was included on the completed questionnaires. For the descriptive analyses of respondents' demographic characteristics and responses to questions, we used Microsoft Excel 2007.

The relationships between interest in MTM services and other variables, including categorical variables, were evaluated using chi-square and Fisher exact tests. SPSS version 19.0 (SPSS, Inc., Chicago, IL) was used for all statistical analyses. Statistical significance was set at the 5% level ($p < 0.05$).

Finally, a literature review for pharmacy education program reform was conducted to ascertain possible means of reducing the academic gap in South Korea between 4- and 6-year pharmacy programs. Questions addressed during the review included which programs exist, who organized them, when they were introduced, how they were developed and implemented, and what their characteristics were. The history of pharmacy program reform in the United States is long, and the United States experience is typically believed to have influenced the introduction of clinical pharmacy education in other countries, including South Korea.^{14,15} We focused our research on colleges and schools of pharmacy, pharmacy education-related organizations, and academic journals; thus, we primarily investigated the American Association of Colleges of Pharmacy, the Accreditation Council for Pharmacy Education, and the *American Journal of Pharmaceutical Education*.

Geographically, Japan is the nearest country to South Korea that has already reformed its pharmacy school system. The Japanese reform was implemented in 2006, after which the South Korean program was accelerated.^{14,16} The Japan Pharmacists Education Center (JPEC) was the main source of information.

RESULTS

Of the 200 questionnaires administered to the pharmacists participating in the continuing education program in Daejeon, 132 were returned (response rate=66.0%). The demographic characteristics of the 132 respondents are presented in Table 1.

The survey section examining how pharmacists gained information, including knowledge about current pharmacy practice, counseling, and clinical services revealed that most respondents obtained knowledge through self-learning using various sources. More detailed results are presented in Table 2. Of the respondents, 97.7% ($n=129$) expressed some degree of satisfaction with these methods of acquiring information and 62.0% ($n=80$) reported some dissatisfaction. Among the respondents who reported dissatisfaction, 87.5% ($n=70$) indicated they would be willing to participate in an education program if an appropriate one was provided.

Furthermore, 129 respondents answered the questions regarding their preferences for additional pharmacy programs to provide updates to their clinical pharmacy knowledge or to overcome the academic gap. One hundred two out of the 129 (or 79.1%) responded that they

Table 1. Demographic Characteristics of Respondents ($n=132$)

Variable	No. (%)
Gender	
Male	52 (39.4)
Female	80 (60.6)
Age	
20–29	3 (2.3)
30–39	16 (12.1)
40–49	63 (47.7)
50–59	29 (22)
60–69	13 (9.8)
≥ 70	6 (4.5)
No response	2 (1.5)
Academic degree	
BS	117 (88.6)
MS	13 (9.9)
PhD	1 (0.8)
No response	1 (0.8)
Current position	
Pharmacy owner	106 (80.3)
Staff pharmacist	11 (8.3)
No response	15 (11.4)
Teaching experience	
Yes	11 (8.3)
No	104 (78.8)
No response	17 (12.9)

preferred short-term open lectures (online or offline) and 19.4% ($n=25$) stated that they preferred academic degree programs. The reasons for needing additional clinical pharmacy education and the results were: to reduce difficulty in teaching about medications and understanding new medicines or prescriptions (52.3%, $n=69$); to increase the portion of medication counseling (41.7%, $n=55$); to keep regular patients through managing medication records or giving information (16.7%, $n=22$); to compensate for insufficient knowledge acquired at pharmacy school (14.4%, $n=19$); and to decrease the gap in clinical pharmacy practice capabilities between 4- and 6-year pharmacy program pharmacists (7.6%, $n=10$).

When asked to indicate the period required for pharmacists who had graduated from 4-year pharmacy programs to become proficient in clinical practice, 55.8% ($n=72$) stated “1 or 2 years,” and 15.5% ($n=20$) suggested “longer than 5 years.” Slightly more than 45% ($n=56$) responded that they expected the period of proficiency of the 6-year program pharmacists to be shorter than that of the 4-year program pharmacists. Specifically, 19.5% ($n=24$) stated “6 months,” and 11.4% ($n=14$) stated “1 year.”

Perceptions of preceptorship are presented in Table 3, while Table 4 demonstrates results regarding preceptor requirements, benefits, and educational programs intended

Table 2. Current Methods for Acquiring Appropriate Clinical Pharmacy Knowledge^a (n=132)

Current Methods	No. (%)
Self-learning through various resources	80 (60.6)
Open lecture (on- or offline)	59 (44.7)
Practical training by senior pharmacists	45 (34.1)
Pharmacy school	43 (32.6)
Master's degree programs in clinical pharmacy	7 (5.3)
Others	5 (3.8)

^a Multiple responses were allowed.

for those who wanted to participate in preceptorships. Only 23.6% (n=29) of respondents replied that they wanted to participate as a preceptor. Respondents were also asked if they would be interested in a preceptor-training program related to an academic degree at a pharmacy school, and they were asked to explain the reason(s) for their choice. Approximately half of the 26 respondents who responded (46.2%, n=12) said they would prefer preceptor training unrelated to a degree because it would save costs and because they did not need another degree to practice pharmacy. The other half (53.8%, n=14) did want preceptor training to be tied to a degree. Their reasons were: to overcome the academic gap between 4- and 6-year pharmacy programs, to obtain objective qualification as a preceptor, to increase their responsibility as an instructor, to motivate practicing pharmacists to become preceptors, to enhance professionalism, to provide fulfillment, and to enrich current curriculum. Respondents also indicated that it would be appropriate to pay an education fee to preceptors per student per week of \$50 (37.0%, n=10), more than \$100 (29.6%, n=8), or \$80 (18.5%, n=5).

Regarding MTM services, nearly two-thirds (68.2%, n=90) of respondents said they would be willing to provide such services and 31.8% (n=42) said they would not. Categorical data were evaluated using the Fisher exact test to identify relationships between interest in MTM services and demographic characteristics, such as gender, age, degree, current position, teaching experience, and willingness to participate in a preceptorship program. We found no significant relationships ($p>0.05$).

In researching other countries' pharmacy programs that were redesigned to reduce the academic gap between 4- and 6-year pharmacy programs, we identified 2 examples of note: non-traditional PharmD programs in the United States¹⁷ and new curriculum-support training in Japan.¹⁶ The US non-traditional PharmD program is intended for practicing BS pharmacists to obtain a PharmD degree in a different way than the traditional PharmD,¹⁷ and the new curriculum-support training in Japan is

Table 3. Perceptions of Preceptorship

Question	No. (%)
1. Have you ever heard about experiential education in a 6-year pharmacy program? (n=128)	
Yes	86 (67.2)
No	42 (32.8)
If you answered "Yes" to question 1, (n=86)	
1-1. How did you know? ^a	
Pharmaceutical associations	24 (27.9)
Media reports	56 (65.1)
Other pharmacists	10 (11.6)
Others (expectation, clinical pharmacy education)	2 (2.3)
1-2. How much do you know?	
Know well	4 (4.7)
Don't know well	81 (94.2)
Don't know	1 (1.2)
1-3. Have you ever heard of a preceptorship?	
Yes	20 (23.3)
No	66 (76.7)
1-4. Have you ever heard about the benefits of being a preceptor?	
Yes	2 (2.3)
No	84 (97.7)

^a Multiple responses were allowed.

intended for practicing pharmacists to acquire the same clinical knowledge, skills, and perspectives as those developed through the 6-year pharmacy program, although this training is not related to a degree.¹⁶

The "new" pharmacists' role of managing patients' pharmaceutical care such as assessing, monitoring, and modifying drug-related problems was also required of already-practicing pharmacists to remain competitive; thus, most colleges and schools of pharmacy developed post-BS PharmD programs for BS-degreed pharmacists who wanted the option of pursuing additional training to earn PharmD credentials.^{15,18} Today, these programs are called: nontraditional PharmD (NTPD), postbachelor's PharmD, or working professional PharmD (WPPD).^{17,19} Implementation varies; some are campus-based, others web-based, and some include combined campus and online courses. However, most are flexible and logistically possible for working pharmacists.^{20,21} While some programs adopt didactic and experiential courses, distance learning techniques are also used to increase the participation of practicing pharmacists, such as scheduled, off-site courses, weekend or evening courses, or a combination of the 2 with class meetings several times per semester and web- and video-based content.^{17,21} In particular, the most important component is the practical experience course, which is intense and requires a specific time

Table 4. Participation in Preceptorship

Question	No. (%)
1. Do you want to participate in preceptorship? (n=123)	
Yes	29 (23.6)
No	94 (76.4)
If you answered 'Yes' to question 1, (n=29)	
1.1. What do you think is required for being a preceptor? ^a	
Graduate degree (MS, PhD)	3 (10.3)
Abundant clinical knowledge	21 (72.4)
Strong passion for teaching	7 (24.1)
1.2. What do you think is the minimum amount of experience of working at a community pharmacy required by a preceptor?	
Under 1 year	3 (10.3)
1–2 years	4 (13.8)
3–4 years	6 (20.7)
4–5 years	8 (27.6)
Over 6 years	8 (27.6)
1.3. Are you interested in a preceptor training program?	
Yes	23 (79.3)
No	6 (20.7)
1.4. What's your preferred preceptor training program time?	
Weekday daytime	2 (6.9)
Weekday evening	15 (51.7)
Saturday morning	6 (20.7)
Saturday evening	3 (10.3)
Others	2 (6.9)
No response	1 (3.4)
2. What would prevent you from participating in preceptor training? ^a (n=123)	
Lack of staff pharmacist	55 (41.7)
Lack of knowledge	54 (40.9)
Lack of time	37 (28.0)
Lack of space	33 (25.0)
Others	2 (1.5)

^a Multiple responses were allowed.

period.²² Through these programs, the academic gap between BS pharmacists and PharmD pharmacists has been bridged in the United States.

A 6-year pharmacy program was implemented in Japan in 2006 and 4-year program pharmacists could register for new curriculum-support training starting in 2007.^{16,23} The JPEC organized a large-scale lifelong training plan review committee, consisting of the Japan Pharmaceutical Association, the Japanese Society of Hospital Pharmacists, pharmacy colleges, and members of JPEC. It was sponsored by the Ministry of Health, Labour and Welfare.^{16,23} The program was created to cater to

pharmacists of all levels of knowledge and experience who had completed the 4-year pharmacy program. The program consisted of self, lecture, and experiential training. A CD-ROM, was used as the delivery method in self-training and its content developed using the 6-year pharmacy core curriculum materials that 4-year pharmacy program pharmacists had not studied in their programs. It included tests according to learning objectives. The purpose of the experiential training was for 4-year pharmacy program pharmacists to acquire practical experience in clinical pharmacies, which was difficult to obtain in a 4-year pharmacy program or in practice after graduation. These clinical training courses included 4 community pharmacy courses and 6 hospital courses. Through these courses, currently practicing 4-year program pharmacists could acquire clinical knowledge, skills, and perspectives that were emphasized in the newer 6-year pharmacy program, thus successfully resolving the academic gap in training.^{16,23}

DISCUSSION

In South Korea, a 6-year pharmacy program was implemented in 2009,¹ and this study's intentions were to suggest a means of reducing the academic gap between 4- and 6-year pharmacy programs. Similar to previous studies, the results of this study demonstrated that the knowledge achieved from 4-year pharmacy college alone is considered insufficient to perform pharmacy practice today.¹² The participants were generally willing to engage in appropriate educational programs to overcome the academic gap. For currently practicing pharmacists, the methods of self-study and open lectures were preferred. Respondents expressed a need for additional clinical pharmacy knowledge to bridge the academic gap, alleviate difficulties in maintaining current pharmacy practice knowledge, and increase pharmaceutical care services. Under the 4-year pharmacy program, it took 2 to 5 years for newly graduated pharmacists to engage adeptly in pharmacy practice and patient counseling. More than half the respondents expected that this period of proficiency would be shorter for 6-year pharmacy program pharmacists. Regarding the survey's section on preceptorship, most respondents demonstrated a poor understanding of the new 6-year pharmacy program and the duties inherent to preceptorship. Furthermore, most respondents reported having little intention to undertake a preceptorship. However, Je, Lee, and Yoon reported that participants tended to shift their attitudes in a more positive direction after preceptorship orientation.¹³ In their study on the relationship between community pharmacy preceptors and job satisfaction in the United States, Payakachat et al found the majority of respondents thought teaching a student

helped improve or maintain one's own clinical skills, thus increasing job satisfaction.²⁴ However, we must note that there was no detailed plan for preceptorships or preceptorship orientation when that study was conducted. Therefore the results might be different if the study were repeated because many schools have recently implemented orientation education for preceptors.

An interesting result of our survey was that only 19.4% (n=25) of respondents preferred a degree-related program to update their pharmaceutical knowledge, whereas, in the case of preceptorship training, 53.8% (n=14) preferred a degree-related program. Of course, this result must be carefully interpreted, given the wide difference between the numbers of total respondents (129 vs 26 for educational programs and preceptorship, respectively). Nevertheless, previous research highlighted a need for intensive educational programs for 4-year-pharmacy program pharmacists, as well as a need for preceptor orientation.¹³

Among the respondents who indicated a preference for participating in preceptorship, 82.8% (n=24) were willing to provide MTM services as well. There was no significant relationship between interest in MTM services and demographic characteristics or willingness to be involved in preceptorship. However, only a small number of respondents replied to the question about participating in preceptorship. If a larger study is conducted in the future, the results may be more favorable for the implementation of a MTM service in South Korea.

The United States and Japan began 6-year pharmacy programs ahead of South Korea. They prepared specialized training for pharmacists who had graduated from 4-year programs to overcome the academic gap such a change caused, allowing these pharmacists to work as preceptors. In South Korea, the Korea Pharmaceutical Association and the Korean Association of Pharmacy Education did not discuss such training at the time the 6-year pharmacy program was implemented and this step is still needed. To determine the format of such an education program, conducting a large-scale survey that includes further consideration of foreign examples might be helpful. With regard to transitional education programs for 4-year pharmacy program pharmacists in South Korea, Park suggested the establishment of a Korean pharmacists' education center (KPEC) modeled on Japan's JPEC.²³ A preparatory committee for a KPEC was established by the Korea Pharmaceutical Association in 2010, but no progress has since been made.²⁵ Master's degree programs in clinical pharmacy operated by some Korean pharmacy schools have partially helped practicing pharmacists who had graduated from a 4-year pharmacy program to obtain further clinical pharmacy knowledge.¹⁴ However, no experiential education

was included in these programs, unlike the non-traditional programs in the United States.¹⁴ Experiential education in this study refers to rotations, or practice experience, in community pharmacies or hospitals to add to the didactic portion of pharmacy education. We have several proposals, based on the findings of our survey and literature review, to close the educational gap created by the reform of the pharmacy education system. First, a nationwide survey targeting 4-year pharmacy program pharmacists must be conducted to identify their concerns regarding the academic gap, their needs for further education, what types of courses would meet those needs, and effective delivery methods of the curriculum. Second, there is an urgent need for government support of these and other education programs because it is important to improve the quality of health care providers in general. Finally, we propose that when this education program is implemented, experiential clinical training should be included to further reduce the academic gap for 4-year pharmacy program pharmacists. These processes and the successful establishment of a 6-year pharmacy program will ensure that excellent new pharmacists are continually produced, and that the clinical abilities of all practicing pharmacists will improve to meet the GPP guidelines. This survey was administered to community pharmacists living in one area; thus, as a convenience sample, the results may not represent the opinions of all pharmacists in South Korea. Additionally, the sample number was small and the survey was limited in terms of identifying interest in MTM services. Finally, this study may not reflect the latest views regarding the perception and adoption of a preceptorship scheme.

However, our survey on the state of the academic gap between 4- and 6-year pharmacy program pharmacists was more comprehensive than previous surveys, and the questionnaire regarding the requirements, compensation, and education programs for preceptors was answered by respondents who will, in all likelihood, become future preceptors. This study also identified the absence of options regarding an education program for 4-year pharmacy program pharmacists in South Korea, and we have made several proposals to address this absence by referring to successfully implemented foreign programs. If reform of pharmacy education is planned in other countries, we suggest that the designers of education programs for practicing pharmacists refer to the results herein. Additionally, examining the experiences of other nations is valuable in reducing trial and error.

CONCLUSION

We conducted a survey of currently practicing pharmacists and conducted a literature review of precedent transition programs in other nations. Practicing pharmacists

in the survey showed concern regarding the academic gap, high need for proper transitional education programs, and low acceptability of preceptorship and the possibility of MTM services. The United States and Japan began 6-year pharmacy programs ahead of South Korea, and they prepared transitional programs for 4-year pharmacy program pharmacists to overcome the academic gap, allowing these pharmacists to work as preceptors with subsequent students. Both programs included experiential education. Therefore, we suggest nationwide efforts and government support to close the academic gap between pharmacists from 4- and 6-year programs. Additionally, experiential education should be included in transitional programs for 4-year pharmacy program pharmacists. These transitional programs for practicing pharmacists should be considered as part of the reform process of pharmacy education in any country.

ACKNOWLEDGMENT

This research was supported by the Chung-Ang University Research Scholarship Grants in 2014.

REFERENCES

1. Lee JH. The current state of preparation and improvement suggestion of pharmacy practice experience in community pharmacy. *J Pharm Policy Res.* 2012;7(1):44-52.
2. Korean Association of Pharmacy Education. Pharmacy education. http://www.ikape.or.kr/sub4/sub4_3.php. Accessed May 3, 2013.
3. Korean Association of Pharmacy Education. Pharmacy Education Eligibility Test. http://www.kpeet.or.kr/intro/about_peet.html. Accessed May 3, 2013.
4. Pharmacy Practice Experiential Education Committee, Korean Association of Pharmacy Education. Pharmacy practice experiential education. <http://www.pkape.or.kr>. Accessed August 26, 2013.
5. Oh JM. The current state of preparation and improvement suggestion of pharmacy practice experience in pharmacy school. *J Pharm Policy Res.* 2012;7(1):32-43.
6. Kim SH. *Study of Good Pharmacy Practice Experience in Community Pharmacy-Focused on Roles and Qualification Standards of Preceptors* [Masters thesis]. Seoul: Ewha Womans University; 2012.
7. American Pharmacists Association, National Association of Chain Drug Stores Foundation. Community pharmacist preceptor education program. 2010 http://elearning.pharmacist.com/Portal/Files/LearningProducts/6b07c742b2e94cdaac7fc8000f27f843/assets/Preceptor%20monograph_061312.pdf. Accessed January 6, 2013.
8. International Pharmaceutical Federation. Joint FIP/WHO guidelines on good pharmacy practice: standards for quality of pharmacy services. http://www.fip.org/www/uploads/database_file.php?id=331&table_id=. Accessed May 18, 2013.
9. Stebbins MR, Cutler TW, Parker PL. Assessment of therapy and medication therapy management. In: Alldredge BK, Corelli RI, Ernst ME, et al. *Koda-Kimble and Young's Applied Therapeutics: The Clinical Use of Drugs*. 10th edition. Baltimore, Philadelphia: Lippincott Williams & Wilkins; 2012: 43-57.
10. No YS. The meaning and implications of the beginning medication therapy management service in U.S. *J Pharm Policy Res.* 2006;1(1):144-160.
11. Pellegrino AN, Martin MT, Tilton JJ, Touchette DR. Medication therapy management services: definitions and outcomes. *Drugs.* 2009;69(4):393-406.
12. Bang JS, Jang JH, Kim SJ, et al. A survey for the recognition and adoption rates concerning the application of preceptorship into the pharmacy education settings. *Kor J Clin Pharm.* 2008;18(1):50-59.
13. Je NK, Lee IH, Yoon JH. Assessment of changes in pharmacists' perceptions of preceptorship and the effect of a preceptor orientation program. *Kor J Clin Pharm.* 2012;22(2):143-152.
14. Kim EY. The global perspective-Korea. In: Cipolle RJ, Strand L, Morley P. *Pharmaceutical Care Practice: The Patient-Centered Approach to Medication Management*. 3rd edition. New York: McGraw-Hill Medical;2012: 487-495.
15. Kreling DH, Doucette WR, Chang EH, Gaither CA, Mott DA, Schommer JC. Practice characteristics of bachelor of science and doctor of pharmacy degree pharmacists based on the 2009 national workforce survey. *Am J Pharm Educ.* 2010;74(9):Article 159.
16. Japan Pharmacists Education Center. <http://www.jppec.or.jp>. Accessed July 8, 2013.
17. American Association of Colleges of Pharmacy. Non-traditional students. <http://www.aacp.org/resources/student/Pages/Non-TraditionalStudents.aspx>. Accessed March 5, 2013.
18. Stolte SK, Scheer SB, Robinson ET. The reliability of non-cognitive admissions measures in predicting non-traditional doctor of pharmacy student performance outcomes. *Am J Pharm Educ.* 2003;67(1):Article 18.
19. College of Pharmacy, Florida University. Working Professional Pharm.D. (WPPD). <http://pharmacy.ufl.edu/education/doctor-of-pharmacy-degree-pharmd/working-professional-pharmd-wppd/>. Accessed June 27, 2013.
20. Breslow RM. A comparison of academic performance of off-campus nontraditional Pharm D students with campus-based Pharm D students. *Am J Pharm Educ.* 2005;69(1):Article 8.
21. Trinca CE. Nontraditional education and training for pharmacists. *Am J Pharm Educ.* 1994;58(3):349-350.
22. Carter RA. In nontraditional education-Assuring quality is job one. *Am J Pharm Educ.* 1994;58(4):411-413.
23. Park GB. Insisting on the establishment of a Korea pharmacists education center. *J Kyunggido Pharm Assoc.* 2008;August 22:2-6.
24. Payakachat N, Ounpraseuth S, Ragland D, Murawski MM. Job and career satisfaction among pharmacy preceptors. *Am J Pharm Educ.* 2011;75(8):Article 153.
25. Korean Pharmaceutical Association. Home page. <http://www.kpanet.or.kr>. Accessed June 25, 2013.