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Status of Pharmacy Administration Education in China: A Survey of Undergraduate Curriculum and Faculty

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Abstract

Background: Pharmacy Administration (Ph.A) became a formal part of undergraduate curriculum in China in 1987. Despite recent growth and diversification, Ph.A curricula remain relatively understudied.

Aims: To describe and analyze the status of undergraduate Ph.A education in China.

Methods: Survey of pharmacy schools conducted through interviews over the telephone or in person.

Results: Among 201 eligible schools, 111 (55%) had a Ph.A curriculum offering a total of 399 courses. Core courses were offered in administration (53%), marketing (15%), jurisprudence (6.5%), systems and regulations (4.8%), and pharmacoeconomics (4.8%). Curricula varied in credit hours and content. A total of 276 staff members were involved in teaching (49% female, 47% part-time) with 79% holding a Master's degree or less. Sixty-three (57%) schools only utilized part-time faculty.

Conclusion: Course structure and content are variable and entry qualifications for teaching staff are lower than for other divisions. Establishing curriculum guidelines and allocating resources to support and attract qualified faculty are recommended.

Keywords: *China, curriculum, pharmacy administration, survey, undergraduate*

Introduction

Pharmacy Administration (Ph.A) became a formal part of undergraduate pharmacy curriculum as outlined by the Chinese Ministry of Education (MOE), formerly known as the State Education Commission of China, in 1987. Since then, the discipline of Ph.A has diversified. There are now more than 200 colleges and universities in China offering various undergraduate specialties and professional options related to pharmaceutical science. Currently, Ph.A content is mandatory in pharmaceutical science programs and also a component of pharmacist licensing examinations in China. Ph.A content has expanded from one course in administration to a range of courses including pharmacy jurisprudence, hospital pharmacy administration, pharmaceutical marketing, pharmacoeconomics, and others (Sun *et al*., 2005; Hu *et al*., 2006). Some schools, like China Pharmaceutical University and Second Military Medical University, have changed Ph.A to Social and Administrative Pharmacy, to increase consistency with programs offered in the United States of America (USA). (Chu *et al*., 2006) Despite the steady growth in interest and diversification, Ph.A remains a relatively young and understudied discipline as compared with more traditional programs in pharmaceutical sciences and there is still a lack of information available on the types of courses taught, the position these courses hold in the curriculum, and the faculties that provide the teaching.

This study is intended to:

1) Investigate the curriculum of Ph.A in pharmacy colleges and universities in China, as well as in different specialties related to pharmaceutical science;
2) Describe the main courses in Ph.A in the pharmacy colleges and universities;
3) Analyze age, gender, education level and part- or full-time positions of the teaching faculties in Ph.A.

Methods

Literature Research and Network Data Retrieval

According to statistics in 2005, there were 257 undergraduate colleges and universities in China that were established, or were approved to establish specialties related to pharmaceutical science such as Pharmacy, Traditional Chinese Medicine, Pharmaceutics, and Pharmaceutical Engineering (Wu and Yang, 2007). Each school was contacted via telephone by searching the directories of two Chinese Pharmaceutical Yearbooks (Peng, 2000; 2005) and the official websites for the MOE and college and university. A total of 201 colleges and universities with established pharmacy-related specialties were contacted to complete the survey. Institutions that were approved to establish pharmacy-

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related specialties but still had no enrollment or those with programs terminated were excluded from the study.

Survey

The survey is divided into three sections:

1) Information on the Ph.A curriculum: name of school; division within pharmacy; Ph.A course name; description of course; semester offered; credit hours; textbook used; and course content.
2) Status of research within the Ph.A curriculum: extent and types of research; resources and funding.
3) Status of teaching faculty: number; age; gender; professional titles; educational background; full/part-time distribution.

Data Collection and Analysis

Three Ph.A faculty members and three Ph.A students from Sichuan University were trained to administer the survey either over the telephone or face-to-face where geographically reasonable. An initial meeting with a designated contact person at the participating school presented the questions from the survey and provided clarifications as necessary. A mutually agreed upon time was given for the school to prepare the requested information and a follow-up meeting collected the results from the designated contact person. Consent was obtained at the time of administering the survey. The survey was conducted from March 2006 to October 2007. Results received were reviewed with the information provided on the websites of the respective schools and any discrepancies were further clarified with the contact person at the school. Descriptive analysis was conducted using Microsoft Excel 2003.

Results

Distribution of Pharmacy Colleges and Universities

Distribution by Category

A total of 201 colleges and universities in China had established pharmacy-related specialties. Out of these, 111 (55.2%) completed the survey process. The majority were from comprehensive, medical, and traditional Chinese medicine (TCM) universities (see Table I).

Distribution by the Time to Establish Pharmacy Specialties

Since 2000, pharmacy-related specialties have been rapidly increasing with approval by MOE. According to the Chinese Pharmaceutical Yearbook in 2000 (Peng, 2000), 96 schools established 137 pharmacy-related specialties. Resources from the MOE website revealed this had increased to 105 colleges and universities having established 284 pharmacy-related specialties by 2005 (MOE, 2001-2005). Of the schools investigated in this study, 53 (47.7%) had established pharmacy-related specialties before 2000 and 58 (52.3%) from 2001 to 2005.

Table I: Distribution by Category of Pharmacy Colleges and Universities

Category	Total Number of Schools	Number of Schools Investigated (%)
Pharmaceutical universities/ pharmaceutical colleges	3	3 (100)
Comprehensive universities/ colleges	58	30 (51.7)
Medical universities/ colleges	44	26 (59.1)
TCM universities/colleges	22	15 (68.2)
Technology universities, science & technology colleges or universities	41	22 (53.7)
Others	33	15 (45.5)
Total	**201 (100)**	**111 (55.2)**

Distribution of Specialties that Offered Courses in Ph.A

The distribution of 245 specialties among the 111 schools investigated is presented in Table II. The distribution from all 201 schools is also included as comparison.

Table II: Distribution of Specialties for the Colleges and Universities that Offered Ph.A Courses

Name of Specialty	Number of Specialties N= 201 (%)	Number of Specialties N= 111 (%)	Coverage (%)
Pharmacy*	107 (25.4)	91 (37.1)	85.0
Traditional Chinese Medicine	58 (13.8)	33 (13.5)	56.9
Pharmaceutics	59 (14.0)	28 (11.4)	47.5
Pharmaceutical Engineering	133 (31.6)	58 (23.7)	43.6
Economics and Marketing†	26 (6.2)	19 (7.8)	73.1
Management‡	12 (2.85)	9 (3.7)	75.0
Traditional Chinese medicine resource and exploitation	12 (2.85)	7 (2.9)	58.3
Cultivation and identifying of Chinese herbal medicine	6 (1.4)	-	-
Others§	8 (1.9)	-	-
Total	**421 (100)**	**245 (100)**	**58.2**

*: Pharmacy includes specialties and professional options of Basic Pharmacy, Applied Pharmacy, Clinical Pharmacy, Pharmacology, Pharmaceutical Chemistry, and Pharmaceutical Trade, etc.; Traditional Chinese Medicine included specialties and professional options of TCM Marketing and TCM Pharmaceutics, etc.; Pharmaceutical Engineering includes specialties and professional options of Chemical Engineering & Pharmaceutics, Bioengineering, Biotechnology, Biotechnology & Pharmaceutical Engineering, etc.

†: Economy & Marketing includes specialties and professional options of International Economy & Trade, Marketing, Pharmaceutical Marketing, Medical Marketing, Medical Economy, etc.

‡:Management includes specialties and professional options of Business Administration, Enterprise Administration, Pharmacy Administration, Public Affairs Administration, and Administration, etc.

§:Others include Marine Pharmacology, Animal Pharmacy, Mongolian Pharmacy, and Tibetan Pharmacy, etc.

Distribution of Courses in Ph.A

The Ph.A curriculum of the 111 schools investigated categorized a total of 399 courses into administration, marketing, jurisprudence, systems and regulations, and pharmacoeconomics (see Table III).

Among all courses in Ph.A, Pharmacy Administration was of the highest frequency offered followed by Pharmaceutical Marketing and Pharmaceutical Law & Regulation. In recent years, offerings for Pharmacoeconomics and Hospital Pharmacy Administration have increased.

On average, each school offered 2.2 Ph.A courses. However, 54 schools (48.6%) offered only one course, mainly Pharmacy Administration, Pharmacy Administration and Law & Regulation or Pharmaceutical Law & Regulation. Twenty-six schools (23.4%) reported offering two courses, 15 schools (13.5%) offered three, 6 schools (5.4%) offered four, 2 schools (1.8%) offered five, 3 schools (2.7%) offered six, 1 school (0.90%) that offered seven, and lastly, 3 schools (2.7%) offered ten courses.

Table III: Ph.A Courses Offered by the 111 Colleges and Universities

Category	Type of Course	Number* (%)
Management	**Pharmacy administration** (includes pharmacy administration of TCM)	210 (52.6)
	Pharmacy administration and law & regulation (includes pharmaceutical administration & law and regulation)	19 (4.8)
	Hospital pharmacy administration (includes hospital pharmacy management, hospital pharmacy, institutional pharmacy administration)	12 (3.0)
	Pharmaceutical enterprise management (includes pharmaceutical enterprise administration, introduction of pharmaceutical enterprise management, pharmaceutical enterprise manufacturing management, pharmaceutical enterprise quality management, pharmaceutical, pharmaceutical manufacturing management, TCM enterprise management, pharmaceutical manufacturer management)	16 (4.0)
	Drug management (includes drug quality management, drug manufacturing management, drug supply management)	3 (0.7)
	Good Manufacturing Practice for pharmaceuticals (includes GMP, GLP, GMP engineering, GMP and application, pharmacy administration and GMP)	9 (2.2)
Economics	**Pharmaceutical marketing** (includes medicine marketing, Marketing, drug marketing)	61 (15.3)
	Pharmacoeconomics	19 (4.8)
	International medical trade	4 (1.0)
	Others (includes pharmaceutical economics, pharmaceutical E-business, pharmaceutical marketing survey and forecast)	3 (0.7)
Jurisprudence & Ethics	**Pharmaceutical law & regulation** (includes pharmacy affairs law, Chinese pharmaceutical laws & regulations, pharmaceutical laws & regulations in China and other country)	26 (6.5)
	International pharmacy law & regulation	4 (1.0)
	Medicine intellectual property	4 (1.0)
	Pharmacy ethnics (includes medicine ethnics, pharmacy professional ethics)	3 (0.7)
	Applied pharmacy laws and regulations	1 (0.3)
Methodology	**Pharmacy administration research method** (includes research method of social sciences)	3 (0.8)
Others	**Monograph of pharmacy policy**	1 (0.3)
	Introduction of pharmacy	1 (0.3)
TOTAL		399(100)

*: Courses in common social sciences such as Administration and Economy, etc., were not counted.

Analysis of Main Courses in Ph.A Specialties

Pharmacy Administration

Among the 91 Pharmacy specialties, 78 (85.7%) offered Pharmacy Administration as did 48 of 58 (82.8%) with a Pharmaceutical Engineering specialty, 31 of 33 (93.9%) with a TCM specialty, 25 of 28 (89.3%) with a specialty in Pharmaceutics, and 23 of 28 (82.1%) with specialties in Medical Trade, Marketing or Administration. For the majority of these specialties, the Ph.A course was listed as one of the main requirements and offered most often in the 6th and 7th semester. However, 43.7% of the Pharmaceutical Engineering specialties listed the Ph.A course as an elective or appointed elective course. The course hours also varied from 24 to 72 hours (average 41 hours) with credits earned from 1 to 4 (mostly 2 credits; 32-40 credit hours) depending on the school.

Pharmaceutical Marketing

The Pharmaceutical Marketing course was offered the most frequently (17 schools, or 60.7%), and most commonly as a compulsory course (94.1%), within specialties in Medical Trade, Marketing, or Administration. It was also offered in 30 (33.0%) Pharmacy specialties, 6 (18.2%) TCM specialties, 3 (10.7%) Pharmaceutics specialties, and 5 (9.3%) Pharmaceutical Engineering specialties. more commonly as an elective course. Course hours ranged from 18 to 72 hours, with an average of 44.8 hours. Credits earned ranged from 1 to 4, with most evenly divided at 2, 3, or 4 credits.

Pharmacy Administration & Law & Regulation and Pharmaceutical Law & Regulation

Thirty specialties offered the course Pharmaceutical Law and Regulation while 19 specialties offered Pharmaceutical Administration and Law and Regulation. These courses were compulsory in 53.3% and 47.4% of the respective specialties. Most often these courses were also offered in the 6th or 7th semester and worth 2 to 3 credits. Course hours ranged from 30 to 54 hours, 42.9 and 33.8 hours on average respectively.

Two trends were observed with the placement of these courses in curriculum. One group views them as comparable to Pharmacy Administration courses. Twenty-six specialties offered these instead of Pharmacy Administration, but with no variation in course outline, content, or teaching material other than the name of the course. Another group of schools offer these as follow-up advanced courses to Pharmacy Administration, focusing on laws and regulations in the pharmaceutical field. Fourteen specialties offered courses in both Pharmacy Administration and Pharmaceutical Law and Regulation.

Pharmacoeconomics

The Pharmacoeconomics course was offered by 19 specialties with 11 offering this course for a specialty in Pharmacy and 5 for a specialty in Administration. The course was most often offered as an elective (63.25%) in the 7th semester (57.9%) for 1 to 2 credits (18-36 credit hours) with 30.4 course hours on average.

Hospital Pharmacy Administration

Twelve specialties offered the Hospital Pharmacy Administration course. Among these, 9 offered this course under a Pharmacy specialty, 2 under Pharmacy Administration and 1 under Pharmaceutical Marketing. Hospital Pharmacy Administration was an elective in 50% of schools, a required credit (16-18 course hours) in 3 schools, and 2 credits or more (36 course hours) for the remaining schools with a 39.5 course hour average.

Teaching Faculty in Ph.A

Organization of teachers in Ph.A

Of the 111 schools investigated, there were 116 colleges (several universities had different courses of Ph.A in different colleges, calculated separately) with teaching staff in Pharmacy Administration. Of them, only 32 established an independent Pharmacy Administration college, faculty, and/or department: 3 established a Faculty of Pharmacy Administration, 27 established a department and 2 were independent colleges. The teaching staff from remaining schools were organized under other departments, such as pharmaceutics or pharmacology.

Of the 116 colleges, only 30 (25.9%) had scientific research projects in the Pharmacy Administration field. The remaining 79 colleges did not participate in any research and 7 gave no information.

Distribution of Teachers in Ph.A

The distribution of teaching staff in Ph.A was obtained from 108 schools (3 schools did not answer). A total of 276 teachers were included consisting of 145 (53%) males and 131 (47%) females respectively. The majority of these teachers were aged 30 to 49 (64.8%) and about half (47.1%) had a Master's degree. Only 20.7% had a doctoral degree or were in the process of obtaining one. (See Table IV, Figure 1) However, a number of teaching staff were pursuing higher education through part-time study.

Full- and Part-time Teachers in Ph.A

Of the 276 teaching staff, 142 (51%) were full-time and 134 (49%) were part-time. Sixty-three schools (57%) used part-time teaching staff only. These part-time teachers not only undertook teaching in the Ph.A discipline but also teaching or research work under other disciplines or departments. There were 91 (68%) part-time teachers from the departments of Pharmaceutics, Pharmaceutical Analysis, Pharmaceutical Chemistry, TCM, and Chemical Engineering and Health Administration. Of these, 12 held concurrent positions in Administration as a university or college president, department director or party secretary. Another 24 (18%) part-time teachers worked in administration, 9 (6.7%) came from subsidiary hospitals; 3 (2.2%) from government (e.g. State Food and Drug Administration), and 4 (3%) from enterprises or industry (See Figure 2).

Among the 142 full-time Ph.A teaching staff, 16 had concurrent administrative or government positions (5 were college presidents, 3 were party secretaries and 8 were in

other administrative roles) and 3 were engaged in administration in the pharmaceutical industry. Full-time teaching staff overall were younger, 73% under 39 years old as compared with 34% in the part-time group.

Table IV: Demographics and Education Level for Teaching Staff in Ph.A

	Category	Full-time	Part-time	Number (%)
Total				**276 (100.0)**
Gender	Male	66	79	145 (51.0)
	Female	76	55	131 (49.0)
Education Level	Below B.S	0	2	2 (0.7)
	B.S	23	55	78 (28.3)
	M.S	77	53	130 (47.1)
	M.S candidate	9	0	9 (3.3)
	Ph.D	12	19	35 (12.7)
	Ph.D candidate	10	12	22 (8.0)
Profession Title	Teaching Assistant	26	5	31 (11.2)
	Assistant Professor	57	32	89 (32.2)
	Associate Professor	42	38	79 (28.6)
	Professor	17	41	58 (21.0)
	Licensed Pharmacist	1	11	12 (4.3)
	Senior Engineer	2	4	6 (2.2)

Figure 1: Distribution of Ages for Teachers within Ph.A

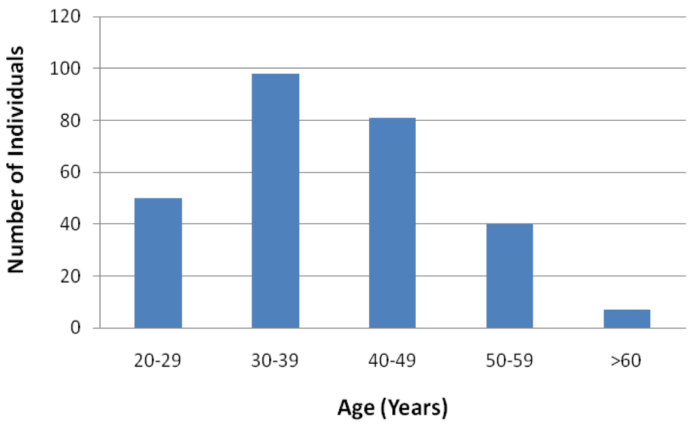
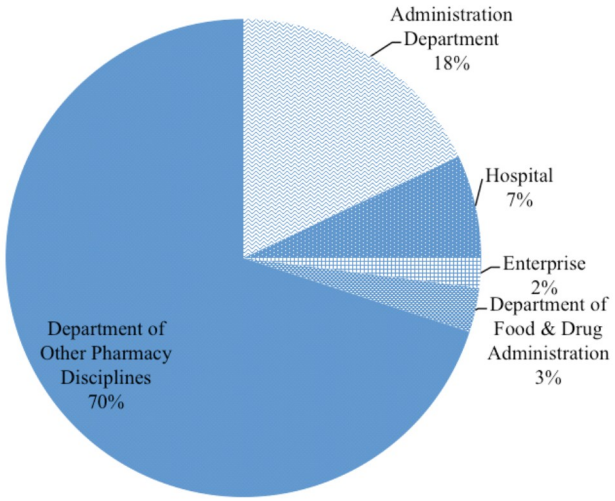


Figure 2: Sources of Part-time Teachers in Ph.A



Discussion

The Ph.A field is interdisciplinary with a combination of courses relevant to Pharmacy and Social Sciences (Yang *et al*., 2004). In comparison with other major disciplines in pharmacy such as Pharmaceutics and Pharmacology, there are more denominations and categories of Ph.A courses offered including administration, law, economy and methodology. These courses have preliminarily formed the basis for development of Ph.A curriculum in China.

Both the Pharmacy Administration and Law and Regulation course and the Pharmaceutical Law and Regulation course are highly relevant to the licensing system for pharmacists in China. This is demonstrated through these courses being commonly offered. The demand for Pharmaceutical Marketing, Hospital Pharmacy Administration, and Pharmacoeconomics was also reflected as emerging disciplines. However, almost half of the schools still offered only one Ph.A course with low course hours and credits. Other significant Ph.A courses such as Pharmaceutical Ethics and Pharmacy Administration Research Methodology were rarely offered.

Ph.A courses were named differently despite similar content or were offered at different levels amongst different schools. Similarly, there was no consistency in the order and weight in the curriculum. For example, Pharmaceutical Marketing and Pharmacoeconomics courses were offered both before or after Pharmacy Administration, which in turn could be offered anywhere from the 4th through to the 7th semester, ranging from 18 to 72 course hours in length. The relationship between the order of the courses and the level of education is unclear. This variability suggests that Ph.A curriculum planning is of low priority in some schools.

Another discovery from this study is the large proportion of part-time Ph.A teaching staff with a wide-array of background training. As a discipline that is closely related with pharmacy practice, the rich practical administrative experience among the Ph.A teaching faculty can be beneficial. However, up to 57% of the school only used part-time teachers and most of them are from external disciplines. A majority of teaching staff held a Master's degree or less and 73% of all full-time teachers were under the age of 39. This is unusual compared with teaching faculties of other pharmacy related disciplines. The entry threshold for the current Ph.A teaching and research staff appears still low and the training does not seem to meet the quality standards set in other pharmaceutical faculties. This also reveals the possibility Ph.A does not warrant enough attention in some schools. However, it is optimistic that, in recent years, a lot of younger teachers have been introduced and cultivated into the field possibly as a result of rapid growth of Masters and Doctoral programs in Pharmacy Administration in China (Chang and Ye, 2007).

Limitations

One limitation for this study is the fact that it covered only 55.2% (111/201) of the schools in China. However, the sample studied did cover all the major pharmacy schools. In fact, the category distribution was relatively consistent across all pharmacy schools. The exclusion of 90 schools was due to insufficient time for the schools to establish and enroll the pharmacy specialties or because they were done on a small

scale. It may be speculated that these schools could have less teaching faculties with a possible higher ratio of part-time teachers. The lack of this data may result in bias in the ratio of full- to part-time teachers, as well as the distribution of their educational levels.

Conclusion

The Ph.A curriculum in China continues to develop and grow with societal demand. However, a lack of systematic planning and consistency is observed. Course structure and content is variable and entry qualifications for teaching staff are lower than for other divisions. Establishing curriculum guidelines as well as allocating resources to support and attract qualified faculty will ensure further growth in this relatively new area for pharmacy practice.

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