RESEARCH ARTICLES

Influences on Malaysian Pharmacy Students' Career Preferences

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Submitted October 14, 2009; accepted October 29, 2009; published November 10, 2010.

Objectives. To identify and evaluate factors affecting the career preferences of fourth-year bachelor of pharmacy (BPharm) students in Malaysia in the presence of a 4-year period of mandatory government service.

Methods. A validated self-administered questionnaire was used in this cross-sectional study to collect data from final-year BPharm students enrolled at 3 government-funded universities and 1 private university in Malaysia. Both descriptive and inferential statistics were used for data analysis.

Results. Three hundred fourteen students responded (213 from public universities and 101 from the private university). Approximately 32% of public university students and 37% of private university students ranked their own interest in pharmacy as the reason for undertaking pharmacy degree studies; 40.4% of public and 19.8% of private university respondents stated that they would enter a nonpharmacy-related career upon graduation if given the choice. Public university students ranked hospital pharmacy as their choice of first career setting (4.39, $p = 0.001$), while private students ranked community pharmacy first (4.1, $p = 0.002$). On a scale of 1 to 5, salary received the highest mean score (3.9 and 4.0, $p = 0.854$) as the extrinsic factor most influencing their career choice.

Conclusions. Final-year students at Malaysian public universities were most interested in hospital pharmacy practice as their first career step upon graduation, while private university students were most interested in community pharmacy. The top 3 extrinsic factors rated as significant in selecting a career destination were salary, benefits, and geographical location.

Keywords: career, graduate, Malaysia, pharmacy students

INTRODUCTION

Over the last 2 decades, pharmacy practice has undergone radical change in terms of re-professionalization, a renewal of patient focus, and the development of approaches, tools, and competencies to provide direct patient care. In December 2009, approximately 7000 pharmacists were registered with the Malaysian Pharmacy Board, giving a pharmacist to general population ratio of about 1: 6000. The Ministry of Health Malaysia (MoH) expects to attain the World Health Organization (WHO) recommendation

of 1:2000 by 2020; this translates into a need for approximately 18,000 registered pharmacists.¹ Increases in the number of registered pharmacists in Malaysia have been fueled largely by increases in the number of applicants to pharmacy degree programs, which has been driven in part by expansion in the number of places available in pharmacy schools. Before 1996 only 1 Malaysian university offered a pharmacy degree; now 5 government-funded (public) universities and 11 private institutions of higher learning have pharmacy programs. The increase in graduate numbers allowed the MoH and Pharmacy Board to implement a radically amended registration process in 2005, in which registration is dependent on a period of mandatory government service. The registration process consists of 1 year as a provisionally registered pharmacist (PRP) and 3 years of mandatory service as a fully registered

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pharmacist (FRP). Full registration is not granted unless the graduate completes the mandatory service period. The aim has been to fill long-standing pharmacist vacancies in the MoH hospital service, which had severely hindered the expansion of clinical pharmacy services. The Pharmaceutical Services Division of the MoH envisions the contribution of pharmacy to patient care in terms of 15 portfolios of pharmacy practice and development and 10 for pharmacy enforcement for the pharmacists practicing in public sector.²

There were 1,356 registered pharmacists in Malaysia in 2005, and 3,133 in 2007.² The introduction of mandatory service was accompanied by upward revision of pharmacist salary scales. Before 2005, MoH preregistration pharmacy graduates were given a training allowance; now they are entitled to a full junior-grade pharmacist salary. Although the effects on degree program and career choice have not been investigated, mandatory service probably has produced some degree of job certainty for at least the first 4 years after graduation; conversely, recruitment into pharmaceutical sectors, including community and industrial, has been reduced.

Numerous studies have investigated the career choices of graduating medical students and doctors completing the preregistration period. Relatively few studies (mostly in the West) provide information on career choices and preferred areas of practice among graduating pharmacy students. One study reported that pharmacy students ranked work environment as the most important factor in deciding career destinations, while career goals upon graduation predominantly were to work in retail chain pharmacies. However, 5 years after graduation, their projected areas of practice were divided between retail and clinical settings.³ Willis et al reported that almost equal proportions of pharmacy graduates in the United Kingdom wished to undertake preregistration training in hospital and community sectors.⁴ Salary, location, personal fulfillment, and the opportunity to use one's abilities and education to help patients were found to be influential factors in the career choices of US pharmacy students.⁵⁻⁷ In Malaysia, little is known about pharmacy students' reasons for undertaking pharmacy degree programs, preferences, about their career and professional role; and opinions about mandatory government service.

METHODS

Questionnaire Development and Validation

Questionnaire items were developed from a detailed review of variables and factors used in previous studies,⁵⁻¹³ with the intention of replication where possible to aid in comparison of the results. Items in the first part of the questionnaire collected demographics data. Items in the second part gathered data on students' job preferences and factors influencing their choice of career and career

preferences. Respondents' willingness to work for MoH healthcare facilities was rated using a 5-point Likert scale anchored at strongly disagree (1) and strongly agree (5). Lecturers from 3 public and 1 private university evaluated the draft questionnaire for clarity; suggestions from these individuals were incorporated into a final draft, which was then pilot tested on 20 randomly selected individuals from the expected study population. These individuals were asked to complete the questionnaire on 2 separate occasions, 20 days apart, and to comment on any item they did not understand, or found ambiguous or confusing. The period of 20 days was felt to be sufficiently long to minimize recall of previous responses and sufficiently short to minimize the development of consistent changes in response. The null hypothesis was that there would be no significant agreement in responses by the same respondents on these 2 occasions. The result of the kappa test (used to assess the level of agreement between 2 respondents classifying a sample of objects on the same categorical scale) had a *p* value of < 0.05 leading to the rejection of the null hypothesis.

Study Population and Design

In this cross-sectional study, data were collected from fourth-year (final-year) students enrolled in bachelor of pharmacy degree programs at 3 government-funded universities and 1 privately run university. At the time of the study, 5 universities funded under the auspices of the MoH or Ministry of Higher Education (MoHE) and 11 other institutions of higher learning offered pharmacy degree courses in Malaysia.

Permission to collect data from students was obtained from the administration of each university. One faculty member from each university was invited to coordinate data collection at their university and briefed on study aims, objectives, and methodology. Fourth-year students were approached randomly, informed of the purpose and nature of the study, provided a study information sheet, and asked to respond to a self-administered questionnaire during class. A researcher was on hand to clarify items and answer questions as needed. The questionnaires were returned to the coordinator. Lecturers in pharmacy practice at the International Medical University screened the questionnaires for completeness and identified invalid responses. All information gathered from students was kept confidential.

Statistical Analysis

The data were analyzed using descriptive and inferential statistical methods available in the Statistical Package for the Social Sciences, version 13.0, (SPSS Inc, Chicago, IL, USA) with significance set at a *p* value of ≤ 0.05 . The chi-square test was used to assess the association between independent (demographic characteristics) and dependent

variables (responses). Spearman correlation was used to evaluate relationships between variables. Weighted scores were calculated to identify the 5 most important job choice factors and preferences for the entire study sample. The purpose for weighted scoring was to create a guide based on the students' ranking. Besides weighting, mean weighted scores were also compiled for comparison to identify the most important job choice factors and preferences for the study sample. Frequency distribution was used to determine the top 5 job choice factors and preferences. The frequency values of the 5 factors and preferences were then multiplied by 5, 4, 3, 2, and 1, respectively. The mean was then calculated using summed values. Once all the weighted scores were determined, the factors and preferences were ranked. The Mann-Whitney test was used to find the difference in mean weighted scores.

RESULTS

Of 314 respondents, 213 (67.8%) were enrolled at public universities and 101 (32.2%) at a private university. Mean age was 22.2 ± 0.9 years. Seventy-seven percent of the respondents enrolled at public universities were Malay and 90% of the respondents enrolled at private universities were Chinese. Indian respondents accounted for less than 3% of the total. More than half (55.9%) of the public university respondents had lived in a rural area before starting college, while more than a third (79.2%) of the private university respondents were from urban areas. None of the private university respondents was married; 8 of the public university students were married. Detailed demographic characteristics are presented in Table 1.

Students could give more than 1 response on the first 2 questionnaire items, but they did not rank their responses. For the first item, the response selected by the most students as the reason for undertaking pharmacy studies was their own interest in pharmacy (31.9% of students at public universities vs. 36.6% at private universities). About 24% and 8% of public and private university students, respectively, reported family recommendation as the reason for undertaking pharmacy studies. Interestingly, almost 21% of the private university students stated employment prospects as their reason to enroll in a pharmacy degree course. Detailed results are presented in Table 2.

Almost the same proportions of respondents from public and private universities (around 67%) chose hospital as a possible work setting upon graduation. A slightly higher proportion of private students selected community pharmacy (67.3%) over hospital (66.3%) as a future work setting. More than a quarter of private students (38.6%) and less than a quarter of public students (22.5%) indicated they would like to work in private healthcare. Smaller proportions of public (17.8%) and private (28.7%) students

Table 1. Demographic Characteristics of Fourth-Year Bachelor of Pharmacy Students in Malaysia Who Participated in a Study of Factors Influencing Their Choices Concerning College and Career (n=314)

Variables	Public University Students (n=213)	Private University Students (n=101)
Gender, No. (%)		
Male	64 (30)	33 (32.7)
Female	149 (70)	68 (67.3)
Age, y	22.2 (0.9)	
Ethnicity, No. (%)		
Malay	163 (76.5)	5 (4.9)
Chinese	44 (20.7)	94 (93.1)
Indian	6 (2.8)	2 (2)
Pre-university location, No. (%)		
Urban	94 (44.1)	80 (79.2)
Rural	119 (55.9)	20 (19.8)
Marital status, No. (%)		
Married	8 (3.8)	0
Unmarried	205 (96.2)	101

selected the pharmaceutical industry. Less than a quarter of students from public and private universities reported they would like to work in sales and marketing (5% vs. 16.8%), government health clinics (12.2% vs. 10.9%), clinical research (11.7% vs. 13.7%), regulatory affairs (10.8% vs. 9.9%), and academia (5.6% vs. 2%). Data on preferred areas of practice are shown in Table 3.

Weighted scores with rank order were calculated for the 5 most influential factors for choosing work in the public and private sectors. In the public student group, attractive starting salaries was the most highly ranked influential factor (715), followed by opportunities for learning and development (568), long-term job security (354),

Table 2. Factors Chosen by Respondents as Influencing Their Decision to Undertake a Pharmacy Degree, No. (%)

Factors	Public (n=213 ^a)	Private (n=101 ^a)
Own interest in pharmacy	68 (31.9)	37 (36.6)
Family	51 (23.9)	16 (15.8)
Job opportunities/ prospects	45 (21.1)	21 (20.8)
Income	36 (16.9)	14 (13.7)
Interest in healthcare	21 (9.9)	9 (8.9)
No specific reasons	15 (7.0)	12 (11.9)
Suitable to pre-university qualifications	10 (4.7)	0
Friends	8 (3.7)	0
Job security	7 (3.3)	4 (3.9)
Challenging	6 (2.8)	0
Teacher advice	5 (2.3)	0

^a Respondents could choose more than one factor

Table 3. Fourth-Year Bachelor of Pharmacy Students' Preferred Area of Work Upon Graduation, No. (%)

Preference	Public University Students (n = 213 ^a)	Private University Students (n = 101 ^a)
Hospital	143 (67.1)	67 (66.3)
Community pharmacy	103 (48.4)	68 (67.3)
Private healthcare	48 (22.5)	39 (38.6)
Pharmaceutical industry	38 (17.8)	29 (28.7)
Sales & marketing	33 (15.5)	17 (16.8)
Public health facility	26 (12.2)	11 (10.9)
Clinical research	25 (11.7)	14 (13.7)
Regulatory affairs	23 (10.8)	10 (9.9)
Academia	12 (5.6)	2 (2)

^a Respondents could choose more than one option

continuing education (226), and training and development programs (107). Private university students ranked opportunities for learning and development first (360) and attractive starting salary last (46). With regard to factors influencing choice to work in the private sector, both student groups ranked monthly income first (870 vs. 385) and opportunity for promotion second (288 vs. 248). Public university students ranked the absence of on-call duty third (201), in contrast to private students (34) who ranked it last. Data relating to factors influencing choice to work in the public and private sector are presented in Tables 4 and 5.

The students from public and private universities listed numerous reasons for pursuing a pharmacy-related career upon graduation. More than a quarter of public and private

Table 5. Factors Influencing Bachelor of Pharmacy Students' Choice to Work in Private Healthcare (n=314)

	Weighted Score
Public University Students (n=213 ^a)	
Monthly income	870
Promotion potential	288
No on-call duties	201
Flexible system	120
Reward linked to performance	54
Private University Students (n=101 ^a)	
Monthly income	385
Promotion potential	248
Reward linked to performance	141
Flexible system	92
No on-call duties	34

^a Respondents could choose more than one factor [calculation of weighted scores has been explained in methods section]

university students said that they would like to pursue a nonpharmacy-related career upon graduation (35.7% vs. 33.7%). Both student groups listed numerous reasons, the most frequently selected being to pursue other interests (35.9% private vs. 45% public) and perceived better income (15.1% private vs. 40% public). A significant proportion of public students (30.2%) cited "experience in non-pharmacy related career." Reasons for embarking upon a nonpharmacy-related career upon graduation are presented in Table 6.

When asked to rate (self-assess) their pharmacy career-related knowledge, most respondents reported having "enough knowledge" (58.5% public vs. 68.3% private), although a significant minority reported "very little knowledge." If government service were not mandatory, 73.2%

Table 4. Factors Influencing Bachelor of Pharmacy Students' Choice to Work in Public Healthcare Facilities (n=314)

	Weighted Score
Public University Students (n=213) ^a	
Attractive starting salary	715
Opportunities for learning and development	568
Long term job security	354
Continuing education	226
Training and development programs	107
Private University Students (n=101) ^a	
Opportunities for learning and development	360
Long term job security	244
Comprehensive benefits	165
Continuing education	94
Attractive starting salary	46

^a Respondents could choose more than one factor.

Table 6. Reasons for Undertaking Nonpharmacy Related Career Upon Graduation (n=106)

	n (%)
Public University Students (n=86)	
To fulfill my other interests	34 (35.9)
To gain experience in a nonpharmacy career	26 (30.2)
Better income	13 (15.1)
To explore other areas	6 (7.0)
Interest in business (other than pharmacy)	5 (5.8)
Pharmacy perceived as stressful profession or occupation	1 (1.2)
Curiosity	1 (1.2)
Private University Students (n=20)	
To fulfill my other interests	9 (45)
Better income	8 (40)
Pharmacy perceived as stressful profession	2 (10)
Interest in business (other than pharmacy)	1 (5)

of the public university respondents would work in MoH hospitals, in contrast to 36.6% of private university respondents, with most of the latter (51.5%) giving a neutral response to this question. Upon completion of mandatory service, 45.5% of public university respondents would continue working in the MoH, 20.7% would like to undertake a higher degree, and 12.7% would join the private sector. Among private university respondents, 34.6% would join the private sector, and 20.8% would practice in another country, while 16.8% of them would continue working with the MoH. Detailed data are presented in Table 7.

Mean weighted scores were calculated for job choice factors and preferences and these scores were ranked to compare any difference in responses between the student groups. Salary was most highly ranked by both groups and their responses were not significantly different (3.9 vs. 4.0, $p = 0.854$). Flexible work schedule was rated relatively low with no significant difference (2.7 vs. 2.6, $p = 0.676$). There were significant differences in the ratings of benefits (3.3 vs. 2.6, $p = 0.001$), geographical location (2.8 vs. 3.2, $p = 0.018$), and advancement opportunities (2.3 vs. 2.6, $p = 0.042$). Both groups ranked hospital pharmacy high (4.4 vs. 3.9), with a significant difference between groups ($p = 0.001$). Private university students preferred community pharmacy, although both groups ranked it high (3.7 vs.

4.1, $p = 0.002$). No significant difference was found between rankings of “research and development” as a job choice factor (2.0 vs. 1.9, $p = 0.855$). Ranking of job choice factors and preferences are shown in Table 8.

DISCUSSION

Remarkable divergence was observed between public and private university students in terms of their preferred destinations upon graduation, perception, and pharmacy-related knowledge. The overall mean age of students was 22.2 ± 0.9 years. Regarding gender, more than two-thirds of the respondents from both public and private universities were female, similar to a study in which female respondents outnumbered male respondents by more than a 2 to 1 margin.¹² In Malaysia and most other countries, female students constitute a greater proportion than males of the students enrolled in undergraduate pharmacy courses. In general, most Malays prefer to study in public universities; whereas, most Chinese due to their strong financial status, fill most of the seats available in private universities. This trend was reflected in the study sample, where more than three-quarters of students in public universities were Malays and more than 90% of the private university students were Chinese. These data are associated with socioeconomic factors, but the precise correlation requires

Table 7. Responses of Fourth-Year Bachelor of Pharmacy Students in Malaysia to Items on Career Knowledge and Choice (n=314)

Item	Public University Students (n=213) No. (%)	Private University Students (n=101) No. (%)	P
Knowledge of pharmacy career			
Very good knowledge	30 (14.1)	9 (8.9)	0.207
Enough knowledge	124 (58.2)	69 (68.3)	
Very little knowledge	52 (24.4)	22 (21.8)	
No knowledge whatsoever	7 (3.3)	1 (1)	
I would undertake a nonpharmacy related career upon graduation			
Yes	76 (35.7)	34 (33.7)	0.726
No	137 (64.3)	67 (66.3)	
I would like to work in a MoH hospital facility			
Strongly disagree	8 (3.8)	2 (2)	0.001
Disagree	6 (2.8)	10 (9.9)	
Neutral	43 (20.2)	52 (51.5)	
Agree	123 (57.7)	33 (32.7)	
Strongly agree	33 (15.5)	4 (3.9)	
Upon completion of mandatory service I would			
Continue working with MoH	97 (45.5)	17 (16.8)	0.001
Pursue postgraduate degree	44 (20.7)	16 (15.8)	
Join the private sector	27 (12.7)	35 (34.6)	
Start a business	29 (13.6)	10 (9.9)	
Practice in other country	14 (6.6)	21 (20.8)	

Table 8. Ranking of Job Choice Factors and Preferences Between Fourth-Year Bachelor of Pharmacy Students at Public and Private Universities in Malaysia (n=314)

Factor	Public University	Private University	<i>p</i>
	Students Mean Weighted Score	Students Mean Weighted Score	
Benefits	3.3	2.6	0.001
Flexible work schedule	2.7	2.6	0.676
Salary	3.9	4.0	0.854
Geographical location	2.8	3.2	0.018
Advancement opportunities	2.3	2.6	0.042
Preferences			
Hospital	4.4	3.9	0.001
Pharmaceutical industry	2.4	2.8	0.003
Community pharmacy	3.7	4.1	0.002
Academia	2.5	2.3	0.026
Research and development	2.0	1.9	0.855

Respondents ranked each item from 1 to 5.

further evaluation. Like other studies,¹²⁻¹³ the majority of the public (96.2%) and private (100%) university students in this study were unmarried or single.

Both extrinsic and intrinsic factors are considered important in choosing a career area, and these domains deserve equal emphasis by employers. Extrinsic factors include the availability of positions; the nature of fringe benefits; job security; salary; the opportunity to meet new people; working conditions; previous background; influence of family, friends, and/or faculty; opportunity to own a business, employer's policies and flexibility of work schedule. Studies have reported intrinsic factors (the nature of the work; a desire for a satisfying or fulfilling role; a sense of accomplishment; opportunities to use one's ability, education, and training; opportunity to serve the community; opportunities for research and advancement; sales opportunities) as the most frequently reported factors influencing career preference and choice.⁶⁻¹⁰ Our public university respondents cited attractive starting salary, opportunities for learning and development, and long-term job security as the most important influential factors for choosing to work in government-run healthcare facilities, public hospitals, and clinics. In contrast, private university students ranked opportunities for learning and development first and attractive starting salary as the least influential factor for choosing to work in the public sector. Revision of pharmacists' salaries by the Ministry of Health as part of the implementation of man-

datory service has made these salaries broadly comparable to those in the private sector, particularly where critical allowances are payable, for example when graduates from West Malaysia are posted to locations in East Malaysia, some of which are remote. In the public sector, pharmacists are also more likely to attend, on a systematic basis, continuing professional development programs. In spite of these factors, students from both groups ranked income as the most important influential factor for choosing to work in the private sector.

In a US study by Schommer et al of career pathways of pharmacists, job security (8.2), stress (7.2), and self-actualization (6.9) were rated highest, while dynamic work schedule (3.9), patient care (4.0), and research (4.6) were rated lowest.¹¹ When these respondents were asked to rank, in descending order (1 to 5) the factors influencing their choice of first job upon graduation (benefits, flexible work schedule, salary, geographical location, and advancement opportunities), both groups rated salary as the most important factor (3.9 public vs. 4.0 private university, $p = 0.854$). Significantly different ratings were observed for benefits (3.3 vs. 2.6, $p = 0.001$), geographical location (3.2 vs. 2.8, $p = 0.018$), and "advancement opportunities" (2.3 vs. 2.6, $p = 0.042$). Unlike the responses obtained in the study by Schommer et al, pharmacy students in a study conducted by Besier et al reported job satisfaction and self-fulfillment as the most important factors in choosing their first job.⁶ Career and promotion prospects (92.4%) were the most important factors influencing United Kingdom (UK) pharmacy graduates to choose specific areas of practice, followed by self-appraisal of skills and aptitude (86.1%). Working conditions (84.8%), salary on graduation (79.8%), and future financial prospects (79.7%) were the other reported extrinsic factors.¹⁵ Savage et al reported that participants rated work environment (97.6%) as the most important factor for job consideration, followed by benefits (94.7%), flexible work schedule (92.9%), salary (84.9%), geographical location (78.1%), and advancement opportunities (66.6%).¹³ Carter et al reported that most recently graduated pharmacists working in community and hospital pharmacies cited "personally rewarding" as the most important factor in deciding their career.⁵

Respondents in our study were shown a list of common areas of practice most relevant to Malaysian pharmacists' roles and asked to rank, in descending order, their preferences of these areas of practice, assuming there was no 4-year mandatory service. The majority of the public university students would prefer careers in hospital pharmacy, whereas private university students would prefer careers in community pharmacy, which is in agreement with the findings of Willis et al, where nearly half of

their UK respondents wanted to undertake preregistration training in community and hospital pharmacy, (45.1% and 43.5%, respectively).⁴ Similarly, in the United States, chain community pharmacy (33.1%), hospital pharmacy (27.6%) and independent community pharmacy (12.4%) were reported to be the most preferred areas to work.⁶ In this study, students from both groups ranked research and development as fifth, i.e. the least preferred choice, with a mean weighted ranking of less than 2. More than half (50.9%) of respondents in the study by Savage et al chose retail pharmacy as their projected area of practice upon graduation, followed by independent pharmacy (18.6%) and clinical pharmacy (18.3%).¹³ This study revealed that job preferences for hospital pharmacy ($p = 0.001$), pharmaceutical industry ($p = 0.003$), community pharmacy ($p = 0.002$), and academia ($p = 0.026$) were significantly different between students from public and private universities.

Less than half of public university respondents (45.5%) would continue working at MoH administered facilities upon completion of the 4-year mandatory service, while the majority of private university respondents would join the private sector. In a US study, when asked their projected area of practice 5 years after graduation, the percentage of pharmacy students who chose independent retail pharmacy and clinical pharmacy increased.¹³

In an Australian study, the decision-making among undergraduate and postgraduate students was influenced by the image of the job created by media.¹⁴ In contrast to a study by Willis et al,¹⁵ in which students were found to be driven to study pharmacy by external motivators such as reputation of the profession and financial reward, this study showed that the majority of respondents from both groups chose pharmacy because of their own interest, with family, job opportunities, and income being less important factors. Surprisingly, approximately one-fifth of the public university students and one-fifth of private university students in this study showed interest in entering nonpharmacy-related careers upon graduation, with the most frequently cited reason being to fulfill other interests.

CONCLUSIONS

Final-year BPharm students at public universities in Malaysia were most interested in a first career in hospital pharmacy, while students at private universities were most interested in a career in community pharmacy. All respondents ranked salary, benefits, and geographical location as the most significant factors for selecting a career destination. A significant proportion stated that if given a choice, they would prefer a nonpharmacy-related career. Upon completion of mandatory service, a large proportion of public university pharmacy graduates would continue

working within the MoH, while most privately funded graduates would enter practice in the private sector. These intended career choices of fourth-year pharmacy students need to be confirmed in graduates. Also, insight is needed into why a significant proportion of respondents would choose not to stay in pharmacy, and why a fifth of respondents at private universities would choose to practice pharmacy outside of Malaysia. The qualitative and cumulative effects of Malaysian registration and mandatory service requirements upon choice of university courses, career opportunities, and practice areas of pharmacy graduates, requires systematic study.

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