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Factors which influence the choice of pre-registration placement of pharmacy undergraduates in Malaysia

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Abstract---*Background:* The liberalisation of PRP training which began on the 1 October 2012 reduce the saturation of pharmacists in the public hospitals and increase the role of provisionally-registered pharmacists in non-hospital settings. This study aims to determine the factors that influence the choice of pre-registration placement of pharmacy undergraduates in Malaysia. *Methods:* The data collection of this cross-sectional study was conducted by using a validated survey instrument which was administered online to the final year pharmacy students in six universities in Malaysia. *Results:* All demographic characteristics such as type of selected university, age, gender, nationality, ethnicity, CGPA and family members or relatives who are working in pharmacy field did not have an association with the first choice of pre-registration placement of pharmacy undergraduates in Malaysia. In addition, previous working experience in pharmacy field, expectation to move up a career ladder in future work life, expectation for a job which have a variety of tasks every day, working hours expectation and salary expectation are the factors that have association with the choice of pre-registration placement. *Conclusion:* These five factors are good indicators for PRP preceptors particularly in community pharmacy to employ better strategies to curb the problem regarding the lack of PRP applicants.

Keywords---Provisional Registered Pharmacist, choice of pre-registration placement ; pharmacy students.

Introduction

The liberalisation of Provisional Registered Pharmacist (PRP) training which began on the 1 October 2012 aimed to fulfil the needs of pharmacists in the local pharmaceutical industry to further enhance the manufacturing of locally available generic drugs that can compete in the international market as determined under the National Key Economic Area (NKEA). Besides, the liberalisation of PRP training can reduce the saturation of pharmacists in the public hospitals and increase the role of provisionally-registered pharmacists in non-hospital settings. Before the implementation of liberalisation, it relies only on public hospitals and health clinics to train pharmacy graduates.[1]As a result of liberalisation, pharmacy graduates also able to choose community pharmacy, industry pharmacy and others as their choice of training placement instead of public hospitals.

From the classified advertisements in Malaysian Pharmaceutical Society's official website, there were many vacancies for pre-registered pharmacists from year 2012 to 2020 particularly in community pharmacies. Thus, there are imbalance or lack of application for pre-registration pharmacist training in certain areas of pharmacy particularly in community pharmacy.

By conducting the study, employers or pre-registration preceptors are able to understand the rationale of the factors which influence the choice of pre-registration placement of final year

pharmacy students in selected universities consequently. They are able to sort out a better strategy to recruit and retain the workforce.

First objective of this study is to evaluate the association between demographic characteristics and first choice of pre-registration placement of pharmacy undergraduates in Malaysia. Second objective of this study is to evaluate the association between each different factors and its influence on the choice of pre-registration placement of pharmacy undergraduates in Malaysia.

2. Materials and Methods

Study setting and design Fourth year pharmacy students from selected universities for the semester 1 from year 2020 based on certain criteria such as geographical location and type of university. Universities from northern region such as *Universiti Sains Malaysia* (USM) and Asian Institute of Medicine, Science and Technology (AIMST University) are chosen. Universities from middle region such as *Universiti Kebangsaan Malaysia* (UKM), *Universiti Malaya* (UM), University of Cyberjaya (UoC) and UCSI University are chosen.

Pharmacy students who do not agree to the consent form or submit incomplete questionnaire will be included in exclusion for this survey. The sampling technique which is used is convenience sampling.

The questionnaire was adopted and adapted from the questionnaire in the journal entitled "Pharmacy Undergraduate Students: Career Choices &

Expectations Across a Four-Year Degree Programme”. [2] Only one language which is English is used in this adopted and adapted questionnaire as the Final Year Pharmacy students had good English proficiency in answering this questionnaire. 2-Point Likert Scale was used to construct the Part C of the questionnaire. Thus, “Have Influence” is marked as one point and “Didn’t have influence” is marked as zero point.

Study Subjects Sample size is 360 pharmacy students which was calculated based on Krejcie and Morgan formula. A total of 196 final year pharmacy students from USM, AIMST University, UKM, UM, UoC and UCSI University were participated in this study.

Ethics Statement All aspects of study was reviewed and authorised by CRERC (Cyberjaya Research Ethic Review Committee). All of the informations were kept private and confidential and were used only for the purpose of this study. Ethical approval was granted by CRERC on 23 November 2020 with a CRERC reference number of UOC/CRERC/ER/261.

Data Collection The instrument which was used to distribute the questionnaires was Google form to reduce paper wastage. The consent of the study was collected by using the consent form included in the Google form questionnaire. Google forms were distributed through WhatsApp instead of face-to-faces.

Statistical Analysis All data was collected and analysed using IBM SPSS statistic version 26.0 (Statistic Package for Social Sciences). Microsoft Excel 2016 program was used to transform the collected data into graphs or charts. Descriptive statistics was used to describe all the demographic data and the factors which influence the pre-registration placement of pharmacy undergraduates.

3. Results

144 respondents (73.5%) choose public hospital as first choice of pre-registration placement. Thus, public hospital is the first choice of pre-registration placement for majority of respondents. 24 respondents (12.2%) choose community pharmacy, 16 respondents (8.2%) choose industry pharmacy

and remaining 12 respondents (6.1%) choose health clinic as first choice of pre-registration placement.

No respondents choose private hospital and others as first choice of pre-registration placement.

A total of 196 final year pharmacy students participated in this study, representing 46.3% of an overall response rate. The finding of this research show that all demographic characteristics such as type of selected university, age, gender, nationality, ethnicity, CGPA and family members or relatives who are working in pharmacy field did not have an association with the first choice of pre-registration placement of pharmacy undergraduates in Malaysia as shown in Table 1. Moreover, previous working experience in pharmacy field,

expectation to move up a career ladder in future work life, expectation for a job which have a variety of tasks every day, working hours expectation and salary expectation are the factors that have association with the choice of pre-registration placement as shown in Table 2.

3.1. Association between demographic characteristics and first choice of pre-registration placement of pharmacy undergraduates in Malaysia.

Table 1. Association between demographic characteristics and first choice of pre-registration placement of pharmacy undergraduates in Malaysia.

Demographic characteristics	Category of demographic characteristics	Public Hospital	Community Pharmacy	Health Clinics	Industry Pharmacy	p-Value
Type of selected university	Public University	80	8	3	8	0.060_a
	Private University	64	16	9	8	
Age	21-22 years old	117	18	11	14	0.703_b
	23-24 years old	23	5	1	1	
	>24 years old	4	1	0	1	
Gender	Female	116	21	8	12	0.433_b
	Male	28	3	4	4	
Nationality	Non-Malaysian	0	0	0	1	0.143_b
	Malaysian	144	24	12	15	
Ethnicity	Others	4	0	0	1	0.602_b
	Chinese	65	12	5	5	
	Indian	20	4	0	4	
	Malay	55	8	7	6	
CGPA	2.00-2.66	3	1	0	0	0.453_b
	2.67-3.32	41	6	5	8	
	3.33-4.00	100	17	7	8	
Family members	Yes	109	20	9	8	0.124_b

or relatives who						
are working in						
pharmacy field	No	35	4	3	8	

a Pearson's chi-squared test, **b** Fisher's Exact Test, * $p < 0.05$ shows significance

3.2. Association between each different factors and it's influence on choice of pre-registration placement of pharmacy undergraduates in Malaysia.

Table 2. Association between each different factors and it's influence on choice of pre-registration placement of pharmacy undergraduates in Malaysia.

Factors	Category for factors	Have an influence	Do not have an influence	p-Value
Previous working experience in pharmacy field	Yes (Hospital only)	2	0	*0.022b
	Yes (Community pharmacy only)	85	11	
	Yes (Hospital and community pharmacy)	16	0	
	No	62	20	
Salary expectation for the pre-registration placement	RM2500 - RM2999	44	35	*<0.001b
	RM3000 - RM3499	64	13	
	RM3500 - RM3999	26	2	
	RM4000 - RM 4499	8	4	
Working hours expectation for the pre-registration placement	40 hours - 44 hours	36	13	*0.006b
	45 hours - 49 hours	67	12	
	50 hours - 54 hours	19	4	
	55 hours - 59 hours	15	11	
	60 hours - 64 hours	3	5	
	65hours and above	10	1	
Expectation to work in a setting where	Yes	129	30	0.070a
	No	25	12	

there is higher possibility to interact with patients				
Expectation to work in a healthcare team	Yes	121	36	0.096a
which involves direct communication with a variety of healthcare professionals in daily routine	No	25	14	
	Yes	155	25	*<0.001b

Expectation to move up a career ladder in future work life	No	5	11	
Expectation for a job which have a variety of tasks every day	Yes	124	31	*0.026a
	No	26	15	
Plan for future work life	Full time career until typical retirement age	79	10	0.094b
	Intend to buy my own business	43	1	
	Work full time, then part time if I have a family	33	3	
	Work full time, then part time if I have my own business	21	4	

	Others (Get FRP and then further study)	1	1	
Most favourite subject in BPHARM curriculum	Community Pharmacy and Primary Care Practice	40	21	0.660a
	Hospital and Clinical Pharmacy	54	38	
	Pharmaceutics and Pharmaceutical Technology	13	5	
	Pharmacology and Pharmaceutical Science	15	10	
Most favourite attachment or training experience	Hospital attachment	78	28	0.539a
	Community Pharmacy attachment	55	13	
	Industry Pharmacy attachment	17	5	
Advice from others	Alumni from Faculty of Pharmacy who is currently undergoing pre-registration or already completed	67	11	0.237b
	Fully Registered Pharmacists from any field	27	10	
	Lecturers from Faculty of Pharmacy	28	6	
	Coursemates	21	6	
	Parents or relatives	19	1	

a Pearson's chi-squared test, **b** Fisher's Exact Test, * $p < 0.05$ shows significance

Regarding first factor which is previous working experiences in pharmacy field, fourth year pharmacy students who chose public hospital (51.4%), health clinic (41.7%) and community

pharmacy (50.0%) as first choice of pre-registration placement mostly have previous working experience in community pharmacy only. However, final year pharmacy students who choose industry pharmacy (43.8%) as first choice of pre-registration placement mostly didn't have previous working experience in any pharmacy field.

Regarding second factor which is salary expectation for pre-registration placement, fourth year pharmacy students who chose public hospital (41.0%), industry pharmacy (50.0%) and community pharmacy (45.8%) as first choice of pre-registration placement mostly choose RM2500-RM2999 as salary expectation as shown in Table 3.10. However, fourth year pharmacy students who choose health clinic (58.3%) as first choice of pre-registration placement mostly choose RM3000-RM3499 as salary expectation.

Regarding third factor which is working hours expectation for pre-registration placement, final year pharmacy students who chose public hospital (41.7%), industry pharmacy (43.8%) and health clinic (50.0%) as first choice of pre-registration placement mostly chose 45 hours-49 hours per week as working hours expectation. However, fourth year pharmacy students who choose community pharmacy (33.3%) as first choice of pre-registration placement mostly choose 40 hours-44 hours per week as working hours expectation.

Regarding fourth factor which is expectation to move up a career ladder in future work life, 94.4% of students who choose public hospital as first choice of pre-registration placement are expected to move up a career ladder in future work life. 87.5% of students who choose industry pharmacy are expected to move up a career ladder in future work life. 83.3% of students who choose community pharmacy or health clinic are expected to move up a career ladder in future work life.

Regarding fifth factor which is expectation for a job which have a variety of tasks every day, 91.7% of students who chose health clinic as first choice of pre-registration placement are expected to have a variety of tasks in pre-registration placement every day. 79.2% of students who choose community pharmacy are expected to have a variety of tasks in pre-registration placement every day. 78.5% of students who choose public hospital are expected to have a variety of tasks in pre-registration placement every day. 75.0% of students who choose industry pharmacy are expected to have a variety of tasks in pre-registration placement every day.

Discussion

Regarding the result for first factor which is previous working experiences in pharmacy field, 50% fourth year pharmacy students who choose community pharmacy as first choice of pre-registration placement have previous experience in community pharmacy only. One aspect of Social Cognitive Career Theory also reveals the fact that an individual is more prone to consider continuing certain task or work if he or she have had a positive experience for doing it. Therefore, individuals will more prone to focus on areas in which they have had proven success.[3]

Regarding the result for second factor which is salary expectation for pre-registration placement, the salary for pre-registration pharmacist for public hospital and health clinic is fixed to RM2740.00 at the UF41 position during the one year pre-registration training period.[4]It is correspond to the result as 59 out of 144 students who choose public hospital are expected salary of RM2500-2999.

Regarding the result for third factor which is working hours expectation for pre-registration placement, 2003 European working time directive defines 48 working hours a week as an appropriate maximum for working hours per week. The objective definition for work-life balance is that those who works more than 48 hours a week will have an imbalance between work life and private life.[5] Therefore, majority of respondents prefer to have work-life balance during the pre-registration placement.

Regarding the result for fourth factor which is expectation to move up a career ladder in future work life, employees are able to move up career ladder starting from UF41 position during pre-registration placement to UF 44, UF 48, UF 52, UF 54 position in future work life for public hospital and health clinic under Ministry of Health. However, a pre-registration pharmacist able to move up the career ladder only if they work in chain pharmacy for community pharmacy. In addition, they can move up career ladder by becoming area manager and eventually possible to become region manager. Regarding the industry pharmacy, pre-registration pharmacist able to move up the career ladder by becoming head of department or even higher position such as Chief Manufacturing Officer.

Regarding the result for fifth factor which is expectation for a job which have a variety of tasks every day, this result dose not correspond to another study by Blossom Yeh Ju Lin, Yeh Ying Chen and Lin Wen Hung, 2007 involving 298 pharmacists in Taiwan whereby community pharmacy have the highest adjusted mean score for task variety compared to hospital and health clinics. Thus, community pharmacist have more variety of tasks in daily work life as compared to pharmacists in hospital and clinics settings. It is in fact that community pharmacist serve in position closer to the management part.[6]

Conclusions

The findings of this study showed that majority of final year pharmacy students from three public universities and three private universities still preferred to choose public hospital as first choice of pre-registration placement. Previous working experience in pharmacy field, expectation to move up a career ladder in future work life, expectation for a job which have a variety of tasks every day, working hours expectation and salary expectation are the factors which have association with it's influence on choice of pre-registration placement. Thus, these five factors are good indicators for PRP preceptors particularly in community pharmacy to employ better strategies to curb the problem of lack of PRP applicants or vacancies in PRP position.

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Conflicts of Interest: The authors declare no conflict of interest.

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