

Diversity amongst international pharmacy students

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Abstract

Objective: To describe the diversity of international pharmacy students' demographics, motivating factors in program choice and career aspirations.

Method: Cross-sectional survey of pharmacy students in Finland, Kuwait, New Zealand, Sudan and Zimbabwe.

Results: Totally 1516 questionnaires were completed. Demographic variables varied. Only 56% of New Zealand students were local citizens. Females predominated except in Zimbabwe (67% male). Less than 10% of students in Kuwait considered pharmacy an easy program, compared to 39% Finnish MPharm students. Philanthropy was the main reason for choosing to study pharmacy, although lifestyle issues played a big role in Finland. Financial motives were important in Sudan and Zimbabwe. A larger proportion of students in these two countries also wanted to work in the private sector. Future career aspirations varied greatly between countries.

Conclusion: Pharmacy students show great diversity between countries which has important implications for academic orientation, course development and moves towards curriculum harmonisation.

Keywords: Career aspiration, curriculum harmonisation, health professional education, pharmacy education, motivation

Introduction

The past decade has seen the number of pharmacy schools increase in many countries (Taylor, Bates, & Harding, 2004). One consequence of this has been increased international mobility amongst pharmacy faculty. As academics move to new countries and new pharmacy schools, they may encounter different course structures and curricula (Castiglia, Chinyanganya, & Smego, 1996, Sramkova, De Jong Van den Berg, & Oerlemans, 2004). This results from considerable international variation in the role of pharmacists and the context in which they practice as well as varying rates of change from the traditional compounding and prescription-preparing role to a more "active", patient-centred healthcare professional who implements some form of pharmaceutical care (Siracuse, Schondelmeyer, Hadsall, & Schommer, 2004). This is also likely to affect the composition of the student body, which may

be very diverse in different countries. For example, the demographic characteristics such as age, gender and ethnicity of students; their motivations for studying pharmacy and their career plans may differ (Ferguson, Roller, & Wertheimer, 1986), factors which educators need to take account of in designing and implementing effective education.

This study illustrates the extent of this variation of demographics, experiences and motivations of students in five countries across the developed and developing worlds with the aim of increasing understanding of the diversity of the international student body. The institutions which participated were Kuwait University, University of Otago (New Zealand), University of Kuopio (Finland), University of Khartoum (Sudan), and University of Zimbabwe.

In Kuwait, the Faculty of Pharmacy admitted its first students in 1997. It is primarily intended for training of Kuwaiti citizens. The first year is held in

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common with medical and dental students, and includes training in English which is the language of instruction. No postgraduate courses are currently available. Kuwait has an extensive public health sector with universal coverage and most students are expected to be employed within government polyclinics or hospitals. There is also a growing private sector with private community pharmacies and hospitals but Kuwaiti pharmacists need 2 years experience before they can own their own pharmacy.

In New Zealand, the School of Pharmacy at the University of Otago was founded in 1963. The undergraduate Bachelors degree involves 1 year of Health Sciences, which is common to medical and paramedical students, during which students apply to be admitted to Pharmacy. The Pharmacy degree takes a further 3 years. After they graduate, students then complete a 1-year internship in a pharmacy (usually hospital or community) before they can register as pharmacists. There are a number of international students with some positive discrimination for Maori and New Zealand-resident Pacific Island students. Postgraduate professional education programs are also offered for registered pharmacists.

In Finland, the Faculty of Pharmacy, University of Kuopio has been educating pharmacists since 1973 and currently educates half of the country's Finnish-speaking pharmacists. The university offers a 3-year BPharm and a 5-year MPharm. The latter is the official EU-recognized professional degree and including 6 month in-service training in a community or hospital pharmacy. The lower degree (also known as prescriptionist, assistant pharmacist) offers employment within the common labour market of Finland, Sweden and Norway, but not the rest of the EU. The first 3 years of study are common for BPharm and MPharm students and those with a BPharm degree can apply through entrance exams to the MPharm program (4th year).

In Sudan, the Faculty of Pharmacy at University of Khartoum was established in 1963 and offers a baccalaureate degree over 5 years and postgraduate studies at both masters and doctorate level, including a MSc for non-pharmacists. Graduates need to complete a year's training (usually in public hospitals, the pharmacy directorate or quality control services) and pass a pre-registration examination before being registered. The public health sector suffers greatly from pharmacists preferring to work in the private sector. Funding in the healthcare system is characterized by reliance on user fees at the point of access rather than prepayment health insurance schemes.

In Zimbabwe, the School of Pharmacy falls under the College of Health Sciences at the University of Zimbabwe. Set up in 1974, it offers a baccalaureate Honours degree over 4 years. Graduates must complete a year of pre-registration training before registration. Pharmacists generally prefer private practice due to poor salaries and conditions of service

in government institutions. Many pharmacists have left the country recently due to deteriorating economic conditions.

Methods

A short, anonymous self-administered questionnaire in English was designed to examine undergraduate pharmacy students' demographic characteristics, major reason for choosing to study pharmacy, opinions about the difficulty of the pharmacy course, career aspirations immediately after qualification and in 10 years time, preferred employment sector (private or public sector) and whether they were happy with their choice to study pharmacy. All questions were close-ended and wording was chosen as much as possible to make the questionnaire applicable and understandable in multicountry settings. However, minor changes were permitted to suit local conditions, e.g. the phrase "God willing" was included in questions in Kuwait related to the future, and commonly understood phrases were used to refer to private and public health employment opportunities.

The questionnaire was distributed to pharmacy students in their professional years of study at universities in five different countries:

- BPharm—Kuwait University, Kuwait City, Kuwait
- BPharm—University of Otago, Dunedin, New Zealand
- BPharm—University of Zimbabwe, Harare, Zimbabwe
- BPharm—Khartoum University, Khartoum, Sudan
- BPharm and MPharm—University of Kuopio, Kuopio, Finland

Ethical permission to conduct the study was obtained from local university or faculty ethical committees where required. Although multiple pharmacy colleges exist in Finland, New Zealand and Sudan, survey sites will be referred to using the country name for ease of reference.

The surveys were carried out in 2004 during May and June (Kuwait, New Zealand, Zimbabwe), August (Sudan) and November (Finland), as best suited the academic calendar so as to maximize responses. An overview of the programs is provided in Table I.

Data analysis

Data was analysed using SPSS for Windows v.13 (SPSS Inc., USA). Where statistical tests are used they are mentioned in the text. The Finnish Bachelor and Masters pharmacy programs were analysed separately since they represented distinct groups of students with important differences in experiences and expectations. Composite analysis aggregating the

Table I. Description of pharmacy programs surveyed and response rates.

		Country					
		Finland	Finland	Kuwait	New Zealand	Sudan	Zimbabwe
Population* (millions)		5.2	–	2.5	3.9	33.6	12.9
Per capita GDP ¹ (US\$)		26,614	–	14,517	21,943	1,171	1,785
No. of pharmacy schools		3 [†]	2 [†]	1	2	10	1
University surveyed		Kuopio	Kuopio	Kuwait	Otago	Khartoum	Zimbabwe
Degree program		BPharm	MPharm	BPharm	BPharm	BPharm	BPharm
No. of students per academic year	1	125/128	23/26	– [‡]	– [‡]	– [‡]	37/48
(responders/total)	2	120/137	24/26	29/31	108/118	153/185	34/47
	3	109/131	21/24	44/49	108/121	90/201	20/43
	4	–	19/38	55/60	95/111	105/176	36/49
	5	–	23/48	40/47	–	98/146	–
	All	354/396	110/162	168/187	311/350	446/708	127/187
Mean class size	<i>n</i>	132	28	47	117	177	47
Response rate	(%)	89.3	67.9	89.8	88.9	62.9	67.9
Internship [¶]	(yrs)	0.5	0.5	0.75	1	1	1

Key; * Population and GDP data taken from World Health Organization country data <http://www.who.int/countries/en/> [accessed 20/12/05];

[†] There are three pharmacy schools offering BPharm level studies. Two of these also offer the MPharm; [‡] A combined general year is held together with other health science students; in some cases, students only elect their professional specialty at the end of this year;

[¶] Pre-registration practice period or internship which usually occurs post-graduation but is integrated into the program for Finnish students.

data from different countries was not performed due to their heterogeneous nature.

Analysis of primary reason for choosing pharmacy

The respondents found it conceptually difficult to identify a single most important reason for choosing to study pharmacy—some selected “Other” and then wrote a combination of the offered options, other respondents simply selected more than one option in spite of instructions to the contrary, while others, particularly Finnish students, found a number of additional reasons behind their choice of program. This was not consistent between countries (students in Finland and New Zealand were more likely to identify multiple reasons and the “Other” choices varied considerably from country to country). These difficulties were not identified in pretesting. This caused some trouble in analysis but, so as not to lose the additional information provided, multiple responses were accepted and additional categories created to reflect those “others” which a significant number of respondents identified.

Results

A total of 1516 questionnaires were completed, representing an overall response of 76.2%, with national response rates varying from 63 to 90% (Table I).

Demographic characteristics

The demographic characteristics of respondents at the various pharmacy colleges are summarized in Table II.

In each university, students were predominantly nationals of the host country, with the proportion greater than 85% except in New Zealand (56% citizens). Females outnumbered males in all cases except Zimbabwe (67% male). More than 80% of students were unmarried apart from the Finnish programs where around two-thirds were single. The Finnish bachelor's program had the greatest proportion of students with children at 11% (lowest New Zealand 1%) and the highest mean age at 23.5 years (lowest Sudan and New Zealand 21.0 years). All comparisons of demographic variables across the programs were statistically significant ($p < 0.001$; χ^2 -test for proportions; ANOVA for mean age).

Perceptions of pharmacy program

Perceptions of whether pharmacy was an easy program varied from 7.7% in Kuwait to 39.1% in Finland (MPharm; Table III). Finnish students were also the “happiest” to be studying pharmacy. There were no significant associations between year of study or gender and contentment with program choice or with ease of the program ($p > 0.05$; χ^2 -test).

Philanthropy—a desire to help others—was the most common reason for deciding to study pharmacy, accounting for 29% of identified reasons (Table IV). Having a high regard for pharmacy, financial reasons, pharmacy not being first choice and wanting to be a professional were also prominent motives. However, there were distinct country variations. Students in Finland reported that lifestyle and career issues, e.g. part-time employment, more suitable work for a woman, steady income, sure of a job in the future, were more important considerations than financial

Table II. Demographic characteristics of respondents.

Respondent characteristics	Country (no. of respondents*)						
	Finland BPharm (n = 354)	Finland Mpharm (n = 110)	Kuwait (n = 170)	New Zealand (n = 311)	Sudan (n = 447)	Zimbabwe (n = 133)	Total (n = 1525)
Male (%)	10.2	10.9	8.9	38.6	27.4	66.9	25.7
Single (%)	64.7	68.2	83.3	98.1	94.1	94.5	85.0
Married [†] (%)	34.5	31.8	16.1	1.9	5.2	5.5	14.6
Divorced [‡] (%)	0.8	0.0	0.6	0.0	0.7	0.0	0.5
Having children (%)	10.7	2.7	8.4	1.0	1.9	8.7	5.2
Citizens (%)	99.7	100.0	88.1	55.8	97.7	98.4	88.8
Mean [SD] age (yrs)	23.5 (5.9)	22.2 (2.8)	21.2 (1.7)	21.0 (2.5)	21.0 (2.0)	21.7 (1.5)	21.7 (3.6)
< 19 years old (%)	1.4	3.7	0.0	2.0	7.1	0.0	3.1
> 24 years old (%)	21.9	17.4	3.6	6.2	4.8	3.2	9.6

* There were a few questionnaires with missing data for each characteristic. All comparisons of demographic variables across the programs were statistically significant ($p < 0.001$; χ^2 -test for proportions; ANOVA for mean age); [†] Includes "Living with partner"; [‡] Includes "Separated".

gain, whereas economics were very important for students in Zimbabwe. About a quarter of New Zealand students had not originally wanted to study pharmacy, and about 9% of Sudanese students had parents making the decision of what to study. Students in Kuwait showed the lowest financial motivation with a mix of philanthropy and wanting to be respected as a professional. Some other country-specific variations were a selection of students in New Zealand who enjoyed the experience of working in a pharmacy, Zimbabwean students who chose pharmacy as it met their desire for setting up their own business, and many Kuwaiti students who wanted to learn more about medicines.

Career aspirations

Where students were able to indicate a preference between private sector and public sector employment, most students indicated a preference to work in the private sector except in Kuwait where there was equal preference (Table V). Students in Sudan and Zimbabwe most wanted to work in the private sector (66 and 79%, respectively). Students in these two countries also aspired to owning a retail pharmacy in the future (88 and 84%, respectively), while 91% of Kuwaiti students shared this wish. There were statistically significant associations (χ^2 -test) between

year of study and wanting to own a retail pharmacy for Finland (BPharm) ($p = 0.004$), New Zealand ($p = 0.001$), and Sudan ($p = 0.003$) with a smaller proportion of students aspiring to own a pharmacy as year of study increased.

The expected employment immediately after completing their training and any internship required for registration varied considerably across countries (Figure 1). Retail pharmacy practice was cited by more than 40% of students in Finland (BPharm and MPharm) and New Zealand while less than 6% of Kuwaiti students saw themselves in this field. Most of the latter students expected to either be in hospital practice (45%) or postgraduate studies (40%). A large proportion of students in Finland (MPharm 39%) and Sudan (35%) also intended to pursue postgraduate studies. A mixed picture was obtained for Zimbabwe and Sudan, which had the largest proportions of students seeing themselves employed in pharmaceutical companies (18 and 25%, respectively).

The respondents' desired employment 10 years into the future followed similar patterns to their choices immediately after graduation (Figure 2). Comparable proportions of students saw themselves in Ministry of Health central management (lowest in New Zealand and Finland BPharm) and retail pharmacy remained the preferred option for students in Finland (63% BPharm; 55% MPharm) and New Zealand (28%).

Table III. Proportion of respondents who consider pharmacy an easy program and who were happy to be studying pharmacy.

	Country (no. of respondents)						
	Finland BSc (n = 354)	Finland MSc (n = 110)	Kuwait (n = 170)	New Zealand (n = 311)	Sudan (n = 447)	Zimbabwe (n = 133)	Total (n = 1525)
Think pharmacy is an easy program (%)	34.2	39.1	7.7	8.1	13.6	22.2	19.2
Happy to be studying pharmacy now (%)	94.4	97.3	88.1	86.1	87.6	87.5	90.1

Table IV. Respondents' main reasons for choosing to study pharmacy.

Reason	Proportion of responses from each country (%)*						
	Finland (BSc) (n = 500)	Finland (MSc) (n = 160)	Kuwait (n = 196)	New Zealand (n = 343)	Sudan (n = 467)	Zimbabwe (n = 134)	Total (n = 1800)
Philanthropy	19	14	33	34	40	29	29
Financial motive	4	9	7	13	17	24	11
Pharmacy not 1 st choice	3	2	19	25	8	19	11
High regard for pharmacy	20	14	5	3	6	2	10
Want to be a professional	7	9	14	10	9	15	10
Lifestyle and career issues	22	20	5	2	1	2	9
Like chemistry/science	6	14	3	4	3	0	5
To know about medicines	5	4	7	2	3	0	4
Parental decision	0	0	4	2	9	2	3
Career change	4	7	0	0	0	0	2
Other	10	8	4	6	5	8	7

* Multiple responses per student were accepted and free responses were categorized. See Methods for full explanation.

A sizable proportion of students in Kuwait expected to be within a university setting (41%) or in hospitals (20%). Working in or for a pharmaceutical company was a popular option in Sudan (29%) and Zimbabwe (32%). The proportion of students seeing themselves working in another country was less than 5% except in New Zealand (27%), Zimbabwe (23%) and Sudan (17%). Some students did not see themselves staying in pharmacy (Zimbabwe 9%, New Zealand 7% Finland BSc 6%, Kuwait 4%, others 1%). The proportion of students who did not see themselves working in 10 years was small—3% in Sudan, and 1% in Kuwait, New Zealand and Zimbabwe.

Discussion

This paper presents an interesting overview of the experiences and aspirations of the students in pharmacy programs for five very different countries. It shows a considerable amount of diversity in the demographics of students, their reasons for choosing pharmacy and their career plans.

The questionnaire used was short and easy for students to complete. An overall response rate of 76.1% providing assurance that the views expressed are fairly

representative of the student bodies surveyed. Differing academic schedules in relation to the timing of the survey and diversity of the programs led to reduced response rates for the Finnish MPharm, Sudanese and Zimbabwean BPharm degrees. While, the non-respondents may differ from those who completed the questionnaires, this is unlikely to have a major impact on the results or conclusions. The study is original in that it compares across continents and cultures. A more detailed questionnaire would have allowed deeper exploration of the issues, but may have reduced the response and been difficult to validate across cultural lines.

There have been many recent changes in the content and duration of entry pharmacy degrees in many countries in response to the changing practice of pharmacy and the needs of local health systems, e.g. the adoption the 4-year MPharm in the UK (Sie, Bates, Aggarwal, & Borja-Lopetegi, 2003). Other countries have also modified their training of pharmacists to respond to local conditions and development. Of the countries in this survey, over the past decade Zimbabwe increased the duration of its program from 3 to 4 years, Finland increased the duration of BPharm from two to three years and

Table V. Future workplace preferences of pharmacy student respondents.

	Country (no. of respondents)						
	Finland BSc (n = 354)	Finland MSc (n = 110)	Kuwait (n = 170)	New Zealand (n = 311)	Sudan (n = 447)	Zimbabwe (n = 133)	Total (n = 1525)
Work in public or private sector							
Public sector (%)	7.6	5.5	44.0	22.5	16.8	8.6	17.3
Private sector (%)	44.1	45.5	42.3	42.1	66.2	78.9	53.0
No preference (%)	48.3	49.1	13.7	35.4	17.0	12.5	29.7
Want to own a retail pharmacy (%)	26.8	69.1	91.0	75.5	88.4	84.4	70.2

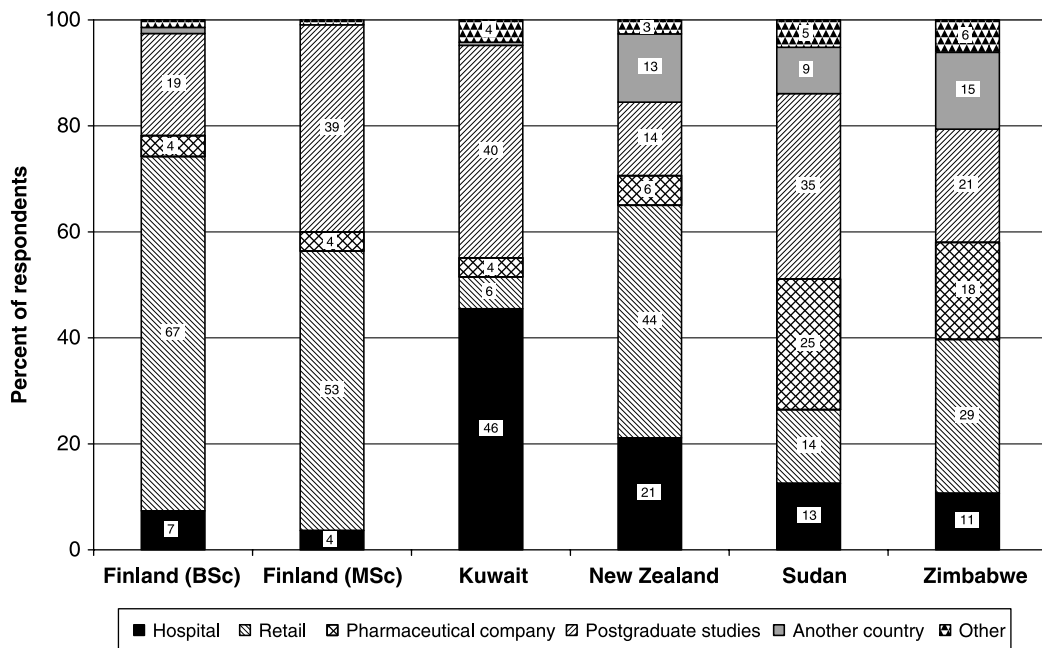


Figure 1. Expected employment immediately after completing graduation and internship.

introduced new content for both BPharm and MPharm, Sudan introduced a pre-registration course and a Masters in Clinical Pharmacy while Kuwait introduced local pharmacy training for its citizens.

The size of student intake compared to national population varies substantially. Finland produces approximately seven times more pharmacists than Zimbabwe (University of Kuopio alone produces four times as many) yet has a third of the population. While there are many factors at play in deciding on student intakes from national requirements to available

resources, this gives an indication of the challenges facing developing countries in producing adequate numbers of pharmacy graduates. This is particularly pertinent when one takes into consideration the effects of health worker migration which has seen two-thirds of graduating pharmacists leaving Zimbabwe for “greener pastures” in developed nations during 2001–2004 (FIP, 2006). Kuwait is at the other extreme producing a moderate number of graduates for a small population. Some of this is part of the process of “Kuwaitization”, replacing expatriate workers in government health

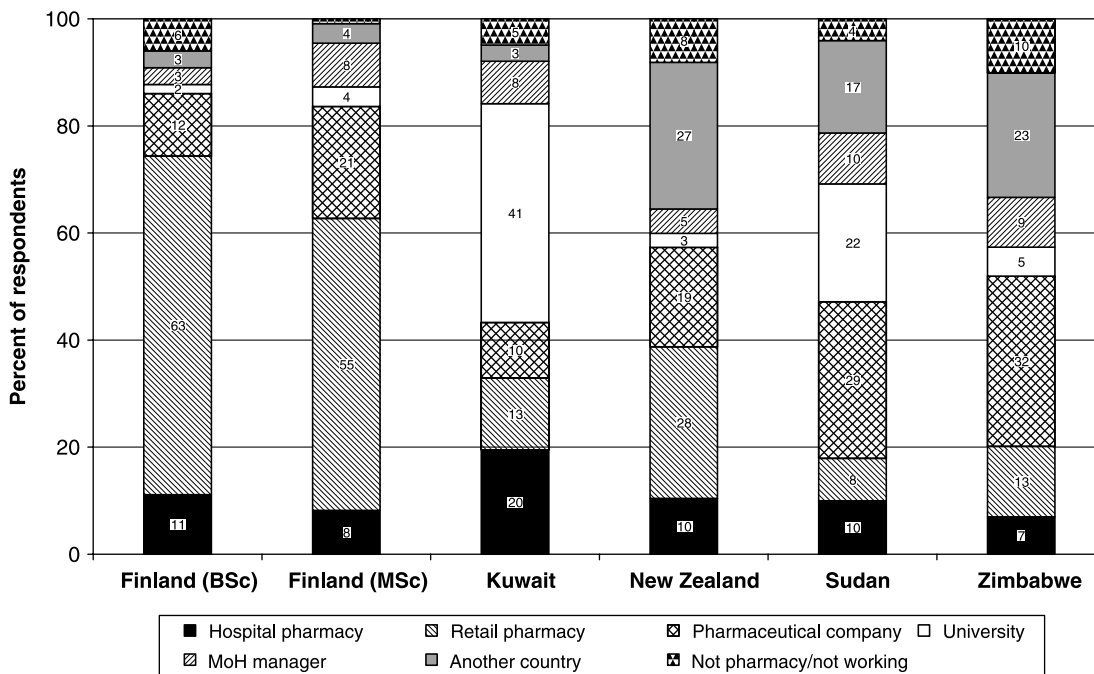


Figure 2. Respondents' desired employment 10 years after completing graduation and training.

facilities with skilled citizens in preparation for the future. The limited private sector employment opportunities for Kuwaiti graduates helps to explain their differences to other colleges in their preferred sector of employment in the future.

The sociodemographic characteristics of students across the countries showed a number of interesting trends. Female students predominated, particularly in Finland and Kuwait. In Finland, pharmacy is seen as a suitable occupation for women with relatively short education (BPharm), more flexible working hours than comparable occupations, e.g. nurses and secure employment, while in Kuwait traditional values restrict opportunities for women to study abroad whereas male offspring are likely to be allowed to travel and live abroad. Zimbabwe was the only country where male students outnumbered females, which may be a reflection of the perception of the pharmacy profession or simply the fact that boys generally have higher school grades due to traditional beliefs about home life which restrict girls' access to education. Career aspirations and job satisfaction have been found to vary with gender (Woodward, Merryman, & Kirk, 1993; Carvajal & Hardigan, 1999a,b) and this may impact curriculum development and motivational strategies at schools of pharmacy.

Finnish students tended to be older and more likely to be married/partnered with children, especially in the BPharm. Poor employment prospects among nurses and many basic scientists has caused there to be a recent tendency to change careers, with pharmacy offering a near-guaranteed job due to a shortage of BPharm graduates across Finland, the city of Kuopio being the only exception. Although the Kuwaiti students tended to be younger, 16% were married since, culturally, women tend to marry at a younger age than men. Zimbabwe was the only country where a greater proportion of students had children than were married/partnered, but this is likely because traditional marriage was not considered as an "official" partnership. These factors were examined due to perceived difficulties that students in family relationships may face in applying themselves to their studies and may affect how courses should be designed to take account of student backgrounds. A previous study in the USA identified that female students often considered managing their pharmacy career around marriage and children but generally did not intend to stop practising pharmacy (Rascati, 1989). This would appear to hold true for the students in this survey with very few envisaging themselves not working in Pharmacy in 10 years time.

Philanthropy was the most commonly cited reason for choosing to study Pharmacy overall and in all countries except Finland where "lifestyle and career issues" and a "high regard for pharmacy" were equally important. This difference in the Finnish students is likely a reflection of the local move of older persons to

change jobs and moving to pharmacy rather than young "idealists" starting off in their adult lives. One of the most commonly identified lifestyle issues involved pharmacy being a suitable occupation for women as mentioned above.

As might be expected, financial motivations were very strong in the two countries with the lowest per capita GDP (Zimbabwe and Sudan). However, financial gain was also important in New Zealand. While 44% of the New Zealand students were non-citizens, there was no difference in this motivation between citizens and non-citizens (data not shown) and factors other than wealth (as estimated from per capita GDP) are likely to be important. Attaining professional status was not identified as being an important factor for most students, which is in line with results from a study of students at eight Australian and New Zealand colleges in the 1980s (Roller & Bury, 1987).

Pharmacy was not the first choice for many students in New Zealand, Zimbabwe and Kuwait, but rather medicine or dentistry (occasionally architecture or engineering!). There is often a common impression that aspiring physicians who do not make it into medical studies choose pharmacy as a second choice, which is supported by these findings. However, these preferences may be identified earlier in life (Kikwilu, Mugonzibwa, Rugarabamu, & Ntabaye, 2000) and some students on scholarship in Sudan and New Zealand noted that they would have chosen medicine but their sponsoring organisation or government had selected them for pharmacy. In addition, in the previous year in New Zealand a change in government policy about the dispensing of most medicines (they are now to be dispensed all at once rather than monthly) would have the effect of reducing the income of community pharmacies. It may have meant that students were less positive about (community) pharmacy, or more worried about their future in New Zealand. The proportion of students where pharmacy was not first choice was low in Finland, where older persons were making career choices and deliberately chose pharmacy and also relatively low in Sudan, possibly due to better salaries and job opportunities compared to other health professionals.

In the USA, due to staff shortages, pharmacy graduates can earn more than academic pharmacists who have been in post for decades (Holdford & Stratton, 2000) so, the trend for upcoming educators is welcome in Kuwait, Sudan and Finland. The need for a larger pool of academic pharmacists has been recognized in other countries where intakes of pharmacy students have increased (Taylor et al., 2004). However, student aspirations may not match local needs and opportunities. For example, in Kuwait there is currently only one pharmacy school which will not be able to absorb all those indicating a desire to become educators.

While these insights into the motivation behind students' choices are interesting, care must be exercised

in drawing conclusions from them given the fact that some respondents provided multiple answers while others followed the questionnaire instructions and restricted themselves to the “most important” reason. In addition, a certain degree of interpretation had to be used in recategorizing the multiple responses. While the general picture would not be likely to change substantially if all respondents had answered the question in the same manner, the relative importance of some reasons could be altered.

Understanding where students come from and their future intentions is important for educators as it provides insight into student motivational factors and aids in the design of programs and courses. This includes planning postgraduate opportunities, so as to retain students within pharmacy (Holdford & Stratton, 2000) and directing career advice delivered to students which can often be inadequate (Wilson, 1999). This is increasingly important as with globalisation and migration of health workers, pharmacy colleges in different countries become almost different campuses of a global educational institution. Indeed, it is this philosophy which engenders trends towards harmonising pharmacy curricula so as to make the transfer of knowledge and skills easier, although the local adaptations alluded to above add to the challenge in deriving a global pharmacy curriculum even where common pharmacy skills and attributes have been identified (Shaw, 2002). Curriculum harmonisation does make migration easier and has led to depletion of pharmacists in developing countries (FIP, 2006) but calls to make training programs in developing countries specific to their needs (and therefore unsuitable for international application; Levy, 2003) have not been found politically palatable.

Conclusions

The aim of this survey was to provide a snapshot of the diversity of the international pharmacy student body in five schools across country and cultural lines. It is descriptive rather than studying the influence of diversity on patient care or professionals as a whole and therefore does not investigate concepts in detail. The International Pharmaceutical Students' Federation is undertaking a larger study in more detailed form which may help to address some of the questions which arise and we hope, our paper will stimulate other comparative cross-national studies. This would allow deeper discussion of the implications of this diversity, because it is clear that there are distinct differences in students' motivations and aspirations which need to be recognized by educators and policymakers as pharmacy curricula are developed to suit local needs, and also within the context of harmonisation. This diversity adds to the richness within the profession as well as providing challenges

for the education of pharmacists and their integration into the global workforce.

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References

- Carvajal, M. J., & Hardigan, P. (1999a). First-job preferences and expectations of pharmacy students: Intergender and interethnic comparisons. *Journal of the American Pharmaceutical Association*, 39, 32–40.
- Carvajal, M. J., & Hardigan, P. (1999b). Estimation of pharmacy students' expected job satisfaction functions: Inter-gender differences. *American Journal of Pharmaceutical Education*, 63, 285–289.
- Castiglia, M., Chinyanganya, F., & Smego, R. A. (1996). Pharmacy education in Zimbabwe. *American Journal of Pharmaceutical Education*, 60, 182–185.
- Ferguson, J. A., Roller, L., & Wertheimer, A. I. (1986). Social factors motivating students toward a career in pharmacy—an international study. *Journal of Social and Administrative Pharmacy*, 3(4), 127–135.
- FIP. (2006). Global pharmacy workforce and migration report: A call for action. <http://213.206.88.26/files/fip/HR/FIP%20Global%20Pharmacy%20and%20Migration%20report%2007042006.PDF> [Accessed 26 September 2006].
- Holdford, D. A., & Stratton, T. P. (2000). A marketing plan for recruiting students into pharmacy school-based graduate programs. A report. *American Journal of Pharmaceutical Education*, 64(Winter Suppl.), 41S–47S.
- Kikwilu, E. N., Mugonzibwa, E. A., Rugarabamu, P. G., & Ntabaye, M. K. (2000). Tanzanian high school students' attitude towards five university professional courses. *East African Medical Journal*, 77, 143–146.
- Levy, L. F. (2003). The first world's role in the third world brain drain. *British Medical Journal*, 327, 170.
- Rascati, K. L. (1989). Career choice, plans, and commitment of pharmacy students. *American Journal of Pharmaceutical Education*, 53, 228–234.
- Roller, L., & Bury, P. C. (1987). Social factors motivating Australian and New Zealand students towards a career in pharmacy. *Australian Journal of Pharmacy*, 68, 283–294.
- Shaw, J. P. (2002). Undergraduate pharmacy education in the United States and New Zealand: Towards a core curriculum? *Pharmaceutical Education*, 1, 5–15.
- Sie, D., Bates, I., Aggarwal, R., & Borja-Lopetegui, A. (2003). An analysis of the new UK Master of Pharmacy degree programme: Rhetoric and reality. *Pharmaceutical Education*, 3, 169–175.
- Siracuse, M. V., Schondelmeyer, S. S., Hadsall, R. S., & Schommer, J. C. (2004). Assessing career aspirations of pharmacy students. *American Journal of Pharmaceutical Education*, 68(3). Article 75. <http://www.ajpe.org/aj6803/aj680375/aj680375.pdf> [Accessed 1 Nov 2006].
- Sramkova, P., De Jong Van den Berg, L. T., & Oerlemans, A. P. (2004). Comparison of Dutch and Czech systems of pharmacy studies. *Pharmaceutical Education*, 4, 153–163.
- Taylor, K. M. G., Bates, I. P., & Harding, G. (2004). The implications of increasing student numbers for pharmacy education. *Pharmaceutical Education*, 4, 33–39.
- Wilson, J. (1999). Inadequate career advice for students. *Trends in Pharmacological Sciences*, 20, 8.
- Woodward, J. M. B., Merryman, J., & Kirk, K. W. (1993). Management aspiration and gender differences in pharmacy students. *Journal of Pharmaceutical Marketing and Management*, 7, 3–24.