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Pharmacy students' perceptions of their profession relative to other health care professions

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Abstract

Objectives (1) To investigate pharmacy students' perceptions of 10 occupations within the medical and allied professions: community pharmacists, dentists, dietitians, general medical practitioners (GPs), hospital pharmacists, medical specialists, nurses, occupational therapists, physiotherapists and social workers. (2) To explore students' perceptions of community and hospital pharmacists at different stages of a four-year undergraduate programme and at the year of pre-registration training.

Method A 90-item questionnaire was administered to 543 pharmacy undergraduates and 95 graduates undergoing their pre-registration year training in 2001.

Setting Faculty of Pharmacy, The University of Sydney, Australia.

Key findings Students perceived the health care professions along three major dimensions, relating to ''empathy'', ''potency'' and ''expertise''. On an empathy dimension, students rated community pharmacists the highest and medical specialists the lowest. On a potency dimension, students rated medical specialists the most powerful, community and hospital pharmacists significantly lower, and nurses the lowest. On an expertise dimension, students rated medical specialists the highest and dietitians the lowest. A significant pattern of differences was noted in students' perceptions and a possible decline was identified in the potency rating of pharmacists at different stages of the pharmacy programme.

Conclusion These differences may be attributed to the differences in the students' value systems, skills and experiences, the influence of reference groups and the content and structure of the educational and training programme in each year.

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Introduction

Over the past decade, the pharmacy profession has undergone a significant paradigm shift with movement away from a traditional distributive role towards a clinical, patient-centred philosophy of practice called pharmaceutical care.[1] The advent of pharmaceutical care has intensified the focus on teamwork and the importance of interprofessional relationships to achieve effective interdisciplinary co-operation.[2] As team members, pharmacists bring specialist knowledge in the area of drug therapy and can support other health professionals, particularly medical practitioners, in the design, implementation and monitoring of therapeutic plans to achieve optimum health outcomes.[3,4] Such teamwork collaborations are considered necessary for effective health care delivery in the modern health care industry.[2,5–12]

The movement towards pharmaceutical care as a practice model has also led to fundamental changes in the role orientation and perspective of the pharmacist.[4,13] Although the knowledge, skills and abilities required may be the same as for clinical pharmacy, it is the orientation of professional attitudes and values that need to change so as to reflect responsibility, advocacy and interdependence in caring for the patient.[3] As a result, more attention has been directed towards pharmacy education, as it not only involves academic learning but also professional socialisation,[3,14,15] whereby individuals selectively acquire not only the knowledge and skills but also behaviours, beliefs, perceptions and values about their profession.[16] Socialisation is a continuous

process which can occur via two mechanisms: professional socialisation, where lay perspectives and knowledge are transformed to professional perspectives and knowledge, and developmental socialisation, where professional perspectives mature and continue to develop.[3]

Professional socialisation is the process whereby students learn about their professional role and the expectations of performance in that role.[17] The process is influenced by social interactions with university faculty members, preceptors, peers, practitioner role models, and other health professionals, which shape students' attitudes, perceptions and values.[3,14–17] Professional socialisation may be impeded by inconsistent messages being given and expectations not being fulfilled, which may result in disillusionment and dissatisfaction with the profession.[16] Since professional socialisation is influenced by academic interactions, pharmacy education is an integral component of the process. Hence, pharmacy education needs to match the goals and objectives of the profession. The academic community within pharmacy has developed new insights on which it bases the academic learning component of pharmacy education, as a result of the changing role of the pharmacist.[17–21]

In addition to academic learning, practice experience is an important element of the socialisation process. It is through professional practice experiences that attributes essential for the effective provision of pharmaceutical care, including responsibility, accountability, communication effectiveness, sensitivity and commitment, can be fostered. Therefore, the incorporation of early practice experiences into the curriculum is extremely important. Such experiences expose students to role models from an early stage in the curriculum, thereby nurturing the professional socialisation process.[6,22,23] Although pharmacy education has evolved over time to attempt to meet future demands and challenges, the integration of practice experience has been difficult to achieve. Hence, the balance between traditional academic components and practice components in the curriculum needs to be addressed in the light of the real workplace environment.[16,24]

Previous researchers have investigated the impact of professional socialisation on students' attitudes as they progress through their professional education.[11,12,24–39] A persistent theme that emerged from most of the early literature was the waning of idealism or the development of "disillusionment" or "realistic disenchantment" with the students' chosen profession, as they progressed through a pharmacy curriculum.[25–34] Although this finding was not consistent across all published studies,[35–37] the general consensus from longitudinal studies is that the professional socialisation of pharmacy students is less than ideal.[29,32,34]

Little attention has been directed towards pharmacy students' perceptions of their professional role relative to the "co-operative" health care environment. The first aim of this study was to investigate pharmacy students' perceptions of 10 occupations within the medical and allied professions: community pharmacists, dentists, dietitians, general medical practitioners (GPs), hospital pharmacists, medical specialists (consultants), nurses, occupational therapists, physiotherapists and social workers. The second aim was to explore students' perceptions of community and hospital pharmacists at different stages of a four-year undergraduate programme and at the year of pre-registration training.

Methods

Materials and procedures

A 90-item questionnaire was administered to 543 pharmacy undergraduates and 95 graduates undergoing their pre-registration year training. Subjects were asked to indicate their perceptions of 10 health occupational groups using nine five-point semantic-differential scales formed by pairs of attributes or bipolar adjectives.[40] The pairs of attributes were: (a) unapproachable–approachable, (b) little trained–highly trained, (c) non skilled–skilled, (d) non powerful–powerful, (e) non accessible–accessible, (f) non essential–essential, (g) badly paid–highly paid, (h) non sympathetic–sympathetic, (i) low status–high status. The scales adopted in this study were previously used by Collins *et al*[24] and were based on a measure originally developed by Furnham *et al*.[11]

On each of the bipolar scales, respondents were asked to rate hospital and community pharmacists, together with eight other occupations within the medical and allied professions presented in alphabetical order: dentists, dietitians, GPs, medical specialists (consultants), nurses, occupational therapists, physiotherapists and social workers. The questionnaire was administered to undergraduate students during the course of a tutorial and posted to the pre-registration graduates.

Subjects

Subjects were recruited in the second semester from all students enrolled in the 2001 pharmacy undergraduate programme at the University of Sydney in Australia and from the Pharmaceutical Society of Australia's graduate registration year training programme. The inclusion criterion was being able to read English. Participation of subjects was voluntary and did not involve payment or course credit.

Data analysis

The factor structure of the study instrument was initially investigated using exploratory factor analysis, using maximum likelihood extraction and oblimin rotation (Statistical Package for the Social Sciences 10.0). Assessment of the instrument's factor structure was considered necessary in view of supporting evidence for Furnham *et al*'s original two-factor "evaluative" and "potency" solution.[11] In that study, no justification for selection of a two-factor solution was presented. Details presented in the published study included only factor loadings and the proportion of variance explained (50 per cent), with the reader left to surmise that eigenvalues

greater than unity was the most likely selection criterion to have been employed. The Collins *et al*[24] study explicated this criterion as that used for the number of factors extracted in their study, identifying two factors consistent with those in the original Furnham *et al* study, together explaining 51 per cent of the total variance. The present study uses additional criteria for the number of factors to be extracted, in order to more rigorously explore the instrument's factor structure. Implemented criteria include the size of eigenvalues, number of steps in the scree plot, and the proportion of total variance explained.

Exploratory factor analyses were conducted across each of the eight non-pharmacy occupations. The educed factor structure was then formally evaluated using confirmatory factor analyses with robust maximum likelihood extraction (LISREL 8.51) for the two hospital and community pharmacy occupations of central concern to the study. Model fit statistics for confirmatory analyses included: the chi-square (χ^2) statistic, Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA), since these are the most frequently emphasised fit statistics.[41] Reliability analyses of derived subscales were conducted using Cronbach's alpha. Derivation and evaluation of the factor structure is therefore across different response sets, circumventing the risk of over-capitalising on sample characteristics when the same data are used for exploratory and confirmatory analyses.

Differences in student perceptions related to each of the 10 occupations assessed were examined using multivariate repeated measures analysis across the set of derived factors. Assessments of potential "declines" in student perceptions related to progression through the pharmacy degree were targeted by mean comparisons across the five cohorts of students enrolled in the four-year undergraduate and one-year graduate programmes. Trend analyses were therefore implemented for each of the derived factors in relation to each of the 10 occupations, to examine whether group means were lower for students in cohorts at later stages of their candidature. Statistical significance was set at 0.05 for all inferential analyses.

Results

In total, 638 subjects completed the 90-item questionnaire. The overall response rate for undergraduates was 75 per cent: 93 per cent of year one, 82 per cent of year two, 49 per cent of year three, and 76 per cent of year four. The overall response rate for graduates was 75 per cent.

Exploratory factor analysis

Exploratory factor analysis using maximum likelihood extraction and oblimin rotation across each of the eight non-pharmacy occupations yielded three primary factors with eigenvalues greater than unity, accounting for 55 per cent of the variance (Tables 1 and 2).

Items that loaded on the first factor were (a) approachable–unapproachable, (e) sympathetic–non sympathetic and (h) accessible–non accessible, indicating an "evaluative" or "empathy" dimension. The empathy subscale of three items returned standardised alpha coefficients ranging from 0.70 to 0.78 across the eight non-pharmacy occupations. Items that loaded on the second factor were (d) powerful–non powerful, (g) highly paid–badly paid, (i) high status–low status, indicating a "potency" dimension. The potency subscale of three items returned standardised alpha coefficients ranging from 0.67 to 0.85 across the eight non-pharmacy occupations. The third factor contained two items, (b) highly trained–little trained and (c) skilled–non skilled, indicating an "expertise" dimension. The expertise subscale returned alpha coefficients ranging from 0.79 to 0.88 across the eight non-pharmacy occupations. Factor loadings for item (f) were low and inconsistent and were not used to label any factor.

Confirmatory factor analysis

The three-factor solution consistently identified in exploratory factor analyses for the eight non-pharmacy occupations was formally evaluated using confirmatory factor analyses for the two community and hospital pharmacy occupations of central concern to the study. In each of these two models, items theorised as indicators for each of the three educed empathy (items a, e, h), potency (items d, g, i) and expertise (items b, c) latent constructs were specified as respective indicators of these constructs, with no cross-loadings permitted. Measurement errors were estimated for each item, and no error covariances permitted. Listwise deletion of missing data resulted in numbers of 637 for the community and 607 for the hospital pharmacy analyses. Model fits were acceptable in both cases (community pharmacy: χ^2=57.71 df = 17, GFI = 0.96, AGFI = 0.93, TLI = 0.96, RMSEA = 0.06; hospital pharmacy: χ^2=99.16 df = 17, GFI = 0.95, AGFI = 0.89, TLI = 0.95, RMSEA = 0.09), with GFI, AGFI and TLI fit statistics exceeding 0.90 in all cases but one (AGFI = 0.89 for hospital pharmacy), RMSEAs below 0.10, and relatively low χ^2 to degrees of freedom ratios. Modification indices for factor loadings (LX) and measurement errors (TD) were not large and suggested no significant departures from the expected three-factor model. Factor loadings and measurement errors for completely standardised solutions are presented in Table 3. Correlations between the three factors were moderate, with correlations between empathy and potency of 0.43 for community and 0.58 for hospital pharmacy, between empathy and expertise of 0.64 for community and 0.43 for hospital pharmacy, and between potency and expertise of 0.57 for community and 0.48 for hospital pharmacy.

Differences in perceptions across health care occupations

The results are shown in Table 4.

Table 1 Factor pattern matrix results (oblimin rotation) for dentists, dietitians, GPs and medical specialists showing the factor loadings of each of the 9 rating scales on the three major factors arising from each analysis*.

Name of factor	Dentists			Dietitians			General Practitioners			Medical Specialists		
	Factor 1 Empathy	Factor 2 Potency	Factor 3 Expertise	Factor 1 Empathy	Factor 2 Potency	Factor 3 Expertise	Factor 1 Empathy	Factor 2 Potency	Factor 3 Expertise	Factor 1 Empathy	Factor 2 Potency	Factor 3 Expertise
Approachable	**0.69**	0.00	0.00	**0.90**	0.00	0.00	**0.88**	0.00	0.00	**0.79**	0.16	0.00
Trained	0.00	0.00	**0.92**	0.12	0.00	**0.63**	0.00	0.00	**0.89**	0.00	0.43	**0.50**
Skilful	0.00	0.00	**0.78**	0.00	0.00	**0.90**	0.13	0.00	**0.69**	0.00	0.00	**0.89**
Powerful	0.13	**0.47**	0.10	0.00	**0.65**	0.00	0.00	**0.52**	0.18	0.00	**0.59**	0.23
Accessible	**0.66**	0.00	0.00	**0.64**	0.00	0.00	**0.66**	0.00	0.00	**0.78**	0.00	0.12
Essential	0.00	0.30	0.27	0.00	0.33	0.34	0.00	0.39	0.23	0.16	0.44	0.23
Pay	0.00	**0.55**	0.12	0.00	**0.67**	0.00	0.00	**0.69**	0.00	0.00	**0.84**	0.00
Sympathy	**0.58**	0.00	0.00	**0.50**	0.17	0.00	**0.46**	0.00	0.00	**0.62**	0.00	0.00
Status	0.00	**0.87**	0.12	0.00	**0.79**	0.00	0.00	**0.84**	0.00	0.00	**0.88**	0.00
Eigenvalue	1.53	2.06	2.22	2.31	2.64	2.65	2.03	2.45	2.51	1.74	3.57	3.13
Total Variance		**54.7**%			**54.9**%			**51.5**%			**64.4**%	
Alpha coefficient†		0.76			0.83			0.81			0.82	

* Factor loadings which have been underlined indicate those scales which have loaded highest on that factor and which have been used to label that factor.
† Reliability analysis (standardised item alpha) of the nine-item study instrument.

Table 2 Factor pattern matrix results (oblimin rotation) for nurses, occupational therapists, physiotherapists and social workers showing the factor loadings of each of the 9 rating scales on the three major factors arising from each analysis*.

Name of factor	Nurses			Occupational Therapists			Physiotherapists			Social Workers		
	Factor 1 Empathy	Factor 2 Potency	Factor 3 Expertise	Factor 1 Empathy	Factor 2 Potency	Factor 3 Expertise	Factor 1 Empathy	Factor 2 Potency	Factor 3 Expertise	Factor 1 Empathy	Factor 2 Potency	Factor 3 Expertise
Approachable	**0.69**	0.00	0.00	**0.74**	0.00	0.00	**0.68**	0.00	0.15	**0.68**	0.14	0.00
Trained	0.00	0.00	**0.90**	0.00	0.00	**0.83**	0.00	0.00	**0.83**	0.00	0.00	**0.89**
Skilful	0.28	0.00	**0.59**	0.00	0.00	**0.84**	0.00	0.00	**0.87**	0.21	0.26	**0.50**
Powerful	0.00	**0.63**	0.00	0.14	**0.60**	0.00	0.16	**0.71**	0.00	0.11	**0.65**	0.00
Accessible	**0.70**	0.00	0.00	**0.62**	0.14	0.00	**0.78**	0.00	0.00	**0.82**	0.00	0.00
Essential	0.58	0.00	0.00	0.28	0.18	0.35	0.23	0.00	0.36	0.59	0.00	0.17
Pay	0.16	**0.66**	0.00	0.00	**0.68**	0.00	0.11	**0.55**	0.13	0.15	**0.69**	0.00
Sympathy	**0.70**	0.00	0.00	**0.39**	0.00	0.34	**0.34**	0.30	0.00	**0.70**	0.00	0.00
Status	0.12	**0.75**	0.00	0.00	**0.73**	0.00	0.00	**0.82**	0.00	0.00	**0.81**	0.00
Eigenvalue	2.50	1.48	2.23	2.40	1.57	2.91	2.38	2.55	2.86	2.68	2.29	2.62
Total Variance		**54.5**%			**52.3**%			**54.6**%			**58.2**%	
Alpha coefficient†		0.74			0.83			0.84			0.82	

* Factor loadings which have been underlined indicate those scales which have loaded highest on that factor and which have been used to label that factor.
† Reliability analysis (standardised item alpha) of the nine-item study instrument.

Empathy dimension

In terms of overall empathy, community pharmacists received the highest mean scores, which were significantly higher than for the other health occupations assessed ($P < 0.05$). Hospital pharmacists had the sixth highest mean scores and these were significantly lower than means for community pharmacists, nurses, social workers, GPs and physiotherapists ($P < 0.05$). The lowest scores were for medical specialists, with significantly lower scores than the other occupations assessed ($P < 0.05$).

Potency dimension

For overall potency, medical specialists had significantly higher mean scores than the other health occupations assessed ($P < 0.05$). There was no significant difference in overall potency ratings between community and hospital

Table 3 Factor loadings (LX) and measurement errors (TD) for completely standardised confirmatory factor analyses of the three-factor "empathy", "potency" and "expertise" model for each of community and hospital pharmacy.

Item	Community pharmacy		Hospital pharmacy	
	LX	TD	LX	TD
"Empathy" factor				
a	0.65	0.57	0.76	0.42
e	0.68	0.53	0.74	0.45
h	0.77	0.41	0.68	0.54
"Potency" factor				
d	0.51	0.74	0.75	0.45
g	0.47	0.78	0.43	0.81
i	0.82	0.33	0.86	0.27
"Expertise" factor				
b	0.79	0.38	0.87	0.25
c	0.88	0.23	0.86	0.26

Table 4 Descriptive statistics for the empathy, potency and expertise dimensions by occupation.

Variable: Empathy				Variable: Potency				Variable: Expertise			
Occupation	Mean	SD	Number	Occupation	Mean	SD	Number	Occupation	Mean	SD	Number
Community pharmacists	12.2	2.1	637	Medical specialists	13.8	2.0	618	Medical specialists	9.3	1.3	618
Nurses	12.1	2.3	627	General practitioners	13.4	1.8	634	Dentists	9.0	1.3	629
Social workers	12.0	2.5	593	Dentists	12.5	1.8	628	General practitioners	8.8	1.4	634
General practitioners	11.3	2.2	633	Physiotherapists	10.4	2.1	603	Hospital pharmacists	8.7	1.3	608
Physiotherapists	11.1	2.0	603	Community pharmacists	9.7	2.1	637	Physiotherapists	8.3	1.5	603
Hospital pharmacists	10.4	2.3	607	Hospital pharmacists	9.6	2.3	608	Community pharmacists	8.0	1.5	637
Occupational therapists	10.3	2.1	579	Occupational therapists	8.7	1.9	578	Nurses	7.5	1.6	626
Dietitians	10.1	2.3	599	Dietitians	7.9	2.0	600	Occupational therapists	7.2	1.6	580
Dentists	9.8	2.2	628	Social workers	7.8	2.2	593	Social workers	6.7	1.7	594
Medical specialists	9.5	2.7	617	Nurses	7.6	2.2	626	Dietitians	6.5	1.5	602

pharmacists (9.7 ± 2.1 vs 9.6 ± 2.3 [mean $\pm$ SD], $P > 0.1$). Community and hospital pharmacists had the fifth highest mean scores and these were significantly lower than those for medical specialists, GPs, dentists and physiotherapists ($P < 0.05$). The lowest scores were for nurses ($P < 0.05$).

Expertise dimension

Medical specialists had significantly higher mean scores for expertise than the other health occupations ($P < 0.05$). Hospital pharmacists had the fourth highest mean scores and were significantly lower than medical specialists, dentists and GPs ($P < 0.05$). Community pharmacists had the sixth highest mean scores and were significantly lower than medical specialists, dentists, GPs, hospital pharmacists and physiotherapists ($P < 0.05$). The lowest scores were for dietitians ($P < 0.05$).

Perceptions of the professions by students at different stages of the pharmacy programme

Empathy

Trend analysis showed a significant linear increase in the empathy ratings of community pharmacists by students at different stages of the pharmacy programme ($F = 51.3$, [1, 632 df], $P < 0.001$, Table 5). Similarly, a significant linear increase in empathy ratings of hospital pharmacists was found ($F = 7.1$, [1, 602 df], $P < 0.01$, Table 5). A significant linear increase in empathy ratings was also found for dietitians, nurses, occupational therapists and social workers using trend analysis. A significant linear decline was found in empathy ratings for medical specialists, GPs and dentists. No significant trend was evident for physiotherapists.

Potency

Trend analysis showed a significant linear decline in potency ratings of community pharmacists by students at different stages of the pharmacy programme ($F = 9.8$, [1, 632 df], $P < 0.01$, Table 5). Similarly, a significant linear decline in potency ratings of hospital pharmacists was found ($F = 28.2$, [1, 603 df], $P < 0.001$, Table 5). There were no other significant trends in potency ratings evident.

Expertise

Trend analysis showed a significant linear increase in expertise ratings of hospital pharmacists by students at

Table 5 Community and hospital pharmacists' scores on the empathy, potency and expertise dimensions by curriculum year.

Profession	Community pharmacists						Hospital pharmacists					
	Year 1	Year 2	Year 3	Year 4	Graduates	Total	Year 1	Year 2	Year 3	Year 4	Graduates	Total
Empathy												
Mean	12.1	11.3	12.3	12.8	13.3	12.2	10.3	10.0	10.6	9.8	11.3	10.6
SD	1.8	2.4	2.0	1.7	1.6	2.0	2.4	2.3	2.2	2.3	2.2	2.3
Number	195	153	91	103	95	637	179	148	85	103	92	607
Potency												
Mean	10.2	9.7	9.2	9.0	9.7	9.7	10.4	9.4	9.7	8.8	9.0	9.6
SD	1.9	2.2	2.3	1.8	1.8	2.0	2.1	2.5	2.4	2.2	1.7	2.3
Number	195	153	91	103	95	637	180	148	85	103	92	608
Expertise												
Mean	8.2	7.9	7.8	7.7	8.3	8.0	8.5	8.5	8.9	9.0	8.8	8.7
SD	1.3	1.7	1.6	1.3	1.3	1.5	1.3	1.5	1.3	1.1	1.2	1.3
Number	195	153	91	103	95	637	180	148	85	103	92	608

SD = standard deviation.

different stages of the pharmacy programme ($F = 10.1$, [1, 603 df], $P < 0.01$, Table 5). A significant linear increase in expertise ratings was also demonstrated for dietitians, medical specialists and social workers. In contrast, a significant linear decline in expertise ratings was demonstrated for GPs and dentists. There were no significant trends in expertise ratings evident for community pharmacists, nurses, occupational therapists and physiotherapists.

Evaluations of pharmacists at each stage of the pharmacy programme

Empathy

Community pharmacists were rated the highest in overall empathy of the occupations assessed and retained that position in all years except year 2 (where it was rated third highest). Hospital pharmacists were rated sixth highest in terms of overall empathy of the occupations assessed but their relative rating ranged from eighth in year 1, seventh in year 2, sixth in year 3, eighth in year 4, to fifth in the graduate year.

Potency

There was no significant difference between community and hospital pharmacists' potency ratings. Community and hospital pharmacists were rated fifth highest in overall potency of the occupations assessed and retained that position in all five years of the course.

Expertise

Community pharmacists were rated sixth highest in overall expertise of the occupations assessed and retained that position in all years of the course and in the graduate year. Hospital pharmacists were rated fourth highest in overall expertise of the occupations assessed but their relative rating ranged from fourth in years 1 and 2, third in year 3, to second in year 4 and the graduate year.

Discussion

The pharmacy undergraduate and graduate students who took part in this study perceived the health care professions along three major dimensions: "empathy", "potency" and "expertise". The empathy and expertise rating for community and hospital pharmacists differed, while the potency rating was the same across these two occupations.

An important contribution of our study has been the identification of three major dimensions. This is in contrast to findings from a previous study using the same study instrument, which suggested medical and allied health care professions are perceived along two dimensions: "evaluative" and "potency".[11] The former dimension included the items "approachable", "accessible", "sympathetic", and "skilful" while the latter dimension included the items "power", "pay" and "status". It is interesting to note that both "training" and "skill" loaded on a third dimension (expertise) in our study, which seems logical, since these two items would appear to be unrelated to the "potency" or the "empathy" dimensions of a profession.

Community pharmacists were perceived to be the most accessible, approachable and sympathetic of the occupations assessed, according to our findings. This high rating agrees with many public surveys in which community pharmacists have been rated one of the most highly respected and trusted professions, and an accessible and informed source of advice.[42] This is also consistent with the role of the pharmacist as a provider of pharmaceutical care.[17] Hospital pharmacists were perceived to exhibit less empathy than community pharmacists. This could be due to the fact that those completing the survey were young and healthy students who may not have had much personal exposure to hospital pharmacists, thereby seeing them as less accessible.

Community and hospital pharmacists were perceived to be similar in power and status, although significantly less powerful than medical practitioners, dentists, GPs and physiotherapists. This may be because pharmacy has traditionally lacked professional attributes such as autonomy and service-orientation, and as a result has been characterised as a "marginal" or quasi-profession with ambiguity concerning its status.[31,33] Pharmacists, although they dispense, still lack the autonomy to prescribe, and their professional service-orientation has been challenged by commercial and business norms that permeate the practice environment.

Hospital pharmacists were perceived to be more highly trained and skilled than community pharmacists in our study. This is not unusual, since hospital pharmacists are often required to obtain a graduate diploma in hospital pharmacy, which involves an extra year of clinical coursework and specialised training in teaching hospitals. Further, they may be thought of as being involved in more clinically oriented interventions and tasks.

The study investigated the perceptions of five sequential cohorts at different stages of the four-year undergraduate programme and the year of pre-registration graduate training. The results indicated a significant pattern of differences in pharmacy students' perceptions of community and hospital pharmacists across the five cohorts. This might be expected in the light of the socialisation process occurring over this time. Differences between cohorts at different educational stages might be attributed to changing personal values, attitudes and motives for choosing a pharmacy career, communication and social interaction skills, previous and concurrent experiences within the pharmacy practice environment, as well as the influence of reference groups and the content and structure of the educational and training programme in each year. Collins *et al*[24] also found that both cultural and curriculum-related differences contribute to differences in students' perceptions. It could also be argued that the significant differences noted between the five cohorts were due to their holding different (and stable) perceptions of the 10 occupations.

The possible decline in the potency ratings of community and hospital pharmacists is consistent with published data, which suggest a growing disenchantment and disillusionment with pharmacy students' chosen profession.[16,24,25–34] A longitudinal study, which traces the same cohort over time, is necessary to monitor the impact of the socialisation process throughout the pharmacy degree. A longitudinal study (Class of 1983) at the University of Toronto found that idealism emerged during the first year, waned during the second year, was revitalised during the later part of the third year, and developed throughout the fourth year. The author argued that the waning of idealism or the growing disenchantment during the second year was a response to the disparity between two concurrent processes of socialisation and academic learning.[38] However, a follow-up study, seven years after graduation, found that faith in the ideal of clinical pharmacy was restored.[39]

The possible decline in the potency ratings of community and hospital pharmacists that was noted may be explained as follows: in the early years, students have a high level of idealism or are presented with the ideal image of the pharmacy profession. However, this idealism wanes over time if students' expectations are unsupported by what is learnt from their educational setting, their experience in the real world, externship and practice. If students are unclear about what should be expected of them because of mixed or inconsistent messages, they may experience role ambiguity where they are unsure exactly what their role should be. Therefore, a growing sense of disillusionment sets in most often during clinical placements in senior years, when students are exposed to professional issues and interactions with other health professionals, and where much of their expertise is either ignored or fails to be implemented. Furthermore, the role expectations of senior students who are trained at a higher level may be inconsistent with the role expectations of current practising pharmacists.

There are several other possible confounders to the results obtained in our study. These include the issue of whether students were identifying themselves as part of the existing profession and practising pharmacists, or as part of a new generation of pharmacists who are trained at a higher level. A further complication arises in that students might have been responding as members of the public and not identifying with the profession at all. It should be noted that students in our study could have experienced different situational influences, such as self-selected externships in third year, which might or might not have met the standards expected by pharmacy administration at the university. To put together all the pieces of the puzzle for this group of students, the following information could have been collected at the time the survey was administered: previous experience within the pharmacy practice environment, whether currently working part-time in pharmacy, whether any direct family members are pharmacists, and the reasons they chose pharmacy as a career.

The major contributions of our study were to identify health occupations as perceived along three major dimensions of "empathy", "potency" and "expertise". Possible decline in students' perceptions of community and hospital pharmacists might indicate a growing disillusionment with their chosen profession at different stages of pharmacy education. A longitudinal study design is necessary to monitor rigorously the impact of the socialisation process on pharmacy students' perceptions. The extent to which changes in the new curriculum, together with cross-disciplinary education, will impact on perceptions over the next few years in an evolving health care environment is also of great interest. Our investigations of students' perceptions have formed the basis for future work in this area, which will look at changes in perceptions with one cohort of students over the full five years. Further research into external factors — outside the educational experience — also needs to be investigated.

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