

A comparison of student attitudes and intentions at the start and end of their BPharm degree programme

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Abstract

Students' reasons for choosing pharmacy as a course of study and career, together with professional and educational perspectives, were evaluated by survey and compared longitudinally between the start and end of a New Zealand BPharm degree. In contrast with a number of studies in medical education, findings indicate persistence of patient-oriented, altruistic and empathetic attitude across years of study. Entrepreneurial intentions remain high, especially among male students. It is suggested that integration of science and communication aspects during later years of study, together with recognition of pharmacy's scope of career pathways may help to engender commitment and optimism towards a pharmacy career.

Keywords: *Choosing pharmacy, career choice, longitudinal, undergraduate*

Introduction

Students' choices of pharmacy as a course of study and career are likely to stem from motivations broadly describable as combining the scientific, altruistic and professional. Intrinsic factors relating to the selection of a pharmacy degree and career include a desire to help people and to work with patients, a desire to be socially useful and pharmacy's science-based nature (Roller, 2004; Siracuse Schondelmeyer, Hadsall, & Schommer, 2004; Willis, Shann, & Hassell, 2006; Wilson, Jesson, Langley, Hatfield, & Clarke, 2006). Extrinsic motivators are largely employment-related and concern career status and prospects, aspirations towards pharmacy ownership, and opportunities for self-employment and financial attainment (Roller, 2004; Davey, Evans, & Stupans, 2006; Willis et al., 2006; Seston, Shann, Hassell, & Willis, 2006). Entrepreneurial intentions and the importance of balancing part-time work and family-building have recently found to be particularly prominent factors for UK students (Hassell, 2006a,b; Seston et al., 2006).

What is less clear in the literature is how student attitudes and perceptions may change over the course

of their period of study, and how these are affected by their education and experiences. Pharmacy student and graduate attitudes and aspirations have been gauged at different stages in the research literature, ranging from pre-degree consideration, bachelor entry-level, doctorate entry-level and up to a decade post-registration (Cline, Mott, & Schommer, 1999; Davey et al., 2006; Hassell, 2006a). Although this has presented a coherent and to some extent international picture of the overall characteristics and aspirations of pharmacy (under)graduates, neither cross-sectional analyses nor generalisation across studies are designed or likely to detect changes within cohorts over time.

Longitudinal or retrospective research that aims to reveal such factors is limited but there are some indications, for example, that with the onset of clinical teaching in later years of study comes a major shift in perceptions where students report increased satisfaction with the course and more positive views about its relevance, but that negative attitudes towards practice are also most prevalent among final-year students (Jesson, Langley, Wilson, & Hatfield et al., 2006). Anecdotal accounts in the literature by practising

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pharmacists have also raised concerns about the role of undergraduate study in diminishing empathy (Gums, 1994; Walker-Renard, 2004).

A wider body of research exists that assesses attitude changes by undergraduate medical students during the course of their degree, in which a particular focus has been on a hypothesised development of “cynicism” by students. Studies have, for example, characterised attitude changes in terms of a loss of idealism, with a decline of importance placed on co-operative working relationships, the doctor–patient relationship, preventive medicine and social factors in health (Woloschuk, Harasym, & Temple, 2004). It has also been reported that, due to the emphasis in education on “affective distance for the purpose of clinical neutrality”, and because of other factors including student subculture, many medical students become measurably less empathetic and more cynical during their studies (Hojat et al., 2004). Others have found that medical students become more cynical and money-oriented during their course of study but also more concerned for patient care (Wolf, Balson, Faucett, & Randall, 1989) or that the value placed by students on ethics diminished over their years of study (Tiberius & Cleave-Hogg, 1984). Events particular to medical student learning experiences, such as the apparently widespread mistreatment of students in hospital settings (Uhari et al., 1994; Kassebaum, & Cutler, 1998) may further lead to what has been termed “deidealization” (Wolf et al., 1989). Despite this range of concerns, others have found that medical students’ altruistic intentions are not lessened over their course of study (Petrie, White, Cameron, & Collins, 1999) nor are characteristics associated with warmth and caring (Zeldow, and Daugherty, 1987). Attitude changes during study relating to the development of a professional self-identity are likely to vary between courses and vocations according to differing socialisation processes. Medical training, for example, is reported to exert a far more powerful socialisation process on students than law (Cavenagh, Dewberry, & Jones, 2000).

It is unclear to what extent the effects of pharmacy educational experiences on student attitudes are comparable with subjects such as medicine but the potential implications of attitude shift are of interest and concern, particularly in light of the continued focus in pharmacy education and practice on models of pharmaceutical care which are at their core humanistic and patient-centred (Berenguer, La Casa, de la Matta, & Martin-Calero, 2004; Foppe van Mil, Schultz, & Tromp 2004).

As regards the perspectives of students on the content of their course of study, there is some evidence that student perspectives alter during their degree, where opinions held about an excessive emphasis on science components early on tend to change towards an acceptance of their value later in the course (Jesson

et al., 2006). Gauging student perspectives on their course of study in this way may enable course delivery appropriate to students’ learning and practice. Moreover, assessing students’ perspectives on current professional debates such as the balance between science and practice in the curriculum may enable educators to see these problems from a new viewpoint (Jesson et al., 2006). The implications of student perspectives are also relevant because students may be influenced not to work as pharmacists and/or to change their course of study in those instances where they feel the pharmacy course is not meeting their expectations (Willis et al., 2006).

The study described here examined attitudinal changes within the BPharm student cohort at the National School of Pharmacy at the University of Otago, New Zealand, over a three year period between the start of the School-specific programme in February 2004 to its completion in October 2006. Although the BPharm degree is four years in length, most students are admitted at the end of a common health sciences first year; graduates who are admitted into the programme are either required to complete certain papers of this year or are credited with the whole of it, depending on their previous study. All applicants, whether first years or graduates, may apply for entry to one or all of the four health science programmes—dentistry, medicine, pharmacy and physiotherapy—offered by the University of Otago and are not required at application to state a preference for one or other programme. Those who are deemed acceptable by the respective admission committees may be offered places in some or all four schools and must then decide which one to choose. Others, however, will not be given such a broad choice and may as a consequence take a place in a programme that might lead them to a career about which they currently know very little and for which they may have little enthusiasm.

The aim of the study was to investigate the stability or fluidity of attitudes and perceptions relating to motivations for studying and working in pharmacy, aspects of professional practice, career aspirations and commitment, and entrepreneurial intentions. Retrospective opinions on pharmacy as a career and course of study were also examined.

Method

This study, which was approved by the University of Otago Ethics Committee as a Category B application, utilised a follow-up to a questionnaire first completed by University of Otago BPharm students at the start of their Pharmacy programme of study in 2004, which was re-administered to the same student cohort with additional questions.

All students who had been admitted into the School of Pharmacy were surveyed at the start of their first lecture, in February 2004. The same cohort was surveyed at the start of the final lecture during their penultimate week of lectures in October 2006. The (anonymous) questionnaires were distributed around the lecture theatre before the start of the lecture. Students were then given 15 min to complete the surveys and were asked to do so in silence, without reference to their neighbours. At the end of the allotted time, class representatives collected the completed questionnaires and handed them to the academic staff member present (who was not one of the researchers).

The “entry” survey was developed in December/January 2002/2003 following a series of interviews and focus group discussions with current and recently graduated students. It was piloted in 2003 by a group of student researchers on that year’s second year intake, following which a number of minor adjustments were made to ensure consistency and ease of analysis. It was then administered formally, as discussed here, to the incoming second year class of 2004.

The 2004 cohort survey was designed to provide information on reasons for choosing pharmacy as a degree and profession, career commitment and preferred career pathway, and aspects of interest and importance in pharmacy practice and professional life. The seven-page questionnaire comprised 24 separate questions, most of these subdivided into further categories of choice. Most questions were multiple-choice, requiring respondents to rate statements on a Likert-like scale of 1–5, with 5 as most important/very interested, through to 1 as not at all important/not at all interested. The 2006 survey administered to

the original 2004 cohort was based closely on the original questionnaire for the purposes of comparison. Additional questions were included to further assess perspectives on career pathways and open-answer questions were included to investigate retrospective views.

Questions analysed for the purposes of this study with data from 2004 and 2006 related to:

- reasons given for choosing to work as a health professional/pharmacist;
- level of interest held in a range of community pharmacy activities;
- level of importance placed on a range of aspects of professional life;
- career commitment, intentions and ambitions;
- appraisal and comparison of different pharmacy sectors;
- retrospective appraisal of changes in attitude towards pharmacy degree, pharmacy practice and towards the health system (open-ended questions); and
- sex.

Data were collected, analysed and reported either as descriptive statistics (Figures 3, 4 and 6) or as priority ratings (Figures 1, 2 and 5) when forced choice options were required. (A first choice factor was accorded a score of three, second choice two and third choice one, with scores weighted to give a final score out of 100. The priority score = factor total/ (3×100) 100. Thus a final score of 100 would indicate maximum possible importance of a factor while a score of zero indicates that it was rated as being of no importance at all.)

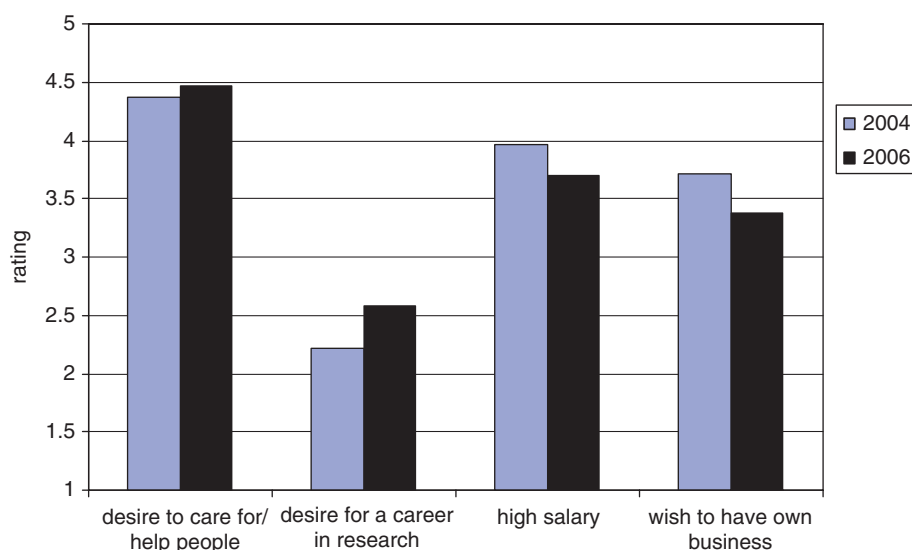


Figure 1. Motivations for working as a health professional across years.

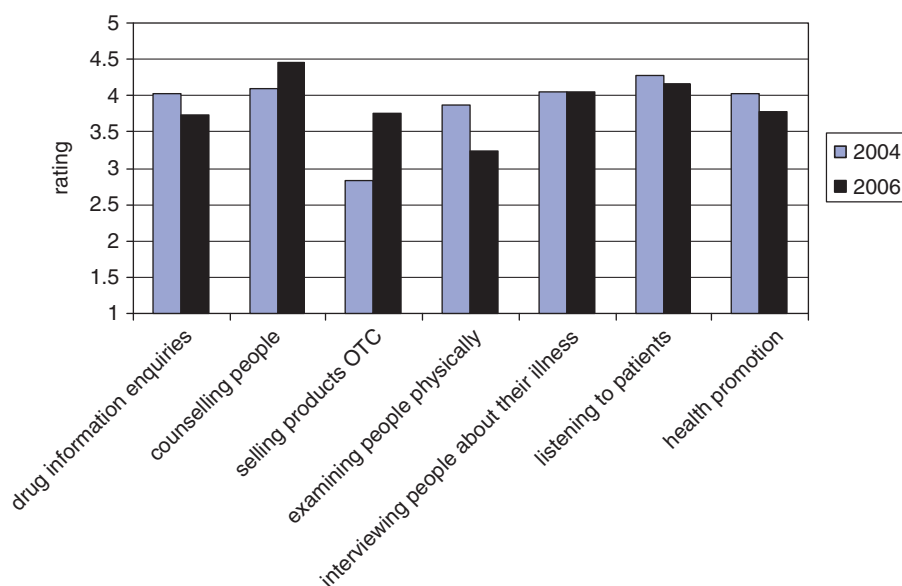


Figure 2. Levels of interest in pharmacy activities across years.

Results

Longitudinal comparisons

One hundred and three (of a total of 110) and 106 (all) students completed the 2004 and 2006 questionnaires respectively. The proportion of male to female students was similar each time, with 40 males (37% of cohort) responding in 2004 and 42 (40%) in 2006.

Motivations to work as a health professional remained reasonably consistent through students' course of study. In response to the question "why do you want to work as a health professional?" Figure 1 shows importance ratings of sample factors relating to altruistic intent ("I want a job where I care for/help people"), interest in a research career, importance of salary and pharmacy ownership, each compared between 2004 and 2006. Other factors investigated remained very similar between 2004/2006, such as desire to work in community pharmacy (3.94 in 2004, 3.92 in 2006) and the status of the profession (3.65 in 2004, 3.62 in 2006).

There was a significant increase ($p = 0.005$) in the number of students who indicated, given a yes/no choice, that they "now want to be pharmacists" from 83% ($n = 83$) in 2004 (when 55 of the 103 students had stated that they would have taken a place in medicine, dentistry or physiotherapy, had it been offered) to 95% ($n = 101$) in 2006. Of the five students who said they did *not* want to become pharmacists and provided a reason why, one stated that "it is not a career path for me", one cited dissatisfaction with the status of the profession—"not as prestigious as I thought"—and one indicated dissatisfaction with the nature of working conditions—"too much workload, too much expectation, too little salary". The remaining two indicated they

intended to utilise their pharmacy degree to enable them to undertake further study, one for a medical degree, the other for a master of business administration.

Some changes were found in attitude towards aspects of practice of most interest to respondents. Higher ratings were given in 2006 than 2004 to "counselling people" and "selling products", and a lower rating was given to "examining patients physically" with other minor variations evident (Figure 2).

There were some limited changes on level of importance placed on the range of aspects of professional practice. "Respect in the community" increased in importance from 3.80 in 2004 to 4.11 in 2006, as did "being a professional" from 4.21 to 4.41. "Working in the community" declined in importance from 4.19 to 3.93. Among the range of other factors, 2004 and 2006 figures were very similar, including "earning a good salary" (4.22 in 2004 vs. 4.20 in 2006), "reliable employment" (4.49 vs. 4.42), "owning my own pharmacy" (3.52 vs. 3.61) and "being in charge of others" (3.06 vs. 3.19).

Few changes were evident between the years 2004 and 2006 in the level of interest held in a range of practice activities. Very little change was shown over time in interest in prescribing drugs (3.89 in 2004 vs. 3.86 in 2006), compounding drugs (2.62 vs. 2.61), or interviewing patients (3.00 vs. 3.05). Slight changes were evident in level of interest in drug information enquiries (3.02 in 2004 vs. 2.73 in 2006) and in counselling people (3.09 vs. 3.47). The largest change in interest in an aspect of practice was in selling products which received a rating of 1.83 in 2004, increasing to 2.76 in 2006.

Lifetime professional ambitions showed some variation between 2004 and 2006 (Figure 3). The proportion of students indicating they wanted

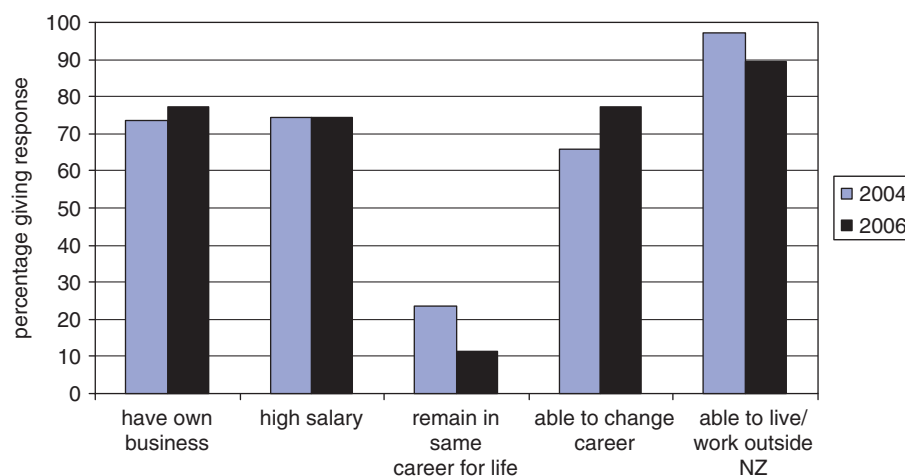


Figure 3. Lifelong career aspirations.

to stay in the same career for life more than halved, from 24% in 2004 to 11% in 2006. This was matched by a corresponding increase in those stating they wished to be able to change career direction. The percentage of students stating a desire to live and work abroad declined slightly though remained high. There was a slight increase in the proportion of those wanting to own their own business.

Data comparing students' responses to the question of which one pharmacy career path they would choose "if you had to choose a career path today" show changes between 2004 and 2006 (Figure 4), although it is problematic to compare directly as an additional option to work as a "manager/pharmacist for a multiple chain community pharmacy" was provided in the 2006 questionnaire, following some major structural changes in the New Zealand community pharmacy sector during the years 2004–2006. Responses nevertheless show a large drop-off in interest in hospital pharmacy over the course of

study compared to other sectors, with a decline also in interest in pursuing a research career, working in education (lecturer) and in public administration. Seventy percent of students in 2006 chose community pharmacy (owner/manager) compared to 41% in 2004 though again results should be compared with caution.

Sector comparisons, career breaks and sex differences (2006 respondents only)

When asked to compare aspects of different pharmacy sectors (Figure 5), students rated community pharmacy most highly in comparison with hospital, research or academia in terms of opportunity to work as part of a team, to earn a good salary and to obtain job satisfaction. Hospital pharmacy was rated highest in terms of opportunity to apply pharmacy knowledge.

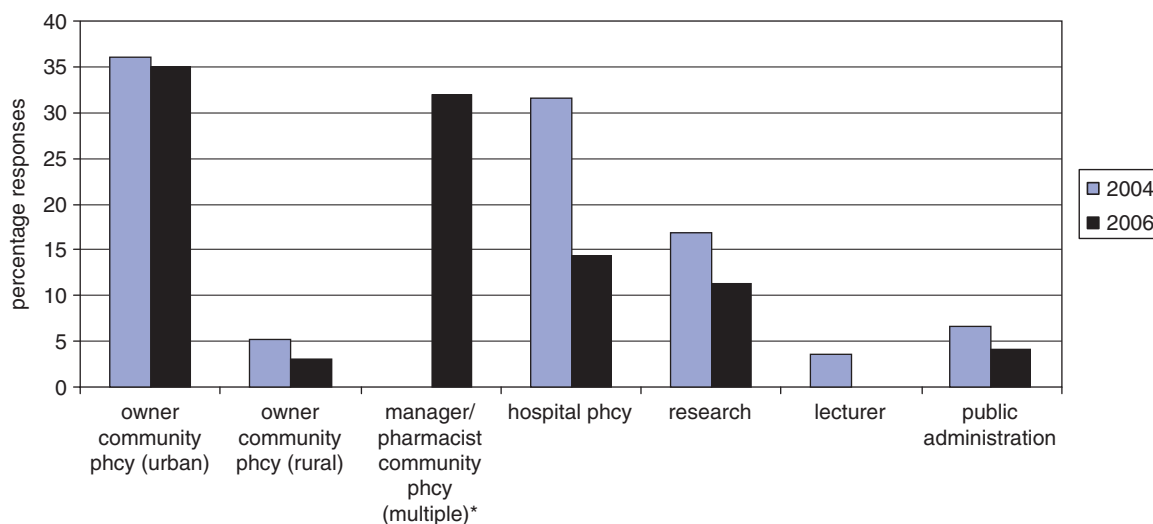


Figure 4. Chosen pharmacy career across years * choice not offered in 2004.

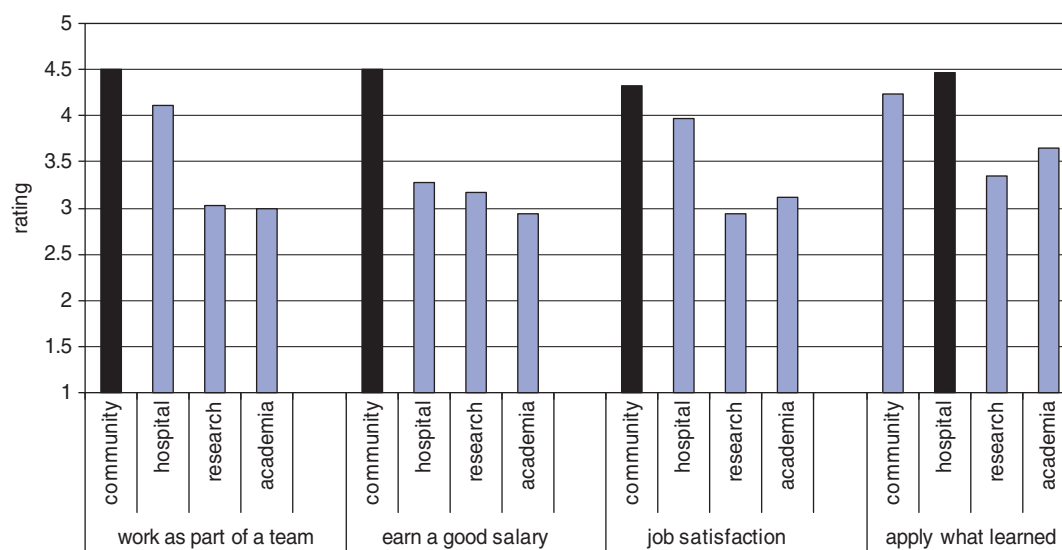


Figure 5. Appraisal of different pharmacy sectors across years.

Ninety three percent ($n = 99$ of 106) of students in 2006 stated that they anticipated taking a career break during the course of their life. Sixty four percent anticipated taking a career break to start a family, 69% for further study and 80% for travel abroad (not including pharmacy work).

Sex differences were found in a number of areas within the responses given by the 2006 cohort (Figure 6). Male students showed greater desire to own their own pharmacy and for a high salary “during the course of my life” than female students. Female students showed greater interest in working in hospital pharmacy and for multiple chain pharmacies than did males. Female students showed greater intention to take a career break during their lives, with 100% of female students and 84% of male stating this. Female

students stated more frequently than male students that they intended to take a career break to start a family (77% vs. 34%).

Retrospective views (2006 respondents only)

Ninety percent of students surveyed ($n = 95$ of 106) completed at least some part of the retrospective, open-ended section of the questionnaire. Two hundred and 46 responses were provided in total; of these only 27 expressed some negativity, most about the heavy workload of the degree programme or what they had discovered (or perceived) to be the state of the health system in general and/or the place of pharmacy in the overall healthcare team.

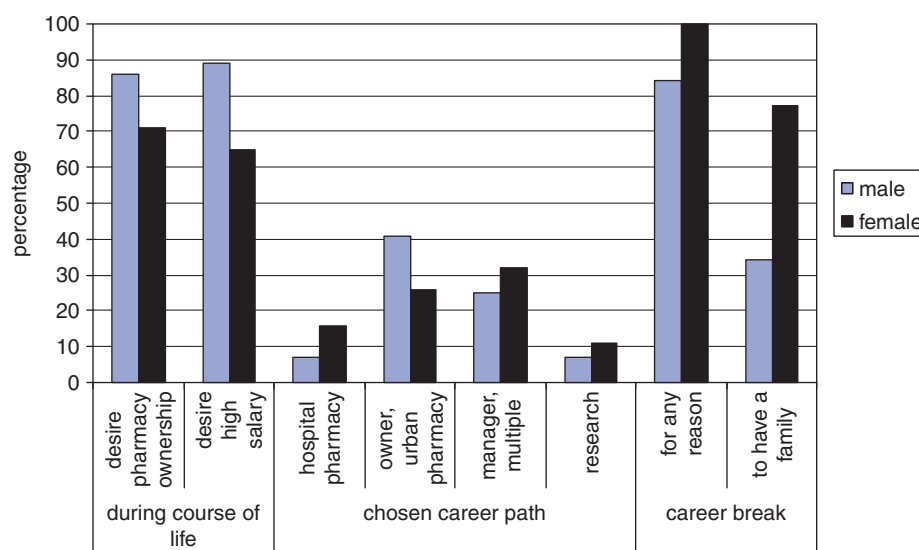


Figure 6. Sex differences in career aspirations.

Fifty nine responses were provided to the question "How have your views changed of pharmacy as a career?" All but six responded positively. For example: Pharmacy was portrayed as offering multiple career pathways, choices and opportunities by 26 of the 59 students (44%) who completed an answer to this question, for example:

It's a much more flexible and professional career than I expected, with lots of opportunities for development in the health sector.

An emphasis on variety in professional work was also mentioned by 19% of students ($n = 11$ of 59):

it is a career that you have to be good in a lot of aspects i.e. communication, accuracy in diagnosis, counselling, able to work with others etc.

Nineteen percent of students ($n = 11$ of 59) who completed this section expressed intentions towards professional life that were positive and ambitious:

Nothing has changed, I am where I want to be and loving it. The prospects are great provided you know what you want and you get it right.

The professional role(s) of pharmacists was contrasted with what students perhaps perceived to be a popular misrepresentation of pharmacists as "pill-counters":

I think it is definitely an interesting career, the move from simply the counter of pills to a trusted counsellor and health professional definitely ups the job satisfaction.

In the 2nd year, before the externship, I thought that all we did was count pills and type out labels but now in the 4th year I know this is not the case, pharmacy comprises so much more.

Other remarks emphasised students' recognition of the importance of—and enthusiasm for—communication and direct patient care in professional pharmacy, for example:

Pharmacists are very important in communicating medical information in everyday language to the general public.

One student also indicated a shift from an extrinsic to intrinsic focus for their career:

I started off looking at career prospects as a main focus, now it's more about helping people and achieving job satisfaction through this.

An issue of concern to one student, however, was the expectation/realisation that the degree of involvement in direct patient care may be limited:

Pharmacy is not as involved in patient care as I'd like it to be. I think we are often very limited due to

stigma and perceptions of how much a pharmacist knows and can do.

One, however, was concerned about having too much involvement and confessed to being "scared of messing up".

Two students had come to the realisation that pharmacy was not the career for them, while two others were concerned about a possible future oversupply of pharmacists, especially as a consequence of reduced opportunities to practise in the UK.

Forty one responses were provided to the question "How have your views changed of pharmacy as a course of study?" Ten of 41 students (24%) indicated that their expectations about the "science" (chemistry in particular) component of the course varied from the actual content. This in some cases was related to an apparent preference for applied/practice issues over the natural sciences:

We need to emphasise more the practical and clinical aspects of pharmacy, currently there is too much science involved in the course.

In relation to this, a number of responses indicated a realisation during the course of the importance of communication skills. Other responses referred to the pharmacy course as being interesting and/or challenging, to the development of transferable skills and to the integration of different aspects of the course over the years of study.

I have become more interested as the degree progresses and becomes more integrated.

Forty three responses were provided to the question "How have your views changed of the health system and/or of other health professionals?" Recognition of the importance of multi-disciplinary work was mentioned by 37% (16 of 43) of students completing this section:

I see now that there is a lot of importance in establishing a good relationship with doctors and other HPs [health professionals] in order to best help a patient.

Three students referred to an apparent perception of the supportive role pharmacists play for doctors, e.g.:

I realise now how much doctors rely on pharmacists to pick up on mistakes.

There were mixed opinions about the relative status of pharmacists:

other HPs need pharmacists input for the well-being of patients. I did not know how relevant pharmacist's opinion can be.

we are actually down at the bottom of the medical hierarchy.

Some students' remarks indicated heightened respect for other HPs, for example:

I have gained a lot more respect for HPs for the expectations and responsibilities they carry for the community.

Four others seemed reassured that:

doctors make mistakes as well.

Other comments related to students' growing realisation of (and surprise at) the extent of regulation of the health system.

In response to a question requesting advice for others considering a pharmacy degree or career, 55 responses were provided. Suggested advice often emphasised the perceived positive aspects to the profession (20 responses or 36% can be characterised as such), such as working reasonable hours (including the importance of this for parenting), choice and variety of career options, and of pharmacy as being generally "rewarding" or a "good career", for example:

a fulfilling and satisfying career, feel like you have a sense of purpose.

it is a good career especially for women as it allows us to look after kids while working.

Other advice was more conditional, recommending that pharmacy represents a good career for those with certain characteristics or preferences, these including an interest in science and/or direct patient care:

if they have good communication skills and enjoy helping people then pharmacy is great for you. Also great for mothers.

it is not purely chemistry, so good communication skills will be important. Must learn good listening skills. Pharmacy is a continuing education career, so although you learn a lot from the School, learning outside will also be useful.

A number of responses also recommended gaining work experience in a community pharmacy prior to committing to a degree course to gain insight into the profession.

"Other" comments included two expressions of concern about the nature of the profession, particularly in regard to (limitations of) direct patient care and pharmacists' responsibilities:

I have enjoyed the medical environment, learning health science but not sure if it's for me at this stage. I prefer more hands-on skills with direct patient care not just a middleman who can get in a lot of trouble if the tiniest mistake is made.

Community pharmacists at the moment do not have the power to make much difference to how or what [medications] are prescribed. This is because they are always on the receiving end of doctors' scripts. People need to work together more.

Differing opinions were given on the desirability of working as a professional pharmacist and with regards to the perceived status of the profession:

pharmacy is a highly respected profession, it also allows you to work during the week and still have weekends free.

pharmacy is going down in NZ, longer hours and worsening pay.

Discussion

This study does not support the notion that empathetic or altruistic attitudes decline over pharmacy students' course of study. The degree to which students' motivations to practise pharmacy were related to "a desire to care for/help people" remained virtually unchanged when comparing ratings given at the start and end of their BPharm course; furthermore this motivation persisted as students' self-reported primary motivation to work as health professionals. Indeed, the difference between the importance placed on altruistic and financial motivations doubled between 2004 and 2006. In addition, aspects of practice relating to direct patient care, such as counselling people, "interviewing people about their illness" and "listening to patients" remained at a similar level from the beginning to the end of their studies. The character of numerous responses given to the questionnaire's open-ended questions reinforced these results with students towards the end of their degree indicating a range of beliefs that can be summarised in the statement by one individual that "pharmacy is... about helping people".

These findings contrast with medical education studies which have suggested that attitude change relating to some form of "empathy decline" over the course of study is a relatively robust phenomenon (Woloschuk et al., 2004; Hojat et al., 2004). Whether these differences are due to the particularities of the courses of study or because, as has been suggested, there are certain circumstances in which medical students may be at risk of some form of de-idealising "abuse" (Uhari et al., 1994) is unclear. Of course, the extent to which medical and pharmaceutical education are comparable is limited and from the results of this study at least, do not appear analogous on the question of empathy decline. That said, as this study used data which was to some extent secondary (the study questionnaire was not originally designed to

test for the maintenance of empathy over course of study) it may be of value in future research to re-examine this question longitudinally with measures more closely constructed for the purpose, such as an adaptation of a "Physician Empathy" scale (Hojat et al., 2004). This would contribute to the validity of assessing attitude changes as well as enabling more robust comparisons between pharmacy and medicine. It should be noted that the findings of this study in no way offer any comparison of the overall degree of altruism/empathy extant between pharmacy and medical students.

As to the related question of the development of a degree of cynicism by students, a number of remarks from this study's respondents did indicate some doubt or negativity about pharmacy practice, especially towards the health system. To what extent this may be considered inevitable, even somewhat desirable in cases where individuals may hold unrealistic ideals, is arguable; however, this study found only very limited evidence to support the idea of a particularly pessimistic or cynical soon-to-graduate body. This question may be worthy of further attention, however, particularly given that the majority of students will pursue community pharmacy registration subsequent to graduation. It is also interesting to note that whilst the question of student attitude changes during a course of study have been well addressed in medicine, comparable studies seem largely absent in pharmacy and for other health disciplines.

The apparent maintenance and development of a generally altruistic, patient-oriented set of attitudes among this cohort may in part be related to the self-reported realisations by a number of students about the extent to which pharmacy emphasises communication (with patients and other professionals) in addition to more "science"-based aspects to the work. This study's open-ended questions also elicited a number of remarks that favourably contrasted the realities of professional pharmacy practice with the stereotype of the "pill counter," which some students themselves apparently held at earlier stages in their studies. The implication was that pharmacy students may during their studies find themselves pleasantly surprised at the scope and opportunities afforded by their potential careers. A frequent theme emerging from student remarks was a positive recognition during study of the variety of career pathways available—such realisations may help engender optimism about the profession, particularly among that part of the student body that had initially attempted entry to medicine. A further implication of a growing awareness of career options may be the reduction by half from 2004 to 2006 of the proportion of pharmacy students indicating that they expected to "remain in the same career for life". This is in keeping with research in the UK which has shown a majority of pharmacy students are "certain" that they wish to pursue multiple careers and/or take career

breaks (Hassell, 2006b; Willis et al., 2006). Whether students' aspirations towards practice are met would require follow-up work in the future. This would be valuable, particularly in light of the concern that students' aspirations towards direct patient care may in some cases prove to be at odds with distribution-based pharmacy models still prevalent in practice (Siracuse et al., 2004).

Students' entrepreneurial aspirations appear to have remained undiminished by their years of study, with around the same proportion of respondents in 2004 and 2006 indicating they would like to own their own business during their lifetime, and similar proportions also stating their chosen career to be pharmacy proprietorship. The level of entrepreneurial intent started high and remained high, a finding aligned with other research that has indicated pharmacy ownership to be the "top ambition" for students (Wilson et al., 2006). More male than female students indicated entrepreneurial intent and aspirations, a finding in keeping with research from the UK (Seston et al., 2006) and Canada (Cockerill, & Tanner, 2001). Hospital pharmacy saw a decline in interest over the years of study. As community pharmacy was appraised most favourably by students in comparison to hospital, research and academia team in terms of salary, and job satisfaction (although hospital was assessed as affording more opportunity to apply pharmacy knowledge) this might explain why the majority of students wished to move into community pharmacy. Other research has indicated that students perceived hospital pharmacy as offering poor salaries but good opportunities to interact with patients (Silverthorne et al., 2003) and that female students were more attracted to the sector (Hassell, 2006b). The difficulties in engendering interest in hospital pharmacy has elsewhere been referred to, where students are reported to have perceived the sector to be badly paid, dull and repetitive (Hatfield, Marriott, & Harper, 2000).

That the proportion of students stating they "want to become a pharmacist" increased significantly over the course of study is in keeping with findings from the UK which have portrayed pharmacy students as developing strong levels of career commitment (Seston et al., 2006). With high proportions of students intending to take career breaks, many of these to start a family, it is likely that part-time and interrupted career pathways will continue to emerge as a factor in professional practice in New Zealand. In New Zealand, as elsewhere, females now make up the majority of students and graduates (Pharmacy Council of New Zealand, 2005) and thus emerging preferences for part-time work patterns may present the profession with supply problems in future (Hassell, 2006a,b). Whether pharmacy's flexible work arrangements will be able to accommodate the growing number of individuals aspiring to work part-time and intermittently remains to be seen.

With respect to retrospective appraisal of the pharmacy course of study, student remarks tended to emphasise the contrast between science and practice elements. It is worth noting that these do not simply reflect those within the student body that “don’t like science” but also a degree of surprise at the emphases on such aspects as communication and clinical care within the curriculum. A number of remarks expressed the opinion that the later parts of the course wherein there is greater integration between course elements were of more value and more satisfying. This finding is similar to that of Jesson et al. (2006) who reported a desire among students for better science-practice integration and contextualisation during the early part of their studies. A more comprehensive student evaluation of course components is naturally a procedural component of course review in pharmacy, however these data were not available for the purposes of this study.

This study is limited to one student cohort, surveyed once at the beginning and once at the end of their pharmacy degree. Suggestions made about attitudinal aspects rely on a degree of inference from responses to a number of questions the validity of which have not been separately tested, although altruistic motivations for pursuing pharmacy have been shown with consistency across countries and over many years (Pratt, 1956; Smith et al., 1974; Ferguson et al., 1986; Willis et al., 2006). The last of these studies questioned UK students about the degree of importance placed on “a desire to help people” which can be considered largely comparable to this study’s own measure of “a desire to care for/help people”.

It will be of additional value to follow up the student body at intervals in the future, particularly on completion of the internship most pursue with a view to registering as pharmacists, and at subsequent stages in their careers. Further longitudinal evaluation of student attitudes and choices would also benefit from student survey at a mid-point in their studies and from the use of established scales (for example the physician empathy scale of Hojat et al., 2004).

Notwithstanding the several limitations of this study, one very encouraging outcome has been the increased positivity of those surveyed towards their profession, whether this was initially “chosen” or not. Whether this was a consequence of exposure to clinical pharmacy practice, the integration of pharmaceutical sciences into this practice, the recognition of a range of possible career opportunities or simply the growing maturity of the students cannot, of course, be teased out by this study. Nevertheless, the results do indicate that this pharmacy curriculum and the academics who teach it have made a difference to the enthusiasm of these future graduates for the profession of pharmacy.

Summary and conclusions

This study has revealed a remarkable degree of consistency between students’ motivations to study and work as pharmacists between the start and end of their period of study, including indicators of altruistic and empathetic motivations. This appears to contrast with a number of studies in medical education though further research would be required to inform the comparison. Students in general favourably compared community pharmacy with hospital pharmacy, and interest in hospital pharmacy appeared to decline over course of study. Intention to remain in the same type of pharmacy career for life declined over the course of study, linked to students’ recognition of multiple career pathways for pharmacy. Entrepreneurial intentions remained high particularly among male students. A very large proportion of students expected to take career breaks.

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