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Article

Pharmacy Student Perceptions of Pharmacist Prescribing: A Comparison Study

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Abstract: Several jurisdictions throughout the world, such as the UK and Canada, now have independent prescribing by pharmacists. In some areas of Canada, initial access prescribing can be done by pharmacists. In contrast, Australian pharmacists have no ability to prescribe either in a supplementary or independent model. Considerable research has been completed regarding attitudes towards pharmacist prescribing from the perspective of health care professionals, however currently no literature exists regarding pharmacy student views on prescribing. The primary objective of this study is to examine pharmacy student's opinions and attitudes towards pharmacist prescribing in two different settings. Focus groups were conducted with selected students from two universities (one in Canada and one in Australia). Content analysis was conducted. Four main themes were identified: benefits, fears, needs and pharmacist roles. Students from the Australian University were more accepting of the role of supplementary prescribing. In contrast, the Canadian students felt that independent prescribing was moving the profession in the right direction. There were a number of similarities with the two groups with regards to benefits and fears. Although the two cohorts differed in terms of their beliefs on many aspects of prescribing, there were similarities in terms of fears of physician backlash and blurring of professional roles.

Keywords: pharmacy prescribing; pharmacy education; qualitative; international

1. Introduction

Pharmacist prescribing can range from prescribing by protocol to independent prescribing. Several jurisdictions throughout the world now have independent prescribing by pharmacists. In Alberta, Canada, all pharmacists may adapt a prescription and prescribe in an emergency, whereas only those with additional qualifications may also prescribe for initial access (independent prescribing) [1,2]. Pharmacists in Alberta obtain this qualification by providing a portfolio of evidence which is reviewed by the Alberta College of Pharmacists and independent prescribers. Australia is just starting the pharmacist prescribing process by defining prescribing competencies and developing a national framework for non-medical prescribing [3,4].

Considerable research has been completed regarding attitudes towards pharmacist prescribing from the perspective of practicing pharmacists, physicians and nurses [5–8]. Currently no literature exists regarding pharmacy student views on prescribing. Pharmacy students are being taught to practice in an environment with advancing clinical roles, however, the question remains: does this actually make them more ready to accept the increasing responsibility that comes with these new practice environments and perhaps more importantly, are students willing to practice within this new environment?

At the University of Alberta (Canada), pharmacy students are enrolled in a four year Bachelor's program after completing a minimum of one year in a pre-pharmacy program. The four year program consists of 16 weeks of clinical placements within the fourth year of study. Students are also required to do six weeks of early practical experiences during their first two years in the pharmacy program. Increasingly pharmacy students are interacting with pharmacist prescribers. In fact, several members of the faculty are registered independent prescribers. Students at the University of Alberta have the opportunity to see pharmacist prescribing in practice during experiential learning placements, as well as in the classroom setting with their instructors.

At Curtin University (Australia), students also complete a four year Bachelor's program; however there is not a pre-pharmacy requirement. Students are involved in 12 weeks of clinical placements within their fourth year of study, but there are currently no requirements for other experiential work during the program. Almost one year of internship training is required prior to registration as pharmacists however this is not part of the university program. Moreover, at Curtin University, no faculty members are pharmacist prescribers. Curtin University students, therefore, have no interaction with pharmacist prescribers and have no experience seeing pharmacist prescribing in practice, as pharmacist prescribing has not yet been legislated in Australia.

The primary objective of this study is to examine pharmacy student's opinions and attitudes towards pharmacist prescribing in two different countries.

2. Methods

2.1. Data Collection

Focus group interviews were chosen to allow for the exploration of participants' views by generating interaction and discussion between participants. Focus groups were limited to a maximum of 60 minutes. Interview sessions started with "Ice-breaker" questions, which were followed by more specific transition questions pertaining to supplementary and independent prescribing models. A definition for each prescribing model was provided to the participants (Table 1). All students were asked to describe advantages and disadvantages of each of the models. Key questions related to whether and under what circumstances participants would assume expanded prescribing roles. Questions were derived from the literature as well as input from both pharmacist prescribing researchers and pharmacist prescribers [9]. Examples of the key questions are below:

- What benefits do you think there are with supplementary and independent prescribing?
- What problems do you think there are with supplementary and independent prescribing?
- Would you assume an independent prescribing role if this was offered to you?
- If you were to assume a prescribing role [supplementary or independent] would you need additional training?
- If yes, in which areas would you need this?
- Where do you see pharmacist prescribing fitting into the role of pharmacists within the health care system?

To avoid introducing hierarchical bias from pharmacy teaching staff, focus groups in both countries were facilitated by pharmacy students enrolled in research programs, as well as a researcher with experience in qualitative methods. None of the researchers involved in facilitating the focus groups were part of the Pharmacy faculty or involved in teaching students. All audio-recorded data were transcribed verbatim into Microsoft Word. Principal investigators of this study then confirmed transcribed data with field-notes and the recordings. Inductive content analysis was performed. This analytic method is conducted by listening and re-listening to the recorded data to identify recurrent themes and also notable omissions from participants. Results were then triangulated and verified by the researchers from both universities.

Table 1. Definitions of prescribing [10,11].

Supplementary prescribing	Voluntary prescribing partnership between an independent prescriber and a supplementary pharmacist prescriber, to implement an agreed patient-specific clinical management plan with the patient's agreement [10].
Independent prescribing	Prescribing by a pharmacist who is responsible and accountable for the assessment of patients with undiagnosed and diagnosed conditions and for decisions about the clinical management, including prescribing [11].

2.2. Sample

Two cohorts of fourth year pharmacy students from two different jurisdictions were invited to participate. Students from other years were not chosen as the aim was to capitalize on participants'

common experiences and level of pharmacy training, as described in the introduction. Students from the University of Alberta were selected using convenience sampling and invited to participate in focus groups. Curtin University students were randomly selected from the entire fourth year student cohort, using a random number generator and invited to participate in focus groups. The difference in selection of the sample was based on logistical factors related to differences in when students were available. At the University of Alberta, only half the fourth year students were available at the time the focus groups were conducted (the other half were on placement), whereas all students at Curtin University were available. All students who participated had not yet completed their fourth year clinical placements. In total 3 focus groups at the University of Alberta of 5 to 7 students and 4 focus groups at Curtin University of between 3 and 9 students were sufficient for achieving saturation. No incentives were provided for participation.

Focus groups were conducted at the beginning of semester for each cohort to avoid potential interference with students' study related activities (September for University of Alberta students and February for Curtin University students). Students were informed that the sessions would pertain to pharmacist prescribing but were given no further information prior to attending the session. Invited students were not required to participate. Ethics approval was granted by the Health Research Ethics Board at University of Alberta, and the Human Research Ethics Committee at Curtin University. All students were clearly informed that their participation was voluntary and without consequence to their academic standing. All focus group participants provided written consent.

3. Results

Thirty-nine students participated in the focus groups, 19 students from the University of Alberta (Canada) and 20 from Curtin University (Australia). Four themes were identified from the content analysis of the focus groups. These themes include "benefits", "fears", "needs" and "pharmacist roles" and are defined in Table 2.

Table 2. Defines these main themes.

Theme	Definition
Benefits	How the students felt pharmacist prescribing could be advantageous to the pharmacists as professionals, the health-care system, and to patients. Includes anything that was seen as a positive related to pharmacist prescribing.
Fears	This relates to any of the concerns or anxieties students displayed over practicing in an environment that includes pharmacist prescribing. Includes any barriers to pharmacist prescribing or feelings of apprehension around pharmacist prescribing in general.
Needs	Pharmacy students identified things that were required for them to feel comfortable with prescribing. This includes infrastructure, to changes in the health-care system and requirements for further education.
Pharmacist Roles	Pharmacy students discussed how they saw pharmacist prescribing fitting into the health care system. Includes role limitations and separation of roles from other health-care practitioners, as well as separation of roles within the profession of pharmacy.

3.1. Benefits

Both groups of students identified several benefits of pharmacist prescribing. First were benefits to the health-care system, especially in terms of efficiency and saving time for both patients and physicians. More specifically students described the accessibility of pharmacists as a benefit to patients, and also emphasized the importance of this as part of the identity of the profession. As one University of Alberta student said, *"It offers you a little bit more flexibility. So if you, as a pharmacist, make an assessment and visit one-on-one with your patient, it saves you time, because you don't have to go and track down the doctor and collaborate and get them to do it for you. It builds that patient/pharmacist relationship because they see you as a care giver and taking an interest in their lives"*.

Students from both groups also discussed the benefits pharmacy prescribing would have for the profession. In particular the students felt that prescribing authority would allow them to practice pharmacy at the level they are trained at in university and also help patients and other healthcare practitioners to recognize pharmacists' existing expertise. As one Curtin student said, *"It's kind of incorporating us where we should be within the health profession and {not} just seen as people who dispense medication and has no other training"*. Students also had the sense that "*in general in the community there's a lot of underestimation of the skill of a pharmacists. They don't see us as having this level of training and it's just that person you go to pick up the (acetaminophen)"* (Curtin University student). They further discussed how prescribing is a reasonable extension of what pharmacists do in terms of making recommendations and it would, more importantly, ensure that there was seamless care as pharmacists themselves could ensure that the recommendations were followed*: "I see it working best when there is a high level of communication and contact and you can create that perfect seamless care"* (University of Alberta student).

There were also important differences between the groups of students with respect to the extent of the benefits they could see coming from pharmacist prescribing. University of Alberta students felt that independent prescribing was more beneficial because it allowed for a higher level of patient care, *"I think it's something that pharmacists should really strive for, if you feel like it would benefit your practise and your patients, and if we don't use it, we'll lose it. I don't think anybody wants to be regressive in our profession"*. A similar sense of urgency for practice change was not apparent in the discussion from the Curtin students, who were primarily in favour of supplementary prescribing. For example, one Curtin University student stated: "*I think it would blur the lines between the roles of a pharmacist and a doctor, I (think) it might cause a lot more problems than benefits. You'd completely take the doctor out the role if you were the one who's implementing, prescribing and then providing the medication*".

3.2. Fears

There were striking similarities between the two groups of students with respect to their fears of pharmacist prescribing. Many of these fears were related directly to taking increased responsibility for patient care. Students felt this was difficult to do given the current practice environment and need for continued follow-up. As one University of Alberta student mentioned when discussing the topic of

follow-up, "*Then who should be doing the follow up? Should it be us then? Because the doctor's already done the diagnosis and then we're just doing all the treatment*".

Further students from both groups felt that there could be backlash from physicians. As one University of Alberta student stated, "*some physicians are adamant that oh, what makes you qualified to prescribe or to make this diagnosis? …It may offend some people that you're doing this".* A Curtin student went on to say, "*I don't think doctors would have a high amount of respect for you as an independent prescriber if you just did a four year degree and they've spent, you know eight years, in medical school, internship, the registering, for you to suddenly take that away from them*". Unlike students from the University of Alberta, Curtin students also discussed concerns and fears from other health-care practitioners, notably nurse practitioners, *"…and then you've got the prescribing nurses who will be like, you know, what about us, that's our role, stay off it, and there's lots of politics behind it".*

Students also expressed trepidation in making decisions regarding a patients' care. In particular, they expressed concern around possible diagnosing patients' conditions: *"At the moment I don't think any of us, or any practising pharmacists have the training to diagnose and then to prescribe"* (Curtin University student). More generally students were concerned about the change in practice necessitated by prescribing and the ambiguity that change would entail. As one University of Alberta student said, *"It's also a comfort thing I find. Like, a lot of pharmacists depending on when you graduated, just don't feel comfortable because you haven't been trained in that way".*

Students also observed that there was a paucity of examples of prescribing activities they could emulate. In fact Alberta students often observed, during their experiential rotations, moments where a pharmacist could adapt a prescription, however, still wanted to get the physician's approval for the change: *"I've seen pharmacists say that they want to {make an adaptation} and then they always go back to, "let's fax the doctor or call the doctor and let the doctor make the decision". They never really want to do it".*

In terms of differences with regards to the theme of fears, the Curtin students were unequivocally afraid of independent prescribing. Although both groups appeared to express a preference towards a collaborative, supplementary approach to prescribing, the fear the Curtin students had for independent prescribing was unmatched by their Alberta counterparts. As one Curtin student said, *"It's the classic conflict of interest that gives pharmacists their role. It's the reason that doctors can't supply medications. It's the reason they can't sell it because there is that conflict of interest and that's why there is that separate role".*

Curtin students also brought up the issue of the potential for patients to abuse the system. More specifically the fear was about patients not following-up appropriately with their family doctor (primary care provider) and using the pharmacists instead, "*There's so many pharmacies at the moment. Who's to say a person won't shop around and say I'll get the highest dose"* (Curtin University student).

3.3. Needs

There were many similarities between the groups with respect to required resources for the successful integration of prescribing into pharmacy practice. Experiential learning was cited by many to be an imperative part of preparing for an advanced role. However, there were slight differences

between the groups in terms of how this advanced education should be structured; Australian students felt that prescribing would require post-graduate certification, while Canadian students were more comfortable with other forms of advanced education, such as specific training courses for vaccination and interpretation of laboratory values. Specialization, whether through advanced certification or experience, was also seen as being important. For example one student stated that *"I definitely want to start by getting the lab values training, so that you can actually order lab values. Because I'm finding that that's a huge area where things could be done so much better"* (University of Alberta student).

The students talked at length about the need for a collaborative working environment. As one student stated, "There are risks in anything if you practice in isolation…there's the checks and balances. I think collaboration is always a good thing… if anybody works in isolation, like if you miss it, then it's a miss. There's no one else to rely on" (University of Alberta student). Students also discussed how prescribing could function within the health care system being dependent on setting and collaboration. For instance, one student from Curtin University suggested that "the pharmacist and the doctor should be working hand in hand anyway for the patient's benefit. I think the current communication methods between the doctor and the pharmacist, even if just supplementary prescribing was to be something we started doing, that would have to be improved". Students also discussed that access to information, such as patients' medical histories, is vitally important to ensure accuracy in prescribing. As one Curtin University student stated "I guess another disadvantage is, to do prescribing, you need to have lots of access to resources, which sometimes are not available in the community".

Staffing and personnel issues were also discussed, mainly in the context of freeing up pharmacists time to do other duties. University of Alberta students talked primarily about the use of technicians and their broadened scope of practice to check prescriptions. Curtin students talked about infrastructure needs in terms of pharmacy design and need for private space (In order to be registered as a pharmacy in Western Australia there are no specific regulations regarding consult space, however to be part of specific programs, pharmacies would require this. In Alberta, there is a requirement for semi-private space.). A Curtin University student: *"If your pharmacy was equipped with an area where you could prescribe medication and people knew that your pharmacy was able to do that and the pharmacist had gone on to do additional training to become a prescribing pharmacist then I would say yes…But at the moment I think the majority of pharmacies are not equipped to do that".*

3.4. Pharmacist Roles

Both groups of students saw a real niche for pharmacist prescribers in rural areas where access to care was limited, particularly in the community setting. As one student from Curtin University said, *"I think if pharmacists can prescribe…potentially you could have the pharmacist looking after like a small rural community".* University of Alberta students also discussed the role of pharmacists in triaging and screening patients. In particular students said, "*If we can solve the problem right then and there, we prevent (from) the patient's perspective to go wait in the clinic for three hours"* (University of Alberta student).

A lot of time was also spent discussing the blurring of professional roles and the overlapping of duties with other health-care professionals. Students expressed a desire to have clearly defined lines

between professions and their respective scopes of practice. This discussion also led into concerns about "stepping on toes": *"There's kind of a blurring of the scopes of our practices, right, because if we have this prescribing and then there's the doctors and then there's the nurses. And there's the optometrists who are also able to do that"* (University of Alberta student). Perhaps in response to this discussion there was also a lot of discussion of role limitations and what prescribing should or should not include. The students felt pharmacists should recognize their limitations and be bound by them. As one Curtin student explains *"I think there must be a boundary of what the pharmacist can or cannot prescribe"*.

Curtin students took this concern over prescribing boundaries slightly further than their University of Alberta colleagues suggesting that there should possibly be some limitations to prescribing to a formulary as a way to enforce these boundaries. University of Alberta students talked more about individual pharmacists recognizing their own boundaries. Curtin students also discussed in more detail a split within the profession, and that clearly not all pharmacists should prescribe: "*I think at the end of the day, suddenly allowing every pharmacist in Australia to be able to prescribe, would be a terrible decision. It's not something that we already have the skills for and it does have to be something that that's earned and extra responsibility on top of the plain pharmacy degree"*. Some Curtin students made an even greater distinction stating, *"I think before it [prescribing authority] gets into a community it would start off in a hospital, as supplementary prescribing, just to see how it goes there. Because you'll have all the clinical knowledge and things like that"*. However, such a distinction was not made by University of Alberta students, who seemed to be working from the assumption that all pharmacists were capable of some level of prescribing.

Another notable difference was the connection of Curtin students to the identity of pharmacists as dispensers, and concerns that pharmacists might lose this role identity if prescribing was sought. As one Curtin student said, *"there's also a lot of potential for pharmacy to lose direction as well…the main sort of role of the pharmacist in a patient's therapy is to supply drugs and drug knowledge. It's not necessarily to look at a patient and diagnose what they've got…we could lose sight of our dispensing role"*. University of Alberta students did not express this concern in terms of the identity of pharmacists.

4. Discussion

The primary reason to undertake this study was to examine differences in the attitudes of students from two universities, one in a jurisdiction with independent prescribing by pharmacists and one without, towards pharmacist prescribing. To begin there were also some surprising commonalities between the two groups. Perhaps most notable were the concerns regarding the attitudes of other health care professionals. This fear of backlash from physicians has also been extensively covered in the literature, and is considered one of the main barriers to pharmacists advancing their practice [12]. Students may have experienced or witnessed repercussions when providing direct patient care while interning or completing their experiential training. Fears about "stepping on toes" and what physicians might think of pharmacists may be partially explained by the media attention pharmacist prescribing has had, and the concerns raised by national physician organizations [13,14].

The need for clear scopes of practice was another common theme. Students from both universities raised concerns about how prescribing blurred the lines between pharmacists and physicians, and even pharmacists and advanced practice nurses. Despite recognition by students that pharmacist prescribing would improve access to care by patients, they were apprehensive about how it could be integrated into the current healthcare system. Some of these fears around scopes of practice may be reflective of the fact that students are not actually familiar with what an expanded scope of practice for pharmacists would look like. For example, in Alberta, despite having the ability to apply for additional prescribing authorization less than 5% of the pharmacist population has applied for and received this ability [15]. As such students are infrequently exposed to well-functioning teams wherein a pharmacist's role is well defined and integrated for the benefit of patients. Students also discussed at length how important experiential training and further education would be in making prescribing a reality for them. For both groups, that additional training would be required to make them ready to take on an expanded scope of practice, despite claims from the Alberta students, in particular, that their current training was sufficient for adopting prescribing. This is similar to what practicing Australian and Canadian pharmacists have cited as being a requirement, and at times a barrier, to expanded scope of practice [7,9,16].

As has been alluded to throughout this section, many of the concerns expressed by the students who participated in the focus groups are also reflected in the concerns raised by practicing pharmacists. This suggests that the students have already adopted what members of our group have called the professional culture of pharmacy [14]. If the profession of pharmacy is truly determined to become a more patient-centred profession, it needs to reconsider how pharmacy students are educated. If the current methods we employ to educate future pharmacists continue to turn out pharmacists who are risk averse and fearful, the profession will remain stagnant.

There were also some notable differences between the groups that may be reflective of the differing scopes of practice for pharmacists in these jurisdictions. For Curtin University students, their main concerns were with independent prescribing and losing sight of the primary role of pharmacists as dispensers and conflicts of interest which may come from prescribing and then dispensing medications. In contrast, University of Alberta students felt that independent prescribing was moving the profession forward and was already within pharmacist's knowledge base.

Taking these findings together there are several factors we feel need to be reconsidered in the training of future pharmacists. First, it is essential that pharmacy students have pharmacist prescriber role models who are actively engaged in taking advantage of advanced scopes of practice available in their particular jurisdiction. The students from both universities seemed to be greatly influenced by these experiences during pharmacy school. By improving these preceptor and mentor relationships with students, there could be an increased desire for students to pursue an expanded scope of practice upon graduation. Secondly, students must be in an environment where positive messages about interactions with other health care professionals are seen and experienced. Interprofessional education may help with this, but it should be combined with positive interactions with interprofessional faculty as well. Thirdly, pharmacy faculty should be promoting a focus on patient-centred care, as this will encourage students to feel that patient care, not dispensing, can be their primary role in the health care team. Previous work has shown that non-pharmacist faculty working within schools of pharmacy may focus on a product-centred role [17]. Finally, students should also be taught that while scopes of

practice are important in helping define who we are as professionals, patient needs should be the primary factor as to what we do in day-to-day practice.

Limitations of this research are that these results may not represent students from these two countries. In addition, prescribing authority for pharmacists in Canada is dependent on province and Alberta has the most independent model when compared to the other provinces. Only students from one university in each country were included, however, these findings represent a snapshot of views of students from their respective countries. We also did not explore in detail where the students' views may have stemmed from (i.e., practice, media, peers) other than their education. In addition, the views are similar to what has been previously published with studies of practising pharmacists.

5. Conclusions

Students from one Australian university appear to have a more limited view of pharmacist prescribing, while their Canadian counterparts have more experience and more positive views with pharmacist prescribing, especially independent prescribing. Even though there were differences, the similarities between the groups regarding fear of prescribing were somewhat surprising. Educators from both jurisdictions can use these results to help bolster pharmacy practice courses to ensure students are being given positive messages of pharmacy practice advancements.

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Conflicts of Interest

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