

RESEARCH ARTICLE

# Pharmacist prescribing training models in the United Kingdom, Australia, and Canada: Snapshot survey

Mariam Ghabour<sup>1</sup> , Caroline Morris<sup>2</sup> , Kyle John Wilby<sup>3</sup> , Alesha J. Smith<sup>1</sup> 

<sup>1</sup> School of Pharmacy, University of Otago, Wellington, New Zealand

<sup>2</sup> Department Primary Health Care and General Practice, University of Otago, Wellington, New Zealand

<sup>3</sup> College of Pharmacy, Faculty of Health, Dalhousie University, Halifax, Nova Scotia, Canada

## Keywords

Curriculum delivery  
Curriculum design  
Pharmacist prescribing  
Pharmacy education  
Training

## Correspondence

Mariam Ghabour  
School of Pharmacy  
University of Otago  
Wellington  
New Zealand  
awama109@student.otago.ac.nz

## Abstract

**Background:** This study sought to identify the differences between training models for pharmacist prescribing across three countries according to the funding, model of prescribing the pharmacist will practice after training, training course framework, method of delivery, assessment, continuing professional development, and barriers and facilitators to enrolment. **Methods:** An online quantitative/qualitative snapshot survey was sent to academics of pharmacist prescribing courses and Deans of different pharmacy schools in the UK (n=49), Australia (n=12), and Canada (n=10). A narrative analysis was undertaken. **Results:** Seventeen pharmacy schools responded (24% response rate). The UK provides postgraduate training courses funded by the government. Canada incorporates prescribing competencies into entry-to-practice courses. Australia does not provide courses yet. **Conclusion:** Pharmacist prescribing is still under-utilised in many countries. Standardisation would reduce variation and improve uptake in countries implementing pharmacist prescribing roles. However, there is currently no international unified system or curriculum for pharmacists' prescribing courses.

## Introduction

Although Organisation for Economic Co-operation and Development (OECD) countries have high-performing and efficient health systems, they still face several challenges, such as an ageing population, an increase in chronic conditions and non-communicable diseases, and a shortage of healthcare professionals. These issues can lead to reduced access to healthcare and medicines and poor patient outcomes (OECD, 2021).

Some countries have developed national strategies to overcome these challenges and ensure that access to healthcare and medicines is not compromised, which, along with other initiatives, such as introducing telehealth, retail clinics, student-run facilities (Bell, 2021), and investing in mobile clinics (University of Southern California, n.d.), has led to the development of non-medical prescribing (NMP) (Cope, Abuzour & Tully, 2016). Non-medical prescribers are health professionals who are not physicians (i.e., pharmacists, dieticians,

midwives, nurses, optometrists, physiotherapists, podiatrists, radiographers) but are qualified to have prescribing rights (Cope, Abuzour & Tully, 2016). In New Zealand, the growth in pharmacist prescribing has lagged behind that of other non-medical prescribers, such as nurses and midwives, reflected in pharmacist prescribers having the lowest contribution to all NMP prescriptions from 2016 to 2020 (Raghunandan et al., 2021). This lag could be due to more educational requirements for a pharmacist to become a prescriber, which makes it a lengthy and expensive training pathway compared to other countries (Raghunandan, Tordoff & Smith, 2017). Pharmacists also have funding constraints to undertake their NMP training, contrary to other health professions, such as dentistry, midwifery, and nursing, which have their clinical training programmes funded by the government (Foreman, 2021). New training and service delivery models are needed to ensure that pharmacists can work at their full scope and help alleviate pressures facing our healthcare system.

The New Zealand Pharmacy Council (the new accreditor of pharmacist prescribing courses) has recently modified the requirements and prerequisites for pharmacist training courses. In response, the two pharmacy schools in New Zealand are currently undertaking changes to their curricula to ensure they are fit for purpose and increase the uptake of NMP training by registered pharmacists (Pharmacy Council NZ, 2021).

This study aims to identify the differences between training models for pharmacist prescribing across three countries according to the funding, model of prescribing the pharmacist will practice after training, training course framework, delivery method, assessment, continuing professional development (CPD), and barriers and facilitators to enrolment.

## Methods

Ethical approval was obtained from the University of Otago ethics committee (#D20/153), and Māori consultation was undertaken with Ngāi Tahu research unit in line with local requirements.

This study implemented an online snapshot survey, including both quantitative and qualitative questions. This design was chosen to allow multiple pharmacy academics to participate and collect various views regarding the research question. An online platform was chosen (SurveyMonkey) for ease of data collection (SurveyMonkey, n.d.).

Pharmacy schools in the UK, Australia, and Canada were surveyed to undertake an audit of different international pharmacist prescribing courses. Alongside the survey, New Zealand-specific data have been collated regarding the design and delivery of the New Zealand pharmacist training course to enable comparisons.

### Survey design

Best practice guidance for developing and conducting online surveys was sought and adopted during the design and data collection phases (Kelley *et al.*, 2003). The survey was developed in several phases:

a) A rapid review of the non-medical prescribing literature was completed, with a focus on pharmacist prescribing in New Zealand, the UK, Australia, and Canada.

b) Then, using the literature review, the research team determined appropriate questions for the survey, with 22 questions selected for all universities and ten and seven additional questions intended for Australian and Canadian universities, respectively.

c) The survey was piloted with convenience sampling of academic colleagues in Canada and Australia, and further questions were added based on responses, such as: “Do you support autonomous prescribing for pharmacists despite the concerns of the Australian Medical Association?” and “Does your institution provide certain orientation/training or CPD programmes – apart from the undergraduate courses – to qualify pharmacists to prescribe?”

d) Minimal language changes were made before rolling out to Survey Monkey.

### Data collection

Academics at all 71 pharmacy schools in the UK (n=49), Australia (n=12), and Canada (n=10) were identified via university websites and invited to participate by e-mail, which contained the participant information sheet.

Survey data were collected from October 2020 to March 2021. The first e-mail invitation was circulated in October 2020 with two bi-weekly reminders, and then answers were collated during October, November, and December 2020. Finally, personal e-mails were sent to known contacts to encourage participation and improve response rates during February and March 2021.

During data collection, all participants were allocated a unique identification number (e.g., Respondent #01, Respondent #02, etc.).

### Data analysis

Data were analysed using narrative analysis, following Moen guidelines (Moen, 2006). This method gave a holistic way of understanding differences between countries in qualifying their pharmacist prescribers. It also made it possible to analyse data from multiple dimensions and present interdependencies, which would help address best practices.

## Results

A total of 17 universities participated distributed as follows: 9 from the UK (53% of total responses and 18.4% of surveyed UK universities), 4 from Australia (23.5% of total responses and 33.3% of surveyed Australian universities), 4 from Canada (23.5% of total responses, and 40% of surveyed universities, yielding an overall 24% response rate).

### Pre-requisites

The UK and New Zealand (University of Otago, n.d.) have similar requirements to enter prescribing courses

(Table I). Canada does not provide postgraduate prescribing courses, as they consider a certain level of prescribing to be a common qualification of graduated trained pharmacists. The provincial entities that regulate pharmacists (e.g., Nova Scotia College of Pharmacists) allow pharmacist prescribing for some indications, varying according to the regulations of each province. These regulations apply to entry-to-practice pharmacists. Some Canadian universities mentioned that they provide students with prescribing-related competencies for patient assessment, diagnosis, monitoring, and follow-up. Other universities also offer CPD courses to upskill pharmacists in prescribing.

**Table I. Pre-requisites for postgraduate pharmacist prescribing training**

	United Kingdom	Australia	Canada	New Zealand
Registered	√			√
Clinical Skills or area of practice	√ (87% of UK respondents)			√
Experience as patient facing pharmacist	2 years minimum	No courses are provided yet	No post graduate prescribing courses	√
Designated Medical Practitioner required	√ (45% of UK respondents)			√
Workplace support (time/budget)	√ (22% of UK respondents)	No courses are provided yet	No post graduate prescribing courses	–

Moreover, Australia is not currently providing prescribing courses for pharmacists, and it is unknown whether this status will change and when. In 2019, the Australian Pharmacy Board facilitated supervised pharmacist prescribing within a collaborative healthcare environment. According to this survey, some Australian universities are willing to provide future prescribing courses to qualify pharmacists to prescribe collaboratively.

In this survey, some aspects of international pharmacist prescribing courses were investigated as follows:

#### **Funding for training courses**

All the respondents in the UK indicated that course fees could be funded by the government through local bodies or organisations, such as the National Health Service. The case differs in Canada and New Zealand, where these courses are self-funded.

#### **Model of prescribing**

Prescribing models differed between the participating countries, with independent prescribing being the predominant model. All UK respondents qualified their graduates for independent prescribing and four universities (44% of participating UK universities) for supplementary prescribing. In New Zealand, all universities that offer prescribing courses (Auckland and Otago universities) are currently training collaborative prescribers, as per New Zealand legislation and regulations (Ministry of Health NZ, 2021).

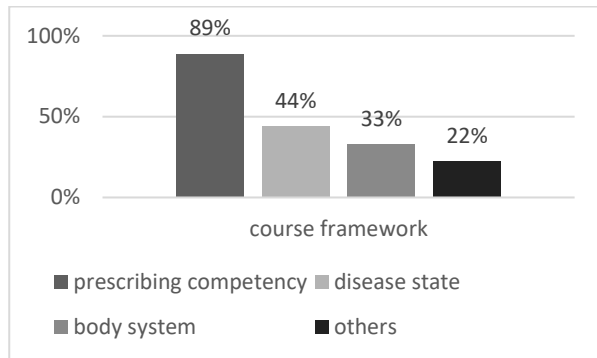
Although Australian universities are not currently providing any prescribing courses for pharmacists, the respondents believed that collaborative prescribing would allow pharmacists to prescribe approved drug classes on their individual formulary. Of all Australian respondents, 75%(n=3) declared this would meet the current public health needs, particularly in rural areas and amidst COVID-19 or other pandemics, and in times of need, such as during natural disasters. Collaborative prescribers were perceived by the respondents to be supportive and would help address concerns about patients not reaching treatment goals and improve the monitoring of adverse events.

In Canada, the prescribing model varies according to the prescribing regulations of each province (Canadian Pharmacists Association, 2022). For example, one respondent mentioned that prescribers are limited to adapting (which is the renewal of an already existing prescription, making therapeutic substitutions to alternative medicine of the same category, and changing dosage forms, route of administration, regimen, or dispensed quantity), or initiating therapy for smoking cessation in their province, whereas a respondent from a different province reported that pharmacists could acquire the prescribing designation of “independent prescriber”, allowing them to prescribe independently. Another respondent stated that pharmacists could practise independent prescribing, adaptive prescribing, and prescribing in emergency circumstances.

#### **Course framework**

When asked how their courses were structured, the UK Universities had designed their postgraduate courses to cover the components of safe prescribing (General Medical Council, 2021), with the majority using prescribing competencies as their general framework (Figure 1). Learning outcomes were mapped to the 32 learning outcomes defined by the General Pharmaceutical Council (2019) (55% of the UK respondents; 5/9) and/or the Royal Pharmaceutical Society's Competency framework (33% of the UK

respondents; 3/9) for all prescribers of 2016 (Royal Pharmaceutical Society, 2021).



**Figure 1: Pharmacist prescribing course framework in the UK (n=9)**

In Canada, the entry-to-practice curriculum also covers competencies related to prescribing (Nova Scotia College of Pharmacists, 2019). There are currently no course frameworks available in Australia.

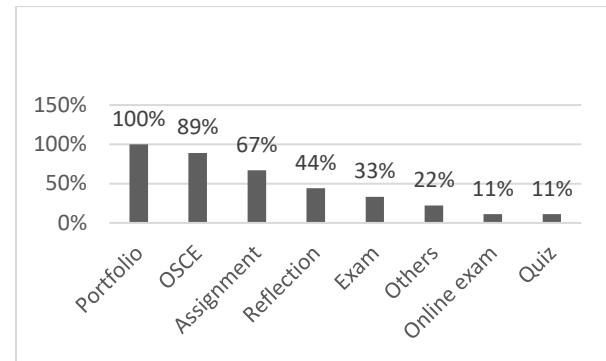
### Methods of delivery

The delivery methods for identified courses varied from on-campus to online, self-paced, or scheduled times, under the supervision of a Designated Medical Practitioner (DMP) or a Designated Prescribing Practitioner (DPP). Of note, COVID-19 restrictions have encouraged more virtual learning.

- All the surveyed universities that offer a prescribing course combined lectures/theoretical elements and in-person clinical workshop components for a total of 20-30 days.
- In the UK, most universities deliver blended lectures/theoretical courses, on-campus (78%, n=7/9) pre-Covid, online scheduled times (67%, n=6/9) or online self-paced (22%, n=2/9), and self-directed learning (33%, n=3/9).
- Clinical workshops were available only face-to-face (100% of UK universities).
- Some universities recently shifted from on-campus to online sessions as a natural upgrade for their education policies or due to COVID-19-related factors.

### Assessment process

Multiple assessment methods are used in prescribing courses. Figure 2 shows the combined use of the different assessment types for all respondents.



**Figure 2: Types of pharmacist prescribing course assessments in the UK (n=9)**

In UK universities, portfolio and OSCEs were the most common assessment methods; however, universities differed in the pass requirements. All used a pass/fail grading system for the portfolio assessment to meet the Royal Pharmaceutical Society competency framework, while OSCE pass marks ranged from 50% to 80%. Due to COVID-19, some universities reported that OSCEs were held through webinars. Written exams were utilised variably between pharmacology, mathematics/calculations, and law/ethics. Reflections were also used with the required pass mark, ranging from 50 to 80%. Assignments, including patient treatment plans, were used by two-thirds of the respondents. Some universities mentioned other assessment types, such as case study presentations and the practical assessment of prescribing practice (PAPP), which were also used to assess the decision-making abilities of pharmacists.

In Canadian universities, assessments vary across provinces. In Alberta, pharmacists submit a portfolio of evidence to be assessed, and if they pass, they receive the “independent prescribing” designation. In other provinces, pharmacists can prescribe after graduation in limited or selected indications and circumstances, and prescribing content is included and assessed in their professional entry-to-practice programme.

In Australian universities, no prescribing courses are available yet.

### Continuing Professional Development (CPD)

Continuing Professional Development (CPD) in prescribing ensures ongoing learning for pharmacists; it varies from one country to another, as follows:

In the UK, five universities did not offer CPD (55% of UK respondents) specific to prescribing, compared to one university, which delivers a stand-alone “Clinical Consultation and Diagnostics Programme” (CCAD) and works closely with an external provider of CPD. Another

university responded that they host the Centre for Pharmacy Postgraduate Education (CPPE), which provides post-registration learning material as an indirect CPD, and two universities reported having annual or periodic updates of their prescribing course.

In Canada, three of the four universities surveyed provide a CPD for Pharmacy Professionals (CPDPP) course. One university delivers CPDPP in the form of an immunisation course, one offers programmes related

to hormonal contraception and minor ailments, and one provides CPD presentations on pharmacist prescribing indications.

### **Barriers and facilitators of enrolment**

Table II outlines the respondents' opinions of the barriers and facilitators for student enrolment. Funding comes through as a strong facilitator, whereas time and staffing are presented as barriers.

**Table II: Barriers and facilitators to enrolment**

Facilitators of student enrolment	Barriers to student enrolment
Future direction of pharmacy and wider workforce development making prescribing qualification essential requirements for many job roles (30%)	Lack of funding for the tuition fees (more funding restrictions due to COVID was reported by some universities) (70%)
Support from workplace/team or line management to allow pharmacists to undertake prescribing course (30%)	Finding clinical mentor or practice supervisor (50%)
Availability of course information online, course reputation & word of mouth, in addition to experiences of previous students (20%)	Time to complete the study in addition to work and personal commitments (40%)
Strong institutional ties with public health entities, was reported as a facilitator to fund course fees, support students with paid study leave and catering supervised practice opportunities (20%)	Practice setting challenges reported by 20% of universities, also for locum pharmacists in getting appropriate financial support and clinical supervision.
	When demand exceed supply (20%)
	Limited capacity of clinical workshops
<b>Others:</b>	<b>Others:</b>
<ul style="list-style-type: none"> <li>Funding opportunities</li> <li>Easy access to academic staff</li> <li>Clear understanding of the nature of pharmacist prescriber role</li> <li>Submitted as annual professional development part of licence requirements</li> <li>Learning, sharing, and collaboration with other pharmacists from different employer companies.</li> </ul>	<ul style="list-style-type: none"> <li>Understaffed public health institutions</li> <li>Pharmacist prescriber's failure to demonstrate clinical patient facing experience.</li> </ul>

### **Future changes to the course and incorporating prescribing competencies to pharmacy first-degree studies:**

Five UK universities (55.5% of UK respondents) would like to make some changes to meet the updated GPhC standards for prescribing and those of other regulators such as NMC and HCPC. These changes would mainly focus on changing assessment methods, particularly portfolios, reflections, and exams.

Four other UK universities (44%, 4/9) reported the desire in the UK to incorporate prescribing competencies into the foundation year (the fifth year) of pharmacy undergraduate courses to enable pharmacists to be 'prescriber-ready' by the time they graduate.

In Australia, two universities (50%, 2/4) believed that the Australian Pharmacy Board would work on achieving pharmacists' autonomous prescribing in the near future, while one (25%) thought that it would not

happen. Should this occur, two Australian universities (50%) agreed on the need for extra modules, depending on the scope of practice, higher level training, interprofessional practice, experiential learning, and implementing a PharmD programme to qualify pharmacist prescribers. Another university highlighted that they already teach prescribing competencies within the Pharmacotherapeutics course, so it would just need a refreshing of the legal requirements of prescribing, some input from Pharmaceutical Defence Limited (PDL, an organisation providing professional indemnity insurance), and recognition of collaborative competencies.

### **Discussion**

This study aimed to investigate different training courses for pharmacist prescribing internationally. Of the 71

invited pharmacy schools in the UK, Australia, and Canada, 17 universities participated. Of the participating universities, 53% were in the UK, 23.5% were in Canada, and 23.5% were in Australia. While no standardised approach for pharmacist training was found, some key elements to the design and delivery of prescribing courses have been identified.

### **Timing of training**

This survey showed two models of prescribing courses: undergraduate qualification of pharmacists, with some refreshing CPD courses and postgraduate courses. The literature revealed that Canada and UK are the most experienced countries in pharmacist prescribing education (Ramos *et al.*, 2022).

Canadian respondents had mainly entry-to-practice courses to qualify pharmacists to prescribe, with different models of prescribing services depending on the province. Some universities offer CPD postgraduate courses, which are not necessarily obligatory to practise the prescribing role. Therefore, all pharmacists in Canada have different levels of prescribing authority, depending on the province's regulations.

This finding is consistent with that of the Canadian Pharmacists Association, which issued pharmacists' scope of practice in Canada in 2022. Pharmacists can initiate new prescriptions for minor ailments in eight provinces, initiate prescriptions in an emergency in ten provinces, provide therapeutic substitutions in nine provinces, and renew or extend prescriptions of continuity of care in twelve provinces (Canadian Pharmacists Association, 2022).

The UK now appears to be in an optimisation phase, moving from the start-up model of stand-alone postgraduate courses to incorporating prescribing competencies into foundation year courses in the future to have pharmacists "prescriber-ready" by the time they graduate.

These proposed changes align with the decision of the General Pharmaceutical Council (GPhC) regarding the best practice for pharmacist prescribing. Learning from the COVID-19 pandemic outcomes, the GPhC reviewed its standards for pharmacist prescribing education in 2022 and announced the implementation of new standards for initial education and training. The GPhC decided to implement a foundation training year to strengthen pharmacist competencies and allow them to achieve independent prescriber status upon registration (General Pharmaceutical Council, n.d.-a).

### **Key components of pharmacist prescribing courses**

This survey identified variations in all aspects of the courses used to train pharmacists, including

prerequisites, funding, delivery method, and assessment. However, countries with the highest success rates of pharmacist prescribers, i.e., the UK and Canada, have some key factors (such as incorporating prescribing competencies into undergraduate/entry-to-practice courses) that appear to be driving the uptake of courses and graduating more pharmacists compared to Australia and New Zealand.

### **Funding**

Funding appears to be positively linked to the rate of prescriber graduates in the UK, where strategic funding plans for pharmacist prescribing training courses have been implemented at the governmental level.

The availability of central funding for NMP training courses is a significant factor for NMP training uptake (Noblet *et al.*, 2017) and achieving some health policies, such as equity of access to medical education, stimulating the supply of physicians to specific geographical areas, and increasing the supply of medical specialities (Institute of Medicine (US) Division of Health Sciences Policy, 1983; Dacre & Walsh, 2013).

### **Method of delivery**

Designing a training pathway that accommodates pharmacist work, family, and personal commitments was identified as a facilitator for enrolment by participants. This survey demonstrates that more providers are offering flexible learning approaches, e.g., having the course content online. Also, some universities tackled the idea of self-directed learning (SDL) rather than a teaching and testing pathway. Flexibility in delivery methods would also help rural-based pharmacists enrol in these courses.

This result is consistent with the literature (Noh & Kim, 2019; Peine, Kabino & Spreckelsen, 2016; Kemp, Baxa & Cortes, 2022), which discusses the benefits of SDL in medical education as a suitable learning approach that complies with the dynamic nature of the clinical field (Noh & Kim, 2019). Benefits of SDL include motivating personal responsibility, providing independent learning and lifelong learning skills, alongside improving personal responsibility, accountability, and confidence (Noh & Kim, 2019; Kemp, Baxa & Cortes, 2022).

A study on SDL versus direct instruction in a modern German medical curriculum indicated that SDL outperforms conventional methods. It helps clarify highly complex topics that cannot be entirely learned in the classroom and others that need high amounts of knowledge to be memorised, as these subjects require concentrated individual work rather than classroom (Peine, Kabino & Spreckelsen, 2016).

### Assessment

Our survey also showed that no single assessment method was applied and that successful models of training use blended approaches, including portfolios, OSCE, reflections, online exams, and assignments. Some universities were even flexible with the assessment approach, e.g., having OSCE held through webinars (in times of COVID-19). All the universities in the U.K. and Canada had a consensus that portfolio was the most adopted assessment method compared to others. Portfolios are considered the gold standard in NMP assessment as they can demonstrate professional skills and competencies. Portfolios have several benefits over other techniques, as they assess professionalism, CPD, attitude, and critical thinking in a way that traditional assessment cannot perform; they encourage reflection and increase the reliability of evaluating performance and competence (Gadbury-Amyot, Bray & Austin, 2014; Haldane, 2014).

This result aligns with the literature (Gadbury-Amyot, Bray & Austin, 2014; Haldane, 2014; Paterson *et al.*, 2016), which verifies the validity and efficiency of portfolios by examining prescribing competencies and assessing clinical evidence to meet the required academic level (Paterson *et al.*, 2016). The significance of this finding was investigated by Gadbury-Amyot and colleagues, who found a positive relationship between the performance of portfolios and students' GPA, and between the performance of portfolios and the National Board Dental Hygiene Examination (NBDHE) (Gadbury-Amyot, Bray & Austin, 2014). Portfolios were also recommended by the Accreditation Council for Pharmacy Education in the USA as a tool to "document self-assessment of, and reflection on, learning needs, plans and achievements, and professional growth and development" (ACPE, 2015).

### Mentorship

Many countries, such as New Zealand, still require prescribers-in-training to have their practice signed off by a medical supervisor. The medical workforce is suffering from shortages, high workloads, and burnout. Consequently, it is challenging for NMPs to access physicians for supervision (Smith, 2023).

This survey has shown that courses in the UK are utilising Designated Prescribing Practitioners (DPP) as supervisors. DPPs can be any registered independent prescriber that are able to demonstrate specific competencies for supervising learning in practice (Royal Pharmaceutical Society, 2019). This change is supported by the General Pharmaceutical Council (GPhC), who have specified this in their education and training of pharmacist independent prescribers' framework in 2019 (General Pharmaceutical Council, n.d.-b).

Few studies in the literature have discussed this point, as it is a novel way of supervision and is still in a growth phase. A survey of stakeholder views on the implementation of the role DPPs in 2022 found that the majority of respondents agreed on the ability of DPPs to report or respond to trainee concerns (Jebara *et al.*, 2022). The majority of stakeholders agreed on the confidence and competence of DPPs in training, supervising, and assessing independent prescribers. Also, the respondents did not have any concerns about the clinical and diagnostic skills of DPPs or their abilities to work collaboratively. The same survey also reported a very high level of agreement on the urgent need to implement the role of DPPs as supervisors, which advantages outweigh the disadvantages (Jebara *et al.*, 2022).

### Limitations

Our study has some strengths as it allowed for examining how various countries qualify their pharmacists to prescribe and highlighted a future direction for pharmacist prescribing to be a pre-registration qualification internationally. It also showed how pharmacists could provide a crucial element to the future of healthcare services globally.

There were some limitations to this study, mainly due to the ongoing COVID-19 pandemic and the relevant health measures taken by different countries, such as lockdowns and the closure of the physical headquarters of some institutions, including universities, which affected the level of participation of the targeted universities, thus yielding a lower response rate than expected.

Using this survey method is also linked to low response rates; carrying out interviews or focus groups may have produced a better response. No quantitative analysis could be performed due to the low response rate, which may indicate non-response bias; however, responses were received from a range of universities and programmes, and there were no significant differences between those who participated and those who did not. Therefore, it is believed that bias has been minimised in this study.

### Conclusion

Pharmacist prescribers are a valuable workforce that needs to be considered and optimised in facing health sector challenges, such as shortages of physicians internationally. Unfortunately, pharmacist prescribing is under-utilised in many countries. For countries that implement pharmacist prescribing, there is currently

no international unified system or curriculum for pharmacist prescribing courses, which is essential, as standardisation would reduce variations and improve the uptake. This survey highlighted the differences in pharmacist prescriber training in three different countries. It showed that some countries are still lagging, such as Australia, whereas the UK is now optimising their training pathway, and Canada considers prescribing as the mainstream qualification of pharmacy graduates. It also highlighted that the incorporation of prescribing qualifications into undergraduate courses to produce prescriber-ready pharmacists upon graduation has potentially been the way to optimise pharmacist prescribing uptake. This model facilitates the pathway for pharmacists to become prescribers, resulting in a higher uptake of this role and improved access to healthcare services.

### Conflict of interest

The authors declare no conflict of interest.

### Source of funding

The authors did not receive any funding.

### References

ACPE. (2015). Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree. Retrieved December 22, 2022, from <https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf>

Bell, M. (2021). 6 Viable Strategies to Improve Healthcare Access. *the Health Science Journal*. Retrieved November 9, 2022, from <https://www.thehealthsciencejournal.com/6-viable-strategies-to-improve-healthcare-access/>

Canadian Pharmacists Association. (2022). Pharmacists' scope of practice across Canada. Retrieved November 13, 2022, from <https://www.pharmacists.ca/advocacy/scope-of-practice/>

Cope, L. C., Abuzour, A. S., & Tully, M. P. (2016). Nonmedical prescribing: where are we now?. *Therapeutic advances in drug safety*, *7*(4), 165–172. <https://doi.org/10.1177/2042098616646726>

Dacre, J., & Walsh, K. (2013). Funding of medical education: the need for transparency. *Clinical medicine (London, England)*, *13*(6), 573–575. <https://doi.org/10.7861/clinmedicine.13-6-573>

Foreman, M. (2022). Pharmacist Prescribing in New Zealand: Slow but steady growth. (Thesis, Master of Clinical Pharmacy). University of Otago. Retrieved November 9, 2022, from <http://hdl.handle.net/10523/12705>

Gadbury-Amyot, C. C., Bray, K. K., & Austin, K. J. (2014). Fifteen years of portfolio assessment of dental hygiene student competency: lessons learned. *Journal of dental hygiene*, *88*(5), 267–274. <https://jdh.adha.org/content/88/5/267.full>

General Medical Council. (2021, April 5). Good practice in prescribing and managing medicines and devices. Retrieved November 9, 2022, from <https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/good-practice-in-prescribing-and-managing-medicines-and-devices>

General Pharmaceutical Council. (n.d.-a). FAQ: reforms to the initial education and training of pharmacists, Education. Retrieved November 9, 2022a, from <https://www.pharmacyregulation.org/education/standards-pharmacy-education/fag-reforms-initial-education-and-training-pharmacists#reforms>

General Pharmaceutical Council. (n.d.-b). Education and training of pharmacist independent prescribers: evidence framework. Retrieved November 9, 2022b, from <https://www.pharmacyregulation.org/sites/default/files/document/education-and-training-of-pharmacist-independent-prescribers-evidence-framework-may-2019.pdf>

General Pharmaceutical Council. (2019). Standards for the education and training of pharmacist independent prescribers. Retrieved January 30, 2023, from <https://www.pharmacyregulation.org/sites/default/files/document/standards-for-the-education-and-training-of-pharmacist-independent-prescribers-january-19.pdf>

Haldane T. (2014). "Portfolios" as a method of assessment in medical education. *Gastroenterology and hepatology from bed to bench*, *7*(2), 89–93. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4017561/>

Institute of Medicine (US) Division of Health Sciences Policy. (1983). *Medical Education and Societal Needs: A Planning Report for the Health Professions*. National Academies Press (US).

Jebara, T., McIntosh, T., Stewart, F., Osprey, A., Bruce, R., & Cunningham, S. (2022). Designated prescribing practitioners: a theory-based cross-sectional study of stakeholders' views on implementation of a novel pharmacy regulator mandated preceptorship model. *International journal of clinical pharmacy*, *44*(5), 1195–1204. <https://doi.org/10.1007/s11096-022-01467-8>

Kelley, K., Clark, B., Brown, V., & Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International journal for quality in health*, *15*(3), 261–266. <https://doi.org/10.1093/intqhc/mzg031>

Kemp, K., Baxa, D., & Cortes, C. (2022). Exploration of a Collaborative Self-Directed Learning Model in Medical Education. *Medical science educator*, *32*(1), 195–207. <https://doi.org/10.1007/s40670-021-01493-7>

Ministry of Health NZ. (2021, November 10). Pharmacist prescribers can now prescribe more medicines. Retrieved



November 9, 2022, from <https://www.health.govt.nz/news-media/media-releases/pharmacist-prescribers-can-now-prescribe-more-medicines>

Moen, T. (2006). Reflections on the Narrative Research Approach. *International Journal of Qualitative Methods*, 5(4), 56–69. <https://doi.org/10.1177/160940690600500405>

Noblet, T., Marriott, J., Graham-Clarke, E., & Rushton, A. (2017). Barriers to and facilitators of independent non-medical prescribing in clinical practice: a mixed-methods systematic review. *Journal of physiotherapy*, 63(4), 221–234. <https://doi.org/10.1016/j.jphys.2017.09.001>

Noh, G. O., & Kim, D. H. (2019). Effectiveness of a self-directed learning program using blended coaching among nursing students in clinical practice: a quasi-experimental research design. *BMC medical education*, 19(1), 225. <https://doi.org/10.1186/s12909-019-1672-1>

Nova Scotia College of Pharmacists. (2019). STANDARDS OF PRACTICE: Prescribing Drugs. Retrieved November 9, 2022, from [https://www.nspharmacists.ca/wp-content/uploads/2016/05/SOP\\_PrescribingDrugs.pdf](https://www.nspharmacists.ca/wp-content/uploads/2016/05/SOP_PrescribingDrugs.pdf)

OECD. (2021). Health at a Glance 2021 : OECD indicators. OECD. Retrieved November 14, 2022, from [https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2021\\_ae3016b9-en](https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2021_ae3016b9-en)

Paterson, R. E., Redman, S. G., Unwin, R., McElhinney, E., Macphree, M., & Downer, F. (2016). Non-medical prescribing assessment - An evaluation of a nationally agreed multi method approach. *Nurse education in practice*, 16(1), 280–286. <https://doi.org/10.1016/j.nepr.2015.10.008>

Peine, A., Kabino, K., & Spreckelsen, C. (2016). Self-directed learning can outperform direct instruction in the course of a modern German medical curriculum - results of a mixed methods trial. *BMC medical education*, 16, 158. <https://doi.org/10.1186/s12909-016-0679-0>

Pharmacy Council NZ. (2021). pharmacist prescribers. Retrieved November 9, 2022, from <https://pharmacycouncil.org.nz/pharmacist/pharmacist-prescribers/>

Raghunandan, R., Marra, C. A., Tordoff, J., & Smith, A. (2021). Examining non-medical prescribing trends in New Zealand: 2016-2020. *BMC health services research*, 21(1), 418. <https://doi.org/10.1186/s12913-021-06435-y>

Raghunandan, R., Tordoff, J., & Smith, A. (2017). Non-medical prescribing in New Zealand: an overview of prescribing rights, service delivery models and training. *Therapeutic advances in drug safety*, 8(11), 349–360. <https://doi.org/10.1177/2042098617723312>

Ramos, D. C., Ferreira, L., Santos Júnior, G. A. D., Ayres, L. R., & Esposti, C. D. D. (2022). Pharmacist prescribing: a review of perceptions and attitudes of patients, pharmacists and other interested professionals. Prescrição farmacêutica: uma revisão sobre percepções e atitudes de pacientes, farmacêuticos e outros interessados. *Ciencia & saude coletiva*, 27(9), 3531–3546. <https://doi.org/10.1590/1413-81232022279.19972021>

Royal Pharmaceutical Society. (2019). A Competency Framework for Designated Prescribing Practitioners.

Retrieved November 9, 2022, from <https://www.rpharms.com/Portals/0/RPS%20document%20library/Open%20access/Professional%20standards/DPP%20Framework/DPP%20competency%20framework%20Dec%202019.pdf>

Royal Pharmaceutical Society. (2021). A Competency Framework for all Prescribers. Retrieved from <https://www.rpharms.com/cfap>

Smith, Y. (2023). Physician-Shortage. Retrieved November 9, 2022, from <https://www.news-medical.net/health/Physician-Shortage.aspx>

SurveyMonkey. (n.d.). Free online survey software and questionnaire tool . Retrieved November 9, 2022, from <https://www.surveymonkey.com/>

University of Otago, N. Z. (n.d.). Postgraduate Certificate in Pharmacist Prescribing (PGCertPharmPres), Qualifications. Retrieved November 9, 2022, from <https://www.otago.ac.nz/courses/qualifications/pgcertpharmpres.html>

University of Southern California. (n.d.). How to Improve Access to Health Care: Current Issues and Potential Solutions. Retrieved November 9, 2022, from <https://healthadministrationdegree.usc.edu/blog/how-to-improve-access-to-health-care/>