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Pharmacists' use of guidelines for the supply of non-prescription medicines: a cross-sectional survey

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Abstract

Objectives Guidelines support best practice for healthcare practice. In Australia, some non-prescription medicines are only accessible after consultation with a pharmacist and are known as Pharmacist Only medicines. Guidelines for providing some Pharmacist Only medicines are available, however, it is currently unknown if and how these guidelines are used in practice.

The objective was to characterise pharmacists', intern pharmacists and pharmacy students' use of guidelines for Pharmacist Only medicines.

Methods A cross-sectional electronic survey of Australian registered pharmacists, intern pharmacists and pharmacy students was administered in July 2020. Questions explored the participants' use of Pharmacist Only medicine guidelines (available both in print and online; available online only) in the preceding 12 months. Data were analysed descriptively (i.e. frequencies, percentages).

Key findings In total, 574 eligible respondents completed the survey. Overall, 396 (69%) reported accessing the online and in-print guidelines in the previous 12 months with 185 (33%) accessing online-only guidelines. The guideline on emergency contraception was used the most out of all guidelines in the past 12 months (278, 48%). Overall, respondents reported accessing guidelines to update knowledge, check their practice reflected best practice and content familiarisation. Respondents' reasons for not accessing guidelines were due to respondents stating they did not need the information or that they had previously accessed the guidelines more than 12 months ago. These reasons varied between respondent groups.

Conclusions Access and use of the Pharmacist Only medicines guidelines varied between pharmacists, interns and students. Further understanding of the influences of the use of these guidelines will help inform professional bodies on how best to develop guidelines to increase consistent use in practice and implement interventions to increase use.

Keywords: pharmacist; practice guidelines; professional behaviour; professional role; non-prescription medicines

Introduction

Practice guidelines play an essential role in healthcare practice and allow regulatory bodies and professional organisations to communicate the process that must be followed when providing patient care. Using practice guidelines is important to ensure consistent, evidence-based practice.[1, 2] Practice guidelines are used differently by different groups; pharmacy students are trained to primarily use practice guidelines to learn about the use of medicines for a variety of medical conditions, while practicing pharmacists use these guidelines to guide and justify their decisions in practice.[3, 4]

Community pharmacists are trusted and easily accessible healthcare professionals,[5] who perform several essential roles within the Australian health system, including advising on treating common ailments, dispensing prescription medicines for acute and chronic conditions and administering vaccines.[2, 6–9] Medicines scheduling in Australia is a classification system that regulates the availability of medicines to the public where Schedule 2 (Pharmacy Medicine) and Schedule 3 (Pharmacist Only) medicines are only available through community pharmacies but do not require a prescription in contrast to those medicines classified as Schedule 4 (Prescription Only) and Schedule 8 (Controlled Drugs) that require a prescription.[10] Pharmacist Only medicines are only available in Australian pharmacies after discussion with a pharmacist to determine if there is a therapeutic need.[11, 12] A generally registered pharmacist must be involved in the sale of all Pharmacist Only medicines, so an intern pharmacist or pharmacy student will always undertake this interaction under supervision. Guidelines provide recommendations for appropriate and effective processes, desired behaviour, professional responsibilities and expected outcomes for the management of Pharmacist Only medicines and state that pharmacists must meet any legislative requirements for their supply.[13]

Multiple simulated patient scenario studies conducted over the past two decades have assessed pharmacists' compliance with various practice standards for providing Pharmacist

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Only medicines.[7, 14–16] An Australian quality improvement study conducted in 2016 found that just over half (n = 140/243, 58%) of pharmacies supplied medicine in concordance with guidelines, while about a third (n = 76/243, 31%) involved overtreatment or overselling of medicines for conjunctivitis and emergency hormonal contraception.[15] Another Australian study conducted in 2017 found that only 60% (n = 61/158) of codeine-containing analgesics were supplied within the legislative requirements.[17] These studies highlight that real-world practice does not consistently reflect guideline recommendations.[7, 18] The reasons for this are not well-known. One Australian study investigating the pharmacist management of naloxone reported that most pharmacists were unaware of resources, such as guidelines were available to assist them.[19] A study investigating short-acting beta-agonists found that while most pharmacists were aware of the guideline, the pharmacy assistants who supported their practice were unaware of the guideline.[20] Other studies have identified that pharmacists have limited awareness of guidelines.[9, 21] A 2021 Australian study reporting on the use of lower back pain guidelines found that over 40% (n = 72/176) of surveyed pharmacists found it difficult to access guidelines, while over 40% (n = 71/176) were unaware of specific guidelines in this area.[21] Taken together, these studies suggest pharmacists' practice in relation to the supply of Pharmacist Only medicines is variable, not always in line with guideline recommendations, and awareness of guidelines needs to be raised. This inconsistency is important to understand to improve the consistency of patient care and opportunities for interventions.

Previous research has assessed whether pharmacists comply with guidelines when supplying Pharmacist Only medicines. However, we are not aware of previous studies that have investigated if and how pharmacists, interns or pharmacy students use practice guidelines for the Pharmacist Only medicines in Australia. Thus, the present study aimed to characterise pharmacists', interns' and pharmacy students' use of guidelines for Pharmacist Only medicine.

Methods

Ethical approval

Approval to conduct this research was granted in June 2020 by The University of Western Australia (UWA) Human Research Ethics Committee (RA/4/20/6014).

Study design

This cross-sectional study was conducted using an online survey methodology. Our method is reported in depth elsewhere and summarised briefly here.[22] Respondents were asked to report which guidelines they had accessed in the previous 12 months and associated reasons for either accessing or not accessing the guidelines. If they had accessed the guidelines, they were asked how they used the guidelines and the perceived usefulness.

Guidelines of interest

An Australian professional pharmacy association, the Pharmaceutical Society of Australia (PSA), provides guidelines for specific Pharmacist Only medicines. The current study evaluated guidelines for 13 different Pharmacist Only medicines provided by this association, with the specific guidelines detailed in Box 1.[13, 23–36] These guidelines are published online behind a pay-wall on a member-only website and in hard copy every three years in the Australian national formulary, a legally required text that must be accessible to pharmacists while practicing named the Australian Pharmaceutical Formulary and Handbook (APF).[37] At the time of the survey, there were guidelines published on the members-only website that were not yet available in hard copy. The guidelines were separated into two groups. The first group are referred to as available 'both online and in print' as they were available to all pharmacists in the print or digital national formulary and on the website. A second group of guidelines are referred to as available 'online only' as they were only available to people with either an online formulary subscription or who were current members of the professional association and could access it on a password-protected website.

Participants

People registered with the Pharmacy Board of Australia were eligible to participate if they held either general (registered pharmacists) or provisional (intern pharmacists) registration. Students enrolled in an approved degree leading to registration as an Australian pharmacist were also eligible. Participation was limited to pharmacists, intern pharmacists and pharmacy students rather than including other pharmacy staff as a pharmacist must be involved in all sales of Pharmacist Only medicines.

Sample size

At the time of the survey, the eligible population comprised 32 777 registered pharmacists, 1850 intern pharmacists and 6500 pharmacy students in Australia.[38] As there was no prior research to inform the selection of outcomes or determine an appropriate sample size, a target sample size of 328 registered pharmacists, 19 intern pharmacists and 65 pharmacy students was established *a priori*, representing a pragmatic 1% quota of the target population that was deemed practical and achievable, while the lack of efficient methods for recruiting a systematic or randomised sample of all registered pharmacists in Australia further complicated the process.

Box 1 Pharmacist Only medicines guidelines by group

Professional practice guideline grouping for survey	Pharmacist Only medicines guidelines
Available in print and online	Chloramphenicol for ophthalmic use[19] Emergency contraception[20] Naloxone[28] Orlistat[24] Prochlorperazine[25] Proton pump inhibitors[16] Short-acting beta$_2$-agonists (salbutamol and terbutaline)[17] Famciclovir[26]
Available online only	Adrenaline (epinephrine)[27] Astodrimer sodium[18] Glucagon[21] High-concentration fluoride toothpaste[22] Nitrates[23]

Recruitment and informed consent

Participation was voluntary and anonymous. The survey was distributed through a variety of channels, including social media ads, electronic newsletters from pharmacy-specific professional organisations, direct contact with training program providers and emails sent to pharmacy franchises with a request for them to distribute the survey to their employees.

The study purpose, anticipated time for completion, data storage, funding and investigators were provided in the participant information. After reading the participant information, participants were asked to provide informed consent to participate before commencing the survey questions.

Survey piloting

Before conducting the survey, a pilot test was conducted using the Qualtrics platform to assess the readability, content and ease of use of the survey questions. The pilot test was conducted with a convenience sample of pharmacists (n = 12), intern pharmacists (n = 4) and pharmacy students (n = 6) who were invited via the research team's professional network. Based on the feedback received from the pilot test, minor adjustments were made to the response options, layout of the survey and typographical errors were corrected.

Survey administration

Using Qualtrics, the online survey was conducted from 7 July 2020 to 31 July 2020, and utilised adaptive questioning with responses randomised to reduce bias. Respondents could only respond to the survey once. The mandatory response function was turned on for all quantitative questions except the multiple answer checkboxes and free text responses. The option of 'I don't know' or 'I can't remember' was provided as appropriate. Participants had the option to return to previous questions and change their responses.

Responses that included the demographics section of the survey and the first content question for the Pharmacist Only medicines guideline section completed were eligible for inclusion in this analysis. This included partial responses. Responses with an atypical timestamp for completion (e.g. completion of the survey faster than expected by investigators) were reviewed individually to determine eligibility for inclusion.

Data analysis

Data were extracted from Qualtrics and imported for analysis into STATA Software, Release 16 (StataCorp LLC, College Station, TX, USA). Descriptive statistics were presented as a total and by group, namely registered pharmacists, pharmacy interns or pharmacy students. Inferential statistics were not performed due to the large number of comparisons undertaken, which can increase the likelihood of Type I errors (false positives) and decrease the overall reliability of the results.

Results

There were 574 eligible respondents to the survey, of whom 444 (77%) were registered pharmacists, 48 (8%) were pharmacy interns and 82 (14%) were pharmacy students (Table 1). This represents ~1.4% of registered pharmacists in Australia responding to this survey.

Recent use of Pharmacist Only medicine guidelines

In total, 396 (69%) indicated they had accessed guidelines available both in print and online in the previous 12 months, compared with 185 (33%) who had accessed guidelines available only online. Overall, the most frequently accessed Pharmacist Only medicine guideline was guidance for emergency contraception (n = 278/574, 48%), followed by guidance for chloramphenicol (n = 167/574, 29%); both available both online and in print. The most frequently accessed online available Pharmacist Only medicine guideline was guidance for adrenaline (n = 96/564, 17%), followed by guidance for nitrates (n = 50/564, 9%). More pharmacy interns and students accessed both types of guidelines than registered pharmacists, with interns and students accessing the guidance for emergency contraception the most (n = 38/48, 79% and n = 51/82, 62%, respectively). The least accessed Pharmacist Only medicine guideline by registered pharmacists and pharmacy students was the guidance for astodrimer (n = 27/440, 6% and n = 4/79, 5%, respectively), while the least accessed for pharmacy interns was for the guidance for high-concentration fluoride toothpaste (n = 5/45, 11%). All Pharmacist Only medicine guidelines were used by <50% of all respondents (Table 2).

Reasons for using Pharmacist Only medicines guidelines

The most common reasons for using both online and in print of Pharmacist Only medicines guidelines were to update knowledge (n = 214/366, 58% and n = 105/158, 67%). For guidelines available online and in print, checking their practice reflects best practice (n = 206/366, 56%) was the second most frequent reason for use. For the online-only guidelines, familiarising with the content was the second most frequent reason for use (n = 85/158, 54%) (Figure 1).

Reasons for not using Pharmacist Only medicines guidelines

The most common reasons for not using Pharmacist Only medicine guidelines were that the respondents reported they did not need the information they contained [n = 237/532 (45%)]. A higher percentage of respondents reported they did not use the online-only guidelines compared with those available both online and in print as they did not know they existed (n = 200/553, 36% and n = 43/532, 8%, respectively). While 30% (n = 157/532) of respondents reported their reasoning was that they had accessed the available both online and in print guidelines over 12 months ago, compared with 11% (n = 61/553) of respondents for online only available guidelines (Figure 2).

How respondents used Pharmacist Only medicines guidelines

Most respondents reported they read the whole guideline (n = 308/524, 59%), followed by those applying the information to adapt their practice (n = 216/524, 41%) (Table 3).

Perceived usefulness of Pharmacist Only medicine guidelines

Over 75% (n = 413/524) of respondents reported that the information provided in the guidelines was exactly what they required, with <1% (n = 4/524) of respondents stating the information was not what they needed (Table 3).

Table 1 Demographics of survey respondents

Characteristic	Registered pharmacist (*N* = 444)	Pharmacy intern (*N* = 48)	Pharmacy student (*N* = 82)	All (*N* = 574)
Gender [*n* (%)]				
Male	126 (28.4)	11 (22.9)	23 (28.0)	160 (27.9)
Female	316 (71.2)	37 (77.1)	58 (70.7)	411 (71.6)
Non-conforming/gender variant	0 (0)	0 (0)	0 (0)	0 (0)
Prefer not to answer	2 (0.5)	0 (0)	1 (1.2)	3 (0.5)
Age (in years) [*n* (%)]				
18–24	18 (4.1)	37 (77.1)	64 (78.0)	119 (20.7)
25–34	206 (46.4)	9 (18.8)	12 14.6)	227 (39.5)
35–44	98 (22.1)	1 (2.1)	4 (4.9)	103 (17.9)
45–54	56 (12.6)	1 (2.1)	1 (1.2)	58 (10.1)
55–64	47 (10.6)	0 (0)	0 (0)	47 (8.2)
65+	17 (3.8)	0 (0)	0 (0)	17 (3.0)
Prefer not to answer	2 (0.5)	0 (0)	1 (1.2)	3 (0.5)
None of the above	0 (0)	0 (0)	0 (0)	0 (0)
State of workplace/study [*n* (%)]				
New South Wales	80 (18.0)	6 (12.5)	12 (14.6)	98 (17.1)
Victoria	11 (2.5)	3 (6.3)	3 (3.7)	17 (3.0)
Queensland	113 (25.5)	8 (16.7)	18 (22.0)	139 (24.2)
South Australia	54 (12.2)	11 (22.9)	17 (20.7)	82 (14.3)
Western Australia	43 (9.7)	10 (20.8)	12 (14.6)	65 (11.3)
Northern Territory	122 (27.5)	6 (12.5)	16 (19.5)	144 (25.1)
Australian Capital Territory	12 (2.7)	2 (4.2)	3 (3.7)	17 (3.0)
Tasmania	5 (1.1)	2 (4.2)	0 (0)	7 (1.2)
Prefer not to answer	4 (0.9)	0 (0)	1 (1.2)	5 (0.9)
Currently member of any pharmacy organisations [*n* (%)][1]				
Pharmaceutical Society of Australia	225 (50.7)	32 (66.7)	72 (87.8)	329 (57.3)
Society of Hospital Pharmacists Australia	123 (27.7)	15 (31.3)	50 (61.0)	188 (32.8)
Pharmacy Guild of Australia	88 (19.8)	9 (18.8)	25 (30.5)	122 (21.3)
Professional Pharmacists Australia	48 (10.8)	5 (10.4)	4 (4.9)	57 (9.9)
National Australian Pharmacy Student Association (NAPSA)	11 (2.5)	9 (18.8)	41 (50.0)	61 (10.6)
International Pharmaceutical Federation (FIP)	12 (2.7)	3 (6.3)	2 (2.4)	17 (3.0)
None of the above[2]	82 (18.5)	6 (12.5)	4 (4.9)	92 (16.0)
Prefer not to answer[2]	5 (1.1)	0 (0)	0 (0)	5 (0.9)
Other	41 (9.2)	1 (2.1)	2 (2.4)	44 (7.7)
Pharmacist principal role [*n* (%)]				
Community pharmacy, owner	45 (10.1)		–	–
Community pharmacy, employee	202 (45.5)	–	–	–
Hospital pharmacy	107 (24.1)	–	–	–
Academia	32 (7.2)	–	–	–
Consultant	8 (1.8)	–	–	–
Industry	22 (5.0)	–	–	–
Prefer not to answer	25 (5.6)	–	–	–
Other	3 (0.7)	–	–	–
Intern pharmacist principal place of practice [*n* (%)]				
Community Pharmacy	–	28 (58.3)	–	–
Hospital Pharmacy	–	18 (37.5)	–	–
Industry	–	0 (0)	–	–

Table 1. Continued

Characteristic	Registered pharmacist (*N* = 444)	Pharmacy intern (*N* = 48)	Pharmacy student (*N* = 82)	All (*N* = 574)
Prefer not to answer	–	0 (0)	–	–
Other	–	2 (4.2)	–	–
Pharmacist years registered [*n* (%)]				
0–2	53 (11.9)	–	–	–
3–5	75 (16.9)	–	–	–
6–10	109 (24.5)	–	–	–
11–20	106 (23.9)	–	–	–
21–30	37 (8.3)	–	–	–
>31	64 (14.4)	–	–	–
How often have they worked as a sole pharmacist in the last 12 months [*n* (%)]				
Never	87 (19.6)	–	–	–
Rarely	111 (25.0)	–	–	–
Sometimes	60 (13.5)	–	–	–
Often	83 (18.7)	–	–	–
Always	97 (21.8)	–	–	–
Prefer not to answer	6 (1.4)	–	–	–

N = total responses for that question and population, *n* = total responses for that answer, % = *n*/*N* × 100%.
– indicates question was not asked of that respondent group.
[1]Indicates a multiple answer question, percentages will not add up to 100.
[2]Indicates an exclusive answer.

Table 2 Respondents use of Pharmacist Only medicine guidelines in the last 12 months by respondent group

Professional practice guideline	Registered pharmacist		Pharmacy intern		Pharmacy student		All respondents	
Guideline Group 1 – Available both online and in print	*N* = 444		*N* = 48		*N* = 82		*N* = 574	
	n	%	*n*	%	*n*	%	*n*	%
Chloramphenicol for ophthalmic use	113	25.5	23	47.9	31	37.8	167	29.1
Emergency contraception	189	42.6	38	79.2	51	62.2	278	48.4
Naloxone	106	23.9	20	41.7	20	24.4	146	25.4
Orlistat	43	9.7	16	33.3	19	23.2	78	13.6
Prochlorperazine	62	14.0	18	37.5	15	18.3	95	16.6
Proton pump inhibitors	89	20.0	25	52.1	30	36.6	144	25.1
Short-acting beta$_2$-agonists (salbutamol and terbutaline)	109	24.5	24	50.0	33	40.2	166	28.9
Famciclovir	103	23.2	23	47.9	27	32.9	153	26.7
Guideline Group 2 – Available online only	*N* = 440		*N* = 45		*N* = 79		*N* = 564	
	n	%	n	%	n	%	n	%
Adrenaline (epinephrine)	73	16.6	10	22.2	13	16.5	96	17.0
Astodrimer sodium	27	6.1	12	26.7	4	5.1	43	7.6
Glucagon	32	7.3	8	17.8	6	7.6	46	8.2
High-concentration fluoride toothpaste	33	7.5	5	11.1	5	6.3	43	7.6
Nitrates	31	7.0	8	17.8	11	13.9	50	8.9

N = total responses for that question and population.
n = total responses for that answer, for example, yes I have used this resource in the past 12 months.
% = *n*/*N* × 100%.
*indicates a multiple answer question, percentages will not add up to 100
# indicates an exclusive answer

Discussion

To the researchers' knowledge, this study is the first to describe if and how registered pharmacists, pharmacy interns and pharmacy students use guidelines for Pharmacist Only medicines in Australia. Guidelines that were available both online and in print were reportedly used by more than half

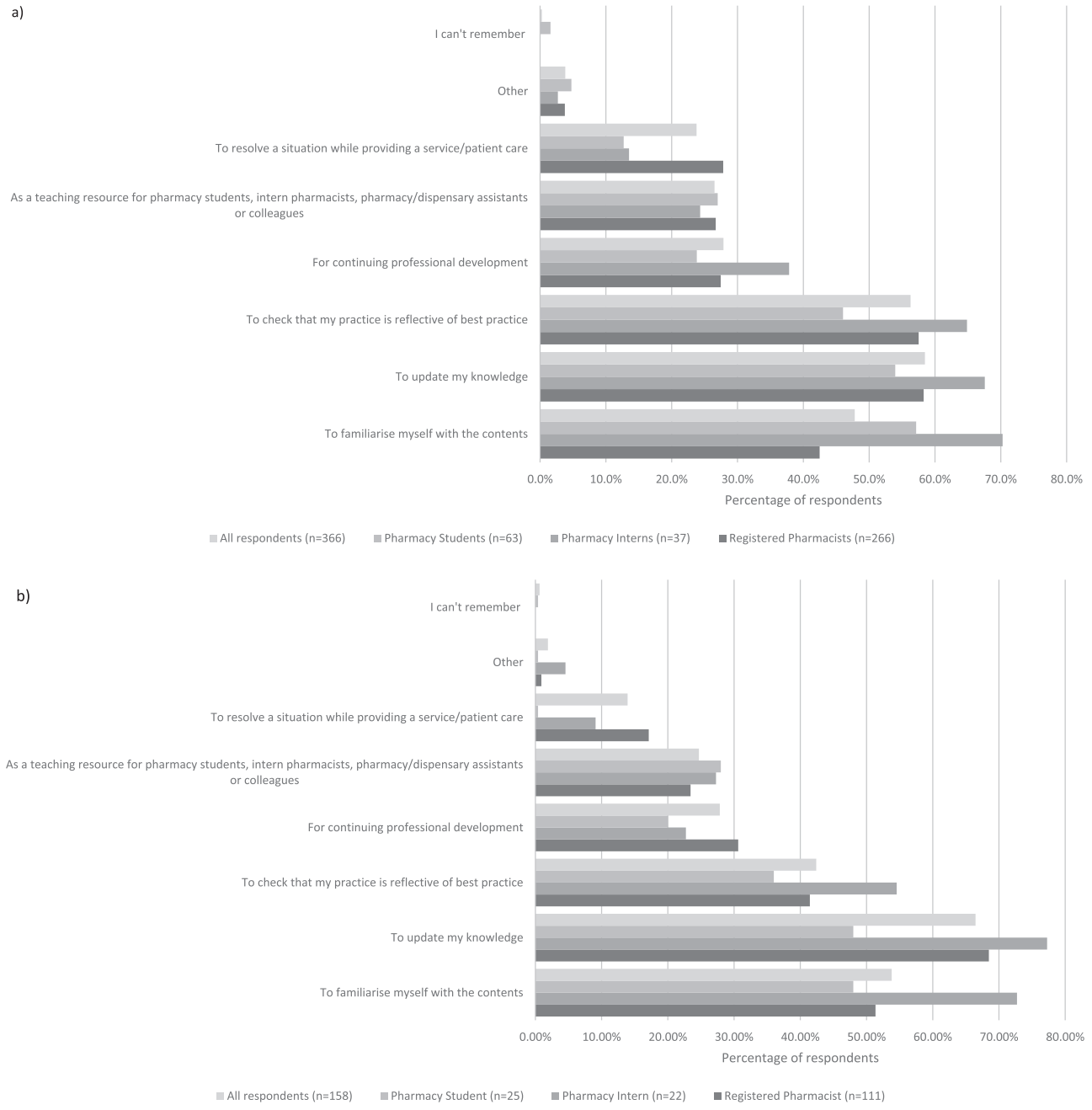

Figure 1 Reasons for using Pharmacist Only medicine guidelines by group for (a) available in print and online and (b) available online only.

of respondents in the preceding 12 months, while online-only guidelines were used by less than half. One-third of respondents had not used the online-only guidelines as they did not know they existed. Usage patterns were observed to be relatively similar between the respondent groups. Understanding reasons for and patterns of use may inform future interventions to increase guideline use to improve the consistency of patient care.

Strengths and limitations

This survey has several strengths and limitations other than those inherent in cross-sectional and online survey designs (e.g. selection bias, social desirability bias). Due to a missing sample frame, no response rate could be calculated. It was a very small number of eligible pharmacists (~1.4% of Australian registered pharmacists) who responded to the survey, which introduces unknown bias with respect to the generalisability of our findings. The survey asked about guideline use within the previous 12 months, so may be subject to recall bias. To reduce this risk, an option was provided to state 'I cannot remember'. This survey was conducted during the COVID-19 pandemic in Australia, where pharmacy practice and guidelines were changing frequently and pharmacists were experiencing high workload with complex patients and scenarios. It is not known what, if any, impact on guideline use from the atypical practice environment at the time the survey was conducted. However, the guidelines for Pharmacist Only medicines did not change during the study period and this survey asked about the previous 12-month use, of which 5 months were before the

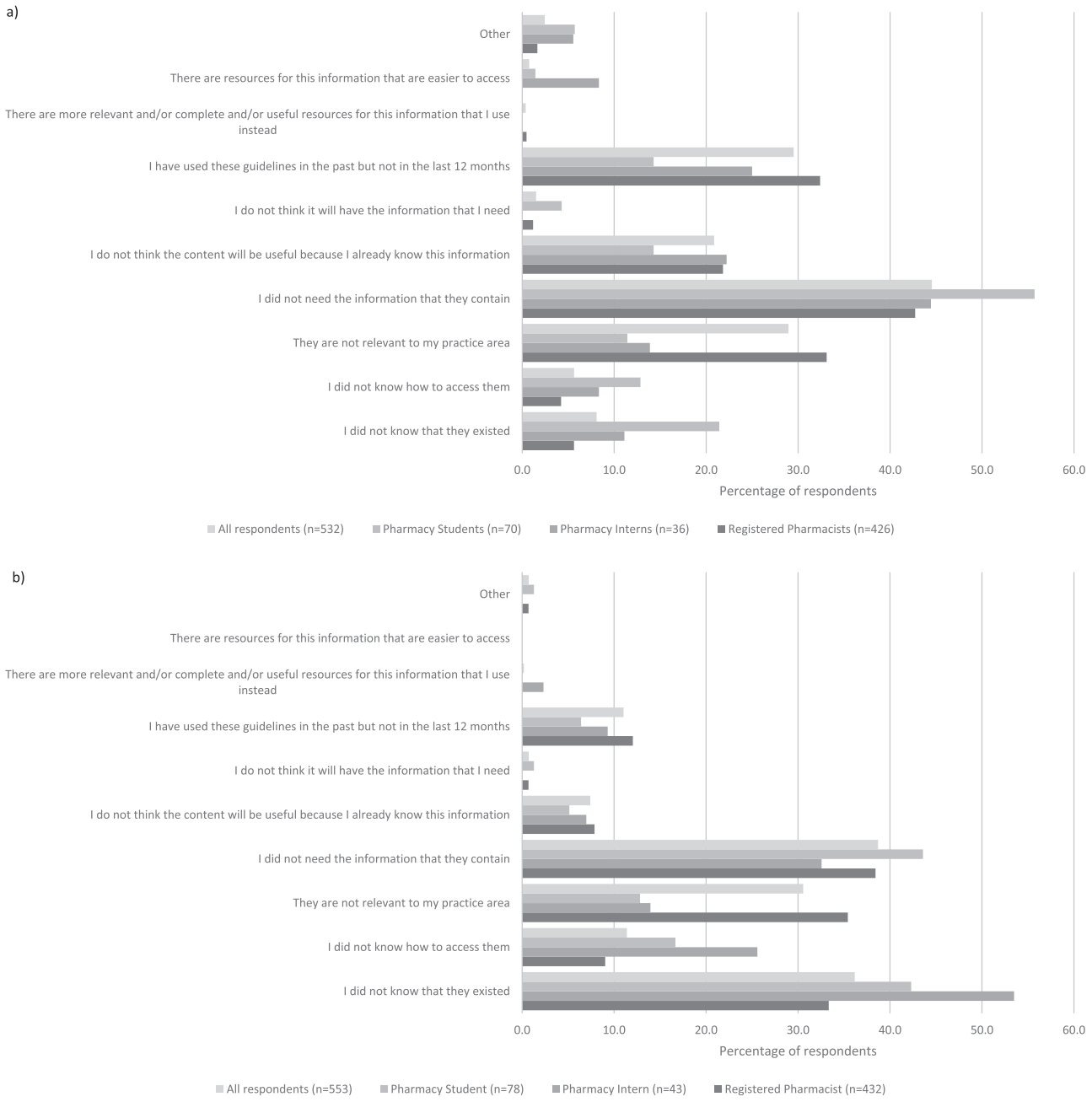

Figure 2 Reasons for non-use of Pharmacist Only medicine guidelines by group for (a) available both online and in print and (b) available online only.

COVID-19 pandemic, thus it is unknown how this may have affected the results.

Results in context

The most common reason reported for the use of the Pharmacist Only medicines guidelines by respondents was to update their knowledge, followed by checking that their practice was reflective of best practice (for available both online and in print guidelines) and to familiarise themselves with the content (for online-only guidelines). There were differences in reasons for not using the guidelines with more pharmacy students reporting they did not need the information the guidelines contained when compared with other respondent groups. These findings were consistent with previous research finding that pharmacists motivation to use guidelines was directly related to their perception of relevance to their practice.[3] Pharmacy students may be reliant on the information provided in their coursework or have not yet experienced either simulated or real-world requests for these medicines, thus not understand the utility of these guidelines. If this is correct, it supports previous work that suggested pharmacy students should be trained to critically evaluate guidelines to develop the ability to deliver evidence-based care.[1] A higher percentage of registered pharmacists reported the guidelines were not relevant to their practice area. Only pharmacists practising in the community are likely to encounter requests for Pharmacist Only medicines regularly, thus, those working in other practice settings may not need this information if it is beyond their current scope of practice. For all respondent types, a higher percentage indicated they did not know the online-only guidelines existed compared with the available both online and in-print

Table 3 How respondents used Pharmacist Only medicine guidelines in the last 12 months and the perceived usefulness by respondent group

	Guideline Group 1: Available both online and in print								Guideline Group 2: Available online only							
	Registered pharmacist, *N* = 266		Pharmacy intern, *N* = 37		Pharmacy student, *N* = 63		Overall, *N* = 366		Registered pharmacist, *N* = 111		Pharmacy intern, *N* = 22		Pharmacy student, *N* = 25		Overall, *N* = 158	
How did they use the selected professional practice resource(s)*	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Read part of it	89	33.5	12	32.4	33	52.4	134	36.6	28	25.2	5	22.7	11	44.0	44	27.8
Read all of it	151	56.8	27	73.0	30	47.6	208	56.8	71	64.0	18	81.8	11	44.0	100	63.3
Applied the information that I read to adapt my practice	106	39.8	24	64.9	31	49.2	161	44.0	38	34.2	10	45.5	7	28.0	55	34.8
Applied the information that I read to advise others on their practice	65	24.4	5	13.5	8	12.7	78	21.3	19	17.1	2	9.1	0	0.0	21	13.3
Confirmed appropriateness of my current practice	95	35.7	15	40.5	21	33.3	131	35.8	26	23.4	5	22.7	2	8.0	33	20.9
Other^	1	0.4	0	0.0	0	0.0	1	0.3	1	0.9	0	0.0	0	0.0	1	0.6
I can't remember#	1	0.4	1	2.7	1	1.6	3	0.8	0	0.0	0	0.0	1	4.0	1	0.6

Usefulness for group professional practice resource(s) that were used*	**Registered pharmacist, *N* = 266**		**Pharmacy intern, *N* = 37**		**Pharmacy student, *N* = 63**		**Overall, *N* = 366**		**Registered pharmacist, *N* = 111**		**Pharmacy intern, *N* = 22**		**Pharmacy student, *N* = 25**		**Overall, *N* = 158**	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Very – the information contained was exactly what I needed/expected	212	79.7	31	83.8	47	74.6	290	79.2	86	77.5	17	77.3	20	80.0	123	77.8
Some what – some of the information was what I needed/expected	52	19.5	6	16.2	14	22.2	72	19.7	22	19.8	4	18.2	4	16.0	30	19.0
Not at all – the information in this document was not what I needed/expected	1	0.4	0	0.0	1	1.6	2	0.5	1	0.9	1	4.5	0	0.0	2	1.3
I can't remember	1	0.4	0	0.0	1	1.6	2	0.5	2	1.8	0	0.0	1	4.0	3	1.9

N = total responses for that question and population.
n = total responses for that answer, for example, yes I have used this resource in the past 12 months.
% = *n*/*N* × 100%.
*indicates a multiple answer question, percentages will not add up to 100 # indicates an exclusive answer

guidelines. This could be for multiple reasons but most likely is that either the respondent did not have access to the online version as they did not have a professional organisation membership or access to the online formulary. It is also possible that they had not had a need to look for the guideline if recent encounters for the specific medicine had not been received. While reasons for use of the guidelines were more consistent across respondent groups, reasons for not using the guidelines were more variable and suggest that when respondents use guidelines, they are using them for similar reasons, however, when they do not, it is more dependent on their current practice area, previous knowledge and experience.

To our knowledge, there have been no previous studies exploring how pharmacists, interns or pharmacy students use guidelines for Pharmacist Only medicines in Australia so limited comparisons can be made to other studies. We only explored self-perception without examining their knowledge. However, previous simulated patient studies in Australia and internationally report that pharmacists rarely supply Pharmacist Only medicines according to professional guidelines.[6, 15, 39] One study reported pharmacists provided adequate counselling before a codeine-containing medicine in <20% of simulated patient scenarios.[40] Therefore, it is possible that respondents may not be regularly reviewing guidelines as they 'do not know what they don't know'. A previous qualitative study reported that there were system-level barriers to providing Pharmacist Only naloxone, stating that most pharmacists seemed unaware of resources to help guide naloxone supply, including professional guidelines.[41] A recent systematic review of international studies including Europe and North America reported that this behaviour is observed across professions, with guideline adherence being influenced by multiple behavioural factors.[42] A scoping review of health professionals use of guidelines in developed countries reported that their uptake in practice is often unpredictable and complex.[43] While we were not aware of similar pharmacist-specific research, it is likely that pharmacists' utilisation of guidelines is similarly complex to these reviews in other health professions internationally. It is important that pharmacists are aware of the existence of guidelines, can access all national guidelines and that these are accessed often, irrespective of the perceived knowledge, to ensure care provided is consistently and in line with current recommendations for best practice.

Implications for practice

This study has implications for guideline developers and practitioners. Guidelines and professional practice resources are an essential part of pharmacy practice and should be accessed and used throughout a pharmacist's career,

regardless of experience. As intern and student pharmacists use guidelines for learning and registered pharmacists for complying with best practice recommendations, guideline developers should ensure guidelines are fit for both purposes. Experienced pharmacists should encourage early career and student pharmacists to access these guidelines throughout their learning and career so that the next generation of pharmacists can continue to provide evidence based, consistent, up-to-date patient care.

Another implication for guideline developers is to consider consistency between guidelines within and between countries. Individual pharmacists may need to determine which guideline is most appropriate for their practice setting. For example, the German guidelines from the gynaecological associations and the Federal Chamber of Pharmacies differ in their recommendations for oral emergency contraception.[44] The German guidelines for emergency contraception supply to males differs from the Australian guidelines.[45] An awareness and explanation by guidelines developers of the rationale behind divergent recommendations could be useful to assist practitioners to understand the application of guidelines to their practice. It is also possible that our findings indicate that pharmacists are applying clinical judgment and critical appraisal of the applicability to their practice about when the guidelines are applicable,[46, 47] which would be consistent with other work that suggests pharmacists develop individual approaches to information retrieval and dispersal.[48] However, for these acute time-limited conditions it is unlikely that there should be substantial variation particularly as the Pharmacist Only medicines are only approved for distinct conditions.

Implications for research

Further research should focus on in-depth qualitative exploration of guideline usage patterns, including influencers of use, and which aspects users found helpful and unhelpful within the guidelines. The current study asked to self-report usage and perception, whereas further research could investigate the consistency and quality of practice that corresponds to the perceived usefulness. It would also be useful to understand the perceptions of what content or presentation corresponds to the perceived usefulness of guidelines. This information will be helpful to policymakers and organisations to redesign resources in line with what users report would help them provide consistent patient care and improve adherence and usability of the resources.

Conclusion

There is variability in the use of Pharmacist Only medicine guidelines among Australian pharmacy students, intern pharmacists and registered pharmacists. While these guidelines are often used for learning and ensuring consistent care, some individuals may not be aware of their availability or feel that they do not need to utilise them. To promote consistent use, it is important for these guidelines to be easily found, understood, relevant and useful, and to provide enough detail for different groups to effectively use them in practice.

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Author Contributions

D.M.: Conceptualisation, Data curation, Formal analysis, Funding acquisition, Investigation; Methodology, Project administration, Resources, Visualisation, Writing – original draft, Writing – review and editing. J.L.J.: Conceptualisation, Investigation, Methodology, Supervision, Writing – review and editing. K.L.: Methodology, Supervision, Writing – review and editing. M.P.: Data presentation, writing – original draft, writing review and editing. S.M.S.: Methodology, Supervision, Writing – review and editing. D.D'L.: Methodology, Supervision, Writing – review and editing. L.S.: Writing – review and editing. R.C.: Funding acquisition, Methodology, Supervision, Writing – original draft, Writing – review and editing. A.P.: Conceptualisation, Formal analysis, Methodology, Resources, Software, Writing – review and editing.

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Conflict of Interest

At the time of writing this manuscript, D.M. was appointed as a Board Director for the Pharmaceutical Society of Australia, J.L.J. was appointed as a Board Director for the Society of Hospital Pharmacists Australia, R.C. was appointed as a Board Director for the Australian Pharmacy Council and A.P. was appointed as a practitioner member of the Pharmacy Board of Australia.

Data Availability Statement

Data for the study are available by contacting the corresponding author if requests are reasonable and in accordance with the ethical approval.

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