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# Evaluation of a transgender health training program for pharmacists and pharmacy students in Australia: A pre-post study

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## ABSTRACT

**Background:** Disparities in healthcare for transgender and gender diverse (TGD) people are well-recognized, with pharmacists reporting a lack of knowledge impacting confidence in their interactions with TGD people. Therefore, a training program in TGD healthcare was designed to address this knowledge gap.

**Objective:** To evaluate the impact of the TGD healthcare training program on the awareness, knowledge, and behaviour of pharmacists and pharmacy students in Australia.

**Method:** An online training program was evaluated by pre-and post-test surveys, which assessed the knowledge and awareness of participants, and three-month post-training interviews, which examined the effect of training on pharmacists' practice when providing care to TGD people. Data were analyzed using paired t-tests, content and thematic analysis.

**Result:** Fifty-six pharmacists and twenty-one pharmacy students completed the training and pre-and post-test surveys. Ten pharmacists were interviewed post-training. There was a significant improvement in the awareness (pharmacists,  $p \leq 0.001$ ; students,  $p = 0.006$ ), knowledge (pharmacists and students,  $p \leq 0.001$ ) and total (pharmacists and students,  $p \leq 0.001$ ) post-test scores for both groups. Interviewed participants found the training program comprehensive and relevant to their practice.

**Conclusion:** This study has demonstrated that educational interventions improve TGD healthcare awareness and knowledge for pharmacists and students with the potential to improve healthcare provision to TGD people and promote inclusivity in society.

## 1. Introduction

While accurate statistical information for the transgender and gender diverse (TGD) population in Australia is not available, it is approximated that around 0.1–2% of the global population identifies as TGD.<sup>1</sup> Challenges faced by TGD people in healthcare settings, including pharmacies, are widely recognized.<sup>2–4</sup> Even though pharmacies provide various pharmaceutical services to TGD people, many TGD people report encountering obstacles to receiving culturally competent care.<sup>5–7</sup> Some challenges faced by TGD people when accessing care from pharmacies include instances of deadnaming, the use of incorrect pronouns, and stigma among pharmacy staff surrounding TGD identities, which may further impede a supportive pharmacy environment.<sup>2,7,8</sup> The overall lack of awareness about TGD health issues and gender-affirming

therapies among pharmacists was also identified as a barrier to accessing essential and affirming healthcare for TGD people.<sup>2,3,8</sup> The Pharmaceutical Society of Australia's 'Professional Practice Standards' and 'Code of Ethics' for pharmacists advise on the provision of culturally sensitive, respectful, and person-centred care to all patients.<sup>9,10</sup> However, a previous study found that TGD people in Australia experienced unequal treatment in pharmacy settings and reported a lack of understanding of their healthcare needs by pharmacists and staff.<sup>7</sup>

Pharmacists, being healthcare professionals who are easily accessible without appointments, are well-positioned to reduce healthcare disparities experienced by TGD people.<sup>2,3</sup> However, they may inadvertently increase these disparities because of a lack of knowledge and understanding of the healthcare needs of TGD people.<sup>3,5,6</sup> Pharmacists have reported feeling less comfortable and confident in providing care to

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this underserved population and have requested education to provide culturally appropriate care without fear of offending TGD people.<sup>6,8</sup> These findings provide an opportunity for pharmacy education providers to design and implement training programs that foster culturally appropriate communication, improve knowledge about the healthcare needs of TGD people and enhance the adaptation of attitudes necessary to embrace gender diversity.<sup>6-8</sup>

Internationally, some initiatives have been implemented to include education about TGD healthcare in pharmacy education.<sup>11-15</sup> Such education has been provided to pharmacists and pharmacy students through continuing professional education (CPE) activities or integrated into university curricula.<sup>11-15</sup> Exposure to the educational content in these activities ranged from one hour to five hours.<sup>11-15</sup> A three-hour CPE activity for pharmacists that included a didactic presentation and facilitated discussion of cases reported increased participants' knowledge of TGD care and hormonal therapies.<sup>12</sup> Frazier et al. implemented a flipped classroom model to teach subject material to pharmacy students, who were required to complete pre-class reading and watch a pre-recorded lecture.<sup>15</sup> In class, students completed a game-style activity reinforcing the learning from the pre-class materials, engaged in discussions and role plays and participated in an interactive session with a TGD person. This activity enhanced students' knowledge and confidence in caring for TGD people.<sup>15</sup> Another study utilized a one-hour lecture introducing LGBT terminology and a two-hour panel discussion with TGD people to improve students' understanding of TGD care.<sup>13</sup> Other studies included a didactic lecture,<sup>16</sup> videos, a Jeopardy game and a panel of TGD people,<sup>11</sup> which all reported increasing students' knowledge and confidence in providing care to TGD people. Recently, guidance about topics to incorporate in pharmacy education to improve TGD healthcare knowledge has been published.<sup>17</sup> Newsome and Gilmer recommended the introduction of content that builds cultural competency, addresses unconscious biases, and improves pharmacotherapeutic knowledge about gender-affirming therapies.<sup>17</sup> However, information about the effect of including TGD healthcare education activities in Australian curricula or CPE activities on pharmacists' and students' awareness and knowledge about TGD healthcare is unavailable.

The lack of availability of TGD healthcare education activities in Australian curricula or CPE activities for pharmacists<sup>8</sup> and considering the requirements of the Australian TGD population<sup>7</sup> prompted the development of an online training program aimed at educating pharmacists and students about TGD healthcare. The design of this training program was informed by data from our previous studies<sup>7,8,18,19</sup> involving appropriate stakeholders, including TGD people, pharmacists, and an expert advisory group. First, a scoping review was conducted to map pharmacists' role in TGD healthcare.<sup>19</sup> Then, interviews with TGD people<sup>7</sup> and pharmacists<sup>8</sup> informed how pharmacists could enhance the healthcare outcomes of TGD people by addressing the common barriers experienced by TGD people visiting pharmacies. Finally, a national survey of pharmacists explored the knowledge, attitudes, practices, and training needs of Australian pharmacists in TGD healthcare.<sup>18</sup> The pharmacists demonstrated positive attitudes and were eager to learn about TGD healthcare to improve their confidence and comfort in delivering care to TGD people.<sup>8,18</sup> Pharmacists favoured CPE activities in the form of online modules.<sup>18</sup> Therefore, an online training program consisting of three modules was developed in consultation with an expert advisory group. This group consisted of three TGD people, three pharmacists and three pharmacy academics. This study aims to evaluate the impact of this online training program on pharmacists' and pharmacy students' knowledge and awareness of TGD healthcare and to explore the outcome on pharmacists' behaviour in practice of providing care to TGD people three months after the training program was provided.

## 2. Methods

### 2.1. Training program and survey tool

Based on previous needs analysis studies,<sup>7,8,18,19</sup> an online training program on TGD healthcare was developed. The details of the design of this training program, which included the following online modules, are discussed in a manuscript that has been submitted for publication elsewhere.<sup>20</sup>

1. Transgender Healthcare – Language, terminology, and key healthcare issues
2. Gender affirming therapies
3. Case Studies in TGD Healthcare

The training program included reading material, links to additional resources and pre-recorded videos of TGD people discussing their past interactions with pharmacists and their healthcare expectations from pharmacists and pharmacy staff. Additionally, videos demonstrating inappropriate versus appropriate interactions with TGD people in a pharmacy setting, including counselling on over-the-counter medicines and hormonal medicines for gender affirmation, were incorporated. These videos were filmed with local TGD volunteers and pharmacists.

A pre-test post-test intervention design was utilized to investigate the impact of this training program on pharmacists' and pharmacy students' knowledge, awareness and attitudes toward providing pharmaceutical care to TGD people.<sup>21</sup> A validated survey tool from a previous study by Hernández-Agosto et al.<sup>22</sup> was adopted, translated into English from Spanish, and modified to suit the Australian context (Supplementary Material 1). Both pharmacists and students were required to complete a pre-test survey before accessing the training modules and a post-test survey after completing all three modules. Questions 1 to 10 constituted the 'Awareness scale' and assessed the awareness of the participants about gender terminology and healthcare needs of the TGD population, while the 'Knowledge scale' (Questions 11 to 24) examined their understanding of gender affirmation therapy for TGD people. Additional demographic and training evaluation questions were added at the end of the post-test survey. Free-text comments about the training program and the outcome evaluation interviews were included to assist in identifying changes in pharmacists' attitudes toward the provision of TGD care.

### 2.2. Participant recruitment for the survey and interviews

**Pharmacists:** All pharmacists who participated in a previous national survey about the knowledge, attitudes and training needs of Australian pharmacists<sup>18</sup> were provided with an opportunity to express their interest in a training program about TGD healthcare. After completing that survey, interested pharmacists provided their contact details (name, email, contact number) via a confidential link. The principal investigator contacted them via email and provided information about enrolment into the online training program on TGD healthcare. A total of 125 pharmacists were enrolled in the training module. The training module was available for completion for pharmacists from October to November 2022.

**Pharmacy students:** All fourth-year pharmacy students ( $N = 25$ ) at James Cook University were enrolled in the online training module on TGD healthcare. This module was offered as a part of an Advanced Pharmacy Practice subject that included expanded and specialized pharmaceutical care. Pharmacy students completed this training in the class at their own pace over two sessions (a total time of five hours). The principal investigator was present in both sessions and answered any queries related to the content. Once students completed the first two modules, the case studies in Module Three were discussed with the students at the end of the second session as a group activity. Participation in pre-and post-test surveys was voluntary and did not affect their

final grade in the subject.

### 2.3. Data collection

**Pharmacists:** Online pre-test and post-test surveys were developed and administered using the Qualtrics platform. Pharmacists were required to complete the pre-test survey to receive access to the training modules. In the pre-test surveys, they were asked to generate a code to access the post-test. This code enabled the researchers to match the pre-test and post-test surveys to the participants. After completing the training, a post-test survey was available for completion. Once respondents completed the post-test survey, a confidential link was provided to complete their contact details (full name and email address) to receive a course completion certificate and express their interest in a three-month post-training evaluation interview.

Three months after the training, the principal investigator contacted the pharmacists who expressed interest in participating in the post-evaluation interview via email. Zoom or phone interviews were arranged with the participants responding to the email.

**Pharmacy students:** A JCU Pharmacy staff member who had no affiliation with this study administered the paper-based pre-test and post-test surveys to the students before and after completing the training modules in the class. This staff member assigned random codes to the students and distributed pre-and post-test surveys with the same code to the same student, allowing the pairing of the pre-and post-test surveys.

### 2.4. Data analysis

**Pre-test post-test survey:** For data analysis, the pharmacist pre-test post-test data were imported from the Qualtrics platform into the SPSS software, while the student pre-test post-test data were manually entered into the SPSS software. Paired *t*-tests were conducted to determine whether there was a difference in the pre-and post-test performances of participants. The differences in awareness scale, knowledge scale and total scores were analyzed. Demographics and other quantitative data were analyzed using descriptive statistics. Qualitative data from open-ended questions were analyzed using content analysis.<sup>23</sup>

**Interview:** Interviews were recorded and transcribed verbatim using the Zoom transcription function. The principal investigator compared these transcriptions with the audio interviews to ensure the accuracy of the data. The transcripts were imported into the NVivo data management software, and themes were derived using Braun and Clarke's framework for thematic analysis.<sup>24</sup>

### 2.5. Ethics

This study was approved by the Human Research Ethics Committee of James Cook University (Approval no. H8265). Participation in this research was voluntary, and the participants could withdraw from this research at any time without any prejudice or explanation.

## 3. Results

### 3.1. Pharmacist pre-test post-test survey

Out of 125 pharmacists enrolled in the training program, 72 completed the pre-test, and 56 completed the post-test. Therefore, data from 56 participants who completed both tests were included in this study. The demographic characteristics of the pharmacist participants are listed in [Table 1](#).

The pre-and post-test statistical analysis revealed significant improvements in the awareness scale ( $p < 0.001$ ), knowledge scale ( $p < 0.001$ ) and the total score ( $p < 0.001$ ) of the pharmacists after completion of the training program. The highest possible test score was 24, with 10 points for the awareness scale and 14 points for the knowledge scale. Although 14 (25%) pharmacists scored 100% on the

**Table 1**  
Pharmacist participant characteristics.

Participant characteristics	Frequency (%)
Gender	
Male	12 (21.4)
Female	39 (69.6)
Non-binary	3 (5.4)
Prefer not to say	2 (3.6)
Age (years)	
18–25	1 (1.8)
26–35	28 (50)
36–45	14 (25)
46–55	6 (10.7)
55 and above	7 (12.5)
Work setting	
Academia	3 (5.4)
Community pharmacy	43 (76.8)
Hospital Pharmacy	7 (12.5)
Other	3 (5.4)

pre-test awareness scale, this number almost doubled after completing the training program, with 31 (55.4%) obtaining a 100% score for the awareness scale. No participant scored 100% on the pre-test knowledge scale and total score. However, 9 (16%) pharmacists scored 100% on the post-test knowledge scale, with 5 (8.9%) achieving a 100% total score on the post-test. [Table 2](#) shows the pre-and post-test scores for pharmacists.

For the pre-test awareness scale, most pharmacists ( $n = 33$ , 58.9%) answered question seven (How can pharmacists create an inclusive environment for transgender patients?) incorrectly. However, this number decreased by one-fifth ( $n = 22$ , 39.5%) in the post-test. For the knowledge scale, three-quarters of the pharmacists ( $n = 42$ , 75%) selected an incorrect option for question sixteen (According to current pharmacy practices in Australia, which therapy is NOT suitable for a transgender woman using hormonal therapy?), while less than a quarter ( $n = 12$ , 21.4%) selected an incorrect option in the post-test.

Most of the pharmacists found the training program valuable for their practice. The themes derived from post-test comments about what they liked about the training program are summarized in [Table 3](#). >96% of pharmacists agreed/strongly agreed that this training program improved their confidence in their knowledge of pharmacotherapeutic options available for gender-affirming therapy. >95% of pharmacists agreed/strongly agreed that this training was beneficial for their practice of providing care to TGD people, while 98.2% agreed/strongly agreed that they would recommend this training program to other pharmacists and pharmacy students.

In the post-test, pharmacists were asked what they would not include in the training and what they would like to add to future training sessions. Most pharmacists stated they liked everything about the training. Several pharmacists requested more practice questions to self-test their knowledge, with a few requesting an interactive session to discuss more case studies and practice counselling. Some pharmacists requested the training material as a PDF file or a printed booklet for later use as a reference guide. Similar results were observed in the three-month post-training interview data ([Table 4](#)).

Although 28 (50%) pharmacists were interested in the post-training interviews, only ten participated. Most pharmacists found that the training positively impacted their communication and approach to TGD patients and transformed their practice. Pharmacists rated the training program between 3 and 5 out of 5. The pharmacists who rated it below 5 stated that the lower rating was mainly because they had not encountered a TGD patient in practice since the completion of the training. Therefore, they could not state the impact of the training on their professional practice, but on a personal level, they felt more confident and comfortable providing care to TGD people. Most pharmacists identified three common barriers to providing care to TGD people in community pharmacies - societal and personal beliefs, lack of privacy and confidentiality, and lack of awareness about TGD health among pharmacists

**Table 2**  
Pre-test and post-test scores for pharmacist participants.

	Awareness Scale Score				Knowledge Scale Score			Total Score				
	Lowest	Highest	Mean	p-value	Lowest	Highest	Mean	p-value	Lowest	Highest	Mean	p-value
Pre-test	6	10	8.7	<0.001	6	13	9.1	<0.001	14	22	17.8	<0.001
Post-test	7	10	9.3		9	14	12.1		18	24	21.4	

**Table 3**  
Themes from pharmacist (n = 56) feedback: What did you like most about this training?

Theme	Frequency	Quote
Comprehensive, easy to understand, convenient	11	“Easy to follow, comprehensive, well set up.” “Information was simple to understand, plenty of resources included.” “Convenient to do at home. Self-paced.”
Informative and innovative	7	“Very informative, provided information that I would not have been educated on elsewhere.” “Opened up a new and very interesting area to me that I had not thought about.”
Knowledge and confidence for practice	5	“Increased knowledge about the transgender population and therapies available to them, specifically medication therapy.” “More confidence around which drugs used, doses and what to counsel on.”
Language, interactions and Pharmacotherapy for Gender Affirmation	11	“A fantastic resource to educate re language and appropriate interaction points.” “I like the treatment section - what hormones are used and what monitoring should be done - this is an area which is not clear in reference texts. Also liked the cases to consolidate my knowledge.”
Relevant to practice	8	“Concise, relevant information and simple strategies to implement.” “It was informative and so relevant to my practice. It is so great to have such a resource available.”
Case studies	11	“The case studies were very instructive and suggested counselling points I would not have thought of.” “The case studies that demonstrate the information and how to deliver it.”
Inclusion of TGD people	6	“Having real perspectives from transgender customers.” “I also appreciated hearing from transgender individuals about how pharmacies could be more inclusive to them.”
References and resources, all information in one place	6	“Up-to-date references and nomenclature.” “I loved how many good resources I was exposed to and have utilized already.” “Detailed information all in one place with excellent examples.”
Videos	13	“I enjoyed the video examples; it helped consolidate the concepts covered in Modules 1 and 2 and acted as a good example of pharmacist interaction.”

**Table 4**  
Themes from the interviews.

Theme	Quote
Awareness Knowledge	“I feel like I am much more confident with some of the tools from the training activities and modules, so I have much greater awareness and respect and empathy for those people in our community who identify as trans.” “The most important thing for me as a pharmacist was the recognition of hormonal therapy. At what point, based on the length of the hormone therapy, you would be considered physiologically male or female? Because then, if I do come across such a patient clinically, I know what to consider the patient’s sex to be in relation to the treatment.”
Comfort Privacy	“So, a lot more comfortable, like addressing pronouns and preferred names and certainly introducing myself with pronouns and asking pronouns in a respectful manner, has been really helpful. I’m feeling comfortable and not self-conscious about doing that, but also sort of being aware of surroundings and keeping in mind privacy concerns.” “I would say privacy for such patients is actually more critical than normal because, obviously, they’re going to have a lot more social stigma attached to them. The way the pharmacy is set up right now that’s something that the whole professional need to work on.”
Change – personal and societal behaviour in pharmacy	“So, I feel like what I took away from this was also how to create open spaces, behave and work empathetically, non-judgmentally. Now, I have an open mind and just embrace everybody as equals, and I feel like that’s a big takeaway message bigger than just what the content was about.” “If I place it [the transgender flag] in the window, would you feel happy, or would you feel scared that people may look at it negatively? Broader society, would they look at it negatively, or would they? People would know they [transgender people] would come here. Would it cause an incident?” “I work in a very ethnic population of [the city], where it can be quite religious, and some of my colleagues are of different belief backgrounds where it doesn’t align with their beliefs. So, there is some of that being a barrier.”
Complete resource Requirement for printed or accessible training material	“I thought it [the training] was a complete resource. Excellent.” “I would like printed material or booklet even at a cost.”
Future training availability for broader consumption	“I would love to see it, maybe added to a university course for pharmacists.” “I’d love to see it available to more pharmacists because I will definitely send everyone to go do it when it is available.”

and staff.

**3.2. Student pre-test post-test survey**

All 25 students completed the modules; however, only 21 participated in both pre-and post-test surveys. Most student participants were female (n = 14, 66.7%) and aged between 18 and 25 (n = 20, 95.2%).

When pre-and post-test surveys were analyzed, a significant improvement in the awareness scale scores ( $p = 0.006$ ), knowledge scale scores ( $p < 0.001$ ) and total scores ( $p < 0.001$ ) was noticed upon completion of the training program.

Only 2 (8.3%) students scored 100% on the pre-test awareness scale; however, 9 (37.5%) students achieved a 100% score on the post-test awareness scale. None of the students scored 100% in pre-test and post-test knowledge scales and total scores. Pre- and post-test scores for students are reported in Table 5. Like the pharmacist's data, most students struggled to answer questions seven (How can pharmacists create an inclusive environment for transgender patients?)

and sixteen (According to current pharmacy practices in Australia, which therapy is NOT suitable for a transgender woman using hormonal therapy?) on pre-test and post-tests. In the pre-test, over three-fifths of the students ( $n = 13$ , 61.9%) selected a wrong answer for question seven. After completing the training program, only 28.6% ( $n = 6$ ) of students answered the question incorrectly. Almost all students ( $n = 20$ , 95.2%) chose an incorrect option for question sixteen on the pre-test, while more than the four-fifths ( $n = 17$ , 81%) still chose an incorrect option after completing the training program.

Students were asked to comment on what they liked most about the training session. The themes from this data are listed in Table 6 with representative quotes. When asked about what they did not like about the training session, most students stated that there was nothing to mention. A couple of students reported not having enough time to complete the training modules in the class, with one stating, "There was so much content to cover in such a small amount of time." Like the pharmacist data, a few students requested more post-module quizzes. Most students appreciated the inclusion of TGD people in training videos; however, a few stated that additional in-person interaction with TGD people in group learning sessions may benefit their learning. Some suggested including case studies in their dispensing and counselling practice sessions to improve their confidence in providing care to TGD people.

>95% of students agreed/strongly agreed that this training program improved their confidence in their knowledge of pharmacotherapeutic options available for gender-affirming therapy. About 91% agreed/strongly agreed that this training was beneficial for their practice and would recommend it to other pharmacists and pharmacy students.

#### 4. Discussion

This is the first study in Australia that has assessed the impact of education about TGD healthcare on the knowledge and attitudes of pharmacists and pharmacy students and the outcome of the behaviour of pharmacists in practice. Most pharmacists and students found this training program valuable and relevant to their practice. Changes in their knowledge levels and attitudes were noticeable post-training. Although previous international studies<sup>11-15</sup> have found that training in TGD healthcare improved the knowledge, attitudes, comfort and confidence levels of pharmacists and students to provide care to TGD people, no study has evaluated the long-term impact of such intervention. In this study, the three-month post-training evaluation interviews with pharmacists provided insight into changes in the behaviour of pharmacists in practice. Furthermore, these interviews shed light on the barriers experienced by pharmacists in providing care to TGD people in pharmacy.

**Table 5**

Pre-and post-test scores for student participants.

	Awareness Scale Score				Knowledge Scale Score				Total Score			
	Lowest	Highest	Mean	p-value	Lowest	Highest	Mean	p-value	Lowest	Highest	Mean	p-value
Pre-test	5	10	8.2	0.006	5	12	8.0	<0.001	10	21	16.2	<0.001
Post-test	6	10	9.1		6	13	9.8		14	23	18.9	

**Table 6**

Themes from student feedback: What did you like most about this training session?

Theme	Frequency	Quote
Comprehensive, easy to understand, convenient	8	"Content was easy to consume and easy to understand." "The ease of undertaking it (having set up as modules)." "Liked the 'learn at your pace' format of the modules."
Informative and innovative	11	"New and very informative, learnt a lot about a topic that I had little knowledge about." "Very new topic for us, so it was incredibly insightful and interesting to learn."
Language, appropriate interactions and Pharmacotherapy for Gender Affirmation	9	"Was useful to learn about how to handle situations in the pharmacy with transgender patients to ensure they feel comfortable; unlikely we could get guidance from our pharmacist as they haven't been taught."
Relevant to practice	4	"I like this training session as it is on a topic that I know very little about but do see in practice."
Safe space to ask questions	3	"The ability to ask sensitive questions and being respectfully responded to."
Videos	6	"The case scenario videos of the pharmacist-patient interaction were helpful to understand the language which should be used in a pharmacy."

Post-training, the most noticeable change in the attitudes reported by participants was their perspective of how they view not only TGD people but everyone in a non-judgmental way. Concerning Aboriginal and Torres Strait Islander people's cultural and clinical safety, the culturally safe practice has been defined as "the ongoing critical reflection of health practitioner knowledge, skills, attitudes, practising behaviours and power differentials in delivering safe, accessible and responsive healthcare free of racism."<sup>25</sup> Similarly, culturally safe practice with TGD people requires ongoing reflection by healthcare professionals on the implicit biases they may unintentionally bring into their practice. This training program enabled participants to introspect and observe their attitudes, behaviours, and practices. Additionally, it equipped them with tools for communicating with TGD people in non-judgmental and inclusive ways. Understanding the patient's preferred language, needs, and values is fundamental in providing culturally safe, respectful, and person-centred care.<sup>26</sup> Pharmacists and students in this training program brought this awareness to their practice through meaningfully engaging in conversation with TGD people and building trusted relationships. Pharmacists in earlier studies have reported that the inability to establish trust with TGD people in pharmacy was one of the main barriers to providing care for TGD people.<sup>8,19</sup> Acknowledging the differences in culture and being cognisant of the elements of respectful verbal and non-verbal communication, healthcare professionals, including pharmacists, can redress the trust barrier and provide equitable care to TGD people.

Misconceptions and a lack of awareness about gender identities often lead to prejudice, discrimination, and marginalization against TGD people.<sup>27</sup> Such personal and social beliefs may harm the mental, emotional, and physical health and well-being and overall quality of life of TGD people.<sup>27,28</sup> Religion and culture often play a critical role in forming worldviews and values that influence personal beliefs.<sup>29</sup> Such beliefs may substantially impact individuals' attitudes and perceptions toward TGD people.<sup>29</sup> Although the effects of pharmacists' religious and cultural beliefs on the provision of care to TGD people in pharmacy have not been extensively studied, some pharmacists in this study raised their concerns about colleagues and staff that may have discriminatory views toward TGD people that may be deeply rooted in their religion and culture. Educational interventions aimed at improving the awareness of healthcare professionals and students about TGD people have been demonstrated to effectively reduce transphobic attitudes and improve their comfort and confidence in care provision to TGD people.<sup>11,16,30,31</sup> Most participants of this study recommended the implementation of this training program at a broader level so that all pharmacists, staff and students are educated about TGD people and become acquainted with wider views. Exposure to diverse perspectives may challenge deeply rooted beliefs and values, eventually improving acceptance of people of varied gender and sexual identities.

Although the visibility of TGD people has increased in recent years, as suggested by our data, social challenges for TGD people persist. Positive changes in personal and societal attitudes may reduce or prevent both subtle and overt forms of stigma in pharmacy and other healthcare settings.<sup>27</sup> Educational interventions promoting acceptance and inclusion of TGD people have been shown to challenge stereotypes and reduce societal stigma.<sup>30,32</sup> Legislative changes and policy reforms are also instrumental in fostering inclusivity and equity in healthcare for TGD people.<sup>27</sup> A recent publication of an 'Equality Statement' by the Pharmaceutical Society of Australia is a positive step toward enhancing the equality for LGBTIQ+ people in pharmacy.<sup>26</sup> With an improved understanding and acceptance of gender diversity, a society can create and foster a culture that embraces and celebrates that diversity. Therefore, training about gender diversity and cultural awareness needs to be implemented at a broader level to irradicate the social and personal stigma toward TGD people.

This training program included pre-recorded videos with TGD people sharing their experiences visiting pharmacies and their expectations from pharmacists and staff. Learning videos demonstrating inappropriate Vs appropriate interactions in pharmacy and exemplifying OTC and prescription medicines counselling were filmed with TGD people and pharmacists. Participants in this study regarded these videos as the most valuable learning tools. These videos enabled them to listen to the perspectives of TGD people and observe actual patient-pharmacist interactions. Including actual patient experiences in education programs has been shown to improve the attitudes of healthcare professionals toward their patients.<sup>33</sup> The involvement of patients in teaching has been found to enhance communication skills and adopt non-judgemental attitudes and respect toward patients, ultimately positively impacting the provision of person-centred care.<sup>33</sup> Other studies included interactive sessions with TGD people and found these sessions effective in improving the comfort and confidence levels of participants in providing care to TGD people.<sup>11,13</sup> Although this training program did not include such interactive sessions, some participants suggested that there might be an opportunity to do so to improve their confidence in communicating with TGD people. However, adding interactive sessions may require more time and resources and entail additional responsibility for protecting the safety and confidentiality of TGD people participating in these activities.

Although most participants received this training program well, some issues may need to be resolved before administering the program on a larger scale. Many participants liked the inclusion of videos and case studies in this training program, but a few criticized the sound quality of the videos. One participant also recommended including

audio transcripts for videos to improve the accessibility of video content in a shared workspace. Some participants recommended adding more multiple-choice question quizzes at the end of the modules to self-test their knowledge. Such quizzes are an important learning tool that engages students in active learning, enhances the desire for learning, and improves understanding and knowledge retention.<sup>34</sup> Therefore, the addition of such post-module quizzes may be beneficial for future learners.

Based on the data, exposure to TGD health content on this one occasion may not be sufficient for knowledge retention as some pharmacists may not see many TGD people in their practice. Pharmacists who do not apply the knowledge and skills obtained through this program regularly may experience a gradual loss of some of the acquired knowledge and skills over time. There are limited studies testing the long-term knowledge retention of the participants after an education intervention.<sup>35</sup> Therefore, as suggested by the participants, providing training at regular intervals, summary communications, and printed materials, including the material covered in the program and new updates in gender-affirming therapies, may be necessary to retain the knowledge and skills of providing person-centred care to TGD people.

#### 4.1. Limitations

Although the sample size for this study was small, the pharmacist participants represented various geographical locations, including rural, remote, regional, and metropolitan areas of Australia. Pharmacists practising in various geographical locations ensured the inclusion of diverse perspectives. The current sample of pharmacists and students was too small to meaningfully run the psychometric tests to re-validate the pre-test and post-test survey tool after adjustment to the Australian context. Therefore, future studies with more participants are required to analyze the validity of the survey tool. Participants performed poorly on some questions (for example, questions seven and sixteen) before and after completing the training program. The reason for such poor performance is unclear, possibly requiring a review of these questions. Australia is a multicultural society, so most pharmacists in Australia are familiar with patients from various cultural backgrounds, and some participants may have participated in this study because of their open and accepting attitudes toward TGD people. This training program may be suitable for pharmacists and students from other English-speaking countries. However, the language and cultural suitability of the content may require to be adjusted according to the culture of the country.

## 5. Conclusion

For the cohort of participants in this study, this education intervention improved TGD healthcare knowledge and awareness for pharmacists and students and over time, the program has a positive outcome on the behaviour of these pharmacists in practice. This training program has provided participants with the knowledge and skills to provide person-centred care in a non-judgmental and culturally respectful way and increased their confidence in their knowledge of gender-affirming therapies. Although the positive impact on pharmacists' practice of providing TGD care was noticed in this pilot study, future research evaluating the long-term impact of such interventions on knowledge retention and the practice of pharmacists is essential. Moreover, implementing this training program at a broader level is necessary to address the negative personal and societal attitudes deeply entrenched in religious and cultural beliefs. Improved attitudes toward TGD people may reduce stigma and create a welcoming, inclusive, and respectful environment for TGD people both within the field of pharmacy and society.

#### CRediT authorship contribution statement

**Swapna Chaudhary:** Conceptualization, Data curation, Formal

analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft. **Daniel Lindsay:** Formal analysis, Methodology, Supervision, Writing – review & editing. **Robin Ray:** Methodology, Supervision, Writing – review & editing. **Beverley D. Glass:** Methodology, Supervision, Writing – review & editing.

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## Declaration of Competing Interest

The authors do not have any competing interests.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.rcsop.2023.100394>.

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