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RESEARCH

Evaluation of a training program to support the implementation of a community pharmacist-led support service for people living with severe and persistent mental illness

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ABSTRACT

Background: With appropriate training, community pharmacists can support people living with severe and persistent mental illness (SPMI) by identifying and managing medication-related issues and physical health concerns. The Bridging the Gap between Physical and Mental Illness in Community Pharmacy (*PharMIbridge*) randomized controlled trial (RCT) tested the impact of an individualized, pharmacist-led support service for people living with SPMI.

Objective(s): To evaluate the impact of the *PharMIbridge* training program on pharmacy participants' knowledge and confidence, as well as stigma and attitudes, in relation to supporting, and providing services to, people living with SPMI; compared to Mental Health First Aid (MHFA) training alone.

Methods: Pharmacy staff (n = 140) from 55 community pharmacies across 4 RCT regions attended face-to-face training. Both intervention group (IG) and comparator group (CG) participants received MHFA training while IG participants received additional *PharMIbridge* training, involving role-plays and mental health consumer educators (MHCEs). A questionnaire including validated instruments was administered at baseline, after training and after 12 months. Comparative analyses included paired *t* tests and mixed between/within analysis of variance (ANOVA).

Results: Pre and post-training surveys were completed by 136 participants, most of which were pharmacists. Both IG and CG participants had significant reductions in stigma ($P < 0.001$) post-training. IG participants' confidence and knowledge regarding metabolic monitoring significantly improved compared to CG ($P < 0.001$). IG participants were significantly more confident and comfortable in providing medication counseling, compared to CG participants ($P < 0.05$).

Conclusion: MHFA training reduced participants' stigma toward mental health. However, the purpose-designed *PharMIbridge* training program provided pharmacists with additional knowledge and skills to confidently support the physical health care needs of people living with SPMI. The inclusion of role-plays and MHCEs allowed pharmacists to self-reflect and practice skills in safe, supportive environments. Future studies should continue to involve MHCEs in pharmacy training and explore whether these improvements are sustainable.

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Background

Severe and persistent mental illness (SPMI) broadly refers to any severe mental illness that is prolonged, requiring long-term treatment, and significantly affecting an individual's daily activities.[1] People living with SPMI have higher morbidity and mortality rates than the general population, as a result of higher rates of physical illnesses such as cardiometabolic and respiratory diseases, many of which may be preventable.[2,3] There is an estimated 9000 premature deaths

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Key Points

Background:

- Training community pharmacists with the skills and knowledge needed to support people living with severe and persistent mental illness (SPMI) is essential because of the high prevalence of physical health conditions among this population.
- Due to their accessibility and roles in medication supply and counseling, community pharmacists are well-positioned to provide mental health care and manage physical health comorbidities associated with SPMI.
- Mental Health First Aid (MHFA) training can improve participants' knowledge of mental health, attitudes toward mental illness, and confidence in helping others with mental health problems or those experiencing mental health crises.

Findings:

- A training program, developed to support the implementation of a pharmacist-led support service for people living with SPMI, led to significant improvements in pharmacists' confidence and knowledge for providing metabolic health interventions and willingness to provide professional services.
- This study adds to the existing evidence that MHFA training reduces stigmatizing attitudes toward people living with mental illness.
- Future mental health training programs should involve collaboration and engagement with people with lived experience of mental illness as a core component, thereby providing consumers with opportunities to share their personal experiences and trainees with opportunities to reflect and improve on their own practice.

in this population annually,[2] which are attributable to modifiable risk factors such as smoking, physical inactivity, and unhealthy diet, reduced access to health care services, as well as the side effects of antipsychotics which are commonly used in the management of SPMI.[4,5] Evidence suggests that health care professionals do not inquire about the physical health of mental health consumers, and that side effects from medications are often dismissed.[6]

Given the significant health burden of SPMI, involving primary health care professionals, such as general practitioners (GPs) and pharmacists, in supporting people living with SPMI is essential to ensure continuity of care from hospitals to communities.[7] Australian data show that more than 75% of antipsychotics are prescribed in primary health care settings by GPs;[8] therefore, these prescriptions are likely filled in community pharmacies, presenting opportunities for pharmacists to engage with people living with mental illness. In addition to medication supply, pharmacists are increasingly recognized for their roles in mental health care.[9] For example, research has shown that pharmacists are capable of screening and assessing people at risk of mental illness and prompting a referral to appropriate health care professionals,[10,11] recognizing and managing psychotropic medication-related problems,[12] and improving medication adherence.[13,14] A recent systematic review exploring pharmacist-led interventions to support people living with SPMI demonstrated that pharmacists could improve both consumer-reported and clinical outcomes including improving medication adherence and reducing symptom severity.[15] It also identified a lack of community pharmacist-led interventions and inconsistencies in training provided to pharmacists prior to delivering such interventions.[15]

Evidence shows that health care professionals, including pharmacists, have stigmatizing attitudes toward consumers living with mental illness.[16-19] Inadequate skills and training in mental health care are associated with stigmatizing attitudes.[20] Previous studies have highlighted the importance of mental health training among pharmacy staff and students to improve skills and confidence to deliver mental health care.[21] Mental health education and training are an effective strategy to improve knowledge and reduce stigma among health care professionals.[22,23] An example of an evidence-based training program is Mental Health First Aid (MHFA), which teaches participants how to recognize the signs and symptoms of different mental illnesses and how to provide initial help to someone experiencing a mental health problem or crisis.[24] MHFA training among pharmacy students has been shown to reduce students' stigmatizing attitudes toward mental health,[25-27] and improve pharmacists' confidence to recognize signs of mental illness, as well as approach and assist people experiencing with mental health crises.[28]

In addition to MHFA training, the opportunity to interact with and learn from people with lived experience reduces stigma compared to education through traditional didactic methods alone.[29] Social contact with mental health consumers either through listening to their personal narratives or interaction during role-plays has been shown to improve pharmacy students' attitudes toward mental illness.[30] There also have been calls for allowing pharmacists to practice their mental health skills in safe and authentic learning environments to provide opportunities for self-reflection and improvement of skills.[29] Furthermore, there is currently limited evidence around community pharmacists' role in managing cardiovascular risk, metabolic syndrome, and related diseases within primary care settings.[31] Therefore, training to upskill pharmacists to take on these roles is necessary.

Bridging the Gap between Physical and Mental Illness in Community Pharmacy (*PharMIbridge*) is a randomized controlled trial (RCT) that aimed to evaluate the effectiveness of pharmacist-led support service (*PharMIbridge* intervention), specifically focusing on consumers' use of medicines and physical health concerns, compared to a standard in-pharmacy medication review service (MedsCheck).[32] The *PharMIbridge* intervention was a 6-month, person-centered, flexible, and goal-oriented support service whereby the pharmacist and consumer worked together to identify potential issues and develop a personalized support plan to address these issues. As part of the development and implementation of the *PharMIbridge* RCT, a training program was developed and delivered to pharmacy staff randomized to either the intervention group (IG) or comparator group (CG).[33] This study focuses on the

evaluation of the training program that was delivered to IG and CG pharmacy staff who were participating in the *PharMIbridge* RCT. Further details on the development of the training program have been published separately.[33]

Objective(s)

The study objectives were to explore the impact of the *PharMIbridge* training program (IG) on pharmacy participants' (1) confidence and knowledge in and barriers and attitudes toward metabolic health screening, (2) stigma and attitudes toward people living with SPMI, (3) willingness to provide professional services to people living with SPMI, (4) confidence in providing mental health crisis support, and (5) barriers and enablers associated with implementing a pharmacist-led support service, compared to MHFA training alone (CG).

Methods

This study was conducted as part of the *PharMIbridge* RCT. The trial has been registered with the Australia and New Zealand Clinical Trials Registry (ANZCTR12620000577910).

Study participants

Pharmacy participants were recruited through community pharmacies as part of the *PharMIbridge* RCT, as described in detail elsewhere.[32] Pharmacy eligibility criteria have been described in detail previously.[32] Pharmacy participants were eligible if they were pharmacists (registered and provisionally registered (intern) pharmacists) or nonpharmacist staff (i.e., people working in the pharmacy who are not pharmacists) in participating community pharmacies. Based on pharmacy randomization, pharmacy participants attended either IG or CG training (Figure 1). Five face-to-face training sessions were held across 4 Australian regions in 3 states and territories, between September 2020 and February 2021. Recruited pharmacies were required to send a minimum of 2 pharmacy staff members, including at least one pharmacist, to 1 of the 5 training sessions.

Training overview for all pharmacy participants

IG training was 2 days while CG training was 1 day. Attendance at the training was a requirement for trial participation. Completion of pre and post-training surveys was mandatory as part of the training requirements. Completion of the 12-month follow-up survey was strongly encouraged. Both groups received the Blended MHFA for the Pharmacy course, which involved 6 hours to 8 hours self-directed online learning plus 4 hours face-to-face training with a MHFA instructor.[34] It was a requirement for both IG and CG pharmacy participants to attend MHFA (if they did not have valid MHFA accreditation) to ensure that they could provide appropriate support if a mental health problem or crisis arose while participating in the RCT. Participants who already had a valid MHFA accreditation were invited to attend MHFA training. IG and CG participants also received training on recruitment and study processes, including consumer eligibility, informed consent, and service documentation.

PharMIbridge training program for IG pharmacy participants

Simulated patient role-play sessions followed MHFA training to provide IG pharmacists with the opportunity to practice MHFA skills (such as assisting a person experiencing a mental health crisis) in a safe and supportive learning environment. The scenarios used were adapted from previously published studies used to assess pharmacy students' MHFA skills.[25,35] These scenarios involved a variety of potential mental health crisis situations that may occur in this population, including signs of suicidal ideation. These role-play sessions were enacted by mental health consumer educators, who were people with a personal lived experience of mental illness or caring for others with lived experience of mental illness. At the end of the role-play, debrief discussions followed to allow for immediate performance feedback from the facilitator, mental health consumer educator, and peers.

Four prerecorded training modules were developed by mental health experts and educators, including psychiatrists, psychologists, pharmacists, and consumers with lived experience of mental illness. Role-plays and case study discussion activities were integrated throughout the training modules to assist with reflection and allow pharmacists to practice newly acquired skills. A Training Working Group comprising health educators, practitioners, mental health consumers, and researchers reviewed and refined the training content.[33]

A pharmacist and mental health consumer mentor pair supported the delivery of the intervention in each RCT region. The 4 prerecorded modules were delivered to IG participants at face-to-face training sessions in the RCT regions by the pharmacist and consumer mentor pairs, with research team members cofacilitating sessions relating to study processes (Figure 1). The pharmacist and consumer mentor pair led further discussions and debriefs and facilitated activities that were embedded in these training modules. Further, mentor pairs provided local community mental health support resource lists and weblinks to better prepare IG pharmacists for delivering the *PharMIbridge* service. This mentoring process was adapted from a previous pilot study.[36]

Survey instrument and study procedure

A 66-item survey consisting of validated scales, with Likert scale response type options and purposely designed questions used in previously published literature was developed. Validated scales included the 16-item Metabolic-Barriers, Attitudes, Confidence, and Knowledge Questionnaire (M-BACK),[37] the 7-item Social Distance Scale (SDS),[38] and the 11-item Mental Illness Attitude (MIA) Questionnaire.[39] The survey also contained 8 items relating to confidence in providing MHFA,[26] 8 items on willingness to provide pharmaceutical care to people living with SPMI,[40] 10 items on professional service delivery by pharmacists,[30] and 6 items on motivations and barriers to working with people living with SPMI.[41] The 12-month follow-up survey (T3) contained 11 items regarding service acceptability, developed based on previous research.[42,43] Demographic data were also collected including age, gender, country of birth, role in the pharmacy, time in current pharmacy role, previous mental health training, and personal and family experience of mental illness.

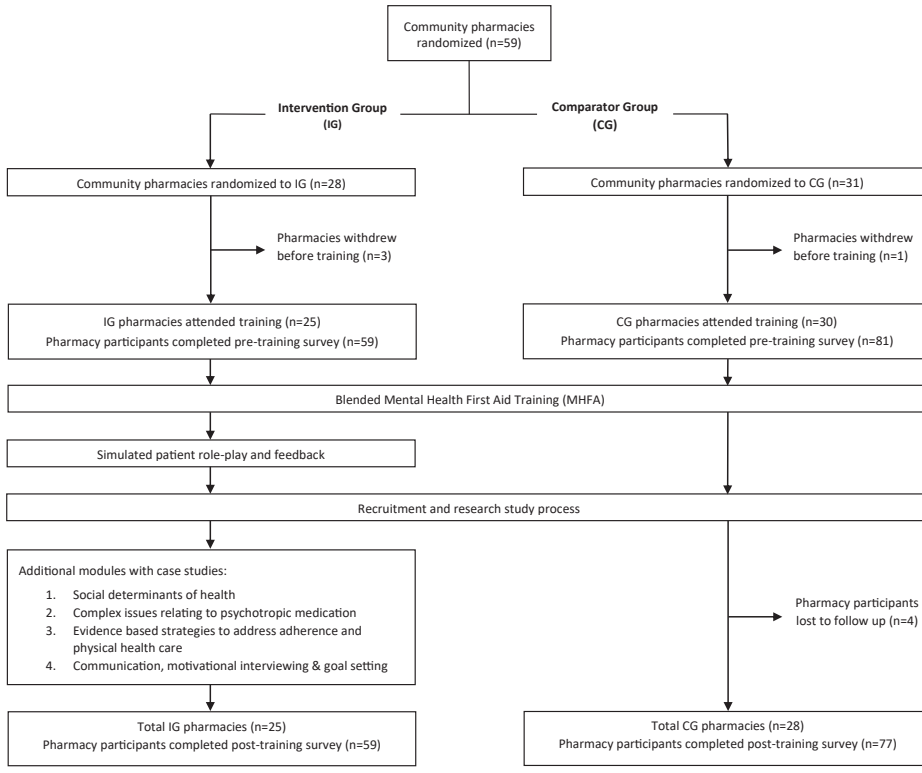

Figure 1. Outline of randomization and training attendance for participating pharmacies (please see separate word document attached).

The pre and post-training and follow-up surveys were administered electronically through REDCap, a secure online data capture tool.[44] The pretraining (T1) survey was emailed to participants prior to training while the post-training (T2) survey was sent within 24 hours of completing their respective training sessions. Participants were invited to complete the follow-up survey 12 months after training (T3). Participants were given a unique identifiable number, which allowed matching of pre and post-training and 12-month follow-up survey data; however, the unique identifier was blinded to the research team. Pharmacist participants were required to complete all 66-items in the survey, while nonpharmacist participants completed only the SDS, MIA, and items relating to confidence in providing MHFA. The 66-item survey took approximately 15 minutes to complete. A reminder email to complete the follow-up survey was sent to participants 4 weeks after the initial invitation.

Data analysis

Data were analyzed using SPSS Statistics for Windows, version 26.0 (SPSS Inc, Chicago, IL). Descriptive statistics of mean ± SD or n (%) were used. Pearson chi-square calculations were used to determine differences in demographic variables between IG and CG participants including gender, age, country of birth, role in pharmacy and years of community pharmacy experience. Individual scores were presented for all items. The total scores were presented if a scoring guide was available (e.g., M-BACK, SDS, and MIA). Paired *t* tests were conducted to compare differences in IG and CG mean scores between timepoints. Mixed between-within analysis of variance (ANOVA) was conducted to evaluate the impact of the training program on all the survey items. A significance level of $P < 0.05$ was used for all analyses. Participants who were lost to follow-up at T2 were excluded from the analysis. Due to the low response rate in T3, only T1 and T2 data were presented and analyzed.

The reporting of the study was guided by the Survey Reporting GuidelinE (SURGE).[45] Ethical approval was granted by the Griffith University Human Research Ethics Committee (Project number: 2019/493).

Results

Participant demographics

The survey instrument was completed by 140 participants at baseline (T1) and 136 participants post-training (T2); representing a response rate of 97% (136/140) (Figure 1). The mean age of participants was 35.5 years (SD 9.93, range 19-67) and the majority were female (63.6%). One-hundred twenty-three registered pharmacists and 17 nonpharmacist staff attended training. Most participants (70.8%) had up to 10-year experience in their current role working in community pharmacy. Less than half (42.9%) had completed MHFA training previously and 33 participants (23.6%) had existing MHFA accreditation. The majority (76.4%), either with or without existing MHFA accreditation, completed MHFA training as part

of *PharMIbridge*. There were no significant differences in terms of gender, age, country of birth, current role in pharmacy, and years of community pharmacy experience between the two groups (Table 1).

Barriers, attitudes, confidence, and knowledge toward metabolic health

IG and CG participants' M-BACK total confidence scores significantly increased after training (both $P < 0.01$), indicating increased confidence in metabolic health screening. However, the significant interaction effect between intervention and time ($P < 0.001$) demonstrates that IG participants were significantly more confident in screening and treating metabolic health compared to CG participants (Table 2).

Both groups had significantly increased knowledge scores after training ($P < 0.001$); indicating pharmacists had better knowledge in metabolic health. However, the significant interaction effect between intervention and time indicated that the improvement in metabolic screening knowledge was greater ($P < 0.001$) in IG participants compared to CG participants.

The total M-BACK barrier score decreased in both IG and CG participants at T2, indicating pharmacists saw less barriers to the provision of metabolic screening and interventions. However, these reductions were not significant, post-training, and no barrier items had statistically significant changes when comparing between IG and CG participants. This indicates that *PharMIbridge* training did not significantly impact participants' views about barriers to metabolic health for people living with SPMI.

The total M-BACK attitude score improved significantly among IG participants at T2 (P=0.004), indicating improved attitudes post *PharMIbridge* training. However, compared to the CG post-training this improvement was not significantly different. "*Metabolic health screening is an important part of my role as a mental health clinician*" was the only item that IG participants showed significant improvements post-training ($P < 0.001$) and when compared to CG ($P = 0.007$).

Stigma and attitudes to mental illness

The total SDS score significantly improved in both IG and CG participants at T2 (both P <0.001), indicating that training significantly reduced stigma among both IG and CG participants. The interaction effect between intervention and time, however showed no significant differences ($P = 0.097$), indicating that the improvement was not statistically significant between groups. This suggests MHFA training had a beneficial effect in reducing stigma among all participants (Table 3). Among all SDS items, willingness to have a person living with SPMI "as a babysitter" scored the lowest in both groups, followed by "have your child marry."

In relation to the MIA questionnaire exploring participants' beliefs about people living with SPMI and about the role of treatment in recovery, both IG and CG participants had a significant reduction in "negative stereotype" scores (both $P <$ 0.001) at T2, indicating that training resulted in less negative stereotypical values among participants. Similarly, the "recovery and outcomes" score increased significantly in IG and CG participants at T2 (both P<0.05), indicating that the training both groups received led to more positive attitudes

Table 1
Baseline participant demographics (n = 140)

Participant demographics	Total n = 140 (%)	IG (n = 59)	CG (n = 81)	*P* value[a]
Gender				0.592
Female	89 (63.6)	36 (61.0)	53 (65.4)	
Male	51 (36.4)	23 (39.0)	28 (34.6)	
Age range (years)				0.253
19-29	45 (32.1)	22 (37.3)	23 (28.4)	
30-49	80 (57.1)	29 (49.2)	51 (63.0)	
50-69	15 (10.7)	8 (13.6)	7 (8.6)	
Country of birth				0.829
Australia	101 (72.1)	42 (71.2)	59 (72.8)	
Other	39 (27.9)	17 (28.8)	22 (27.2)	
Current role in pharmacy				0.168
Registered pharmacist				
Pharmacy owner	28 (20.0)	16 (27.1)	12 (14.8)	
Nonpharmacy owner (pharmacist in charge, pharmacist on duty, pharmacist manager)	85 (60.7)	35 (59.3)	50 (61.7)	
Intern pharmacist	10 (7.1)	4 (6.8)	6 (7.4)	
Nonpharmacist staff				
Pharmacy student, pharmacy assistant, pharmacy/dispensing technician, retail manager	17 (12.1)	4 (6.8)	13 (16.0)	
Community pharmacy experience (years)				0.612
< 1	33 (23.6)	11 (18.6)	22 (27.2)	
1-5	47 (33.6)	20 (33.9)	27 (33.3)	
6-10	19 (13.6)	7 (11.9)	12 (14.8)	
11-15	19 (13.6)	10 (16.9)	9 (11.1)	
>15	22 (15.7)	11 (18.6)	11 (13.6)	

Abbreviations used: CG, comparator group; IG, intervention group.
Note: Percentages may not equal 100% because of rounding.
Values were bolded if they were statistically significant. $P < 0.05$ was considered significant for all analysis.
[a] Pearson chi square test used to determine difference in participant characteristics.

Table 2
Pharmacist pre and post-training Metabolic-Barriers, Attitudes, Confidence, and Knowledge (M-BACK) scores

Items	IG (n = 55)			CG (n = 65)			*P* value for group x time interaction effect[b]
	T1 mean (SD)	T2 mean (SD)	*P* value[a]	T1 mean (SD)	T2 mean (SD)	*P* value[a]	
Barriers[c]							
My workload prevents me doing any health promotion activities with consumers	2.35 (0.80)	2.47 (1.02)	0.359	2.62 (1.00)	2.51 (1.05)	0.389	0.207
Consumers with a severe mental illness are not interested in improving their physical health	2.04 (0.79)	1.75 (0.73)	**0.017**	2.14 (0.85)	1.95 (0.72)	0.070	0.491
Informing clients about the possible effects medications may have on their physical health will increase nonadherence	2.49 (0.92)	2.27 (0.83)	0.182	2.51 (0.85)	2.4 (0.93)	0.404	0.588
Screening for metabolic syndrome and physical health interventions are pointless as poor physical health outcomes are unavoidable	1.64 (0.65)	1.44 (0.60)	0.078	1.69 (0.75)	1.69 (0.83)	1.000	0.249
Total barriers	8.51 (2.10)	7.93 (2.17)	0.101	8.95 (2.27)	8.55 (2.21)	0.129	0.672
Attitudes[d]							
Metabolic health screening is an important part of my role as a mental health clinician	3.64 (0.78)	4.15 (0.80)	**0.001**	3.83 (0.82)	3.94 (0.83)	0.300	**0.007**
Giving smoking cessation advice is an important part of my role as a mental health clinician.	4.36 (0.52)	4.51 (0.60)	0.073	4.42 (0.53)	4.43 (0.56)	0.843	0.246
Encouraging consumers to increase their level of physical activity is an important part of my role as a mental health clinician	4.25 (0.52)	4.35 (0.62)	0.279	4.26 (0.54)	4.37 (0.57)	0.128	0.876
Discussing nutritional intake is an important part of my role as a mental health clinician	4.15 (0.56)	4.24 (0.58)	0.279	4.06 (0.77)	4.25 (0.64)	0.070	0.483
Total attitudes	16.40 (1.88)	17.24 (2.24)	**0.004**	16.57 (2.00)	16.98 (2.18)	0.092	0.253
Confidence[d]							
I am confident in my ability to screen for metabolic syndrome	3.00 (0.98)	3.96 (0.74)	**0.001**	3.15 (1.05)	3.58 (1.07)	**0.001**	**0.001**
I am confident in providing smoking cessation advice to consumers.	4.20 (0.56)	4.38 (0.62)	**0.017**	4.26 (0.67)	4.29 (0.63)	0.686	0.160
I am confident in prescribing exercise interventions to prevent/treat metabolic syndrome.	3.53 (0.94)	4.13 (0.58)	**0.001**	3.80 (0.87)	3.95 (0.86)	0.115	**0.005**
I am confident in using dietary interventions to prevent/treat metabolic syndrome in consumers.	3.47 (0.88)	4.13 (0.61)	**0.001**	3.58 (0.97)	3.85 (0.78)	**0.012**	**0.011**
Total confidence	14.20 (2.73)	16.60 (2.07)	**0.001**	14.80 (2.86)	15.68 (2.59)	**0.001**	**0.001**
Knowledge[d]							
I have a good knowledge of metabolic syndrome.	3.24 (0.88)	4.02 (0.62)	**0.001**	3.31 (1.04)	3.65 (0.89)	**0.001**	**0.002**
I understand how to screen for metabolic syndrome.	3.02 (0.93)	4.00 (0.72)	**0.001**	3.11 (1.09)	3.46 (1.12)	**0.005**	**0.001**
I understand how to read pathology reports for lipids and glucose results.	3.91 (0.82)	4.35 (0.67)	**0.001**	3.94 (0.83)	4.03 (0.83)	0.223	**0.004**
I understand the metabolic side-effect profiles of different neuroleptic medication.	3.40 (0.93)	4.16 (0.66)	**0.001**	3.68 (0.87)	3.94 (0.83)	**0.018**	**0.002**
Total knowledge	13.56 (2.76)	16.53 (2.08)	**0.001**	14.03 (3.08)	15.08 (2.95)	**0.001**	**0.001**

Abbreviations used: CG, comparator group; IG, intervention group; T1, pretraining; T2, post-training; SD, standard deviation.
Values were bolded if they were statistically significant. $P < 0.05$ was considered significant for all analysis.
[a] *P* value from paired *t* tests between T1 and T2 scores.
[b] *P* value for group x time interaction effect from mixed between-within ANOVA.
[c] A lower score indicates lower barriers towards metabolic screening.
[d] A higher score indicates improved attitudes, confidence and knowledge towards metabolic screening.

and beliefs about the outcome of treatment and recovery from mental illness. The interaction effect between time and group was not significant in both "negative stereotype" and "recovery and outcomes" subscales, indicating no significant differences between IG and CG participants (Supplementary Table 1).

Confidence in providing mental health crisis support

All scores improved at T2, indicating increased confidence in providing mental health crisis support. All 8 items in relation to recognizing signs of a mental health problem or crisis, approaching and encouraging a person experiencing a mental health crisis and referring appropriately to professional help significantly improved among IG and CG participants at T2 ($P < 0.05$). There were no significant differences between groups in all 8 items (Supplementary Table 2).

Willingness to provide care and services for people living with SPMI

Both groups had a higher score for all items at T2, indicating more willingness to provide medication counseling and screen for drug related problems (Table 4). IG participants were significantly more "confident" and "comfortable" in providing medication counseling at T2 ($P < 0.01$). The change from T1 to T2 was not significant for the CG participants. The interaction effect between intervention type and time was significant for

Table 3
Pharmacy participants' social distance scale pre and post-training scores

Item[c]	IG (n = 59)			CG (n = 77)			*P* value for group x time interaction effect[b]
	T1 mean (SD)	T2 mean (SD)	*P* value[a]	T1 mean (SD)	T2 mean (SD)	*P* value[a]	
Share a flat	2.54 (0.82)	2.86 (0.66)	**0.001**	2.52 (0.82)	2.75 (0.71)	**0.002**	0.434
Work alongside	3.32 (0.68)	3.66 (0.54)	**0.001**	3.31 (0.59)	3.48 (0.58)	**0.006**	0.081
Have as neighbor	3.42 (0.59)	3.61 (0.62)	**0.015**	3.38 (0.63)	3.42 (0.61)	0.567	0.147
Have as babysitter	2.12 (0.81)	2.61 (0.67)	**0.001**	2.06 (0.85)	2.30 (0.76)	**0.006**	**0.034**
Have your child marry	2.54 (0.77)	2.83 (0.75)	**0.001**	2.49 (0.88)	2.70 (0.74)	**0.009**	0.461
Introduce to single friend	2.68 (0.84)	2.93 (0.74)	**0.006**	2.49 (0.74)	2.75 (0.67)	**0.001**	0.960
Recommend for job	3.08 (0.62)	3.31 (0.56)	**0.006**	3.05 (0.63)	3.22 (0.64)	**0.027**	0.637
Total	19.71 (4.01)	21.81 (3.55)	**0.001**	19.31 (3.84)	20.62 (3.58)	**0.001**	0.097

Abbreviations used: CG, comparator group; IG, intervention group; T1, pretraining; T2, post-training.
Values were bolded if they were statistically significant. $P < 0.05$ was considered significant for all analysis.
[a] *P*-value from paired *t* tests between T1 and T2 scores.
[b] *P* value for group x time interaction effect from mixed between-within ANOVA.
[c] A higher score indicates less stigmatizing attitudes.

medication counseling, suggesting that *PharMIbridge* training significantly improved pharmacists' confidence and comfort in providing medication counseling for people living with SPMI.

At T2, both IG and CG participants were significantly more "confident" and "comfortable" in screening for drug related problems. The interaction effect between time and group was not significant, indicating no significant difference between IG and CG pharmacists in how "confident" and "comfortable" they were to screen for drug related problems.

Five of the 10 items relating to pharmacists' attitudes toward professional service delivery were significantly improved ($P < 0.05$) in IG participants post-training (T2). One item had significant improvement among CG participants (Supplementary Table 3).

Motivations and barriers toward providing professional services

A higher score indicates fewer barriers or more incentives toward providing professional service. Four of the 6 items exploring motivations and barriers to the provision of pharmaceutical care for people living with SPMI significantly improved in the IG while only 2 items significantly improved among CG participants. For example, IG participants' T1 and T2 scores significantly improved in the item "people with a SPMI are requesting my advice" ($P = 0.003$) but CG participants' scores for this item did not improve. There was a significant improvement between IG and CG participants for item "Community pharmacists are an integral member of consumers' mental health care team" ($P = 0.028$) (Supplementary Table 4).

Discussion

The *PharMIbridge* training program, developed specifically for pharmacists to support people living with SPMI, significantly improved pharmacists' knowledge and confidence in relation to metabolic health screening and willingness to provide professionals services to people living with SPMI, compared to MHFA training alone. Both the IG and CG received MHFA training, which led to significant improvements in stigma and attitudes and self-reported confidence in providing mental health crisis support. The findings highlight that in addition to MHFA, additional training regarding metabolic and physical health is important to provide pharmacists with the knowledge and skills to support people living with SPMI. Furthermore, the involvement of people with lived experience of mental illness in the delivery of the *PharMIbridge* training program provided IG pharmacists with opportunities to practice their newly acquired skills in safe, authentic learning environments and allowed for pharmacists and consumers to share their experiences.

Table 4
Pharmacists' pre and post-training scores for items relating to self-reported behaviors and willingness to provide professional services to people living with severe and persistent mental illness

Item[c]	IG (n = 55)			CG (n = 65)			*P* value for group x time interaction effect[b]
	T1 mean (SD)	T2 mean (SD)	*P* value[a]	T1 mean (SD)	T2 mean (SD)	*P* value[a]	
I am confident in providing medication counseling	4.22 (0.74)	4.60 (0.49)	**0.001**	4.4 (0.58)	4.51 (0.53)	0.180	**0.028**
I am comfortable in providing medication counseling	4.33 (0.77)	4.64 (0.49)	**0.002**	4.46 (0.53)	4.54 (0.50)	0.321	0.055
I am interested in providing medication counseling	4.56 (0.60)	4.62 (0.59)	0.595	4.54 (0.56)	4.57 (0.50)	0.698	0.852
I am likely to provide medication counseling	4.56 (0.50)	4.67 (0.47)	0.135	4.46 (0.59)	4.52 (0.53)	0.437	0.661
I am confident in screening for medication related problems	4.04 (0.84)	4.44 (0.60)	**0.001**	4.02 (0.82)	4.32 (0.59)	**0.002**	0.511
I am comfortable in screening for medication related problems	4.22 (0.66)	4.49 (0.54)	**0.001**	4.17 (0.72)	4.4 (0.52)	**0.013**	0.732
I am interested in screening for medication related problems	4.55 (0.54)	4.64 (0.49)	0.168	4.45 (0.56)	4.46 (0.56)	0.837	0.454
I am likely to screen for medication related problems	4.27 (0.73)	4.56 (0.50)	**0.005**	4.12 (0.76)	4.2 (0.67)	0.415	0.121

Abbreviations used: CG, comparator group; IG, intervention group; T1, pretraining; T2, post-training; SD, standard deviation.
Values were bolded if they were statistically significant. $P < 0.05$ was considered significant for all analysis.
[a] *P*-value from paired *t* tests between T1 and T2 scores.
[b] *P* value for group x time interaction effect from mixed between-within ANOVA.
[c] A higher score indicates more willingness to provide medication counseling and screen for medication related problems.

The *PharMIbridge* training program significantly improved pharmacists' knowledge and confidence in providing metabolic health screening and interventions, compared to MHFA training alone. Attitudes toward metabolic monitoring, which can be an integral component to the successful delivery of mental health services, also improved after *PharMIbridge* training among IG participants. Pharmacists' active participation in physical health care monitoring can result in measurable changes in the physical health of people living with mental illness.[46] Poor knowledge and a lack of confidence regarding metabolic screening have been identified as barriers to mental health professionals proactively screening for physical health problems among people living with SPMI.[47,48] "Diagnostic overshadowing" which refers to "the process by which a person with a mental illness receives inadequate or delayed treatment on account of the misattribution of their physical symptoms to their mental illness"[49] can further delay treatment and access to physical health care for consumers living with SPMI.[50] A recent systematic review demonstrated that training in processes, such as ordering lab measurements could facilitate pharmacists' involvement in screening for cardiometabolic risk factors, metabolic syndrome, and other related diseases among people living with SPMI.[31] Another study evaluating a pharmacist and nurse driven metabolic monitoring program showed significant improvements in the frequency of monitoring for blood pressure, weight, hemoglobin A1C, and lipid levels for people taking antipsychotic medications.[51] This reiterates the importance of training pharmacists to support the physical health care needs of the SPMI population where ongoing mental and physical health support is needed to improve life expectancy and quality of life for this population.

The significant, positive changes in stigma seen in both groups in this study were not unexpected, given the plethora of literature describing improvements in attitudes and self-reported behaviors after MHFA training.[27,52,53] MHFA is known to improve mental health literacy and teaches participants to recognize the signs of mental health problems and crises.[54,55] By providing factual information which contradicts inaccurate stereotypes, MHFA can help decrease stigma and increase pharmacists' confidence to support and work with people living with SPMI. Furthermore, SDS items in both groups had the lowest scores, indicating highest social distance for items that involved a "close" social distance such as "have as a babysitter" or "marry your child." This is consistent with other studies exploring pharmacists' and pharmacy students' level of social distance toward consumers with schizophrenia, in which items involving a "close" social distance are harder to improve.[40,56]

Mental health stigma is a significant barrier that prevents consumers from seeking help,[57] which directly impacts health care providers' willingness to provide help. Previous studies exploring pharmacists' attitudes toward consumers living with schizophrenia demonstrated that low stigma levels were associated with more willingness to provide medication counseling in schizophrenia.[40] However, there were no significant differences in stigma toward people living with SPMI between groups post-training in this study, while IG participants who received the additional *PharMIbridge* training were significantly more confident and comfortable in providing medication counseling, compared to those in CG. This highlights the complexities surrounding interventions to reduce mental health stigma and further suggests that addressing mental health stigma is a multidimensional social issue requiring a long-term, multifaceted approach. Nevertheless, the improvements seen in medication counseling post-*PharMIbridge* training may partly be due to the additional social contact IG participants had by interacting with consumers with lived experience of mental illness and having opportunities to practice their counseling skills and receive feedback from both mentor pharmacists and lived experience educators. On the other hand, there was no difference between groups in terms of pharmacists' willingness to identify drug-related problems for people with SPMI. It is hypothesized that more social contact is required for medication counseling compared to identifying drug related problems which could be undertaken with appropriate clinical knowledge without having to communicate directly with the consumer living with SPMI.

The *PharMIbridge* training included mental health consumer educators as mentors and in role-plays during training to facilitate self-reflection among participants. Previous studies have reported on the positive impacts of involving mental health consumers as educators and recommend they be a key part of mental health education for community pharmacy staff members.[58,59] The incorporation of social-contact-based interventions with people with mental illness could help achieve short-term attitudinal improvements.[60] Pharmacists have mentioned in previous research that mental health consumer educators led them to reflect on their own practices regarding medication counseling techniques.[58] The process of reflection helps integrate new knowledge to existing understanding.[61] In line with findings from other studies,[62] there is a need to continue to collaborate with consumers in the design and delivery of mental health education, as well as evaluate the impact of training methods in terms of behavior change and clinical outcomes.

Strengths and limitations

To our knowledge, this is the first study to develop and evaluate the impact of a training program aimed to upskill pharmacists to better support the mental and physical health of people living with SPMI. Consistent with the results of other studies, further mental health training including MHFA is needed to increase pharmacists' confidence in providing mental health care services.[28,63] Alongside previously published research,[33] the findings of this study could be used to guide the development and implementation of training on a larger scale. A key strength of this study was the inclusion of community pharmacy staff from different geographic regions in Australia. While this sample size remains small which may impact the generalizability of the results, participants were practicing in different geographic areas which ensures a broad range of perspectives.

The sustainability of improvements discussed in this paper remains unknown. The T2 survey was disseminated immediately following training. Participants had not had the chance to reflect and practice newly acquired skills yet and it remains unclear whether improvements seen in this study translate to actual behavior changes in practice. Previous studies showed that the effectiveness of MHFA on participants' knowledge, stigma, attitudes, and confidence remained up to 6 months

post-training, while the effects after 12 months remain unclear.[52] In this study it was intended to collect 12-month follow-up data to explore the potential long-term impact of the *PharMIbridge* training once pharmacists had gone on to recruit consumer participants and deliver the *PharMIbridge* intervention. However, the T3 data collection period was conducted during a time of significant competing priorities for *PharMIbridge* pharmacies in Australia with the unfolding COVID-19 pandemic and their involvement in the provision of COVID-19 vaccinations and rapid antigen test supply.[64,65] This highlights the real-world challenges of obtaining longer term follow-up data. Losses to follow-up of more than 20% should not be considered as it could affect study validity and have the potential to cause bias.[66,67] Therefore, due to the high proportion of participants lost to follow-up in this study, T3 data collected was excluded from analyses.

Furthermore, the data in the survey was self-reported. Over or underestimation of actual behaviors in self-reported measures is common. This was shown in other studies in the context of MHFA training, in that self-reported improvements or behaviors may not translate to improvements in actual behavior.[25] This should be taken into account when interpreting the results; and therefore demonstrates the need to include direct observations of behaviors and impact on clinical outcomes to comprehensively assess the effects of the training. Finally, as part of the eligibility criteria for the *PharMIbridge* RCT, it may be possible that those who participated in the trial and completed the surveys had a special interest in the disease state or population. This in turn, could affect how they responded to each statement or question.

Conclusion

This study demonstrated that MHFA training improved participants' mental health stigma and confidence to provide crisis support. The *PharMIbridge* training program provided pharmacists with additional knowledge and skills regarding metabolic health to confidently support the physical health care needs of people living with SPMI. Future mental health training programs should continue to provide role-playing opportunities for pharmacists to practice skills and involve mental health consumers. Future studies are warranted to explore whether these improvements are sustainable.

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Supplementary Table 1
Pharmacy participants' pre- and post-training Mental Illness Attitude scores

Items	IG (n = 59)			CG (n = 77)			*P* value for group x time interaction effect[b]
	T1 mean (SD)	T2 mean (SD)	*P* value[a]	T1 mean (SD)	T2 mean (SD)	*P* value[a]	
People with mental illness are unpredictable[c]	2.97 (0.87)	2.41 (0.77)	**0.001**	2.95 (0.78)	2.56 (0.73)	**0.001**	0.236
People with mental illness are hard to talk with[c]	2.20 (0.80)	1.98 (0.80)	**0.036**	2.29 (0.82)	2.10 (0.70)	0.066	0.788
People with mental illness only have themselves to blame for their condition[c]	1.37 (0.58)	1.24 (0.43)	**0.031**	1.34 (0.66)	1.44 (0.66)	0.172	**0.020**
People with mental illness will improve if given treatment and support[d]	4.24 (0.73)	4.36 (0.87)	0.226	4.13 (0.78)	4.40 (0.61)	**0.008**	0.283
People with mental illness feel the same way we all do at times[d]	2.92 (1.28)	3.19 (1.20)	0.088	3.12 (1.20)	3.31 (1.25)	0.178	0.721
People with mental illness can pull themselves together if they want[c]	2.10 (0.98)	2.03 (1.08)	0.583	2.21 (0.98)	2.08 (1.01)	0.183	0.688
People with mental illness can eventually recover[d]	3.34 (1.04)	3.78 (0.93)	**0.001**	3.70 (0.81)	3.79 (0.78)	0.289	**0.014**
People with mental illness are a danger to others[c]	2.31 (0.62)	1.86 (0.68)	**0.001**	2.34 (0.77)	2.12 (0.61)	**0.026**	0.115
People with mental illness can be as successful at work as others[d]	4.29 (0.62)	4.46 (0.60)	**0.032**	4.29 (0.63)	4.32 (0.62)	0.567	0.206
Treatment can help people with mental illness lead normal lives[d]	4.46 (0.50)	4.56 (0.68)	0.224	4.39 (0.67)	4.55 (0.53)	0.083	0.665
People are generally caring and sympathetic to other people with a mental illness[d]	2.93 (0.91)	2.92 (1.04)	0.892	2.95 (0.83)	3.03 (0.99)	0.450	0.554
Negative stereotypes[c]	10.95 (2.51)	9.53 (2.35)	**0.001**	11.12 (2.51)	10.30 (2.40)	**0.001**	0.066
Recovery and outcomes[d]	22.17 (2.85)	23.25 (3.07)	**0.001**	22.57 (2.84)	23.40 (2.63)	**0.012**	0.576

Abbreviations used: CG, comparator group; IG, intervention group; T1, pretraining; T2, post-training; SD, standard deviation.
Values were bolded if they were statistically significant. $P < 0.05$ was considered significant for all analysis.
[a] *P*-value from paired *t* tests between T1 and T2 scores.
[b] *P* value for group x time interaction effect from mixed between-within ANOVA.
[c] A lower score indicates positive attitudes and beliefs.
[d] A higher score indicates positive attitudes and beliefs.

Supplementary Table 2
Pharmacy participants' pre and post-training for Mental Health First Aid confidence items

I feel confident that I can …[c]	IG (n = 59)			CG (n =77)			*P* value for group x time interaction effect[b]
	T1 mean (SD)	T2 mean (SD)	*P* value[a]	T1 mean (SD)	T2 mean (SD)	*P* value[a]	
Recognize the signs that indicate that someone may be developing a mental health problem or experiencing a mental health crisis.	3.68 (0.75)	4.27 (0.52)	**0.001**	3.66 (0.75)	4.25 (0.52)	**0.001**	0.949
Approach someone who may be developing a mental health problem or experiencing a mental health crisis.	3.61 (0.87)	4.39 (0.59)	**0.001**	3.60 (0.91)	4.26 (0.55)	**0.001**	0.428
Ask a person whether they are having thoughts of suicide.	3.53 (0.94)	4.46 (0.54)	**0.001**	3.49 (1.00)	4.32 (0.52)	**0.001**	0.549
Listen to and interact with a person without expressing judgement about their situation.	4.29 (0.62)	4.53 (0.54)	**0.005**	4.26 (0.47)	4.48 (0.53)	**0.001**	0.873
Offer a person information and support about mental health problems.	4.05 (0.68)	4.56 (0.53)	**0.001**	4.12 (0.71)	4.44 (0.50)	**0.001**	0.143
Encourage a person to seek appropriate professional help.	4.27 (0.49)	4.61 (0.49)	**0.001**	4.31 (0.49)	4.47 (0.53)	**0.033**	0.083
Confident that I can encourage a person to access other support.	4.24 (0.54)	4.56 (0.60)	**0.001**	4.23 (0.51)	4.42 (0.55)	**0.012**	0.180
Confident that I can recognize and correct other people's misconceptions about mental health problems.	3.97 (0.61)	4.51 (0.54)	**0.001**	3.97 (0.74)	4.32 (0.59)	**0.001**	0.117

Abbreviations used: CG, comparator group; IG, intervention group; T1, pretraining; T2, post-training SD, standard deviation.
Values were bolded if they were statistically significant. $P < 0.05$ was considered significant for all analysis.
[a] *P*-value from paired *t* tests between T1 and T2 scores.
[b] *P* value for group x time interaction effect from mixed between-within ANOVA.
[c] A higher score indicates higher confidence towards providing Mental Health First Aid.

Supplementary Table 3
Pharmacists' pre and post-training attitudes scores toward providing pharmaceutical service for people living with SPMI

Items	IG (n = 55)			CG (n = 65)			*P* value for group x time interaction effect[b]
	T1 mean (SD)	T2 mean (SD)	*P* value[a]	T1 mean (SD)	T2 mean (SD)	*P* value[a]	
Patients with severe and persistent mental illness do not want to talk to pharmacists about the duration of treatment with their medications[c]	2.53 (0.77)	2.15 (0.76)	**0.001**	2.54 (0.79)	2.37 (0.78)	0.070	0.129
Patients with severe and persistent mental illness receive all the information they need about their medications from their psychiatrist and/or GP[c]	1.93 (0.81)	1.95 (0.87)	0.874	2.08 (0.74)	2.02 (0.78)	0.541	0.600
It requires too much time to adequately counsel patients with severe and persistent mental illness about their medications[c]	2.20 (0.85)	2.07 (0.90)	0.301	2.34 (0.91)	2.20 (0.89)	0.219	0.946
I would feel awkward asking a patient why he/she has been prescribed an antipsychotic medication[c]	2.24 (0.90)	1.98 (0.78)	**0.034**	2.51 (1.02)	2.14 (0.92)	**0.001**	0.474
A psychiatrist and/or GP is the most qualified professional to advise patients with severe and persistent mental illness about their medications[c]	2.49 (0.86)	2.20 (0.73)	**0.008**	2.38 (0.95)	2.32 (0.92)	0.626	0.174
My opinions about severe and persistent mental illness will affect my ability to provide pharmaceutical care to patients with severe and persistent mental illness[c]	2.11 (1.07)	1.91 (0.89)	0.175	2.14 (1.00)	2.28 (1.15)	0.321	0.095
Patients with schizophrenia do not want to talk to pharmacists about the side-effects of their medications[c]	1.96 (0.58)	1.80 (0.65)	0.083	2.11 (0.71)	2.12 (0.78)	0.888	0.221
Patients with severe and persistent mental illness do not want to talk to pharmacists about their mental health symptoms[c]	2.33 (0.75)	1.89 (0.71)	**0.001**	2.40 (0.79)	2.20 (0.83)	0.124	0.168
Patients with severe and persistent mental illness follow the advice of pharmacists when using their medications[d]	3.58 (0.60)	3.71 (0.69)	0.196	3.34 (0.64)	3.49 (0.77)	0.077	0.837
Patients with severe and persistent mental illness do not understand the information provided by pharmacists about their medications[c]	2.29 (0.63)	2.02 (0.68)	**0.008**	2.38 (0.60)	2.20 (0.77)	0.070	0.536

Abbreviations used: SPMI, sever and persistent mental illness; CG, comparator group; IG, intervention group; T1, pre-training; T2, post-training; SD, standard deviation.
Values were bolded if they were statistically significant. $P < 0.05$ was considered significant for all analysis.
[a] *P*-value from paired *t* tests between T1 and T2 scores.
[b] *P* value for group x time interaction effect from mixed between-within ANOVA.
[c] A lower score indicates improved attitudes towards providing pharmaceutical care.
[d] A higher score indicates improved attitudes towards providing pharmaceutical care.

Supplementary Table 4
Pharmacists' perceived barriers and incentives toward providing professional service to people living with SPMI

Items[c]	IG (n = 55)			CG (n = 65)			*P* value for group x time interaction effect[b]
	T1 mean (SD)	T2 mean (SD)	*P* value[a]	T1 mean (SD)	T2 mean (SD)	*P* value[a]	
I am motivated to work with mental health consumers and carers in my current role	4.29 (0.63)	4.40 (0.53)	0.224	4.29 (0.58)	4.35 (0.51)	0.418	0.682
People with a severe and persistent mental illness are requesting my advice.	3.51 (0.77)	3.82 (0.75)	**0.003**	3.60 (0.77)	3.78 (0.82)	0.103	0.415
Mental health services are readily available for support and referral.	2.71 (0.99)	3.45 (0.94)	**0.001**	3.11 (1.00)	3.46 (1.02)	**0.009**	0.062
There are funding initiatives to support me providing services in the community for people with a severe and persistent mental illness.	2.62 (0.95)	3.11 (1.08)	**0.001**	2.65 (0.94)	3.17 (1.14)	**0.001**	0.855
Providing advice about mental health medication will make a difference to the consumers and carers I work with.	4.31 (0.54)	4.42 (0.50)	0.204	4.23 (0.52)	4.29 (0.46)	0.375	0.661
Community pharmacists are an integral member of consumers' mental health care team	4.40 (0.71)	4.58 (0.71)	**0.024**	4.57 (0.53)	4.51 (0.50)	0.418	**0.028**

Abbreviations used: SPMI, sever and persistent mental illness; CG, Comparator Group; IG, Intervention Group; T1, pretraining; T2, post-training; SD, Standard deviation.
Values were bolded if they were statistically significant. $P < 0.05$ was considered significant for all analysis.
[a] *P*-value from paired *t* tests between T1 and T2 scores.
[b] *P* value for group x time interaction effect from mixed between-within ANOVA.
[c] A higher score indicates less barriers or more incentives towards providing professional service.