

A pharmacy asthma service achieves a change in patient responses from increased awareness to taking responsibility for their asthma

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Abstract

Objectives If novel health services are to be implemented and sustained in practice, the perceptions and views of patients form a critical part of their evaluation. The aims of this study were to explore patient's perceptions and experiences with a pharmacy asthma service and to investigate if there was a change over time.

Methods Interviews and focus groups were conducted with patients participating in the asthma service at three time points. Data were transcribed verbatim and thematically analyzed using a framework approach.

Key findings The service led to an enhanced awareness and understanding of asthma, changes in participants' beliefs and attitudes towards asthma management, changes in asthma-related health behaviours and improved self-efficacy. Participants were very positive about the service and the role of the pharmacist in asthma management. There was a shift in participant perceptions and views, from being at an abstract level in those who had completed just one visit of the service to a more experiential level in those who had experienced the entire comprehensive asthma service.

Conclusions A sustained experience/multiple visits in a service may lead to more concrete changes in patient perceptions of severity, beliefs, health behaviours and enhanced self-efficacy and control. The study highlights a need for such asthma services in the community.

Introduction

Over the past few decades, in addition to their traditional role of dispensing medications, community pharmacists have been increasingly involved in the provision of primary health care through medication and chronic disease management. Pharmacists are equipped, not only to screen/identify patients at risk, but also to provide ongoing monitoring and management in patients with chronic medical conditions.^[1] Novel roles have been developed in pharmacy-based specialized service models,^[2–6] which incorporate the idea of trained pharmacists providing pharmaceutical care or chronic disease management. These services in asthma, diabetes,

obesity and hypertension have demonstrated^[2–6] positive clinical and economic outcomes.

Asthma is a common chronic condition affecting almost 300 million people worldwide.^[7] In Australia, the prevalence of asthma is high (10%), and it has been declared a national health priority.^[8] Despite continuing and extensive national efforts to improve the quality of life and health outcomes for people with asthma, the management of this chronic condition remains suboptimal. The most common reasons for this include the inappropriate use of medications, lack of self-management skills and lack of access to timely and

comprehensive care.^[9] Patient education and targeted interventions at the primary health care level have the potential to address most, if not all, of these areas of concern.^[9] Community pharmacists, as part of the health care team, can play a significant role in the management of asthma. The role of pharmacists in asthma management is reinforced by reports that patients with asthma often visit community pharmacies more regularly than their physician, obtaining non-prescription and prescription medications.^[9]

Various community pharmacy-based asthma care models have been developed and tested globally.^[10] These models have ranged from focused interventions targeting a particular area of asthma management, including inhaler technique reviews,^[11,12] self-management programmes,^[13] optimizing therapy^[14] and identification of non-adherence to medications,^[15] to multicomponent brief interventions,^[16] to comprehensive disease state management interventions delivered by trained pharmacists.^[2,17,18] In addition, pharmacist-delivered asthma telephone consults,^[19] health promotion^[20] and group-based asthma education^[21] have also been piloted. The majority of these asthma models have demonstrated significant improvements in clinical, humanistic and economic outcomes.^[2,9,11,12,15,17] A significant body of work comprising various models has been undertaken in Australia. Based on this level of evidence, the development and implementation trial of the Pharmacy Asthma Management Service (PAMS), a comprehensive patient-focused specialized model of asthma management in primary health care, was funded by the Australian government.^[22,23] This trial reported positive asthma outcomes for patients including significant improvements in asthma control, inhaler technique, action plan ownership, asthma-related quality of life, perceived control of asthma, medication adherence and asthma knowledge.^[22–24] The provision of such specialized services suggests advantages to not only individual patients (through improved asthma control translating into enhanced health outcomes) but also to the pharmacy profession (through the utilization of community pharmacists' clinical skills and expertise and for professional satisfaction) and to the health system at large (through cost savings from avoided asthma exacerbations necessitating emergency room visits and/or hospitalizations).

Most research in the area of pharmacy-based asthma care services has focused on clinical or economic evaluations, with few studies exploring the patient experience. Where patients' views have been sought, most studies have used quantitative patient satisfaction instruments.^[25] Given the importance of patient perspectives on the health care they receive, understanding the acceptability of pharmacy-delivered services to patients is critical to informing health care practice and policy.

The aim of this study was to explore patient experiences with, and the acceptability of, a PAMS. This was undertaken

at three different time points during the study so as to investigate whether there was a difference in the patients' perspectives over time.

Methods

Description of PAMS

The PAMS was funded by Australian Government Department of Health and Ageing. The PAMS study was a pragmatic implementation trial^[23] of our original work in a randomized controlled trial.^[17] Community pharmacies from four states/territories in Australia (New South Wales, Australian Capital Territory, Queensland and Victoria) were recruited, with a proportional representation of pharmacies in regional and metropolitan areas. All participating pharmacists were provided with pre-reading material for self-directed study and were trained face-to-face over 2 days in advanced asthma management, followed by an independent assessment of knowledge and skills.^[23] One hundred and six pharmacists were trained, of whom 96 proceeded to deliver the service. Based on the study protocol, pharmacists were to recruit up to 10 regular asthma patients at their pharmacy who were at risk of poor asthma outcomes. Recruited patients attended pharmacist-led consultations, in a private area of the pharmacy, focusing on their asthma control and factors influencing asthma control, smoking cessation, medications use, action plan ownership, inhaler technique and asthma-related goal setting. The consultations were structured for research purposes, but were intended to be individualized to the patients' condition and desired autonomy in management of their condition.

Ethics approval

The study protocol was approved by the human research ethics committees of The University of Sydney (Ref no. 11419) in 2008 and ratified by Charles Sturt University, The University of Queensland and Monash University. All pharmacists and patients provided written informed consent. Pharmacists were reimbursed for their time.

Study methodology

Qualitative feedback was sought from study participants at three time points during and after completion of the asthma service (Figure 1) to gain an insight into their perceptions and experiences as the trial progressed. Participants were sampled randomly from the pharmacies, and participated at only one time point so as to minimize their research load. The data were obtained through individual interviews and focus groups until saturation of themes was observed. The use of

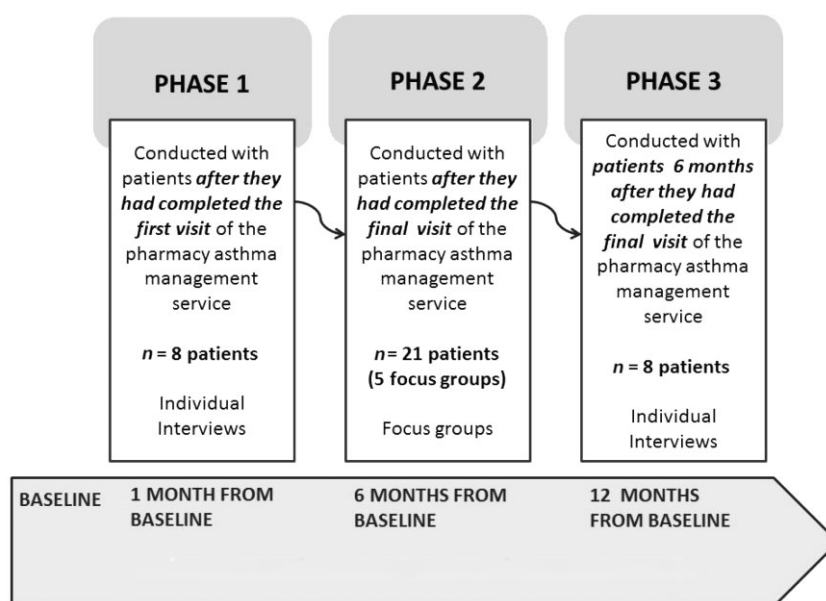


Figure 1 Study design.

both individual and group interviews provided a means of validating data obtained via the different interview methods.^[26]

For the individual interviews, a semi-structured interview guide, based on previous research experience, was developed, with questions pertaining to participants' experiences with the asthma service, positive/negative aspects of the service, their relationship with health care professionals, perceived value of the service for the community and future demand for the service. Interviews were conducted via telephone at a time convenient to participants. Interviews were shared between two interviewers from the main research center, who were trained in a consistent approach. Focus groups were organized at a time and location convenient to all participants and were facilitated by investigators from the closest research center using a similar interview guide.

Data analysis

Interviews and focus group discussions were transcribed verbatim by professional transcribers independent of the research team. Initial readings of the transcripts and discussion of codes and themes were undertaken. Given the longitudinal design of the study and the wide-ranging nature of the topics covered during the interviews, we applied a framework method^[27] of analysis to the data. This entailed a structured conceptual matrix of cases (participants) and the themes that emerged from the coded transcripts. This approach enabled comparisons to be made within and between themes and cases, both at single and multiple time points.

Results

Sixteen interviews and five focus groups were conducted with 37 participants at the three different time points (Figure 1). Analyses of the interview/focus group transcripts identified several themes regarding participants' experiences and their perspectives of the PAMS (Tables 1 and 2). Several of the identified themes were consistent across the three time points, i.e. emerging from both the interviews and focus groups (Table 2). In some of the themes, however, a differing level of participant perception and complexity of language was demonstrated (Table 1). This was especially exhibited in Phases II and III, when participants had experienced the entire asthma service, as compared with Phase I, when participants were relatively new to the service. Within the identified themes, participants' perceptions and views differed across the three time frames, being at an abstract level in Phase I to a more developed and experiential level in Phases II and III. This transformation was also evident in the use of more advanced language and specific terms (Table 1) related to asthma management by the participants.

Increased awareness and understanding of asthma

Participants displayed an increased awareness and understanding of asthma at each time point. Some reported that the asthma service was particularly novel to them; this was most evident in those participating in the first round of interviews. However, participants who were interviewed at the

Table 1 Key quotations from participating patients that demonstrate differing level of patient perceptions and complexity of language over the three time points

Theme	Phase I (beginning of service) Abstract level Lay language and reference to general aspects of service	Phase II (end of 6-month service) and Phase III (6 months post-service) Experiential level Complex language and reference to specific aspects related to asthma care
1. Increased awareness and understanding of asthma	'It gave me an insight into the likes of what asthma actually does and how it works'. (Phase I, PI 6)	'I was pointed out a few things that I didn't really understand at the time. That fact that I really should use a preventer regularly'. (Phase III, PI 4) 'Being aware of your triggers as well makes you aware to take your preventer beforehand'. (Phase II, FG 5)
2. Change in beliefs and attitudes	'I don't think that I realised that I had such a problem. I just thought that was good'. (Phase I, PI 3)	'I wasn't sure about side effects, so I wasn't keen to have it (preventer) every day, twice a day. But now I understand a little bit about it I'm not so worried about the "steroid" part of it'. (Phase II, FG 5) 'I had a stigma about using sprays and steroids and everything else. But I found that since I am using them properly just how much better I feel'. (Phase III, PI 8)
3.1 Differences in health behaviour: improved inhaler technique	'It's been very, very much an eye opening experience. . . I thought I knew quite a bit about asthma, but I certainly learnt new things . . . refined techniques, like inhaler techniques'. (Phase I, PI 4)	'I also bought a spacer, after quite some weeks, and I found that it's made a big difference'. (Phase II, FG 3) 'Once I got onto the right dosage and technique 'cause the pharmacist put me onto a spacer . . . I've controlled it (asthma) more since I have been on the spacer, instead of just taking the puffer and blowing into your mouth . . . it was a life saver'. (Phase II, PI 3)
3.2 Differences in health behaviour: differences in medication-taking behaviour	'It's (the service) made me aware of what I should do to control it and why I should now. Because I used to take it when I get sick . . . if I got better, then I used to stop, and then I'd get sick again, and then take it again. . . Now I understand that it's supposed to be an ongoing process'. (Phase I, PI 8)	'I just thought it was because I was doing too much stuff. . . and everything, and then I started taking it (preventer) and within a week it was like wow, this is what breathing feels like'. (Phase II, FG 1) 'I never used to take a preventative or anything like that, had the medication at home, but never used to take it how it was supposed to be taken, and from this (service), I've found out a lot of things and now I believe being on a preventer, it (asthma) has improved'. (Phase II, FG 1) 'I used to live with the Ventolin®, sort of not out of reach. Now it's not around. So I'm completely off it by being disciplined and using my preventer properly – it's very much helped me'. (Phase II, FG 3) 'The main thing probably was to be conscientious and take my medication every time I was supposed to do it. That was probably my biggest problem . . . The service really made me aware of taking my medications as prescribed'. (Phase III, PI 5)
4. Improved perceived control and self-efficacy	There were no comments related to this theme in Phase I.	'It was all these positive reinforcements and steps to get you through to a stage where you saw benefits yourself. So it was good that you were in control and managing'. (Phase II, FG 2) 'I've actually found how to control my asthma, which is probably as important. If you can control it, well, there's no hassles with it. I hardly get asthma anymore, and if I do, well, I know what to do'. (Phase III, PI 4) 'As long as you can manage your asthma, you can function properly. I'm not tired all the time . . . I can walk up a hill now and upstairs, which I couldn't before . . . I had to stop, even when I was on the full medication'. (Phase III, PI 3) 'I didn't realise like when you start to wheeze . . . I'd put up with it until my wheezing got too bad that I was like barely being able to breathe before I would do something about it. But now I have my puffer before I go out . . . I've learnt that the puffer lasts for like a four hour period, so I can take it at the start of a game and still have the desired effects from it at the end'. (Phase II, FG 1) 'It's great to know that you are feeling like you have much more control than you had previously'. (Phase III, PI 7)
5. Identifying value/importance of service	'I think that the pharmacist got my asthma more under control more than my GP ever has had'. (Phase I, PI 6) 'I would like to thank you, because it has changed my life'. (Phase I, PI 3)	'I think with having the machine (spirometry) here too, that between appointments for me I'd go on to the preventer, and then you'd see that your lungs had actually improved, you know. I think it does, I think it gives you another energy level'. (Phase II, FG 1) 'I was just amazed with the preventative medication . . . how much difference it made to me'. (Phase II, FG 1) 'I think a lot of people with asthma don't realize how serious it is. I think that's the biggest problem. And if the pharmacist can convince the patient that they should do these tests (spirometry) it would make a big difference'. (Phase III, PI 5) 'The spirometry did show that the last time I went back I was actually breathing better than when I first started going . . . I guess its a measure of how you actually are . . . so it was worthwhile'. (Phase III, PI 4) 'I think that's probably one of the things that I was failing to do which I had never been shown was how to actually use my puffers properly and I found that very beneficial'. (Phase II, FG 3)

FG, focus group; GP, general practitioner; PI, patient interview.

Table 2 Key quotations from participating patients that demonstrate themes that did not change over time

Theme	Quotations
1. Need/demand for ongoing service	'Some asthmatics, they're probably ignorant of a lot of aspects of asthma and their condition at the moment . . . like I certainly was. So once they understand and they learn about their actual asthma, I feel that there'll be a pretty big demand for it [asthma service]'. (Phase I, PI 8) 'I'd like another one at least, like in the future, like some follow up . . . I'd do it again definitely and I'd like a follow up visit'. (Phase II, FG 2) 'It should run for everybody, as a permanent ongoing thing'. (Phase III, PI 4)
2. Realizing the benefit of pharmacist/GP collaboration	'I told him I was involved in this program and [the pharmacist] had identified that I needed to be on a continuous preventative treatment and the GP thought that was fine and wrote up a script'. (Phase I, PI 3) 'To me it's an extension of after a doctor's . . . it's more follow through'. (Phase II, FG 3) 'Between pharmacist and GP, I've got an Action Plan, so I know what I'm doing'. (Phase III, PI 3) 'My asthma was out of control, and I was just taking the medications that the doctors just kept giving me . . . the pharmacist tested me . . . I went through the whole thing (service) and he rang up the doctor . . . and between the two of them, they got me onto the right dosage . . . it's been a 100% improvement'. (Phase III, PI 3)
3. Support for the role of the pharmacist in service delivery	'He's very, very good . . . always informative, always willing to answer questions and makes it nice to actually go and sit down there and participate in the service'. (Phase I, PI 5) 'I thought he [pharmacist] was very knowledgeable . . . he knows all the things he sells in the chemist too . . . like these things [holds up spacer]. Doctor never suggested those. He [pharmacist] seemed to do more for me, he seemed to know more and he seem interested that you get better'. (Phase II, FG 4) 'She was excellent, as I say excellent. You couldn't fault [the pharmacist] at all. Her heart was right in what she does and I mean for a busy lady like her, I could not speak more highly of the service that she provided . . . I have not heard one bad thing about this at all'. (Phase III, PI 7)

FG, focus group; GP, general practitioner; PI, patient interview.

completion of the service expressed not only an enhanced understanding of the disease itself but also a heightened awareness of specific aspects of asthma management including trigger awareness and the importance of preventers (Table 1).

Change in beliefs and attitudes

An important theme that emerged from the data was the suggestion that participation in the asthma service had led to a change in the beliefs and attitudes of participants towards asthma and its management. Irrespective of when participants were interviewed, several of them realized that their asthma was poorly controlled and that it was possible, as well as important, to manage it properly. In participants who had completed the service, however, there was a demonstrated positive change in beliefs and attitudes towards asthma medications. Participants displayed different attitudes towards the importance of preventer medications and the need to manage their asthma properly and further, they linked these novel changes to the enhanced health outcomes they had achieved (Table 1).

Differences in health behaviour

Differences in health behaviour were a dominant theme that emerged. The majority of the participants indicated that the

asthma service had influenced them to change various asthma-related health behaviours, especially in relation to inhaler technique, achievement of goals and asthma medications. Participants expressed an increased awareness of how their changes in health behaviours had translated positively into their overall health and quality of life. Specifically, in two of the health behaviours, i.e. inhaler technique and medication taking, there was a notable difference between the three time points. Participants in Phase I of the study merely realized the importance of correct technique and regular medications. In contrast, Phases II and III participants were more reflective of the importance of their asthma medications/correct inhaler technique, taking action in terms of managing their asthma through the proper use of medications/technique, as well as linking enhanced health outcomes to the changes they had initiated (Table 1).

Improvement in inhaler technique

Participants perceived a marked improvement in their inhaler technique. Some participants expressed how the pharmacist, as part of the asthma service, had reviewed and corrected their inhaler technique. It was interesting to note that in the early phase of this study, perceptions were abstract and limited to how the service had been central in improving their knowledge about correct inhaler technique. On the other hand, upon completion of the service, participants

seemed to have more experienced enriched perceptions, wherein they not only acknowledged that the service had improved their inhaler technique but also recognized the potential benefits of improvement in their inhaler technique on their health (Table 1).

Differences in medication-taking behaviour

Medication-taking behaviour of participants was reported to have changed as a result of the service. For a majority of the participants, the asthma service improved their knowledge and understanding of asthma medications and raised their awareness of the importance of using regular preventative medications. In general, participants reported using their preventer medications regularly, resulting in a reduction of their need for reliever medications, and attributed this to their participation in the asthma service. In Phases II and III, when participants reported on the changes in their health behaviour, they identified that this occurred in the context of a change in perceptions/beliefs about their illness. This demonstrates a link between improved knowledge and understanding and medicine-taking behaviour (Table 1).

Achievement of set goals

Participants reported that they found the goal setting aspect of the service quite useful. Further, an achievement of goals set during the service was evident from participants' reflections, whether earlier or upon completion of the asthma programme.

Improved perceived control and self-efficacy

The PAMS led to enhanced self-efficacy and perception of control. This theme was predominantly noticeable in participants who had experienced the complete asthma service. These participants displayed a confidence in their ability to control and manage their asthma, as well as to undertake activities in which they were previously unable to participate (Table 1).

Identifying value/import of service

Whether they had experienced a single consultation or the entire comprehensive service, the majority of the participants recognized the importance of the asthma service and realized the benefits that the service had provided to them. One notable trend was the increase in language complexity across the three time points. While Phase I participants described the beneficial aspects of the service using lay terms, those in Phases II and III used more complex medical language to describe the service and the individual service elements that they considered valuable (Table 1).

Generally, participants reported the overall service to be valuable and several participants also detailed how individual aspects of the asthma service had contributed to substantial advances in their health outcomes. These reported useful service aspects included the provision of information, lung function testing using spirometry, and inhaler technique review and correction.

There were also several themes identified in which no change in language occurred over time (Table 2). These were need/demand for ongoing service, realizing the benefit of pharmacist/general practitioner (GP) collaboration and support for the role of the pharmacist in service delivery.

Need/demand for ongoing service

Participants expressed a strong need and demand for such a pharmacy-based asthma service in the community on a regular basis. Participants felt that an ongoing service would help keep their asthma in check/control through the provision of regular follow-ups by their pharmacists. They also felt other asthma patients would benefit from such a service. Even participants who had completed just one visit of the study were greatly supportive of a future pharmacy-delivered asthma programme.

Realizing the benefit of pharmacist/GP collaboration

Participants reflected positively on the inter-professional collaboration between their pharmacists and GPs. For many participants, this collaboration resulted in several successful interventions such as possession of an asthma action plan, timely access to a GP and change in asthma medications.

Support for the role of the pharmacist in service delivery

Participants were extremely supportive of the role that their community pharmacists had played in the delivery of the asthma service and management of their asthma. Some participants appreciated the convenience and ease of accessing the pharmacist, while others valued the time spent by the pharmacist during the consultation.

Further, several participants expressed trust and confidence in their pharmacist and were happy with their pharmacists' knowledge and expertise in regard to asthma and its management. Some participants also noted a genuine interest in their health on the part of the pharmacists.

Disliked elements of the service

Overall, the participants had very few comments about what part of the service they disliked. Some felt that the visits were

too long (median visit length ranged from 20 to 75 min^[23]), and some participants did not like the effort involved in performing spirometry. Indeed, most participants expressed satisfaction with the service as it was, seeing no need to make improvements.

Future of the service

There was a dichotomy of views in regard to the future structure of the service. While some participants wanted fewer visits, others wanted more over the same period of time. With respect to arranging consultations with their pharmacists, most participants preferred to have appointments with their pharmacists. Participants also suggested the extension of the service to children and younger people under the age of 18.

Discussion

This study explored participants' experiences with and their acceptability of a specialized asthma service delivered by community pharmacists. Further, participant views were elicited at three different time points on various aspects related to the asthma service including how they received the service, the role of the community pharmacist in service delivery, service aspects that they liked/disliked, the impact of the service on their asthma and overall health, and the future of the service. In general, participants were very positive about the pharmacy-based service and were supportive of having the pharmacist play an enhanced role in the management of their asthma. There were very few negative comments, pertaining only to the length of the visits and the effort required for spirometry. With increased exposure to the specialized asthma service, there was an increased understanding of asthma, changes in participants' beliefs and attitudes towards asthma and its management, changes in asthma-related health behaviours and enhanced self-efficacy. There was also a difference at the different time points in the reported perceptions, whereby these developed from an abstract to a more experiential/concrete level. Common themes relating to asthma knowledge, attitudes and medication use behaviours were elicited at each of the time points, highlighting the continuing relevance of each of these to the participant's experience of the pharmacist's service. Participants expressed a strong desire for a future ongoing asthma service in their community pharmacies.

The main strength of this study is related to the repeated feedback from participants over time as they experienced a pharmacy service. We were able to observe a difference in participant perceptions from merely being positive to actually relating the service elements to their improved health. Another strength of this study is the large number of patients we were able to have participate in interviews and focus groups. Our study also had several limitations. Firstly, a

combination of focus groups and individual interviews was employed to collect qualitative data, given the issues with convenience and timing. This combination of methods, however, balanced the data from group discussions with the richness of the individual interviews. Another limitation was that although the data were collected at three time points, the study did not longitudinally monitor each participant's experiences over time. Because different participants were recruited in each phase, it cannot be guaranteed that they had different attitudes and behaviours; however, participants were chosen randomly so we have some confidence this is not the case. Given that they were involved in a free service, participants may have felt 'obliged' to give positive feedback. However, the use of independent interviewers/facilitators and venues other than the pharmacy would have reduced this response bias. Another limitation is that participants were recruited from a self-selected group of pharmacies participating in the larger trial, whose pharmacists may have been more enthusiastic and committed to patient care, which may have influenced the patients' views.

An important highlight of the study was the notable difference in participant's perceptions and views at the three different time points for some of the identified themes. This difference was demonstrated especially in those who had experienced the entire asthma service as compared with those who had completed just one visit. Within many of the identified themes, perceptions developed from being at an abstract level in Phase I to a more experiential level in Phases II and III. This change over the three time points was also supplemented by the use of advanced language and specific terms related to asthma management by the participants, suggesting that they had linked the service to their health improvements and they could articulate the link.

A number of participants discussed how they felt their asthma had improved since their involvement in the service and how they had achieved targets and undertaken activities that had previously seemed unattainable. Further, they also reported an increased awareness and understanding of asthma and its management, especially on completion of the service. These participant-reported experiences coincide with and support the clinical and humanistic outcomes measured during the PAMS study.^[22,23,28] For example, participants highlighted a change in their attitude towards the use of preventer medications, and their clinical outcomes reflected this, with an increase in preventer use and asthma control at the end of the service.^[23] Other measures, such as the perceived control of asthma, inhaler technique and adherence, were reported by participants to have improved and had also changed significantly over the service when measured clinically.^[23] In addition, this pharmacy-based asthma management study led to significant improvements in knowledge of the asthma patients, which was sustained for at least 12 months after the service.^[24] This demonstrates that the

pharmacy asthma service delivered clinically important improvements in asthma patients, which also translated to positive patient experiences and enhanced health outcomes from their perspective.

Participants were accepting of the role of pharmacists in asthma management and perceived the need for the service to be provided in the future, not only as a follow-up for themselves but also for other potential asthma patients in the community who may benefit from the same. This acceptance of community pharmacists is consistent with other studies where pharmacists have been involved in chronic disease management as well as independent prescribing.^[29,30] The themes related to the pharmacist did not change over the three phases of this study.

Of significance was the difference at the three time points in the participants' perceptions, whereby these developed from an abstract to a more experiential/concrete level. The study identified differences in beliefs and attitudes of the participants. This is consistent with a health-illness behaviour model reported in the literature, the common sense model of self-regulation (SRM)^[31]. This model postulates that with appropriate messages, patients engage in a dynamic and transactional process of having an initial awareness of their illness, converting this to action for controlling or managing the illness, and further to appraising their personal outcomes.^[31] Our analysis suggests that increases in participants' knowledge and understandings about their illness and medications, coupled with the positive emotions they expressed, may have resulted in revisions in beliefs about the consequences of having a condition such as asthma and perceptions of the controllability of the condition.

According to the SRM model, these cognitive and emotional representations may have influenced changes in coping and behaviour, and subsequent appraisals of improvements in symptoms and general health. For example, while participants new to the service displayed a change in attitude towards their asthma and the need to manage it properly, participants who had completed the service recognized the benefits of their actions in terms of positive health outcomes. Similarly, participants also displayed substantial changes in their reported health behaviours. For instance, regarding inhaler technique and medication-taking behaviour, participants in Phase I of the study recognized the importance of using correct technique and regular preventer medications. Participants in Phases II and III, on the other hand, not only recognized the importance of changing their health behaviour but also realized how this change in behaviour had manifested in marked improvements in their asthma.

In contrast to our study, previous studies that acquired feedback from users have often done so at a single time point. There is, however, evidence to show that users have different expectations of a community pharmacist's role based on whether they had or had not experienced a

pharmacist-delivered service or programme,^[32,33] generally with well-developed expectations as well as high satisfaction after experiencing the service, as opposed to at baseline, where service expectations are low. Without realistic expectation of a service, patient satisfaction with the service provided is rather meaningless. Thus, it is important to extend public awareness and acceptance of the pharmacists' role in the provision of specialized services so that patients have realistic expectations. This has also been suggested by other studies exploring the user acceptability of community pharmacy-based specialized services.^[29,30]

Conclusion

This study provides an insight into patients' views and experiences with a specialized community pharmacy-delivered asthma management service. The study highlights that a sustained experience with a service may lead to more experiential or concrete changes in patient perceptions of severity, beliefs, health behaviours, and enhanced efficacy and control. This engagement of the patient in action to benefit his or her asthma is the key to developing sustained self-management behaviour and enabling the patient to take responsibility for his or her asthma control. The study findings add to the evidence that the asthma service is feasible, beneficial and acceptable to patients and that patients positively received pharmacists playing an enhanced role in the management of their asthma. Given the awareness and acceptability of pharmacist-delivered asthma management after experiencing a service, raising public awareness of the extended roles and responsibilities of pharmacists will be vital for the sustainability of such services.

Declarations

Conflict of interest

The Author(s) declare(s) that they have no conflicts of interest to disclose.

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Authors' contributions

PNP performed the analysis of transcripts and writing of paper. BS checked the transcripts and themes, helped in the design of original pharmacy intervention and qualitative feedback, and read and reviewed the manuscript. KSL checked the transcripts and themes, was the project officer in the original pharmacy intervention, and read and reviewed the manuscript. LME conducted focus groups, helped in the design of original pharmacy intervention and qualitative feedback, and read and reviewed the manuscript. KS conducted focus group, helped in the design of the original

pharmacy intervention and qualitative feedback, and read and reviewed the manuscript. DLB conducted focus group, helped in the design of the original pharmacy intervention and qualitative feedback, and read and reviewed the manuscript. SZBA helped in the design of the original pharmacy intervention and qualitative feedback, and read and reviewed the manuscript. IK checked the transcripts and themes, helped in the design of the original pharmacy intervention and qualitative feedback, and read and reviewed the manuscript. LDS conducted focus groups, helped in the design of original pharmacy intervention and qualitative feedback, and read and reviewed manuscript. CLA conducted focus groups, helped in the design of original pharmacy intervention and qualitative feedback, and read and reviewed the manuscript. All Authors state that they had complete access to the study data that support the publication.

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