Factors influencing family physicians' drug prescribing behaviour in asthma management in primary care

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ABSTRACT

Introduction: Little is known about the decision pathway that family physicians (FP) take in considering drug therapy for their asthma patients. This study aimed to explore the factors that influence FPs' decisions in prescribing medications for their asthma patients.

Methods: A qualitative method using focus group discussions (FGD) was used to gather qualitative data based on a semi-structured topic guide from FPs of different training backgrounds and practices. 29 Singapore FPs working as private general practitioners (GP), polyclinic doctors and locums were recruited into five FGDs.

Results: The FPs' asthma drug prescription decisions were related to the FPs' medical training and acquisition of asthma-related information and updates. Uncertainty of disease diagnosis, patients' beliefs and their perceptions of the disease and treatment, as well as the FPs' concerns about drug side effects, were significant considerations for the participants. Costs related to differential subsidies in the consultation fees and drugs between public polyclinics and GP clinics in the local primary healthcare system, was a key factor in influencing the FPs' asthma drug treatment decisions.

Conclusion: FPs' asthma drug prescribing behaviour is influenced by their medical training, disease definition, patient factors and drug costs in the context of the local primary healthcare system and policy.

Keywords: asthma, qualitative research, family physician, drug prescription

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INTRODUCTION

In Singapore, the walk-in, fee-for-service healthcare system allows asthmatic patients to select their sites of treatment at primary care centres of their preference, including family physicians (FPs). FPs include private general practitioners (GP) and public polyclinic physicians. They can also seek treatment directly at specialist clinics. Most patients obtain their asthma drugs dispensed directly from these primary care clinics out of convenience, although they could purchase them with doctor-endorsed prescriptions from private pharmacies. The polyclinics receive their drugs from their centralised pharmacy departments via an open tender system. Polyclinic physicians are not involved in drug procurement. With government subvention, polyclinic patients enjoy subsidised consultation and drug charges.

However, charges for the common asthma drugs, such as inhaled corticosteroids (ICS), may vary within the polyclinics, depending on whether they are generic or patented. Inhaled patented combination drugs, long-acting beta-2 agonists (LABA) and oral leucotriene receptor antagonists are generally not subsidised, and hence patients have to pay market prices for such drugs at the polyclinics. The health authority established such a drug price scheme as part of the local healthcare policy to encourage physicians to use cost-effective medications. On the other hand, GPs negotiate drug prices with the respective pharmaceutical companies directly and they set their drug charges themselves; the cost of drugs may therefore vary between GP clinics. The differential treatment subsidy in the local primary healthcare system has resulted in a higher daily patient load per doctor seeking consultation at the polyclinics compared to GP clinics, and this generally reduces the average consultation time per patient at the polyclinics.[1]

Both the local Ministry of Health (MOH) and international Global Initiative for Asthma (GINA) clinical practice guidelines (CPG) in asthma management are readily available to guide Singapore FPs in their therapeutic options for treating asthmatic patients in primary care.

Each registered physician is provided with a free copy of the CPG and they can also access the CPG at the MOH website.[2,3] CPG recommends the long-term use of ICS in managing patients with persistent asthma. All polyclinics are officially accredited postgraduate training centres for family medicine (FM) and organise regular in-house training programmes for their doctors. Most GP clinics do not have a structured training programme, although GPs are expected to attend continuous medical education (CME) events to fulfill the requirements of the Singapore Medical Council. Asthma-related topics, including CPG, are covered by the FM training curriculum and are included in the FM examinations for trainees.

While an earlier local questionnaire survey of primary care doctors self-reported adherence to CPG's recommended treatment, it did not correlate with their actual drug prescriptions.[4] In contrast, Roghmann and Sexton reported that physician's adherence to asthma CPG was low.[5] Asthma control was also shown to be suboptimal in the Asia-Pacific region, including Singapore.[6] This could be related to reports of inappropriate drug prescriptions such that patients with persistent asthma were not prescribed "preventer"/ controller medications.[7-11] Other studies showed that FPs prescribed more inhaled and even oral short-acting beta-2 agonists (SABA) than ICS.[12,13]

What is lacking is an explanation for this disparity, as there could be other factors influencing FPs' actual asthma drug prescription. However, there has been no precedent study to determine the factors that influence the local FPs' prescribing behaviour in asthma drug therapy. This qualitative study aimed to explore these factors, as understanding these factors would facilitate the design and introduction of FP-targeted interventions to optimise asthma drug therapy for patients managed in primary care.

METHODS

The investigators are Singhealth Polyclinic staff who are directly involved in the asthma care of their patients. The idea for the study was mooted as we encountered inappropriate asthma drug management among patients who presented with asthma exacerbation in our clinics. Due to the paucity of related studies in the local setting, the investigators conceptualised the study based on grounded theory and decided to use a qualitative research method to determine the issues.[14] This method allows for an in-depth exploration of the ideas, concerns and other complex interrelated processes that influence FPs' decisions in prescribing the various types of asthma medications. The investigators developed a semi-structured topic guide after mutual deliberations and obtained approval for the study protocol from the SingHealth Polyclinics institutional review board. Purposive sampling was carried out to include FPs from both public and private primary care clinics, with considerations of their background in FM postgraduate training (those with a basic degree, diploma or masters degree in FM), in order to capture a wider spectrum of views.

The first author facilitated all five focus group discussions (FGDs).[15] The other investigators assumed the roles of note-taker and assisted in obtaining participants' consent and demographic data. The objective of the study was explained to the participants at the onset of the FGD and the confidentiality of their identities was ensured. Each FGD was audiotaped, and lasted between 45 and 90 mins. Brief notes of each session were taken as reference for the subsequent transcription of the written script by an independent transcriber. Participants were encouraged to speak freely and described their personal views of managing their asthma patients. They were reimbursed for their travel expenses.

The study was concluded when a saturation of ideas was achieved after five FGDs. The tape-recorded interviews were transcribed in their entirety into text files. The transcripts were audited independently by the investigators to ensure consistency. The first author analysed the qualitative data after all transcripts were read several times and simultaneously coded, using the software NVivo® version 7 (QSR International Pty Ltd, Australia). The results were then discussed among the investigators. Potential conceptual and content-related themes were formulated in the thematic analysis. The quotes included in the results were typical views expressed by the participants in each FGD and are used to exemplify emergent themes. Preliminary results were also sent to selected participants to improve the reliability of the report. The entire study began from its conception in August 2005 and ended in October 2007.

RESULTS

The participants comprised 29 FPs, including 16 polyclinic physicians, five GPs from group practices, seven GPs from solo practices and one locum doctor. Their profiles are described in Fig. 1. The investigators organised the themes into the following domains: the FP, the patient, the asthma disease (including its diagnosis and treatment), and the local primary healthcare system and policy. The key results are summarised in Table I.

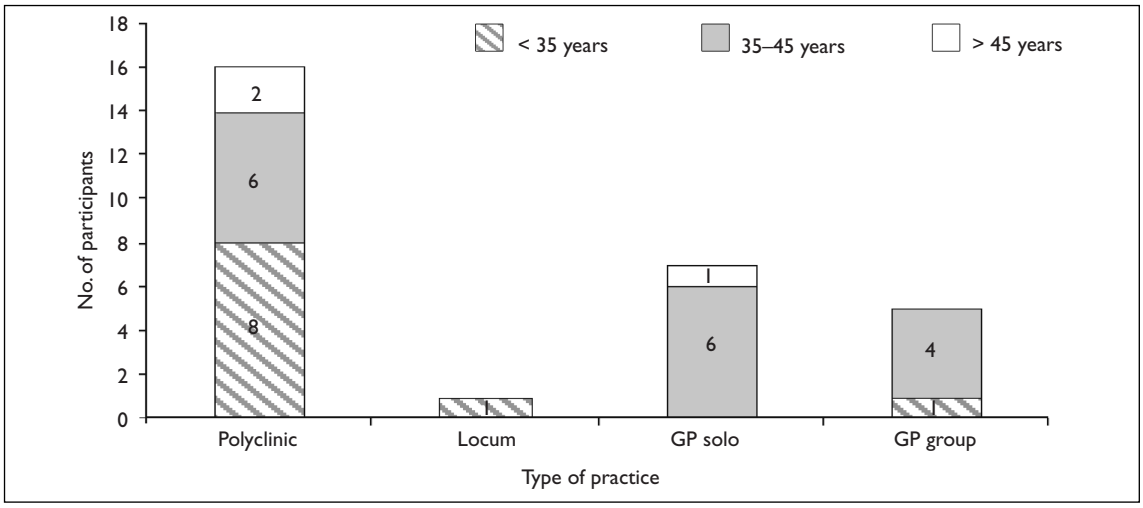

Fig. 1 Bar chart shows the age and practice profiles of the participants.

Table I. Summary of factors influencing the family physician's drug prescribing behaviour in asthma management.

Factors	Details
Family physician	Differential training background in asthma drug therapy and exposure to relevant continuous medical education (CME) activities as well as briefings by pharmaceutical company sales personnel.
Disease	Uncertainty and difficulty in asthma diagnosis and differentiation from other respiratory conditions, such as COPD, as a result of the lack of a lung function assessment facility in most primary care clinics.
Primary healthcare	Walk-in primary healthcare system affects the patient's health-seeking behaviour, relating to the cost of the system and policy consultation and asthma medication, patient load and consultation time, and ancillary support from nurses in asthma counselling in public polyclinics.
Patient	Patient's personal view and expectations of asthma medication in terms of acceptability, mode of use and cost.

The family physician factor: training in asthma management

The participants' prescribing behaviour seemed to be influenced by their exposure to the medical training at the sites of their practice.

"Well, the only time that I've been updated on GINA is when I was asked to present at CME (at polyclinic)." – Polyclinic physician, FGD5

Regardless of whether the qualification was a diploma or a masters degree in FM, participants with postgraduate qualifications were more articulate on the CPG recommended asthma drug therapy. Some of these participants took on the role of FM trainers in their practices and were more proactive in ensuring that fellow doctors adhered to appropriate medications and that maintenance therapy was continued according to the CPG.

"It's education… The practice where I come from, the majority of the doctors understand that there should be continuity of care, but I'm worried about certain doctors, who are not aware that there should be a TCU (local medical term for "to check up") date for patients to come back again for asthma. I believe it's important again, to educate the doctors including those doctors who come to our institutions, especially those who are here on a temporary basis, for example, locum, … they may not be aware…." – Polyclinic physician*, FGD1 (* denotes participant with a postgraduate qualification).

With a structured training programme in their clinical setting, the polyclinic participants appeared to be more confident in prescribing short-burst steroid treatments to their acutely ill patients. With the CPG as their reference, some participants highlighted the differences in the prescribing habits of FPs.

"I don't exceed 40 mg (of prednisolone), because the pharmacist starts getting palpitation!" – Polyclinic physician A, FGD5. *"They (GPs) give only 5 mg (of prednisolone)!"* – Polyclinic physician B*, FGD5.

The investigators noted that some participants with basic qualifications tended to prescribe medications according to their past experiences with the drugs. Few GP participants mentioned updates of asthma drug therapy provided by pharmaceutical drug representatives during the latter's clinic visits.

"Do you get such (asthma drug) information from the drug firm?" "Yes … also xxx (pharmaceutical company) used to give us one book that covers a lot of things…about inhaled steroids, what are the side effects of steroids, how to overcome them ... how you use the inhaler properly, classification of asthma..." – GP, FGD4.

They also appeared to be selective in their attendance at asthma-related CME events.

"Selecting those useful ones (CME) that you want to go to, that can be an issue. Certain topics you are quite interested, you want to go, but there are no other available ones." – GP, FGD2.

Thus, the knowledge base of the FPs in asthma drug therapy varied widely, which could lead to varying levels of practices in asthma treatment. For example, one participant recommended the use of home nebulised bronchodilator therapy for the relief of asthma exacerbation to his asthmatic patients, which differed from the current recommendations.

There was a certain degree of steroid phobia among some participants, even for the inhaled route of administration, especially with the long-term use of corticosteroids for paediatric patients. A fear of side effects, such as growth retardation, could deter their continuous prescription as preventer/controller drugs.

"Steroids will batter their (children's) growth" – GP*, FGD2.

On the other hand, medical evidence to show the benefits of such therapy and information to allay the patient's or caregiver's fear of side effects could boost their confidence to continue the use of preventer/controller drugs.

"We need to have the assurance, and be ready for the question and problems that can pop up (with steroid use)" – GP*, FGD2.

The disease factor: difficulty in diagnosis confirmation and severity assessment

The participants reported difficulties in confirming a diagnosis of asthma and a severity assessment for some of their "fresh" or newly-encountered patients with symptom-based presentations.

"A lot of times it's very difficult, because they're very vague in their perception of asthma, of what it actually is. Is it just runny nose, cough, or is it a true attack, you know?" – Polyclinic physician, FGD5.

Most participants did not have a spirometry facility in their clinics and admitted that peak flow measurements were not routinely carried out.

"To be honest, I have actually not used it (peak flow meter). But if I did, I'm sure it'd be quite helpful." – Polyclinic physician, FGD5.

Some assessed severity based on the intensity of use of reliever medication. This uncertainty of diagnosis and lack of an objective measurement of disease severity affected participants' asthma drug prescription behaviour.

"Some doctors tell me they never touch the CPG at all. Realistically, judging from the amount of Ventolin (salbutamol from AstraZeneca) they (patients) buy, and the symptoms they are having, you know more or less, they need something more than a reliever, or a long-term preventer, so that's how you can gauge." – GP, FGD2.

Some participants were aware of the tools to assess asthma severity, such as the asthma control test (ACT). They left ACT pamphlets at the patients' waiting area in their clinics, but usage by the patients was rare.

"We leave it (ACT pamphlet) there for them (patients) to take and do…Usually they just read through, but they don't do it." – GP, FGD4.

Some participants expressed doubts and confusion between a diagnosis of asthma and that of chronic obstructive pulmonary disease (COPD) for a selected group of patients. They would allow the regular use of SABA for the latter. Some would consider a trial of medications to differentiate between the two diagnoses.

"I see a significantly larger number of COPD (patients). I find that it's a very convenient diagnosis because it gives them the liberty to use their Ventolin... you know, (giving Ventolin) very liberally by the doctors." – Polyclinic physician, FGD5. *"I am not sure whether it is COPD or asthma? I actually start them on treatment for COPD with Spiriva (tiotropium by Boehringer Ingelheim). You see (the patient) doesn't get better or becomes better with corticosteroid, he may be asthmatic."* – GP, FGD2.

Some participants reported that they would prescribe SABA based on clinical signs suggestive of bronchoconstriction for their "fresh patients". For them, the diagnosis of asthma becomes secondary, as they tend to prescribe drugs to target at resolution or relief of the symptoms.

"…diagnostic resolution is dependent on therapeutic options" – GP*, FGD3.

The primary healthcare system and policy factor: cost issues and the walk-in system

The clinical setting of the participants was noted to be an influence on their asthma drug prescriptions, and was largely related to patients having to pay both consultation fees and drug charges in private GP clinics, while the costs of both were subsidised by government subvention in the polyclinics. Cost was the key determinant in physicians' prescribing behaviour and was commonly highlighted in all the FGDs.

"We are very cost-conscious, for ourselves, for our patients, may be more so for our patients. You find that the better medicine, those which are evidence-based and effective … are always more expensive than we want them to be. So cost is an issue" – Polyclinic physician*, FGD1.

The participants pointed out that the costs of long-term maintenance use of preventer/controller medications for persistent asthmatic patients could be a deterrent, even with the use of generic drugs.

"Some of these patients are not poor to the extent that they can't afford. They don't need medical financial assistance. When these patients come and see you for cough and cold, normal medicine, tablet Ventolin, they can

afford. But when you continuously put them on something expensive, it is a strain on their finances." – Polyclinic physician*, FGD1.

For GP participants, cost and drug choice could be related to their contractual agreements with individual pharmaceutical companies.

"There are other generic ones, but sometimes because of contractual reasons we have to stop some of these. You see, my practice has changed (as a result of this) such that I'm not very proactive in using it (referring to a specific brand of ICS)." – GP, FGD2.

Cost was also the main consideration for polyclinic participants, and partly related to the subsidy variability of different types of asthma drugs in their polyclinic setting.

"Despite the subsidy, it's still quite expensive, it's a burden to the patients … it's still a significant cost to patients. For beclomethasone (current generic brand is "Beclo-Asma" from Green Cross Pharma), it's a few dollars; for Pulmicort (budesonide from AstraZeneca) which is longer acting, I mean with fewer puffs, can last longer, but still is a burden for the patients. For adults, Pulmicort, two puffs bd are used after you use becomethasone 4 puffs tds, so (the turbuhaler), that's used as a last resort." – Polyclinic physician, FGD1.

The GP participants relied more on the frequency of patients returning for treatment, often for acute exacerbation, as a gauge of asthma severity. This is in the context of a walk-in primary healthcare system.

"I think most of the time the patients who come to see us at the primary care level, are not the persistent kind of asthmatic ones. They probably have one attack once a year. So my oral medication is usually my first line. It's only when they come a bit more frequently, … when they come a second time, quite close to the first time, then I'll approach the subject of inhalers. To tell them about inhalers is actually quite straightforward, you tell them they take too much medication it's not very good; it's safer, the inhaler. So usually by third time, and if they need to come and see you again, they're generally more ready to accept the inhalers. So it's a lot of preparation: at every visit, you tell them, if you're not going to recover, I'm going to move to this (use of inhaler)." – GP*, FGD3.

However, asthma severity classification appeared to be applied more rigorously in the polyclinic setting, facilitated through the use of visual aids, such as charts. Quality improvement processes also provide feedback to polyclinic participants on appropriate asthma drug treatment.

"Either we don't have the time, or maybe we have forgotten the classification, or we are too busy to ask…but if we have charts, we have reminders, then it's just an additional effort to just look at the chart." – Polyclinic physician, FGD1.

No participant indicated that they would use LABA alone, but a combination of LABA and ICS appealed to most of them in terms of perceived effectiveness and convenience. Cost was again highlighted as a barrier to the use of combination drugs.

"Newer more convenient medicine is useful, some even have LABA that could be used as rescue medicine; that's very good but it is going to cost more (for patients)." – Polyclinic physician, FGD3.

Few cautioned against initiating such drugs, especially for fresh patients, lest the physician be perceived as mercenary and run the risk of ruining any patient-physician relationship as a result of cost issues. However, most participants would not hesitate to use combination drugs if cost was not a consideration. GP patients may have their treatment cost fully or partially reimbursed by their employers.

"Whenever I start them on something new, I start them on XXX (combination drug). I'll ask them to come back and let me know how it is…actually rarely happen like that (i.e. patient returns for review)" – GP, FGD2. *"Let's say patient can afford, I prefer to use LABA and ICS"* – GP, FGD4.

Some participants even reported "off-label" usage of these drugs for patients who were outside of the age range indicated by the manufacturer.

"Off label usage … XXX (combination drug), strictly speaking is indicated for four years and above, you see it being used for two-year-old patient." – GP*, FGD4.

The patient factor: beliefs, needs and expectations

Some participants highlighted that catering to the immediate needs of their asthmatic patients was critical in deciding on their choice of drug treatment, including the choice of inhalers.

"The younger ones I probably will not mind trying Pulmicort. But the older ones, the frail old ladies who can hardly speak, they won't be able to use." – Polyclinic physician, FGD5.

Patients' personal views and understanding of their disease and treatment, perception of disease severity and levels of motivation were significant considerations that affected their asthma drug prescription behaviour. It was especially so for patients who require long-term maintenance therapy with preventer/controller asthma drugs.

"Patients are operating from a different level from us. They may not see from our scientific perspective." – Locum doctor*, FGD3.

While many participants were aware of the medical evidence that ICS is clinically effective in persistent asthma, they faced resistance from some patients in initiating such medication, as it has to be taken on a daily basis.

"You have to double-check that it is actually consistent with the patient's belief system. We may believe that two asthma attacks per month would warrant beclomethasone; the patient may not share that belief. So you have to explore the patients' belief system about asthma, and what is "severe" for them, what is "moderate' for them, what they are prepared to take. Most of them are prepared to take the blue one easily during (an) attack. The question you have to convince them, if you have frequent attacks, what's your frequency, what do they feel about having beclomethasone and to use it. Are they motivated to use it? Does it make a better choice by taking beclomethasone every day to prevent a single attack? … the critical level which (a) patient becomes motivated to do so is different for every patient." – Polyclinic physician*, FGD1.

Maintaining these patients on preventer/controller medication was perceived as being difficult in the walk-in primary care settings.

"(A patient) coming in to review usage of maintenance (controller) inhaler is very, very rare!" – GP, FGD2.

Some participants reported that it would be easier to prescribe oral SABA, as they perceived that it would be more easily accepted and consumed by patients.

"If they (patients) have taken things like Bricanyl (terbutaline from AstraZeneca) or prednisolone before, for some reason they just can't break out of the tablet thing. They just want a tablet no matter what happens to them, and they just want to buy over the counter." – GP, FGD2.

For children, the need for caregivers to purchase an aerochamber or spacer for use with the inhaled SABA was identified as a barrier.

"Some patients are very resistant to converting oral to inhaled (drugs). We see two types of patients who are very resistant: the elderly who have lots of other medical problems, who only want the tablet Ventolin. They don't want any other medicine, they want to pop the Ventolin tablet three times a day and they are very happy with that. It's very difficult to convert them to use inhaled medication. The other group is the young children. Their parents find it difficult to use the spacer device and pump (inhaler). It's very much easier to just pop the medication into the child's mouth." – Polyclinic physician, FGD3.

On the other hand, the FPs' ability to introduce long-term maintenance therapy to their patients was linked to trust in the patient-physician relationship for chronic asthma care.

"You have another group of people who are very reluctant to use preventers, either because of fear, fear of the lack of efficacy, fear of being enslaved to a medication, fear of the side effects, fear of costs or all of the above. So there are so many barriers to this tissue and I guess maybe as doctors, we have lost some moral authority on our management with regard to this condition. They may not, say, distrust us, but they don't have the complete trust that we would have preferred in the past. So it's very hard to sell them an idea that goes on and on for a long time. It boils down to rapport and trust." – Locum*, FGD3.

Few participants would consider the use of Singulair (montelukast from MSD) as an add-on medication. They were aware that the cost of such therapy could be a deterrent.

"I use it (montelukast) as an adjunctive therapy rather than as a mainstay … expensive, all about the price." – GP*, FGD4.

Many participants reported that patients had a tendency towards the quick relief of their acute symptoms through the use of SABA. In a local setting, SABA is recommended only after consultation, with a prescription from polyclinic physicians. In contrast, some GPs allow their known asthmatic patients to purchase SABA without consultation and would also do so at the patient's request, even for a consultation for unrelated symptoms.

"… coming in just to buy the medication without consulting…. Most of the time, they (patients) just buy the Ventolin inhaler over the counter" – GP, FGD2.

While the consultation time is generally shorter in polyclinics due to the high patient load, the resources available to the polyclinic physicians provided additional support in their CPG-recommended drug prescription behaviour, especially in reinforcing adherence to maintenance preventer/controller drug therapy. Polyclinic doctors reported a reliance on nurses to fulfill this educator role. On the other hand, GP participants indicated that they would personally educate patients to reaffirm their mutual rapport.

"Sometimes the patients tend to use less (than the prescribed dose), or the technique is wrong, so always ask them to go to NP (nurse practitioner) to show them." – Polyclinic physician, FGD1.

DISCUSSION

This study has highlighted the complex interrelated factors that influence FPs in their choice of asthma drug therapy in actual clinical settings. Patients often depend on their physician's expertise and selection of drugs for their treatment. While patients' views of asthma medications in general have often been negative, their confidence in doctors has been reported to be high.[15] Riding on this confidence, the FP could play an even more significant role in optimising patients' drug therapy. In addition, good

role modelling in asthma management among FPs with advanced FM qualifications will set examples for their trainees and junior doctors to adhere to CPG-recommended asthma drug therapy behaviour.

However, they perceived that patients were wary of the cost of treatment and were hesitant to initiate drugs compatible to the patient's asthma status, lest it affected the physician-patient relationship, especially in the private GP clinic settings. Such a barrier could have arisen from the structure of the local primary healthcare system, where prescription is directly provided by the clinics, unlike in Western countries where consultation is dissociated from prescription. In addition, patients' beliefs, perceptions and acceptance of the asthma treatment, especially towards the use of inhalers, appear to exert a powerful influence on the FP's prescribing decision. It is important for FPs to recognise that patients use information from a range of sources to formulate beliefs that then affect their medicine-taking behaviour.[16] Catering solely to patients' perceived needs and preferred treatment could result in physicians' lower adherence to the CPG.[17]

These two key factors have resulted in FPs prescribing more short-term reliever asthma drug prescriptions, which are then perceived as standard treatment by patients. This could lead to further episodic rescue therapy, and a vicious cycle would ensue in this current state of asthma care. In contrast, while asthma drugs are heavily subsidised in the public polyclinics, the resultant heavy patient loads compromise the consultation time. This might hamper the polyclinic doctors' appropriate assessment of their patients' asthma status and would have an adverse impact on their decision to prescribe the appropriate asthma medication.

A better understanding of the complex issues will enhance the design of a specially tailored training programme, which targets the specific needs of FPs. An example is the FPs' concern about the side effects of the long-term use of steroids, which was highlighted in this study. Megas et al reported a similar steroid phobia, which was common among French physicians.[18] Such a perception should be deliberated in a tailored training programme that addresses the concerns of physicians. This, in turn, will enable FPs to counsel their patients effectively. In keeping with this, Moonie et al reported success in introducing one such community-based educational programme to primary care physicians, which resulted in the improved treatment of moderate to severe asthma.[19]

The results showed FPs' personal preferences in their choice of CME programmes. It is important to recognise the FPs' perceived personal needs and interests. Didactic approaches to educating physicians and prescribing detailing have proven to be ineffective or inconclusive in producing changes in learner behaviour.[20-23] More innovative and interactive education modules for FPs and the use of information technology, such as a reactive computer reminder system, may be possible solutions, but their outcome and effectiveness require further appraisal.[24,25] Despite the availability of combination drug therapies for asthma, Osman reported that patients were no more likely to use them regularly compared to individual steroids and relief inhalers. In fact, patients dislike taking any medication regularly. However, the outcome for patients can be improved through structured behavioural interventions.[26] Thus, skills in introducing structured behavioural modification, effective communication and motivation techniques to counsel patients to change their attitudes towards asthma medications and to address their concerns should be the focus of an educational programme for FPs.

Sufficient time and effective communication are the two key factors in an ideal asthma consultation. Partridge suggested using the limited consultation time effectively by offering patients more information prior to the consultation.[27] This is especially useful in a busy polyclinic setting, where the physician-patient communication may be improved by ensuring that patients receive pertinent information related to their appointment in advance and provisions are made to encourage patients to list any questions, fears or concerns regarding their treatment prior to the consultation. Task substitution by nurses in the polyclinics ensures that patients receive adequate counselling on asthma drug therapy. As the patients' ability to recall information given to them may influence their adherence to drug therapy and satisfaction, the whole professional team should be involved in order to achieve effective time management and to enable nurses to reinforce or provide information to patient prior to or after the physician consultation. In this way, FPs will likely encounter reduced patient resistance to the long-term use of preventer/controller medication. Judicious use of clinical quality methods and tools can improve clinical processes, leading to a quality prescribing decision.

A spirometry service is available in all restructured hospitals, but it is currently lacking in primary care. Better integration of primary and secondary care in terms of sharing spirometry services at an affordable cost and the integration of electronic medical records would reduce uncertainty in asthma diagnosis and severity classification, thus providing an impetus for FPs to embark on appropriate asthma therapy. Cost was featured prominently in all FGDs. The health authority should review its policy on

funding mechanisms in asthma drug therapy for the entire primary healthcare system. Appropriate drug treatment and achieving asthma control for patients will also translate into long-term savings in healthcare expenditure due to reduced hospitalisations, and provide intangible benefits such as declining absenteeism from school or work with an enhanced quality of life.[3]

This qualitative study did not allow the investigators to correlate the input of the participants with their actual prescriptions for asthma patients. This method is exploratory in intent and the results should not be generalised to all FPs in Singapore. Drugs were dispensed directly from GP clinics, which contributed to their income. The GPs in the FGDs were reluctant to discuss the financial prescribing incentive scheme offered by pharmaceutical agencies, which may have an influence on their prescribing behaviour. This was not an issue for polyclinic doctors, as drugs were obtained from a centralised procurement centre.

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