Barriers to the provision of asthma services and perceived practice towards asthma management among urban community pharmacists in Selangor, Malaysia

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This study aims to assess the perceived practice and barriers towards the provision of asthma management services among urban community pharmacists in Selangor, Malaysia. The study also highlights both pharmacist and patient-related barriers in asthma counseling. One hundred fifty urban community pharmacists in Selangor, Malaysia, were randomly selected and recruited for the present cross sectional baseline study. Previous studies have explored pharmacists' perception on their roles in asthma management in different parts of the world. The data was collected through self-explanatory questionnaires (containing 47 items). The extracted data from the completed questionnaires were analyzed descriptively and inferentially using Statistical Package for Social Science (SPSS) version 19. Results showed that pharmacists perceived their roles in asthma management along three major dimensions: 'patient self-management', 'medication use' and 'asthma control', mean (±SD) score of the perception towards asthma management was 99.29 ± 4.58 over a maximum possible score of 110 with 90.26%. There were significant differences between the pharmacy education level and perceived practice of asthma management while there were insignificant differences between age, gender, ethnicity, number of practicing year and perceived practice of asthma management among respondents. Most common barriers towards asthma counselling including lack of time, lack of asthma knowledge, lack of counselling space and cost of asthma drugs. Conclusively, urban community pharmacists in Selangor, Malaysia, demonstrate good perceived practice of better management of asthma with multidimensional dimensional role against in disease care.

Keywords: Asthma. Perceived practive. Treatment barriers. Community pharmacists. Disease management.

INTRODUCTION

Over the past years, it has been suggested through research that suboptimal drug therapy may be one of the most prevalent components of medical care that causes preventable patient injury (Mann *et al.*, 2014). In addition to the symptoms of the disease itself, Patients with chronic diseases such as asthma often experience a considerable physical, emotional, and social burden (Boehmer *et al.*, 2016; Meltzer, 2016). For many chronic conditions, poor patient compliance with prescribed medications and other aspects of medical treatment can adversely affect the treatment outcome (Loghman-Adham, 2003).

Regardless of the medical condition, non-compliance persists across socioeconomic and geographic boundaries (Vardeman-Winter, 2016). Poor compliance occurs in both acute and chronic therapy and approximates 50% for long-term therapies for chronic medical conditions (Hylands-White, Duarte, Raphael, 2017). Recent studies have demonstrated that patients do not always adhere to treatment regimens for a number of reasons (Vietri *et al.*, 2016) including breakdown in communication between health professionals and patients (Dawson-Rose *et al.*, 2016).

Community pharmacists have expanded their roles in recent years to include giving health care advice to people with acute and chronic illnesses (Butler *et al.*, 2017). Community pharmacists are in a unique position to help patients managing chronic illnesses in the light of their expertise, their regular interaction with patients

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and accessibility (Bailey et al., 2016; Ogunbayo et al., 2017). Pharmacists have the duty of providing pharmaceutical care to asthmatic patients and the quality of care depends greatly on their attitudes and knowledge of pathophysiology and pharmacotherapy of the disease (Watkins et al., 2016; Hersberger, Messerli, 2016). Given the focus on improving primary-care management of asthma, pharmacists often represent an underutilized resource (Watkins et al., 2016). In developing countries, community pharmacies are the first point of contact between pharmacist and patient (Khanal et al., 2016). Therefore, the role of community pharmacists is vital for the management of chronic ailments like asthma.

When it comes to the delivery of asthma management services, it is appropriate that pharmacists undergo specialized training and recognized as experts in asthma (Han et al., 2016). However, without necessarily delivering a comprehensive and/or structured disease-state management service, there is a wide range of specific interventions that pharmacists can deliver as part of routine practice (Patterson et al., 2016). Till now, no randomized studies have tested the perception of community pharmacists in the provision of asthma management among urban community pharmacists in Selangor, Malaysia. Therefore, this study aimed to assess the perceived practice and barriers toward asthma management among the urban community pharmacists.

SUBJECTS AND METHODS

Study design and population

A cross-sectional survey was conducted from January 5th to July 15th, 2016, in the state of Selangor, Malaysia. The minimum effective sample size was estimated to be 150 by using the online sample size calculator Raosoft® with a confidence interval of 95 and 5% margin of error. Due to lack of sampling frame and up-to-date electronic population database, a convenient sampling technique was used. A total of 157 registered urban community pharmacists were initially approached, but only 153 gave signed consent for participation. Data from 3 participants were incomplete and therefore excluded from the studies.

Data collection

The survey was conducted by a single investigator. The questionnaire was adapted and designed from several publications with approval from the corresponding authors (Anderson et al., 1998; Chopra et al., 2002; McDonald,

Gibson, 2006; Kritikos, Reddel, Bosnic-Anticevich, 2010) and aligned with latest GINA (Global Initiative for Asthma) guidelines (Global Initiative for Asthma GINA Report, 2012). The investigator systematically met with the community pharmacists and explained the objectives of the survey. Apart from the rare cases where the pharmacists responded on the spot, the investigator was often obliged to return at a time suitable for the pharmacists. If the questionnaire was not filled out on the day of the visit, the pharmacist was requested to respond in front of the investigator or to schedule another visit. After six visits to the same pharmacy without a response, the respondent was excluded from the study. There were three parts of the questionnaire. The first part of the questionnaire was consisted of socio-demographic data, the second part of the questionnaire evaluated the perceived practice (n = 22 items) with three main domains of patients' self-management (item number: 1,4,5,6), medication use (item number: 8,9,10,11,12) and asthma control (item number: 2,3,7,13,14,15,16,17,18,19,20, 21,22), (n:22 items) and third part of the questionnaire assessed the barriers in practicing better management of asthma (n = 25 items). A five-point Likert-type scale (from strongly agree to strongly disagree) was used to elicit the perception of the pharmacists towards management and treatment outcomes of asthma. The maximum score for perceived practice was 110. Respondents who scored more than 66 points were considered as having good perceived practice. The said score makes 60% of the total score (66/110x100=60%). The choice of 60% was made based on previous studies where the said percentage values were considered as good perceived practice. Content and face validation was done by a group of senior pharmacists in academia and practicing community pharmacists. The questionnaire was pretested on a convenient sample of 33 pharmacists (not included in the final sample) which were not the targeted population. Rasch measurement model was applied to confirm the reliability of the questionnaire with Real Item Reliability (Real RMSE) of r=0.79. The Rasch measurement model was also applied on the real data in order to reconfirm the reliability of the questionnaire whereby Real Item Reliability (Real RMSE) of r=0.84 was obtained. The questionnaire was endorsed as valid and reliable for the research among health professionals mainly pharmacists to assess the perceived practice and barriers of asthma management among community pharmacists.

Data analysis

All data were analyzed using Statistical Package for

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Social Science (SPSS Inc., Chicago, Ill., USA) version 19. The independent t-test and one-way ANOVA with post hoc Tukey HSD (honestly significant difference: a post hoc analysis used for multiple comparisons in order to detect whether or not differences between pair-wise groups exists) were used where appropriate. The level of statistical significance was set at $p < 0.05$.

RESULTS

This study successfully recruited 150 urban community pharmacists in Selangor, Malaysia, hence fulfilled the sample size requirement.

Socio-demographic data and asthma professional practice

The socio-demographic characteristics of the participants are presented in Table I. The mean (±SD) age of the respondents was 31.53 SD ± 4.93. There were 55 (36.7%) male and 95 (63.3%) female respondents. On ethnicity basis, the number of Malay respondents were 89 (59.3%), the Chinese 51 (34.0%) and the Indian 10 (6.7%)). The majority of respondents had a bachelor's degree (134 (89.3%)). The mean (±SD) number of

TABLE I - Socio-demographic data of study participants

Demographic Parameters	Groups	N (%)
Age	21-30	69 (46.0
	31-40	75 (50.0)
	>40	6 (4.0)
	Mean= 31.53, SD= ±4.93, Min.=23, Max=43	
Gender	Male	55 (36.7)
	Female	95 (63.3)
Ethnicity	Malay	89 (59.3)
	Chinese	**51 (34.0)**
	Indian	10 (6.7)
Pharmacy Education Level	Bachelor of Pharmacy	134 (89.3)
	Master of Pharmacy	16 (10.7)
Number of Practicing year(s) at community level	1-5	99 (66.0)
	6-10	48 (32.0)
	>10	3 (2.0)
	Mean= 4.76, SD= ±2.62, Min=1, Max=11	

practicing years at community (primary care) level was 4.76 (±2.62). Only 6 pharmacists were current smoker and 1 pharmacist had asthma.

Out of 150 retail pharmacies 124 (82.7%) were chain and 26 (17.3%) independent, with 94 (62.7%) located in shopping malls and 56 (37.3%) in shopping strips. The mean number (±SD) of working hours of the pharmacists in the community pharmacies was 32.45 (±11.3) per week. There were 147 (98.7%) pharmacists who were aware, and 145 (96.7%) knowledgeable about the contents of the asthma guidelines used in the country. Malaysia's own asthma care clinical practice guidelines (CPG) were used by 98(65.33%) pharmacists while Global Initiative for Asthma (GINA) guidelines was used by 52 (34.67%) pharmacists. The mean number (±SD) of asthma prescriptions was 12.38 (±3.23) out of all prescriptions 33.87 (±9.16) received by the pharmacists per week. In addition, 5.21 (±0.95) out of total patients (23.07(±3.48)) were asthmatic patients seen per week. The mean time (±SD) of 5.59(±1.47) minutes spent on each asthma prescription. About 27.59 (±4.12) asthma drugs were dispensed per week.

An average (±SD) of 4.68 (±0.78) minutes spent by the pharmacists to educate the asthmatic patients with the help of nebulizers (5 (3.3%)), booklets (100 (66.7%)), spacer devices (16 (10.7%)), peak expiratory flow meters (5 (3.3%)) and metered dose inhalers (24 (16.0%)). All pharmacists were providing asthma educational material like pamphlets (103 (68.7%)), brochures (44 (29.3%)), (booklets 3(2.0%)) during counseling session. All pharmacists used to demonstrate how to use an inhaler by using patient's inhaler (106 (70.7%)), using placebo inhaler (71 (47.7%)) and verbally 135 (90%). All pharmacists referred asthmatic patients to the physician (108 (72.0%)) and pulmonologist (42 (28%)). There were 140 (93.3%) pharmacists who agreed that patients with asthma should receive asthma counseling and education at every opportunity, while 144 (96%) pharmacists agreed that patients should also receive counseling from physicians. Most of the respondents (136 (90.7%)) agreed that pharmacists are just as effective as physicians in providing asthma counselling and education.

Many pharmacists (124 (82.7%)) were aware of asthmatic patients presented at the pharmacy between acute episodes of asthma. All pharmacists always asked the asthma patient to consult a doctor and obtain a prescription whenever a prescription is needed. For inhaled corticosteroids (150 (100%)), injectible corticosteroids (150 (100%)), oral corticosteroids (150(100%)), combination inhaled beta$_2$ agonist+corticosteroids (143 (95.3%)), leukotriene modifiers (137 (91.3%)) and

cromones (147 (98.0%)), pharmacists used to request a prescription prior dispensing to asthmatic patients. The majority of pharmacists (147(98.0%)) already provided treatment during an asthma attack at the pharmacy and afer that all pharmacists used to advice the patients to consult the physician. Pharmacists suggested providing patients with acute episodes of asthma with inhaled beta$_2$ agonist (short acting) (144(96.0%)), oral beta$_2$ agonist (138(92.0%)), inhaled corticosteroids (138(92.0%)), injectable corticosteroids (49 (32.7%)) and oral corticosteroids (133(88.7%)). They proposed inhaled beta$_2$ agonist (long acting) (148 (98.7%)), oral beta$_2$ agonist (148(98.7%)), inhaled corticosteroids (146(97.3%)), injectable corticosteroids (139 (92.7%)), oral corticosteroids (149 (99.3%)), inhaled combination of beta$_2$ agonist+corticosteroids (135(90%)), leukotriene modifiers (143 (95.3%)) and cromones (139 (92.7%)) for long-term treatment. Almost all (145 (96.7%)) pharmacists did not think that patients should continue a long-term treatment after an acute episode. All respondents agreed to participate in professional education related to the management of asthma. Also, 120 (80%) of pharmacists agreed to participate in seminars, courses, conferences and workshops while 11 (7.3%) and 9 (6%) pharmacists agreed to get asthma related professional education via patient care audits and written clinical materials or guidelines, respectively.

Pharmacists' perceived perceptions of their role in asthma management

The overall mean (±SD) score of the perceived practice of asthma was 99.29 (±4.58). About 82.7% (n = 124) of the participants strongly believed that pharmacists should counsel the patients about issues related to asthma to the elder age. Almost two thirds of participants (123 (82.0%)) also strongly believed that pharmacists should counsel the patients about the frequency of use of reliever inhaler. Most pharmacists (121 (80.7%)) strongly agreed that patients should know about the general definition of asthma.

One third of pharmacists (50 (33.3%)) had neutral opinion about the counseling of inhaler technique on a regular basis whereas 39 (26.0%) pharmacists had neutral opinion about counseling on self-monitoring of asthma (by symptoms or peak flow measurements).

One way ANOVA was applied to compare the mean differences of perceived practice score among different groups of age, ethnicity and number of practicing years at community level and independent sample t-test was applied to compare the mean differences among gender and pharmacy education level of urban community pharmacists presented in Table III. There was a significant difference between the pharmacy education level and perceived practice of asthma management while there was no significant difference between age, gender, ethnicity, number of practicing year and perceived practice of asthma management among respective respondents.

Barriers towards asthma management

The four major barriers identified by over 95% of pharmacists impacting on their ability to provide specific asthma services included pharmacist's lack of time, patients' perception that they are already well cared by the doctor, lack of time and asthma knowledge among pharmacists. Most of the barriers were related to 'patient factors' that included Patient's lack of asthma knowledge and cost of the drugs. These barriers were identified as the potential hindrances towards asthma management as identified by pharmacists presented in Tables IV and V.

DISCUSSION

This current study showed that pharmacists had good perceived practice of asthma with the mean (±SD) score of 99.29 (±4.58). Pharmacists perceived their roles in asthma management along three major dimensions: 'patient's self-management', 'medication use' and 'asthma control'. Similar type of studies had been conducted over the last decade in assessing the pharmacist's role in the management of asthma (Garcia-Cardenas et al., 2016). Some other studies of the similar type were also conducted to explore the pharmacist's perceptions about their roles in the asthma management (Saini, Krass, Armour, 2004; Schulz et al., 2001) however, this is the first study that demonstrated the perceived practice and barriers toward asthma management among community pharmacists working in the urban area in Selangor, Malaysia. It was observed that guidelines for managing asthma patients could not define the optimal role of community pharmacists for an average community pharmacist working in Selangor. Therefore pharmacists own perceptions about their role could be of prime importance for future development. The similar findings were also observed in a study conducted in rural and metropolitan area of New South Wales, Australia (Kritikos, Reddel, Bosnic-Anticevic, 2010). Almost two thirds (127 (84.6%)) of the pharmacists agreed that they should counsel the patient about self-monitoring of asthma control and asthma self-management. Many pharmacists believed that patients should know about the difference between the preventer and reliever inhaler. With regard

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TABLE II - Perceived practice about the asthma management **(n = 150)**. The roles of the pharmacists should include counseling asthmatic patients about

Item number	Item	Strongly disagree n (%)	Disagree n (%)	No comment n (%)	Agree n (%)	Strongly Agree n (%)
1	General definition of asthma	01 (0.7)	06 (4.0)	22 (14.7)	121 (80.7)	
2	Trigger factors and avoidance strategies			31 (20.7)	36 (24.0)	83 (55.3)
3	Patient's current level of asthma control (symptoms) and severity.		03 (2.0)	12 (8.0)	44 (29.3)	91 (60.7)
4	Patient self-monitoring of asthma control (by symptoms or peak flow measurements).		03 (2.0)	39 (26.0)	21 (14.0)	87 (58.0)
5	Action plan ownership of asthma			25 (16.7)	25 (16.7)	100 (66.7)
6	Asthma self-management by the patient (i.e. recognizing when and knowing how to take action when asthma gets worse) (early warning signs).			15 (10.0)	33 (22.0)	102 (68.0)
7	Differences between reliever and preventer (controller) medications.			23 (15.3)	32 (21.3)	95 (63.3)
8	Frequency of reliever inhaler use.		01 (0.7)	04 (2.7)	22 (14.7)	123 (82.0)
9	Overuse of reliever medication.		01 (0.3)	37 (24.7)	23 (15.3)	88 (58.7)
10	Adherence with preventer (controller) medication.			15 (10.0)	21 (14.0)	114 (76.0)
11	Adherence with reliever medication.			42 (28.0)	34 (22.7)	74 (49.3)
12	Inhaler technique when first prescribed the inhaler.		02 (1.3)	13 (8.7)	36 (24.0)	99 (86.0)
13	Inhaler technique on a regular basis.		5 (3.3)	50 (33.3)	16 (10.7)	79 (52.7)
14	Handling and cleaning of spacer and nebulizer when required.			13 (8.7)	25 (16.7)	112 (74.7)
15	Purpose and potential side effects of the asthma drugs.		3 (2.0)	30 (20.0)	27 (18.0)	90 (60.0)
16	Interactions of drugs with asthma and asthma medication.			05 (3.3)	25 (16.7)	120 (80.0)
17	The danger of non-prescribed self-medication including certain traditional medicines.			10 (6.7)	30 (20.0)	110 (73.3)
18	Smoking cessation (if relevant).			07 (4.7)	23 (15.3)	120 (80.0)
19	Issues associated with children with asthma.		7 (4.7)	38 (25.3)	28 (18.7)	77 (51.3)
20	Issues associated with asthma in the elderly.		4 (2.7)	10 (6.7)	12 (8.0)	124 (82.7)
21	Advantages and disadvantages of various inhalational delivery systems.		10 (6.7)	18 (12.0)	16 (10.7)	106 (70.7)
22	Immunotherapy for asthma			16 (10.7)	15 (10.0)	119 (79.3)

to the adherence with medication 108 (72%) pharmacists had the perception to counsel the patient about adherence with reliever medication while 135 (90%) pharmacists were of the opinion to counsel the patients about adherence with preventer medication. Most pharmacists had the perception to counsel the patients about inhaler technique when patients received the first prescription of inhaler (135 (90%)), handling and cleaning of spacer and nebulizer when required (137 (91.4%)), advantages and disadvantages of various inhalational delivery systems (122 (81.4%)), interactions of drugs with asthma and asthma medication (145 (96.7%)) and the danger of non-prescribed self-medication including certain traditional medicines (140 (93.3%)). The similar sort of results were

TABLE III - Distribution of perceived practice of asthma according to socio-demographic variables

Variables	Groups	N	Mean + SD	(df)	P value
Age	21-30	69	99.23 ± 4.90		
	31-40	75	99.21 ± 4.37	149	.099
	>40	6	100.83 ± 3.37		
Gender	Male	55	99.50 ± 4.19	148	.181
	Female	95	99.15 ± 4.79		
Ethnicity	Malay	89	98.90 ± 4.39		
	Chinese	51	99.98 ± 4.98	149	.406
	Indian	10	99.20 ± 3.91		
Pharmacy education level	Bachelor of Pharmacy	134	97.32 ± 4.70	148	.035
	Master of Pharmacy	16	99.93 ± 3.43		
Number of practicing year(s) at community level	1-5	99	99.62 ± 5.06		
	6-10	48	98.70 ± 3.42	149	.397
	>10	3	97.33 ± 3.21		

TABLE IV - Response of pharmacists towards barriers in asthma management Indicate to what extent you feel each of the following factor impact on the pharmacist's ability to provide specific asthma counseling or services

Item number	Item	Strongly disagree n (%)	Disagree n (%)	No comment n (%)	Agree n (%)	Strongly Agree n (%)
1	Lack of time by the pharmacist		4 (2.7)	10 (6.7)	12 (8.0)	124 (82.7)
2	Lack of time by the patient.		7 (4.7)	38 (25.3)	28 (18.7)	77 (51.3)
3	Pharmacists' perception that it is not their roles.		10 (6.7)	18 (12.0)	16 (10.7)	106 (70.7)
4	Patient's perception that it is not the pharmacist's roles.			16 (10.7)	15 (10.0)	119 (79.3)
5	Language barriers.			13 (8.7)	25 (16.7)	112 (74.7)
6	Patient's health beliefs.		10 (6.7)	50 (33.3)	58 (38.6)	32 (21.3)
7	Pharmacist's lack of asthma knowledge.			07 (4.7)	28 (18.7)	115 (76.7)
8	Patient's lack of asthma knowledge.			04 (2.7)	10 (6.7)	136 (90.7)
9	Patients' perception that they are already well cared for by the doctor.			19 (12.7)	14 (9.3)	117 (78.0)
10	Conflict between professional and commercial interests		3 (2.0)	08 (5.3)	18 (12.0)	121 (80.7)
11	Trying not to "overstep" the role of the doctor.		7 (4.7)	38 (25.3)	28 (18.7)	77 (51.3)
12	No financial incentive.		10 (6.7)	86 (57.3)	32 (21.3)	22 (14.7)
13	Difficulty to know patient's need.		10 (6.7)	18 (12.0)	17 (11.3)	105 (70.0)
14	Lack of appropriate educational materials available to use including inhalational devices and peak flow meter.			16 (10.7)	15 (10.0)	119 (79.3)
15	Cost of appropriate educational materials to patients is prohibitive.			13 (8.7)	25 (16.7)	112 (74.7)
16	Patient presenting without a prescription.		46(30.7)	34 (22.7)	53 (35.3)	17 (11.3)
17	Cost of the drugs.			13 (8.7)	33(22.0)	104 (69.3)
18	Lack of counseling space.		1 (0.7)	21 (14.0)	13 (18.7)	115 (76.7)
19	Lack of support staff.		6 (4.0)	07 (4.7)	26 (17.3)	111 (74.0)

TABLE V - Lack of Confidence or Skills

Item number	Items	Strongly disagree n (%)	Disagree n (%)	No comment n (%)	Agree n (%)	Strongly Agree n (%)
1	Asthma medication counseling		6 (4.0)	46 (30.7)	26 (17.3)	72 (48.0)
2	Asthma adherence counseling		4 (2.7)	10 (6.7)	12 (8.0)	124 (82.7)
3	Asthma self-management counseling			12 (8.0)	40 (26.7)	98 (65.3)
4	Asthma triggers factor counseling.			11 (7.3)	29 (19.3)	110 (73.3)
5	Reviewing and counseling about asthma control			11 (7.3)	32 (21.3)	107 (71.3)
6	Asthma monitoring			07 (4.7)	44 (29.3)	89 (66.0)

also observed in a study conducted in Belgium; where community pharmacists intervention, like counseling and educating patients about different inhalation, nebulization and relieving techniques and instruments, improved the health outcomes significantly (Mehuys *et al.*, 2008; Lemmens, Nieboer, Huijsman, 2009). Almost all pharmacists (143 (95.3%)) had the perception to counsel the patients about smoking cessation when applicable. This was mainly important because smoking cessation could improve the lung function and decrease the severity and symptoms of the disease significantly (Chaudhuri *et al.*, 2006).

Comparing the current study with some of the other studies on asthma management, a significant difference between the pharmacy education level and perceived practice of asthma management was noted. The difference demonstrated that highly qualified respondents had good perceived practice as compared to less qualified respondents while there was no significant difference between age, gender, ethnicity, number of practicing year and perceived practice of asthma management among respective respondents (Mehuys *et al.*, 2008).

In this study, pharmacists identified most important and common barriers to asthma counseling including both pharmacists and patients related factors. For pharmacists related factors, most of the participants (85%) agreed that lack of time, lack of knowledge, lack of appropriate educational materials, lack of counseling space and 'pharmacists' perception that "it is not their role" are the most important barriers in asthma counseling. Lack of time by the patient, patients' perception that "it is not the pharmacist's role", cost of drugs and no financial incentive were the most commonly observed patients related barrier by the pharmacists regarding asthma counseling. Similar types of barriers were identified by Australian community pharmacists (Kritikos, Reddel, Bosnic-Anticevich, 2010).

Furthermore, all enrolled pharmacists agreed to participate in professional education related to asthma

management programs. Among these community pharmacists, 120 (80%) pharmacists recommended seminar/ workshop/course or conference as a medium for this purpose, while rest of them were divided in their recommendations between written clinical material/ guideline (9(0.6%)) and patient care audits 11(7.3%). So there is a need to design an educational asthma care program for the local community pharmacists keeping in view the GINA guidelines to improve pharmacist's professional capabilities which will ultimately lead to increase patient care outcomes in the future (Armour *et al.*, 2007).

Limitations

This study was conducted only among urban community pharmacists in one state of Malaysia (i.e. Selangor), therefore the finding of this study cannot be generalized to the whole population of urban community pharmacists in Malaysia. The design of this study was cross-sectional, so the findings of the study could be considered only as correlation not causal. Although the cross sectional study design does not permit strong causal inferences yet can be very useful for describing variables and their distribution patterns. The strength of this study was the high response rate in recruited respondents.

CONCLUSION

Overall, urban community pharmacists in Selangor, Malaysia, possessed good perception on better management of asthma. Community pharmacists perceived a three-dimensional role in asthma care. This study also highlighted both pharmacist- and patient-related barriers towards asthma counseling. Most of the barriers were related to 'patient factors'. The major barriers towards asthma management observed were lack of pharmacist's time, patients' perceptions about the

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physician's care, lack of patient's time, knowledge and awareness about asthma and cost of the drugs as identified by pharmacists. The Malaysian participants' experiences are similar to those reported in previous studies conducted in other countries, but some other perceptions and barriers peculiar to the Malaysian context have been identified. Future studies should explore more barriers and find out the ways to solve these highlighted barriers.

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