ORIGINAL ARTICLE

Evaluation of knowledge and attitude towards asthma care in hospital and community pharmacy settings at central Saudi Arabia

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Abstract

Aim: The purpose of this study is to evaluate the knowledge and attitude towards asthma care in hospital and community pharmacy settings at central Saudi Arabia. **Materials and Methods:** A cross-sectional study was carried out over a period of 2-month from July 2015 to August 2015. The study population involves pharmacists registered with the Health Affairs Directorate and was practicing in community pharmacy and hospital pharmacies. **Results:** More than two-third of participants (62.6%) claimed that they know the short-acting beta 2-agonist is the most efficient drug to relieve bronchial smooth muscle in acute attacks, about (34.2%) of them knew that the side effects of inhaled steroids and sympathomimetic drug. A very low percentage of participants know (16.2%) the knowledge of asthma pathophysiology. About 86.2% reported that poor asthma control is due to poor inhaler technique and 83.2%, did not know the appropriate time to use the peak flow meter. However, regarding attitudes, more than 97% of the pharmacists agreed to the need for special training and 99.4% reported that the person should learn education skills to become an asthma educator. Analysis based on pharmacist groups found hospital pharmacists had knowledge and attitude scores higher than community pharmacists, and the difference was significant ($P < 0.05$). **Conclusion:** The study results revealed that the pharmacist is having low knowledge about pharmacotherapy of asthma and suggested for continuing education programs of pharmacy practitioners, can provide a more effective patient education, improve patient knowledge, and use inhaled medications properly.

Key words: Attitudes, community, hospital, knowledge, pharmacist, Saudi Arabia

INTRODUCTION

Asthma is an obstructive lung disease characterized by dyspnea, expiratory wheezes and a prolonged expiratory phase during the ventilator cycle.[1] Asthma is an important health problem in Saudi Arabia as well as in the world. More than 300 million people have asthma worldwide, and at least 2 million people are suffering from asthma in Saudi Arabia.[2,3] The prevalence of asthma in Saudi Arabia is about 20-25%.[4,5] This could be attributed to environmental factors including, indoor pets, dust, sand storms, and tobacco.[4] Moreover, this high prevalence of asthma could be attributed to an increase in asthma awareness in the general population and among healthcare professionals, allowing more individuals to be diagnosed. A recent studies among patients and healthcare professionals involving physicians and pharmacists[2,5,6] showed that low asthma control low prospects, and over-estimation of the level of asthma control are common among patients, and that classifying disease severity and proper use of inhaler are the least understood part of the guidelines among health care professionals. These results clearly indicate a need for further management and education programs in Saudi Arabia.

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Received: 11-10-2015
Revised: 06-12-2015
Accepted: 18-12-2015

The objective of asthma treatment is to control symptoms and to decrease emergency department visit for acute asthma treatment.[1,5] Inappropriate treated of asthma is the major factor contributing to activity, sleepless nights, and death. Although asthma cannot be cure, optimal management of asthma requires a good collaboration between patients and healthcare professionals, including nurses, social workers, and pharmacists. Although community pharmacists have a major role in asthma care, because they are among the more readily accessible healthcare professionals in the community.[7] In addition, the increase in the prevalence of asthma globally needs some kind of intervention that could be useful in retarding the progression of this disease. One of the steps that have been shown to be useful is improving the level of knowledge on the disease and its management among health care providers and patients.[6] Therefore, competent pharmacists should have a positive attitude and sufficient knowledge are vital to the outcome of pharmaceutical care for asthma patients.

Few studies have assessed a health care professionals' knowledge toward asthma care in Saudi Arabia, however, a study involving 74 pharmacists was carried out by Khan and Azhar in Saudi Arabia. They used the simulated patient approach to assess the pharmacists' knowledge toward the proper use of inhaler and found that pharmacists had poor knowledge to use an inhaler.[2] A survey looking at primary health care personnel's knowledge toward asthma managements was carried out in eastern Saudi Arabia, by Taha *et al*.[8] The primary health care personnel were physicians and nurses they showed that primary health care personnel's had deficiencies in knowledge about different aspects related to bronchial asthma. Another cross-sectional study was also carried in Aseer region, Saudi Arabia involving 61 primary physicians.[9] They evaluated their knowledge, attitude and practice toward asthma care. The study found the mean total score for the case scenarios was poor, which was 37.7% of the total marks.

To the best of our knowledge, only a study was conducted among community pharmacists in Saudi Arabia, to investigate their knowledge about the use of the inhaler, however, it showed that they have poor knowledge about the use of the inhaler. Therefore, this study is aimed to evaluate the knowledge and attitude towards asthma management in hospital and community pharmacy settings at central Saudi Arabia**.**

MATERIALS AND METHODS

A cross-sectional study was carried out in Riyadh city, the capital of Saud Arabia, over a period of 2-month from July 2015 to August 2015. The study population was practicing community pharmacists and hospital pharmacist in Riyadh city. The study populations enrolled in this study were pharmacist working in governmental hospitals and community pharmacies.

Sample Size

About 2000 number of pharmacists registered with the Health Affairs Directorate in Riyadh city was selected. By using (Raosoft Inc.) online calculator found that if the error rate tolerates was 5%, and 95% confidence levels were employed the sample size should be 323. The study selected 350 community pharmacies using a stratified random selection method. Two tertiary government hospitals were covered, and all pharmacists working in these hospitals were invited to participate.

Asthma Knowledge Test

The asthma knowledge test was adopted from the previous study that examined the knowledge and attitude of healthcare professionals.[10] A pilot test was performed on a sample of 10 pharmacists. The pharmacists involved in the pilot study not involved in the final research or had no contact with the participants of the study. The questionnaire was composed of 10 multiple choice questions divided into three categories, included pharmacotherapy, and pathophysiology of asthma and peak flow measurement ad plan care. Scores were calculated as the sum of correct answers; the highest possible score was 10. The asthma knowledge test were validated using pharmacists and the reliability test Cronbach's alpha = 0.8 after the slight modifications were made on the questionnaire based on feedback comments from pilot testing. The study was explained to participating pharmacists orally and by covering letter, and they were assured that only aggregate data would be reported. The response of the pharmacists to the survey was either obtained at the same time or collected at a later time if the pharmacist was busy.

Asthma Attitude Test

The asthma attitude test was built to measure the pharmacists' attitudes toward asthma. It was modified from the previous study validated by the researchers elsewhere.[10] The questionnaire consisted of 10 questions. All the items in the questionnaire were scored on a five-point Likert scale: Strongly disagree, disagree, neutral, agree and strongly agree. For the positive questions, the score for the Likert scale were 1 (strongly disagree) to 5 (strongly agree) and for the negative questions, the score were reverse of the positive questions.

The total number of items in the subscales was 10 questions. The subscales were:

1. The need for special training.
2. Health impact of asthma
3. Autonomy of patients.
4. Value of close monitoring
5. Role of pharmacist on asthma care.

Finally, after the pilot test, the Cronbach's alpha validity for the questionnaire was 0.6.

Statistical Analysis

The data were keyed into the SPSS version 22 for Windows for analysis. A descriptive statistic was used to analyze the data includes numbers, percentages and mean (± standard deviation). Mann–Whitney test was used to compare the pharmacist groups.

RESULTS

Of 350 CPs to whom questionnaires were distributed, 197 responded (56.3%). A total of 220 hospital pharmacists were invited to participate, only 101 of them turned up. The majority of the subjects were male (83.2%); there were 50 females (16.8%), as shown in Table 1.

Table 1: Demographic data of pharmacists (*n*=298)

Demographic characteristics	Frequency (%)
Pharmacy type	
Hospital pharmacy	101 (33.9)
Community pharmacy	197 (66.1)
Gender	
Male	248 (83.2)
Female	50 (16.8)
Education level	
Postgraduate	268 (89.9)
University	15 (5.0)
Specialist	15 (5.0)
With asthma history	104 (34.9)
With asthma family history	194 (65.1)

Knowledge of Asthma Pharmacotherapy

More than two-third of participants (62.6%) claimed that they know the short-acting beta 2-agonist is the most efficient drug to relieve bronchial smooth muscle in acute attacks. The study discovered, however, that the percentage of participants who knew about the side effects of inhaled steroids (34.2%) and sympathomimetic drug, administered as an aerosol (17.7%) was low (Table 2). In addition, Table 3 presents the mean (median) score for pharmacist groups. The hospital pharmacist had a mean score of 1.4 out of 4 while community pharmacists had a mean score of 1.3. No significant difference was found, however, between the pharmacist groups ($P = 0.86$).

Knowledge of Asthma Pathophysiology

A very low percentage of participants (16.2%), were aware about the mast cell is the cell that triggers allergic reactions after exposure to the allergen.

Knowledge of Peak Flow Measurement and Plan Care

The majority of the participants (86.2%), reported that poor asthma control is due to poor inhaler technique, non-adherence to therapy and uncontrolled environmental factors. More than two-third of participants (63.3%) claimed that they know ranges characterizes of yellow zone for peak flow meter but the majority of them (83.2%), did not know the appropriate time to use the peak flow meter. Other hand, low percentage of participants (24.7%), who knew the long-term asthma medication for children (Table 2). Hospital pharmacists showed high score than community pharmacist ($P = 0.001$), as shown in Table 2.

Attitude of Asthma

Table 3 shows the responses of pharmacists on various statements regarding attitude of asthma care.

Attitude of the Need for Special Training

More than 97% of the pharmacists agreed to the need for special training and approximately all pharmacists (99.4%) reported that the person should learn education skills to become an asthma educator. there was no significant difference between pharmacist groups ($P = 0.374$).

Attitude of Health Impact of Asthma

Approximately all pharmacists (99.3%), believed that health care providers should understand the influence of asthma care activities on patients' daily lives.

Attitude of the Autonomy of Asthma Patients

The majority of pharmacists (90%), also agreed that the outcome of asthma management depends more on a patient's behavior than efforts of healthcare providers. A few of pharmacists (48.6%) did not agree that asthma patients have the right to decide not to take care of their disease. This study found a significant difference between hospitals pharmacists and community pharmacists in subscale for the autonomy of patients ($P = 0.002$), as shown in Table 4.

Attitude of the Value of Close Monitoring

As shown in Tables 3 and 4. More than half of pharmacists (51.3%), reported that asthma patients have benefit with peak flow meter and the majority of them (87.3%) believe

Table 2: The responses of pharmacists on various statements regarding knowledge of asthma care

Items	Correct answer (%)	Incorrect answer (%)
Among the following physiological factors, which could affect theophylline blood concentration the most?	129 (43.4)	168 (56.6)
Which of the following could be a side effect of inhaled steroids?	103 (34.7)	194 (65.3)
Which of the following ranges characterizes the "yellow zone" for peak flow meter measurements?	187 (63.0)	110 (37.0)
Poor asthma control may be related to:	256 (86.2)	41 (13.8)
Which of the following is considered the cell that triggers an allergic reaction after exposure to the allergen?	144 (48.5)	153 (51.5)
What is the best time to use a peak flow meter, if the patient can use it only once daily?	50 (16.8)	247 (83.2)
Which of the following has nothing to do with an inflammation reaction?	184 (61.7)	114 (38.3)
Which one of the following is not a sympathomimetic drug, administered as aerosol, and could dilate the bronchioles with fewer systemic side effects?	52 (17.7)	242 (81.2)
Long-term asthma control for children with moderate continuous asthma should include which of the following drugs?	72 (24.7)	214 (75.3)
Which statement is true about short-acting beta 2-agonists?	186 (62.6)	111 (37.4)

Table 3 shows the responses of pharmacists on various statements regarding attitude of asthma care

In general, I believe that	Strong agree *n* (%)	Agree *n* (%)	No comments *n* (%)	Disagree *n* (%)	Strongly disagree *n* (%)
Healthcare providers should understand the influence of asthma care activities on patients' daily lives	158 (53.0)	138 (46.3)	2 (0.7)	-	-
Pharmacists should be certified to provide primary asthma care	130 (43.6)	161 (54.0)	4 (1.3)	3 (1.0)	-
The impact of asthma on patients' emotions is minor	5 (1.7)	9 (3.0)	69 (23.3)	123 (44.3)	83 (27.9)
To become a competent asthma educator, it is necessary to learn education skills	131 (44.0)	165 (55.4)	2 (0.7)	-	-
The outcome of asthma treatment depends more on a patient's behavior than efforts of healthcare providers	115 (38.6)	168 (56.4)	11 (3.7)	4 (1.3)	-
Asthmatic patients may not benefit from disease monitoring with peak flow meter	9 (3.0)	16 (5.4)	102 (34.2)	139 (46.6)	32 (10.7)
Control of respiration function is too complicated in asthma care	129 (43.3)	140 (47.0)	23 (7.7)	5 (1.7)	1 (0.3)
People with asthma have the right to decide not to take care of their disease	12 (4.0)	27 (9.0)	114 (38.3)	111 (37.2)	34 (11.4)
The asthmatic patient is the most important member in the asthma care team	122 (40.9)	153 (51.3)	21 (7.0)	1 (0.3)	1 (0.3)
The pharmacist could play an important role in the asthma care team	164 (55.0)	118 (39.6)	14 (4.7)	1 (0.30)	1 (0.3)

that control of respiration function is too complicated in asthma care. In addition, hospital pharmacists had significant positive attitude that community pharmacists ($P = 0.001$).

Attitude of the Role of Pharmacists on Asthma Care

It was interesting that 94.6% of pharmacists believe that the pharmacists could play an important role in the asthma care team.

DISCUSSION

A pharmacist is one has a responsibility to care for patients with asthma. Patients with asthma may visit pharmacies, at least, monthly for refills. Short-term discussions with a pharmacist occur without cost or an appointment. Consequently, patients with asthma might visit their pharmacist more usually than their asthma provider. Because they have ability to access to medication use data and patients, pharmacists can identify common drug-related problems. For instance, poor device technique, overuse of quick-relief medications, and no adherence to maintenance medications. To provide pharmaceutical care for patients with asthma demands that pharmacists should be sufficiently with comprehensive knowledge of the disease and its management. Literature reviews have shown that insufficient knowledge and negative attitude of pharmacists can provide improper effective patient education, inadequate knowledge and encourage improper asthma treatment.[11] The objective of the present study was to assess pharmacist's knowledge and attitude toward asthma patients' care.

In general, this study revealed that the mean score of both community pharmacists and hospital pharmacists were low (4.2 and 4.8 respectively). A cross-sectional study was conducted in Nigeria to evaluate the knowledge of community pharmacists toward asthma managements, however, it found the mean score of knowledge was 8.04 ± 1.79 (out of 14). Due to differences in the questions selection, the findings of the present study may not be directly comparable to those of the previous study. An intervention study was done to assess the impact of asthma continuing education program on pharmacists' knowledge and attitude about asthma care.[10] This study found the baseline knowledge score of pharmacists toward asthma care was 7.18 out of 10.

This study reveals that majority of pharmacists could state the factors that could precipitate asthma attacks. Surprisingly, the majority of pharmacists were lacking regarding pharmacotherapy of asthma. Both hospital pharmacist and community pharmacists scored less than the deemed level in all items classified in the general principles of asthma pharmacotherapy. Particularly, a higher level of wrong belief was observed in anticholinergic bronchodilator (ipratropium bromide) is not a sympathomimetic drug administered as aerosol (17.7%). In addition, another misconception was observed in this study was the side effects of inhaled steroids (34.2%). In other words, this study recorded a mean pharmacotherapy score of 1.3 out of a maximum of four. Our finding was lower than that of Chiang *et al*.[10] who found a mean knowledge score of 2.65. Since both this study and Chiang's utilized the same measurement. Pharmacists should have adequate knowledge in therapeutic drug monitoring. Suchpoor knowledge of pharmacists in pharmacotherapy could lead to treatment failure contribute to the major factor contributing to activity, sleepless nights, and death.[11] Therefore, pharmacists should be treated in pharmacotherapy.

In this study, the knowledge scores in the subscales for the pathophysiology of asthma as well as the peak flow meter and care plan were low. These are serious areas of knowledge deficit which could effect on the quality of pharmaceutical care given to asthmatic patients. These findings are similar to the previous finding.[10,12] Education of pharmacists on this issue will definitely contribute to improvement in the care of asthma patients.

In response to the statements on the need for special training, most of the pharmacists had the right attitude. This presented that the pharmacists felt that they needed to update their knowledge and skill through special training in techniques of providing patient education and patient counseling, as well as to change patients' behavior.[13] This study noted a mean attitude score of 8.8 out of a maximum of 10, which implied that pharmacists granted to the need for special training. This finding is almost similar to that of Chiang *et al*. who found a mean attitude score of 8.9.

Table 4: Knowledge and attitude scores for pharmacists groups

Items	Mean (median)		*P**
	Community pharmacists	Hospital pharmacist	
Pharmacotherapy	1.3 (2)	1.4 (2)	0.86
Pathophysiology of asthma	1.1 (1)	1.1 (1)	0.65
Peak flow measurement ad plan care	1.7 (2)	2.2 (2)	0.000
Total score	4.2 (5)	4.8 (5)	0.006
Attitude			
The need for special training	8.81 (9)	8.87 (9)	0.374
Health impact of asthma	8.2 (8)	8.9 (9)	0.000
Autonomy of patients	9.3 (9)	9.6 (10)	0.002
Value of close monitoring	5.0 (5)	5.5 (6)	0.000
Role of pharmacist	4.3 (4)	4.6 (5)	0.000
Total score	35.0 (36)	37.0 (38)	0.001

*Mann–Whitney test

In response to the statements on the impact of asthma on patients, this is very important as it measures the concern of the pharmacists about the patient's daily life. The impact of asthma on the patient is major because its manifestations involving impairment of pulmonary function and symptoms such wheezing, dyspnea and impairs the normal life activity of patients.[14] In this study, pharmacists had a mean score attitude score of 8.2 out of 10, which implied that majority of pharmacists believed that the impact of asthma on patients is major. This finding is slightly lower than that of Chiang *et al*.[10] who found a mean attitude score of 8.56.

The health care provider's belief in the role of patients in the management of asthma is measured by their attitude toward the autonomy of the patients. Their positive attitude showed the health care providers' agreement with empowering patients toward the management of their problems. The result of this study for the subscale of the autonomy of asthmatic patients was 9.3. The finding is, however, lower than that of Chiang *et al*.[10] who found a mean attitude score over of 10. The difference can be attributed to the difference in background of the study subjects.

The value of close monitoring is very important in the management of asthma. The goal of asthma treatment is to obtain clinical control and reduce future risks to the patient. All current asthma guidelines emphasize the importance of asthma control.[15] Therefore, the attitude of the pharmacists toward asthma control should be correct in order for them to advise their patients properly. This study found that the pharmacist's attitude toward the value of close monitoring was 5.2 out of 1 which is lower than a study conducted by Chiang *et al*., who found a mean score of 7.62.

In response to the statements on the role of pharmacists on asthma care, this is a very important as it measures the concern of the pharmacists toward their role in the prevention and treatment of asthma. All healthcare professionals, including pharmacists play a significant role in educating patients through providing information on the types of asthma drugs, demonstrating how to use inhaled drugs properly, and given information about peak flow meters, as well as inquiring patients about their written asthma management plan and monitoring use of drugs by individual patients.[16,17] This study found that approximately all of pharmacists believed they play important in asthma care.

Analysis based on pharmacist groups found hospital pharmacists had knowledge and attitude scores higher than community pharmacists, and the difference was significant ($P < 0.05$). This could be related to the acquisition of a Pharm D degree, which involves patient oriented pharmacy education.

The current findings calls for continuing education programs of pharmacy practitioners can provide a more effective patient education, improve patient knowledge, and use inhaled medications properly.[18,19]

Limitation of Study

Although the findings of this study are promising, the study has some limitations. A small sample size and single site used in the study. Therefore, nationwide survey of this type study may yield a more reliable information about the knowledge of pharmacists.

CONCLUSION

This study showed that the pharmacists had inadequate knowledge about asthma. Particularly, there are still some deficiencies pharmacotherapy of asthma and side effect of inhaled steroids. This study also found that pharmacists had a positive attitude toward asthma care. However, hospital pharmacists had a higher knowledge score than community pharmacists.

ACKNOWLEDGMENTS

The authors wish to express their gratitude to all the hospital and community pharmacist those participated in the study and for supporting this study.

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Source of Support: Nil. **Conflict of Interest:** None declared.