

EVALUATION OF PHARMACY STUDENT AND COMMUNITY PHARMACIST KNOWLEDGE AND IMPACT ON DISEASE STATE MANAGEMENT OF PATIENTS WITH ASTHMA

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ABSTRACT

Objective: To evaluate the knowledge of pharmacy students and community pharmacists regarding etiology, symptoms, medications, prevention and history of asthma to correlate with the needs of training and years of experience and their impacts on patient.

Methodology and design: This study was a cross sectional randomized study, involved pharmacy students in their last year from Philadelphia University-Amman, and different community pharmacists. Data was collected from 400 pharmacy students and 200 community pharmacists with different years of experience.

Conclusion: Community pharmacists have good impact on patients with asthma; especially after having more than 6 years' experience. Well-trained pharmacists with asthma knowledge of optimal device technique and medication maintenance in addition to good communication skills reduces the rate of hospital admission and improve quality of life for asthmatic patients.

Keywords: Asthma, Knowledge, pharmacist, pharmacy students

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INTRODUCTION

Asthma is one of the common causes of death in world. Asthma is a chronic respiratory disease that inflames and narrows pulmonary airways intermittently. Although the diagnosis and the management guidelines of asthma were improved over the past decade, as well as widely accepted national and international guidelines for clinical practice are distributed, asthma control still suboptimal.

⁽¹⁾ According to WHO estimates, 235 million people suffer from asthma.

Asthma is common disease in all countries with all levels of development; it can affect low, lower-middle and high-income countries and over 80% of asthma deaths occur in low and lower-middle income countries. ⁽²⁾ In 2015, 0.40 million people died from asthma, a decrease of 26.7% compared with 1990. The decrease in age-standardized death rates was 58.8% between 1990 and 2015. Pathophysiology and clinical trial findings add evidence that most asthma deaths at all ages are preventable by treatment with low-dose inhaled corticosteroids and other management strategies or, to a lesser extent, avoidance of risk factors ⁽³⁾. Predisposing factors such as exposure to dust, gases and fumes account for more than 10% of asthmatic attack. Allergies considered as the main contributing factor in 70% of asthmatic patients ⁽⁴⁾.

The severity and frequency of asthma varies from person to person and the symptoms can occur several times daily or per week, and in some cases, asthmatic attack could be associated with physical activity and others at night. Depending on the triggering factors, preventive measures supplied by clinical pharmacist by providing patient counseling through improving knowledge of patient about disease, risk factors, medication management and

preventive measures to control asthma plays an important role in improving lifespan, quality of life and therapeutic outcomes ⁽⁵⁾.

Pharmacists have a huge role in patient education and treating asthmatic patients. Vigilance and clinical decisions are required to optimize treatment outcomes. It's important to continuous patient counseling and assessment of technique used for inhalers, drug of choice and knowledge about factors triggering asthmatic attaches in improving quality of life and reduces the rate of hospital admission. ⁽⁶⁾

Treating asthma is complex, and pharmacists must consider many factors when assessing and counseling patients with asthma. Several recently published articles shed new light on key issues in asthma prevention and treatment, including the value of correct inhaler technique, optimal medication selection, and the effect of concomitant medications that may worsen asthma symptoms. Results of these studies can provide insight for pharmacists on ideal strategies to manage persistent asthma ⁽⁷⁾.

The communication skills of pharmacists need to be improved throughout more patient centered approach in order to take greater account of patient's perspectives and experiences in using their medication. Pharmacist's communication skills need to be further developed into a more patient centered approach in order to take greater account of patient's perspectives and experiences in using their medication. Finally, more research is needed to establish a solid evidence base for the impact of pharmacists' education and counseling practice on patients' medication adherence and treatment outcomes ⁽⁸⁾.

SUBJECT, MATERIAL AND METHODS

This was a cross-sectional randomized study aimed to evaluate pharmacy student's and community pharmacist's knowledge about the disease of asthma regarding to its etiology, natural history, symptoms, prevention, and medication used. Patients with asthma are targets for improved pharmaceutical care; community and hospital pharmacists have the opportunity to cooperate with each other, which will result in improving asthma care and reducing hospitalizations.

Subjects

Students from Faculty of pharmacy- University of Philadelphia in the fifth year of study and community pharmacists were recruited for this study. The study included a total of 600 participants, 400 pharmacy students (163 males, 237 female) and 200 community pharmacists (127 male and 73 female). The community pharmacists were divided into 4 groups according to the time period of experience. Group A: 1-3 years, group B: 3-6 years, group C: 6-8 years, and group D: 8-10 years. This study was approved by Philadelphia University - Jordan.

Study design

A questionnaire was designed to involve 44 questions in six sections: A. etiology of asthma, B. symptoms and assessment of severity, C. medication used for treating

asthma (mechanism of action, proper route and frequency of administration, adverse effects, contraindications, and drug interactions), D. prevention of asthmatic attack, E. history of asthma, and F. how to use inhalers (Table 1-6). The questionnaire was distributed to the students and community pharmacists and was asked to answer all of the questions depending on their scientific knowledge received from their study and experience. Each participant spends time ranged between 20-30 minutes to complete the questionnaire. Questionnaire with missed information, which accounted 150 (20%), were discarded from the study.

Statistical analysis

Participant replays were evaluated as percentage of correct, incorrect answer, and cannot answer for each section. The variability between student-community pharmacists and community pharmacists' age and job experience were evaluated using Chi square. SPSS 17.9 (SPSS, Cgicago, IL, USA) was used.

RESULTS

Six hundred respondents attended this study including 400-University student at fifth year of study and 200 graduated pharmacists with different years experience of community pharmacy work. Table 1 shows the distribution of the study population.

Table 1: Demographic information of participants

Demographic	N (%)	
Total participants	600 (100%)	
Age range (24-49 years)	Male	Female
	290 (48.33%)	310 (51.67)
Pharmacy students	400 (66.67%)	
Age range (24-27 years)	Male	Female
	163 (27.17%)	237 (39.5%)
Community pharmacy Mean age 39.37 ± 5.43	200 (33.34%)	
	Age (range 30-49 years)	
	30-35	58 (9.67%)
	36-40	72 (12%)
	41-45	51 (8.5%)
	46-49	19 (3.17%)
	Male	Female
	127 (21.17%)	73 (12.17%)
	Job experience	
	1-3 years	32 (5.33%)
	3-6 years	58 (9.67%)
	6-8 years	73 (12.17%)
8-10 years	37 (6.17%)	

Overall knowledge of students concerning the etiology of asthma was significantly less than graduated pharmacists. Seven over eleven questions (63.64%) was higher percentage of accurate answer between gradated pharmacists comparing to students (Table 2, and Table 8). Pharmacist's experience was significantly improving knowledge about etiology of the disease. Pharmacists

with more than 6 years of experience showed to have significantly greater knowledge than those with less than 6 years experience (Table 9).

Regarding the symptoms and assessments of severity, only two over seven questions (28.67%) were answered by graduated pharmacists with correct replay comparing to the students (Table 3, and Table 8). Poor information

about symptoms and severity of disease were found mostly with all pharmacist job experience group ($p = 0.083$) (Table 9). Although students' knowledge about medications used for treating asthmatic patients was considered good with correct answer of 71.08% of questions as average (Table 8), two questions over sixteen (12.5%) was not significantly varied from graduated pharmacists (Table 4). With time, the knowledge about medications used for patients with asthma was increased significantly, especially, after 8 years of experiences (Table 9).

The knowledge about asthma prevention strategies was good in three over four (75%) of main questions in both students and graduated pharmacists. There was a significant higher percentage in the correct answers among graduated pharmacists in comparison to the students (Table 5). This is also supported by significant variation in average results from graduated pharmacists and student as shown in table 8 ($p=0.003$). Experience in community pharmacy for more than 6 years will

significantly improve the knowledge about prevention strategies as shown in table 8 ($p=0.013$).

Experience for more than 6 years is very important for developing the information about the Natural History of Asthma (Table 9), although, it was fully understandable through the graduate studies period, a significant higher average percentage (75%) of correct answers were observed by graduated pharmacist comparing to the students (Table 6, and Table 8).

The most considerable and effective patient education about use of inhaler was correctly answered by 42.86% of students comparing to graduated pharmacists. There was no significant change in answers of 3 questions over 7, as a result, a significant higher percent of average correct answer was seen in graduated pharmacists comparing to the students, $P= 0.004$ (Table 8). More than 8 years of experiences resulted in significantly improvement in over all correct advice about inhaler use (Table 9).

Table 2: Questions and results concerning etiology of asthma

Section A: Etiology						
Questions	Participant	N (%) Of correct answer	N (%) Of incorrect answer	N (%) Of cannot say	P value	
Asthma symptoms can be caused by	Air pollution	Students	368 (92.00%)	11 (2.75%)	21 (5.25%)	0.008
		Pharmacist	196 (98.00%)	3 (1.50%)	1 (0.50%)	
	Living with a person who has asthma	Students	357 (89.25%)	11 (2.75%)	32 (8.00%)	0.179
		Pharmacist	372 (93.00%)	12 (3.00%)	16 (4.00%)	
	A common cold	Students	179 (44.75%)	137 (34.25%)	84 (21.00%)	0.000
		Pharmacist	175 (87.50%)	20 (10.00%)	5 (2.50%)	
	Exercise	Students	253 (63.25%)	115 (28.75%)	23 (8.00%)	0.000
		Pharmacist	167 (83.50%)	25 (12.50%)	8 (4.00%)	
	Certain foods	Students	189 (47.25%)	95 (23.75%)	116 (29.00%)	0.000
		Pharmacist	120 (60.00%)	49 (24.50%)	31 (15.50%)	
	Without obvious reason	Students	253 (63.25%)	21 (5.25%)	126 (31.50%)	0.042
		Pharmacist	147 (73.50%)	7 (3.50%)	46 (23.00%)	
	I can pass my asthma to persons I'm living with	Students	368 (92.00%)	11 (2.75%)	21 (5.25%)	0.009
		Pharmacist	193 (96.50%)	3 (1.50%)	1 (0.50%)	
Asthma is more likely if a blood relative in family or in previous generation already has asthma	Students	242 (60.50%)	84 (21.00%)	74 (18.50%)	0.531	
	Pharmacist	130 (65.00%)	39 (19.50%)	31 (15.50%)		
In asthma, the breathing tubes in lungs become narrow due to swelling of their wall	Students	316 (79.00%)	31 (7.75%)	53 (13.25%)	0.177	
	Pharmacist	170 (85.00%)	31 (6.50%)	17 (8.50%)		
In asthma, the breathing tubes also become narrow due to	Students	305 (76.25%)	21 (5.25%)	74 (18.50%)	0.009	

tightening of muscle around them	Pharmacist	171 (85.50%)	11 (5.50%)	18 (9.00%)	
In asthma, the breathing tubes also become narrow due to mucous (sputum) collection	Students	242 (60.50%)	74 (18.50%)	84 (21.00%)	0.104
	Pharmacist	137 (68.50%)	25 (12.50%)	38 (19.00%)	

Table 3: Questions and results concerning symptoms and assessments of severity of asthma

Section B: symptoms and assessments of severity					
Questions	Participant	% Of correct answer	% Of incorrect answer	% Of cannot say	P value
Symptoms of asthma are breathing difficulty with wheezing or whistling sound	Students	379 (94.75%)	10 (2.50%)	11 (2.75%)	0.191
	Pharmacist	195 (97.5%)	1 (0.50 %)	4 (2.00%)	
Asthma symptoms vary in severity from time to time, being less sometimes and more at other times	Students	400 (100.00%)	0 (0.00%)	0 (0.00%)	1
	Pharmacist	200 (100.00%)	0 (0.00%)	0 (0.00%)	
Asthma symptoms are more likely to occur at night or early morning	Students	295 (73.75%)	21 (5.25%)	84 (21.00%)	0.687
	Pharmacist	154 (77.00%)	9 (4.50%)	37 (18.50%)	
I can judge how sever my asthma is	Students	137 (34.25%)	116 (29.00%)	147 (36.75%)	0.819
	Pharmacist	73 (36.50 %)	54 (27.00%)	72 (36.00%)	
Severity of asthma can be measured by a test of blowing out air into a machine	Students	305 (76.25%)	32 (8.00%)	63 (15.75%)	0.000
	Pharmacist	192 (96.00%)	4 (2.00%)	4 (2.00%)	
Severity of asthma can also be measured at home using a simple devise called a peak flow meter	Students	137 (34.25%)	63 (15.75%)	200 (50.00%)	0.000
	Pharmacist	134 (67.00%)	26 (13.00%)	40 (20.00%)	
Asthma attack can be dangerous	Students	397 (99.25%)	0 (0.00%)	3 (0.75%)	0.975
	Pharmacist	200 (100.00%)	0 (0.00%)	0 (0.00%)	

Table 4: Questions and results concerning medications used for treating asthma

Section C: Medications					
Questions	Participant	% Of correct answer	% Of incorrect answer	% Of cannot say	P value
Asthma medicines can be given as tablet/ syrups/ inhaler	Students	284 (71.00%)	63 (15.75%)	53 (13.25%)	0.000
	Pharmacist	189 (94.50%)	7 (3.50 %)	4 (2.00%)	
The best way to take asthma medication by inhalation	Students	337 (84.25%)	63 (15.75%)	0 (0.00%)	0.000
	Pharmacist	186 (93.00%)	9 (4.50%)	5 (2.50%)	
Asthma medicines are usually of two types- one to give immediate relief from symptoms (relievers) and other to prevent symptoms (preventers)	Students	274 (68.50%)	31 (7.75%)	95 (23.75%)	0.000
	Pharmacist	191 (95.50%)	7 (3.50%)	2 (1.00%)	
I know which the drug for regular use is and which is to be used if breathlessness occurs	Students	288 (72.00%)	59 (14.75%)	53 (13.25%)	0.000
	Pharmacist	184 (92.00%)	16 (8.00%)	0 (0.00%)	
The most effective drugs for controlling asthma are steroids	Students	168 (42.00%)	96 (24.00%)	136 (34.00%)	0.000

	Pharmacist	164 (82.00%)	11 (5.50%)	25 (12.50%)	
Steroids can be harmful, but given by inhalers are usually free from significant harmful effects	Students	337 (84.25%)	63 (15.75%)	0 (0.00%)	0.000
	Pharmacist	189 (94.50%)	11 (5.50%)	0 (0.00%)	
Medicine for asthma has to be taken till my symptoms disappeared and then can be stopped	Students	284 (71.00%)	63 (15.75%)	53 (13.25%)	0.000
	Pharmacist	172 (86.00%)	17 (8.50%)	11 (5.50%)	
Medicine for asthma has to be taken even after symptoms are no longer there, till my doctor advise me to	Students	337 (84.25%)	42 (10.50%)	21 (5.25%)	0.002
	Pharmacist	189 (94.50%)	7 (3.50%)	4 (2.00%)	
Do NSAID, aspirin, and some of drugs for cardiovascular diseases cause asthma symptoms?	Students	179 (44.75%)	74 (18.50%)	147 (36.75%)	0.000
	Pharmacist	169 (84.50%)	14 (7.00%)	17 (8.50%)	
Patients with asthma should use drugs for prophylaxis even if they feel well.	Students	326 (81.50%)	42 (10.50%)	32 (8.00%)	0.000
	Pharmacist	197 (98.50%)	0 (0.00%)	3 (1.50%)	
Is there is any life threatening when asthmatic patient does not use the drugs regularly?	Students	364 (91.00%)	17 (4.25%)	27 (6.75%)	0.000
	Pharmacist	198 (99.00%)	0 (0.00%)	2 (1.00%)	
Do the inhaled drugs reach the systemic circulation?	Students	392 (98.00%)	4 (1.00%)	4 (1.00%)	0.604
	Pharmacist	194 (97.00%)	4 (2.00%)	2 (1.00%)	
Do you think that inhaled drugs have harmful effects?	Students	295 (73.75%)	31 (7.75%)	74 (18.50%)	0.000
	Pharmacist	179 (89.50%)	9 (4.50%)	14 (7.00%)	
Do inhaled medications cause tolerance?	Students	137 (34.25%)	105 (26.25%)	158 (39.50%)	0.000
	Pharmacist	177 (88.50%)	16 (8.00%)	7 (3.50%)	
Can asthmatic patients do sports?	Students	168 (42.00%)	137 (34.25%)	95 (23.75%)	0.000
	Pharmacist	164 (82.00%)	27 (13.50%)	9 (4.50%)	
Can asthmatic patients become pregnant?	Students	379 (94.75%)	0 (0.00%)	21 (5.25%)	0.087
	Pharmacist	191 (95.50%)	2 (1.00%)	7 (3.50%)	

Table 5: Questions and results concerning Prevention of asthma

Section D- Prevention					
Questions	Participant	% Of correct answer	% Of incorrect answer	% Of cannot say	P value
If I can identify and advise factors that increase my symptoms, my asthma will be controlled better	Students	389 (97.25%)	0 (0.00%)	11 (2.75%)	0.382
	Pharmacist	198 (99.00%)	0 (0.00%)	2 (1.00%)	
I can prevent or reduce asthma symptoms	Students	337 (84.25%)	21 (5.25%)	42 (10.50%)	0.000
	Pharmacist	189 (94.50%)	2 (1.00%)	9 (4.50%)	
I can prevent asthma if I take my medication regularly	Students	274 (68.50%)	52 (13.00%)	74 (18.50%)	0.000
	Pharmacist	187 (93.50%)	4 (2.00%)	9 (4.50%)	
If asthma symptoms are getting worse, I know how to change my medication	Students	168 (42.00%)	158 (39.50%)	74 (18.50%)	0.017
	Pharmacist	108 (54.00%)	59 (29.50%)	33 (16.50%)	

Table 6: Questions and results concerning the Natural history of asthma

Section E- Natural history					
Questions	Participant	% Of correct answer	% Of incorrect answer	% Of cannot say	P value
Asthma cannot be cured	Students	354 (88.50%)	25 (6.25%)	21 (5.25%)	0.107
	Pharmacist	187 (93.50%)	9 (4.50%)	4 (2.00%)	
Although asthma cannot be cured, it can be controlled fairly well	Students	359 (89.75%)	7 (1.75%)	34 (8.50%)	0.008
	Pharmacist	191 (95.50%)	5 (2.50%)	4 (2.00%)	
Is asthma a psychological disorder?	Students	232 (58.00%)	84 (21.00%)	84 (21.00%)	0.000
	Pharmacist	154 (77.00%)	18 (9.00%)	28 (14.00%)	

Table 7: Questions and results concerning the Use of inhaler

Section F: Use of inhaler					
Questions	Participant	% Of correct answer	% Of incorrect answer	% Of cannot say	P value
Only use it when patient need it	Students	284 (71.00%)	63 (15.75%)	53 (13.25%)	0.000
	Pharmacist	175 (87.50%)	25 (12.50%)	1 (0.50%)	
Patient can avoid using it	Students	221 (55.25%)	95 (23.75%)	84 (21.00%)	0.000
	Pharmacist	190 (95.00%)	7 (3.50%)	3 (1.50%)	
Patient can alter the dose	Students	200 (50.00%)	115 (28.75%)	85 (21.25%)	0.002
	Pharmacist	130 (65.00%)	43 (21.50%)	27 (13.50%)	
Patient can stop it for a while	Students	284 (71.00%)	63 (15.75%)	53 (13.25%)	0.514
	Pharmacist	148 (74.00%)	32 (16.00%)	20 (10.00%)	
Patient can use it as a reserve, if other treatment doesn't work	Students	337 (84.25%)	42 (10.50%)	21 (5.25%)	0.269
	Pharmacist	175 (87.50%)	13 (6.50%)	12 (6.00%)	
Patient can use it before doing something which might make him breathless	Students	179 (44.75%)	74 (18.50%)	147 (36.75%)	0.024
	Pharmacist	112 (56.00%)	25 (12.50%)	63 (31.50%)	
Patient can take less than instructed	Students	324 (81.00%)	74 (10.50%)	147 (8.50%)	0.197
	Pharmacist	168 (84.00%)	23 (11.50%)	9 (4.50%)	

Table 8: Average results

Average results					
Questions	Participant	N (%) Of correct answer	N (%) Of incorrect answer	N (%) Of cannot say	P value
Section A: Etiology	Students	279.28 (69.82%)	55.48 (13.87%)	65.24 (16.31%)	0.009
	Pharmacist	162.92 (81.46%)	18.28 (9.14%)	18.74 (9.37%)	
Section B: symptoms and assessments of severity	Students	293.24 (73.31%)	34.56 (8.64%)	72.56 (18.14%)	0.050
	Pharmacist	164 (82.00%)	13.42 (6.71%)	22.42 (11.21%)	

Section C: Medications	Students	68.32 (71.08%)	55.64 (13.91%)	60.56 (15.14%)	0.000
	Pharmacist	183.32 (91.66%)	9.82 (4.91%)	7.00 (3.5%)	
Section D- Prevention	Students	292.00 (73.00%)	57.76 (14.44%)	50.24 (12.56%)	0.003
	Pharmacist	170.5 (85.25%)	16.25 (8.12%)	13.25 (6.63%)	
Section E- Natural history	Students	315 (78.75%)	78.68 (19.67%)	46.32 (11.58%)	0.000
	Pharmacist	177.34 (88.67%)	10.66 (5.3%)	12 (6.00%)	
Section F: Use of inhaler	Students	261.28 (65.32%)	70.56 (17.64%)	68.24 (17.06%)	0.004
	Pharmacist	156.86 (78.43%)	24.00 (12.00%)	19.28 (9.64%)	

Table 9: Pharmacist job experience and knowledge about asthma

Pharmacist job experience						
Questions	Participants	Experience (year)	N (%) Of correct answer	N (%) Of incorrect answer	N (%) Of cannot say	P value
Section A: Etiology	Group A	1-3	22 (68.75%)	6 (18.75%)	4 (12.50%)	0.012 ^a
	Group B	3-6	42 (72.41%)	6 (10.34%)	10 (17.24%)	
	Group C	6-8	65 (89.04%)	5 (6.85%)	3 (4.11%)	
	Group D	8-10	35 (94.59%)	1 (2.70%)	1 (2.70%)	
Section B: symptoms and assessments of severity	Group A	1-3	23 (71.88%)	3 (9.38%)	6 (18.75%)	0.083
	Group B	3-6	43 (74.14%)	6 (10.34%)	9 (15.52%)	
	Group C	6-8	66 (90.41%)	3 (4.11%)	4 (5.48%)	
	Group D	8-10	34 (91.89%)	1 (2.70%)	2 (5.41%)	
Section C: Medications	Group A	1-3	26 (81.25%)	3 (9.38%)	3 (9.38%)	0.033 ^b
	Group B	3-6	49 (84.48%)	3 (5.17%)	6 (10.34%)	
	Group C	6-8	70 (95.89%)	2 (2.74%)	1 (1.37%)	
	Group D	8-10	37 (100.00%)	0 (0.00%)	0 (0.00%)	
Section D- Prevention	Group A	1-3	22 (68.75%)	7 (21.88%)	3 (9.38%)	0.003 ^c
	Group B	3-6	42 (72.41%)	8 (13.79%)	8 (13.79%)	
	Group C	6-8	67 (91.78%)	4 (5.48%)	2 (2.74%)	
	Group D	8-10	36 (97.30%)	0 (0.00%)	1 (2.70%)	
Section E- Natural history	Group A	1-3	23 (71.88%)	6 (18.75%)	3 (9.38%)	0.000 ^d
	Group B	3-6	44 (75.86%)	9 (15.52%)	5 (8.62%)	
	Group C	6-8	67 (91.78%)	4 (5.48%)	2 (2.74%)	
	Group D	8-10	36 (97.22%)	1 (2.77%)	0 (0.00%)	
Section F: Use of inhaler	Group A	1-3	25 (78.13%)	3 (9.38%)	4 (12.50%)	0.004 ^e
	Group B	3-6	41 (70.34%)	10 (17.24%)	7 (12.07%)	
	Group C	6-8	55 (75.34%)	12 (16.44%)	6 (8.22%)	
	Group D	8-10	31 (86.11%)	4 (11.11%)	2 (5.55%)	

^a: post-hoc test statistically significant between group C and D with A and B

^b: post-hoc test statistically significant between group D with A, and C

^c: post-hoc test statistically significant between group C and D with A and B

^d: post-hoc test statistically significant between group C and D with A and B

^e: post-hoc test statistically significant between group D with A, B and C

DISCUSSION

Asthma is a disease in which the pharmacist can play an important role in different ways. Asthmatic patients need lifelong counseling, thus precise patient education improves medical care and patient health. If the patient does not adhere to the physician and pharmacist advices and if did not take the medicine regularly, the disease

symptoms may deteriorate.⁽⁹⁾ Since asthma is a chronic disease and needs an indefinite treatment, knowledge about signs and symptoms, exacerbating factors, etiology of disease and medication used by the patients can improve the outcomes of patient disease by reducing the frequency of attack, improving lifestyle, avoiding adverse

effect of drugs, hospital admission and consequently prevent death.⁽¹⁰⁾

Similar to any chronic disease, successful treatment of asthma depends on patient's knowledge about his/her disease, prevention of exacerbating factors and medication used.⁽¹¹⁾ Many studies conducted to identified the impact of, both community and hospital, pharmacist on asthmatic patient education and treatment with the disease outcome. These studies confirmed that the community pharmacists have significant effect on many aspects of asthma like etiology, triggering factors, proper management, treatment adherence, device techniques, and attitudes.⁽¹²⁻¹⁵⁾ Maureen and Bruce, 2019 shows that higher adherence is associated with better symptom control in patients with asthma, whereas suboptimal adherence is a modifiable independent risk factor for asthma exacerbations.⁽¹⁶⁾ The first step toward improving patient adherence involves accurately assessing whether or not patients have followed the treatments recommended to them. Incorrect technique for using inhalers considered as manifestation of unintentional poor adherence. The proper use of inhaler by asthmatic patient is one of the medical problems facing physician. The difficulty of using inhaler by patient could resulting from variety of reasons, including certain disease such as arthritis or mental problems.⁽¹⁷⁾ Furthermore, some of inhalers needs rapid and forced inspiration to ensure drug delivery to the site of action like dry-powder inhalers.⁽¹⁸⁾ Patients with asthma or COPD may have comorbidities and have polypharmacy, so it is important to discuss all drugs used which may have potential drug interaction or contraindication with the possibility of behaviors changes that affecting inhaler administration.⁽¹⁹⁾

A prospective cohort study conducted to determine the effect of applying a Web-based support tool to record the possible problems associated with using anti asthmatic drugs and providing pharmaceutical care intervention comparing to ordinary care provided to patients with chronic respiratory disease (COPD and Asthma) in Dutch community pharmacy. According to the current practice guideline, nineteen harmful drug problems were detected including use of high dose of rapid onset, short acting, β -agonist drugs, small maintenance dose of long acting β -agonist, nonadherence to corticosteroid inhalation and misusing inhalation devices. Patient education about proper method of devices selection and using techniques, adherence to treatment, dose monitoring and treatment modification according to patient disease state result in a significant improvement of patient health with reduction in corticosteroid oral dose and the frequency of antibiotics use.⁽²⁰⁾

Community pharmacist in rural Australia was evaluated in the training of pharmacist on asthmatic patient outcome. These pharmacists were trained to use an evidence-based, peer-led educational approach. By using these programs, the knowledge was not only improved in asthmatic patients, but also provided the information to the general public. Good communication by health care providers helps with increased satisfaction and better adherence, in turn improving health outcomes and reducing the use of health care resources. It is important for clinicians and pharmacists to use empathy and relevant communication approaches (eg, open questions and attentive listening) to build trust and support full and honest discussions.⁽²¹⁾ The relationship between patient

and healthcare staff is the cornerstone of successful treatment outcomes and can play in achieving more tailored and individualized care. Addressing these needs is expected to further improve medication adherence and quality of life of patients with asthma and in a cost-effective manner.⁽¹⁶⁾ Economically, asthmatic patients who are highly educated and received periodic management services shows a significant improvement in their symptoms and had overall reduction in the cost of treatment although their medications cost are increased due to addition of new anti-asthmatic drugs to their regimen.⁽¹⁹⁾

In this study, pharmacist experience between 6-8 years after graduation showed improve in knowledge about asthma in different aspects like etiology, symptoms, prevention strategies, natural history and the proper way to use inhaler. This requires hard work on medical health staff like workshop, seminars and scientific advanced courses to provide pharmacist with optimal and more precise information and accurate method of education for patients with asthma. The knowledge shortage in students was seen mainly in information related to asthma symptoms, use of inhaler and assessment of severity followed by etiology. Relatively good information was seen about prevention strategies and asthma history. Additionally, more than 8 years of experience is in required enhancing pharmacist learning regarding inhaler and medications used for asthmatic patients.

CONCLUSION

Pharmacists should provide special and accurate counseling to tailored population suffering from chronic disease like asthma. Precise instructions provided by pharmacists concerning risk factors, pathophysiology of asthma, inhalers technique, medication, and prophylaxis strategies aids to improve the quality of counseling. In developing countries, the concept of patient counseling is at the infancy stage and data regarding pharmacist-provided counseling in asthma are scarce. Well-trained pharmacists with high communication skills are essential to reduce the rate of hospital admission and improve quality of life for asthmatic patients.

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