ORIGINAL ARTICLE

A study investigating the community pharmacist knowledge about the appropriate use of inhaler, Eastern Region AlAhsa, Saudi Arabia

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Abstract The current study aims to assess the community pharmacist's skills to make correct use of metered dose inhalers (MDIs). Seventy-four pharmacists were approached using six clusters from the most populous areas of Alahsa, Eastern region Saudi Arabia. Of whom $n = 71$, responses were taken in consideration to perform the statistical analysis. Scoring of pharmacist demonstration was done using a nine-step checklist for the appropriate use of inhaler. A simulated patient approach was used to assess pharmacist's skill. Majority, 98.6% of the pharmacists were Egyptian nationals with a mean age of 38.74 ± SD 4.52. Overall, pharmacists were found to have a poor recognition (mean score = 4.2 ± SD 2.08) with the steps considered while using an inhaler. However, significantly better knowledge differences were observed among the pharmacists aged 30–35 years (5.52 ± 2.14, $t = 2.851$, $p = 0.009^*$). In addition, job experience (3–4 years) was found significantly ($p = 0.003^*$) associated with a better knowledge toward the appropriate use of inhaler. It was seen that the young pharmacists working on chain pharmacies have comparatively better knowledge than the other groups.

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1. Introduction

Asthma is one of the chronic lung conditions affecting more than 300 million people worldwide. So far, there is no ultimate cure for asthma, except to manage it symptomatically. Negligence in this regard aggravates the symptoms that result approximately in 200,000 deaths annually (Khaled et al., 2008). For the symptomatic management of asthma the appropriate use of an inhaler is the key factor. However, in the case of improper use, patients will not receive the appropriate dose of the drug and will result in poor outcome (Giraud and Roche, 2002; Fink and Rubin, 2005). In the current practice community pharmacists have a major role in counseling patients about the appropriate use of drugs (Ballantyne, 2007). Particularly for asthmatic patients, pharmacists can easily identify a patient with un-control due to poor inhalation technique (Ekedahl, 1996; Cordina and McElnay, 2001). However,

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Table 1 Demographic information of respondents.

Demographic	N (%)
Nationality	
Egyptian	70 (98.6%)
Saudi	1 (1.4%)
Pharmacy type	
Chain pharmacy	37 (52.1%)
Individual/independent pharmacy	34 (47.9%)
Educational profile	
Bachelor of Pharmacy	71 (100.0%)
Age [range 30–48 years]	
Mean age = 38.74 ± 4.52	
30–35 Years	21 (29.6%)
36–40 Years	28 (39.4%)
41–45 Years	16 (22.5%)
46–48 Years	6 (8.5%)
Job experience	
3–4 Years	5 (7.06%)
5–6 Years	8 (11.3%)
7–8 Years	18 (25.4%)
9–10 Years	40 (56.3%)

only some pharmacists are capable to identify such patients. Many pharmacists lack the skills essential to demonstrate the correct use of metered dose inhalers (MDIs) (Kesten et al., 1993; Cain et al., 2001). To ensure the appropriate use of MDIs, one should follow the nine steps essential for ensuring the delivery of the exact dose to the lungs (Khaled et al., 2008). It is the job of pharmacists to master these nine steps and educate the patients through systematic demonstration to ensure the expected outcomes (Cordina and McElnay, 2001; Basheti et al., 2005). In case the pharmacists have a poor knowledge about these critical steps, the patient will remain deprived of the exact inhalation technique that will assist asthma control. Therefore, it is very essential to evaluate the community pharmacist's knowledge about the basic steps to use an inhaler.

Particularly, seeing the situation in Saudi Arabia, asthma is a common respiratory problem. Environmental condition, exposure to tobacco smoke and indoor pets are the common factors contributing to asthma among Saudi youth (Al Frayh et al., 2001). In terms of access to health care facilities, all the Saudi nationals are entitled for a free treatment at the public hospitals. However, still many visit private hospitals or purchase their medicines from the individual and chain pharmacies. In the recent two decades, a massive growth is seen in the Saudi community pharmacy business. In year 1985, there were 1233 community pharmacies in Saudi Arabia, which jumped to 3244 in year 2001 (TA, 2003). The current number might be higher than these, of which 835 pharmacies are owned by individuals and rest are the chain pharmacies that have branches throughout Saudi Arabia. At the moment, Saudi community pharmacy is facing three main challenges; one is the shortage of human resource (pharmacist), two is the non-prescription sale of medicines and three most of the community pharmacy owners are non-pharmacist businessmen who have more interest in cash than in the national drug policies

(Al-Mohamadi et al., 2011; Bawazir, 2005). Among these, the non-prescription sale of medicines is under spotlight for couple of years. It might be possible that many community pharmacists are dispensing MDIs to consumers without a prescription. However, no one has ever evaluated the community pharmacist's knowledge about the critical steps involved while using a metered dose inhaler. In addition, the knowledge about the inhaler technique is found to be declined if not reviewed on a routine basis (Skaer et al., 1996). Therefore, the current study aims to evaluate the community pharmacist's knowledge about the appropriate use of MDIs in the Eastern Region, Alahsa, Saudi Arabia.

2. Method

A cross-sectional study was planned among the clustered community pharmacies in the Eastern region, Al-Ahsa (AH). AH is the major urban center in the eastern region of the Kingdom. The period of this study was from 1st March 2012 to 15th April 2012. A simulated patient approach was used to assess pharmacist's knowledge for the adequate use of inhalers.

2.1. Study sample

In order to draw a representative sample of community pharmacists from AH, a survey was done to estimate the number of pharmacies in the region. A total of 150 pharmacies were identified in the AH region, of these about 100 were in the urban areas and the rest were in the rural areas. Keeping in view the population facts, six clusters were defined and 71 pharmacists were approached. Of these, 31 were independent pharmacies owned by a single owner and the rest 40 were from the two main chain pharmacies in the region.

2.2. Simulated patients

A simulated patient approach was used to evaluate the community pharmacist knowledge about the appropriate use of MDIs. Simulated patients group was comprised of six students from the second year, Doctor of Pharmacy (Pharm D) batch, College of Clinical Pharmacy, King Faisal University. These students were trained for the role-playing session (counseling for asthmatic patient for inhaler use) for the final year student in the pharmaceutical care lab practical (scheduled during the study period).

2.3. Assessment of the pharmacist's knowledge about appropriate use of MDIs

The assessment of the pharmacist was done using criteria for using MDIs as listed in the Guidelines for the Diagnosis and Management of Asthma, National Asthma Education and Prevention Program (Basheti et al., 2005) Detailed steps enlisted in this guideline are as follows;

○ Shake the inhaler and remove the cap.[*]
○ Breathe out slowly and completely.
○ Hold the inhaler in upright position.
○ Insert the mouthpiece into mouth between closed lips.[*]
○ Depress the canister once...[*]

Table 2 Pharmacist demonstration about the critical steps while using inhalers.

Steps for using inhalers	% Pharmacist demonstrating these steps	% Pharmacist not demonstrating these steps
1-Shake the inhaler and remove the cap	42.25	57.75
2-Breathe out slowly and completely	29.58	70.42
3-Hold the inhaler in upright position	69.01	30.99
4-Insert the mouthpiece into mouth between closed lips	74.65	25.35
5-Depress the canister once…	66.20	33.8
6- At the same time breathe in slowly for deep inhalation	45.07	54.93
7-Remove the inhaler with closed lips	57.75	42.25
8-Hold your breath for 5–10 s	25.35	74.65
9-Wait for 20–30 before starting the second puff	18.31	81.69

○ At the same time breathe in slowly for deep inhalation.[*]
○ Remove the inhaler with closed lips.
○ Hold your breath for 5–10 s.
○ Wait for 20–30 s before starting the second puff.

Upon the selection, a group of two students entered the pharmacy. One pretended to be an asthma patient, while other pretended as his friend. The simulated patient entered the pharmacy pretending as an asthma patient. In first step, the simulated patient told the pharmacist that he is recently diagnosed asthmatic and is not aware of the exact procedure to use a metered dose inhaler (MDI). Meanwhile the simulated patient also tries to socialize with the pharmacist in order to know his demographic information, educational background and years of experience as shown in Table 1. All the information was noted by the second student using the spreadsheet on the smart phone.

In the second step, the pharmacist's counseling session about inhaler was assessed using the nine item criteria. When the pharmacist explains the procedure to the simulated patient, the second student who is pretending as his friend marks the steps missed by the pharmacist during the session. Upon the demonstration of every right step, one mark was given to the pharmacist and in the case, he missed a step or demonstration was wrong was graded as zero.

2.4. Ethical consideration

The study protocol was approved by the departmental research committee (chaired by Vice Dean) and deanship of scientific research, King Faial University. Any information that discloses the name of the pharmacist was avoided. The names of the of community pharmacy were only noted to distinguish between the chain and independent pharmacies and are not disclosed in any form that may label the image of the pharmacy.

2.5. Data analysis

The demographics of the community pharmacist were calculated through descriptive statistics using Statistical Package for Social Sciences SPSS 13®. A parametric statistics (ANOVA and independent sample t-test) was applied to see the differences among the groups based on score. p-Values < 0.05 were considered statistically significant.

3. Results

Total of $N = 74$ pharmacists were approached, of whom three have refused. *One of these three mentioned that he is busy and cannot explain about it now, the second one mentioned that the*

Table 3 Mean score comparison among the groups.

Variable	Mean score	df	F/t	p
Age				
30–35 Years	5.52 ± 2.14			
36–40 Years	4.12 ± 2.04	62	2.851	0.009[*]
41–45 Years	3.40 ± 1.40			
46–48 Years	2.33 ± 0.81			
Job experience				
3–4 Years	6.80 ± 1.92	62	2.325	0.003[*]
5–6 Years	4.87 ± 1.72			
7–8 Years	4.98 ± 2.41			
9–10 Years	3.35 ± 1.51			
Pharmacy type				
Chain pharmacy	4.48 ± 2.10	68	1.226	0.226
Individual pharmacy	3.88 ± 2.04			

[*] Significant, ANOVA, Student t-test.

leaflet is inside go home and read it thoroughly and the third one said that there is nothing to explain about it. Finally, 71 pharmacists were assessed during this study. Analysis of data revealed that only one of the pharmacists assessed during this study was Saudi. Nearly all the pharmacists working on the community pharmacies were Egyptians 70 (98.6%). About 37 (52.1%) of the pharmacists were from the chain pharmacies while other 34 (47.9%) were from the individual/independent pharmacies. A higher number of the pharmacists were from the middle age (36–40 years) with a mean age of 38.74 ± 4.52. The entire pharmacists were having a bachelor degree in pharmacy and majority of them 40 (56.3%) having an experience of about 9–10 years. Details about the demographics of the pharmacist are shown in Table 1.

When the assessment criterion was applied, it was seen that only four steps were demonstrated commonly by the majority of 57–75% of the pharmacists. These steps are; breathe the air slowly out of the lungs, tilt back your head slightly, place the inhaler mouthpiece in the upright position and close the lips and breathe in slowly for 3–5 s (Table 2). Scoring of the responses revealed that nearly all possess a moderate level of knowledge about the appropriate use of inhalers. As a whole, mean score for the pharmacists was 4.2 ± 2.08. Details about the knowledge score as per the pharmacist demographics are shown in Table 3.

4. Discussion

Treatment outcomes for the asthmatic patients are widely dependent on the appropriate use of inhalers (Al-Hassan, 2009). Poor understanding of the patients with the appropriate use of inhalers means that they lack proper education or counseling by the health care provider to use inhalers. Pharmacists are the one responsible to educate the patients about the critical steps that must be followed while using an inhaler (Al-Hassan, 2009). However, if the pharmacist is not knowledgeable, then the patients will remain deprived of the right method to use an inhaler. The current study is one such effort to assess community pharmacist knowledge about the essential steps for inhaler use. Findings of the current study demonstrate a poor knowledge among the majority of community pharmacists toward the critical steps during the inhaler use. Only 29.58% of the pharmacists has explained to breathe out before taking a puff. Similarly deep inhalation after the puff is explained by 45.07% of the respondents. Final evaluation has shown a moderate knowledge among the community pharmacist towards the appropriate use of inhalers. Those pharmacists aged 30–35 years were found to have a significantly (5.52 ± 2.14, $t = 2.851$, $p = 0.009^*$) higher knowledge about the appropriate use of inhalers. In addition, job experience (3–4 years) was found significantly ($p = 0.003^*$) associated with a better knowledge toward the appropriate use of inhalers. Similarly, those pharmacists working on chain pharmacies were found more knowledgeable than the pharmacists working on independent pharmacies. These findings comply with the international studies that report pharmacist's deficient knowledge in explaining the patient about the correct inhaler use (Chopra et al., 2002; Basheti et al., 2005). Poor skills to use inhalers will decrease the confidence level among the community pharmacists and may result in the provision of incorrect instruction to the asthma patient. In addition, it is possible that due to wrong inhalation techniques, the patient is under dosed and therapeutic objectives are not achieved. Keeping in view the patient condition the physician may advise a higher dose that may increase the direct cost with a higher probability of side effects.

5. Limitation

Most of the community pharmacists approached were Egyptians; therefore, the finding of this study cannot be generalized for the Saudi pharmacists.

6. Conclusion

Pharmacists working on community pharmacies in Alahsa region were not aware of the correct way to use inhalers. It was seen that the young pharmacists working on chain pharmacies have comparatively better knowledge than the other groups.

7. Recommendations

This study was conducted only in one city in the eastern region of Saudi Arabia. Studies with large sample sizes should be performed to address this issue nationwide. Furthermore, the regulatory and licensing authorities should assess the skills of the community pharmacist in the use of metered dose drug delivery devices before giving license to practice.

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