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Competency of Metered-Dose Inhaler Use among Saudi Community Pharmacists: A Simulation Method Study

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Research Article

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ABSTRACT

Metered dose inhalers (MDI) are commonly used by asthma and chronic obstructive pulmonary disease (COPD) patients. Incorrect MDI technique by patients leads to poor outcome of the treatment. Insufficient skill in the use of MDI device by pharmacists worldwide was reported. The aim of this study was to assess the community pharmacist's competency on MDI technique use in Saudi Arabia and to identify the factors affecting the competency of MDIs use among the community pharmacists in Riyadh, Saudi Arabia.

INTRODUCTION

Inhalation medications are widely approved prescribed for patients with asthma and chronic obstructive pulmonary disease (COPD). The inhaled route allows therapeutic agents are delivered directly to the lungs which give a more rapid onset of action, better efficacy and less adverse effects [1,2]. Clinical responses to inhaled medication depend on the inhalation technique of the patient. Incorrect technique prevents patients from getting the maximal benefit from their medicines [3-5]. The most commonly prescribed inhaler devices are either the metered-dose inhalers (MDIs) and dry-powder inhalers (DPIs) and the selection should be based on the availability, cost, patient preference, physician preference and clinical situation [6]. To use inhalers correctly by the patients with asthma and COPD they should receive clear instructions and physical demonstration given by a health professional [7]. Patient education about inhaler technique is very important in the management of asthma and COPD and can be improved with education [8,9]. The role of the community pharmacist worldwide changes and moved towards a focus on patient care. The community pharmacist's should focus more on patient-oriented services rather than the traditional focus on product and dispensing services [10]. Community pharmacists can provide effective training in correct inhaler technique [11].

The prevalence of asthma and COPD in Saudi Arabia is high [12,13]. Community pharmacies are the most accessible healthcare facilities to the patients which provide a timely opportunity to instruct patients on the use and administration of inhaled medications. Community pharmacists can make a significant contribution to improve the outcome of treating asthma and COPD patients due to their expertise on medication and their everyday contacts with the patients on dispensing and counseling. Pharmacists can help asthma, COPD patients to achieve the treatment outcomes by providing the patients with suitable information and counseling. One of the counseling issues is educate the patients how they can use their inhaler medications correctly.

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Simulated patient methodology has been adapted and used to assess quality practice in the health sector as well as in pharmacy practice [14,15]. The use of simulated patients in pharmacy practice research has become increasingly worldwide over the past two decades [16-19]. There are different names of simulated patient such as: pseudo patient, pseudo patron, simulated patient, pseudo customer, shopper patient or mystery shopper. Simulated patient is a person who is trained to go to the pharmacy with determined scenarios to assess quality of certain services provided by pharmacy employees [18-20].

Few studies conducting on the Arabic region to investigate the appropriateness of MDIs use among community pharmacies staff [16,21]. Therefore, the current study aims was to assess the community pharmacists competency on MDI technique use in Saudi Arabia and to identify the factors affecting the competency of MDIs use among the community pharmacists in Riyadh, Saudi Arabia.

METHODS

A cross-sectional study was done among the community pharmacists in the capital Riyadh, Saudi Arabia from 1st April 2012 to 1st August 2012. A simulated patient approach was to assess the community pharmacists competency on MDI technique use in Riyadh, Saudi Arabia. This study was approved from Qassim University, Project No (PP-06-1432H) Furthermore a verbal consent was obtained from the community pharmacists. No personal data about pharmacies or pharmacists was obtained. The MDI used in this study was Ventolin® (Salbutamol) evohealer. The competency on MDI technique use was defined in this study as correct use of MDIs.

Sample Size and Sampling Technique

According to the annual reports of the Ministry of Health 2011 the numbers of pharmacies are 1804 community pharmacies in the capital Riyadh [22]. Based on this reports 317 community pharmacies were selected conveniently from each region in the capital Riyadh to have an estimate of precision at the 95% confidence interval (CI), with an α=0.05.

Simulated Patient and Scenario

Simulated patient methodology was used in this study as shown in **Table 1**.

Table 1. Simulated patient methodology.

s.no.	step	Notes
1.	Select the Simulated Patients (SM)	Invite and interview pharmacists with minimum 3 years' experience. Select two pharmacists.
2.	Train the SM about MDI use, scenario, how to evaluate community pharmacists and record the interaction with them.	Workshops and educational materials (Videos, notes and pictures)
3.	Examine the ability of SM (MDI use, scenario, how to evaluate community pharmacists and audio visually record the interaction with community pharmacists)	One author and invited external examiners.
4.	Conduct study and report results to authors	-
5.	Analyze results.	Check the reliability of the result by comparing the SM evaluation checklist with the recorded video.
6.	Sent feedback to community pharmacies	A 30 minutes meeting with community pharmacists to increase the awareness of the new roles of pharmacists and pharmaceutical care services was done. Educational materials (Video and brochures) about MDI appropriate use were given.

A simulated patient team was consisted of two pharmacists. Furthermore theoretical and practical workshops about simulation scenario, evaluate MDI competency use and recording method were provided. All simulated patients underwent MDI use assessment after workshop. The simulated scenario was that a patient diagnosed with asthma and went to the community pharmacy with Ventolin® (Salbutamol) evohealer and told the community pharmacist "My physician has prescribed this devise for me. Could you please educate me how can I use it?" The interaction between community pharmacists and simulated patient was audio visually recorded using hidden micro camera and reported the evaluation using evaluation checklist after leaving the pharmacy. Furthermore the reliability of the results was done by comparing the SM evaluation checklist with the recorded video.

Evaluation of the Community Pharmacist Competency on the MDIs Use

The evaluation was done by using MDI evaluation checklist as shown in **Table 2**.

The checklist was adapted from the latest Guidelines for the Diagnosis and Management of Asthma, National Asthma Education and Prevention Program [23]. Scoring systems were used in this study as each performed step was given a value of one and unperformed or wrong step was given a value of zero. A good appropriateness of Ventolin® (Salbutamol) evohealer use is awarded to community pharmacists completing successfully seven steps or more including the critical steps. A moderate appropriateness of Ventolin® (Salbutamol) evohealer use is awarded to community pharmacists completing successfully five or six steps including the critical steps. A poor appropriateness of Ventolin® (Salbutamol) evohealer use is awarded to community pharmacists completing less than or equal to four steps.

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Table 2. Recommended checklist of metered-dose inhaler (MDI)[22].

S.no	Step	Score
1	Shake the inhaler well *	
2	Remove the dust cap *	
3	Exhale slowly through pursed lips	
4	If using the "closed-mouth" technique, hold the inhaler upright and place the mouthpiece between your lips. Be careful not to block the opening with your tongue or teeth	
	If using the "open-mouth" technique, open your mouth wide and hold the inhaler upright 1–2 inches from your mouth, making sure the inhaler is properly aimed	
5	Press down on the inhaler once as you start a slow, deep inhalation *	
6	Continue to inhale slowly and deeply through your mouth. Try to inhale for at least 5 seconds.	
7	Hold your breath for 10 seconds (use your fingers to count to 10 slowly). If 10 seconds makes you feel uncomfortable, try to hold your breath for at least 4 seconds.	
8	Exhale slowly.	
9	Wait at least 30–60 seconds before inhaling the next puff of medicine.	

Statistical analysis

The data were descriptively analyzed using Statistical Package for the Social Sciences® (SPSS) version 15 for Windows. Differences in proportional were tested with Chi-square test or Fisher's Exact test. All reported p-values are two tailed, and the result is significant if p-value is ≤0.05.

RESULTS

Among 360 community pharmacists visited, 196 community pharmacists were excluded from the study because of: the unclear video recorded or asked the simulation patient (SP) to read leaflet or refer SP to the physician. Out of 164 community pharmacists 100% were male. The mean age of the respondents was found to be 29.71 ± 1.697 years. 45.3% of the respondent's age was ≤29 years old and 54.3% were 30 years old and older. Among the respondents 65 (39.6%) had an experience more than five years and the rest had a five years' experience or less.

Majority of the respondents were worked in chain community pharmacies 137 (83.5%) and 27 (16.5%) were worked in an independent community pharmacies. The results of this study showed that the majority of the respondents were Egyptians and they were graduated from Egypt 114 (86%), then 12 (7.3%) were Yemenis and they were graduated from Yemen and 11 (6.7%) community pharmacists were graduated from other countries.

Table 3 shows the assessment of the community pharmacist's competency on MDI technique use for each step. **Table 3**

Table 3. Assessment of the community pharmacist's competency on mdi technique use for each step.

s.no	Step	Community Pharmacists 164 (100)
1	Shake the inhaler well *	60 (36.6)
2	Remove the dust cap *	164 (100)
3	Exhale slowly through pursed lips.	65 (39.6)
4	If using the "closed-mouth" technique, hold the inhaler upright and place the mouthpiece between your lips. Be careful not to block the opening with your tongue or teeth.	129 (78.7)
	If using the "open-mouth" technique, open your mouth wide and hold the inhaler upright 1–2 inches from your mouth, making sure the inhaler is properly aimed.	
5	Press down on the inhaler once as you start a slow, deep inhalation **	60 (36.6)
6	Continue to inhale slowly and deeply through your mouth. Try to inhale for at least 5 seconds.	103 (62.8)
7	Hold your breath for 10 seconds (use your fingers to count to 10 slowly). If 10 seconds makes you feel uncomfortable, try to hold your breath for at least 4 seconds.	12 (7.3)
8	Exhale slowly.	5 (3)
9	Wait at least 30–60 seconds before inhaling the next puff of medicine.	9 (5.5)

Note: * Critical step

Table 4 shows the factors affecting the appropriated use of MDI.

DISCUSSION

The findings of this study shows that respondents (100%) were male, this is consistent with the previous report that there is a lack of Saudi pharmacists in Saudi Arabia with most of them working in public hospitals and polyclinics because of better

salaries and benefits [24,25]. The findings of this study shows that the majority of community pharmacists (64.6%) had a poor knowledge; 28% had a moderate knowledge and only 7.3% had a good knowledge.

Table 4. Factors affecting competency on MDI technique use.

Characteristics n (%)	Total 164 (100%)	Good knowledge (Competency use) 12 (7.3%)	p-value*
Pharmacy type	137 (83.5)	11 (8)	0.692
Chain	27 (16.5)	1 (3.7)	
Independent			
Experience	65 (39.6)	9 (13.8)	0.013
>5 years	99 (60.4)	3 (3)	
≤5 years			
Age	89 (54.3)	10 (11.2)	0.040
>29 years old	75 (45.7)	2 (2.7)	
≤29 years old			

Note: * Chi-square test or Fisher's exact test

There is a similarity between the findings of this study and the studies in Arabic countries in terms of poor knowledge among pharmacists [16,21]. the findings of this study shows that experience and age play a major role on MDI appropriate use. There was significant difference between community pharmacists with experience more than five years and pharmacists with five years'experience or less. Generally this study has found that majority of community pharmacists had poor knowledge and unfamiliar with MDI appropriate use. MDIs are usually prescribed to patients with asthma and COPD and the success of the therapy depends on correct inhaler technique use[1-5]. Pharmacists have responsibility to ensure that patients use prescribed medications correctly. However this cannot be achieved when those who teach patients have questionable skills. The improper inhaler technique use will lead to uncontrolled diseases, worsening treating outcomes,increase emergency departments visits and decrease quality of life. Educate the patients for the correct MDI technique improve their device use and control the disease. Pharmacist counseling can significantly improve MDI technique.

Development in Pharmacy practice since last decades especially after the introduction of clinical pharmacy concepts in the late 1960s, followed by the philosophy of pharmaceutical care in the early 1990s has contributed very much in the public health, improve treatment outcomes and improve quality of life. Pharmaceutical care changed the approach of Pharmacy practice from product oriented to Patient oriented [26,27].

Community pharmacists in Riyadh can be trained easily for providing pharmaceutical care to patients. Training provided to community pharmacists has a positive effect on their knowledge and skills and can improve patient drug knowledge, inhaler technique, and level of compliance. According to the conducted international studies about the impact of providing pharmaceutical care by pharmacists for patients with asthma and COPD, pharmacists not only improved patients' inhalers technique use but medications knowledge, and adherence therapy. These aspects can improve treating outcomes, control their diseases and improve patient quality of life [28-31]. the feedback was given to community pharmacists. Educational materials (Videos and brochures) about MDI appropriate use was given to community pharmacists. A 30 minutes meeting with community pharmacists to increase their awareness towards the new roles of pharmacists and pharmaceutical care services was done.

CONCLUSION

Majority of the community pharmacists in community pharmacies had a poor knowledge of MDI. Experience and age play important role on MDI appropriate use among community pharmacists. Educational materials were given to community pharmacists. It may contribute to improve their skills on MDI technique and educate patients correctly on their MDIs. This study was done only on the capital Riyadh. In this sense, it was not possible to generalize the result of this study. Studies on other cities are highly recommended. Increase the awareness towards the important of counseling and move towards provide a good pharmaceutical care is highly recommended. The Study of the impact of different interventions to improve inhaler technique is also highly recommended.

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