

Knowledge and Practice of Asthmatic's Patients Regard using Meter Dose Inhaler

Hassanat E. Mustafa^{1*}, Mishkat S.A. Rokza², Badria A. Elfaki³

¹Department of Nursing practices, Umm Al-Qura University, Faculty of Nursing, Makka, Saudi Arabia, & Al-Neelain University, Khartoum, Sudan

²Department of Nursing, OmdurmanIslamic University, Khartoum, Sudan

³Department of Nursing practices, Umm Al-Qura University, Faculty of Nursing, Makka, Saudi Arabia, & Al-Neelain University, Khartoum, Sudan

***Address for Correspondence:** Dr. Hassanat Elbashir Mohammed Mustafa, Assistant Professor, Department of Nursing Practices, Umm Al-Qura University, Faculty of Nursing, P.O.: 715-21955, Makkah AlMakrama, Saudi Arabia

Received: 08 Apr 2018/ Revised: 15 Jul 2018/ Accepted: 27 Oct 2018

ABSTRACT

Inadequate management of asthma can lead to physical handicaps and death. The study aimed to assess the knowledge and practice of asthmatic participants to use a meter dose inhaler device. A descriptive study involved 105 participants, conducted at public hospitals in Khartoum state from July to October 2014. The questionnaire and observational checklist were used for data collection. The study enrolled 51% female and 49%, male. Most of the participants of their age group ranged, between 36 to 45 years, 35% were workers and 31% received University education while 44% had chronic asthma. The level of participant's knowledge was very good regard the care and storage of the device; sequent 77–79%. There were 64% had a moderate level of knowledge of preparation dose 69%, replacing the inhaler device and cleaning mouthpiece 60%, while 56% had very poor knowledge to rinse mouth after a puff. A highly significant difference between the level of knowledge and education (P value<0.001) regard replacing the inhaler device, and cleansing mouthpiece. All participants demonstrated the correct technique of using inhaler device, position, removed, pressed replacement the cap, shaking the inhaler device and took a deep breath. While half of them had a moderate skill level for opening mouth technique, continuous breathing and rinsed mouth after suffuse, and fewer participants had poor technique during repeated the puff. Most of the participants reflected moderate to a poor level of knowledge and had very good practice for correct used inhaler meter device; this revealed that the discrepancy between knowledge and practice.

Key-words: Asthma, Knowledge, Meter dose inhaler, Patients, Practice

INTRODUCTION

Asthma is a chronic inflammatory disorder of the lung which leads to narrowing of air passages in response to various triggers, leading to episodes of shortness of breath and wheezing. The symptoms of asthma can vary greatly in frequency and severities, ranging from intermittent mild symptoms to an incapacitating and life-threatening disorder ^[1].

Worldwide 235-330 million people are affected by asthma

in 2011, and approximately 250,000-345,000 people die per year from the asthma ^[2]. The proportion of people with asthma in United States grew by nearly 15%. In 2009, asthma caused 479,300 hospitalizations, 1.9 million emergency department visits, and 8.9 million doctor visits ^[3]. According to the recent report by Global Initiative for Asthma (GINA); South Africa has the world's fourth highest asthma death rate among five to 35 year olds and estimated that 3.9 million in South Africans with asthma, 1.5% dies of this condition annually ^[4].

In Sudan the prevalence of asthma increased from 5% in 2009 and 2010 to 5.6% in 2011 according to the annual reports of the Federal Ministry of Health ^[5]. Also the prevalence of asthma separately among university students and workers in Khartoum state was found to be 7.4 % ^[6]. Inadequate management of asthma can lead to

How to cite this article

Mustafa HE, Rokza MSA, Elfaki BA. Knowledge and Practice of Asthmatic's Patients Regard using Meter Dose Inhaler. Int. J. Life Sci. Scienti. Res., 2018; 4(6): 2080-2087.



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a significant social and physical handicap and can result in death due to respiratory failure. Pharmacological therapy is one of the pillars for proper asthma management [7]. A short burst aerosolized medicine inhale through Metered Dose Inhalers (MDIs) device that delivers a specific amount of medication to the lungs; usually self-administered by the patient [8]. It was first developed in 1950s, and became most widely used devices for aerosol therapy. Over 70 million patients in the world use a metered dose inhaler either alone or in association with a spacer [7,8]. Recent study found that more than 60% of patients were unable to use their MDIs correctly and impact of poor inhaler technique based on the evidence practice will results in a decreased response to medication and poor asthma control A large proportion of patients prescribed inhaled medications do not use their inhalers correctly. Overall, up to 90% of patients show incorrect technique in clinical studies with standard metered dose inhalers (MDIs) [9].

Incorrect inhaler practicing technique is common among patients with asthma result in suboptimal disease control, disability and absences from work in addition to potential side-effects oral corticosteroid treatment [6] so was important to know steps and benefits of correct uses of the meter dose inhaler device [4,10,11]. The purpose of this study to evaluate knowledge and practice of asthmatic patients regard using of meter dose inhaler to maximize benefits of oral inhalation medication.

MATERIALS AND METHODS

A descriptive study was conducted at the Chest Department in public hospitals at El-Shaab, Omdurman and Abu-Anga in Khartoum state, Sudan from July to October 2014. Populations of the study were entire asthmatic patients, who visited or admitted at chest units during the study period. Non-probability, convenience sampling technique was adopted, sample size enrolled in this study was 105 subjects which selected based on criteria, included both genders at age 18 years and above with various qualifications, occupations and using the meter dose inhaler. While excluded critical asthmatic cases, children, asthmatic didn't use the meter dose inhaler and patients disagree to participate. Study variables included background data such as age, gender, education levels, occupation and duration of the disease, dependent variables about knowledge, about preparation, inhalation steps, storage

mouth rinse, and cleanness and correct practice for uses meter dose inhaler device.

Data was collected using interviewing and observation techniques. The questionnaire and checklist constructed to collect relevant data for knowledge and practice of participants about meter dose inhaler device. A structured questionnaire was composed of 13 close-ended questions, consists of two sections. The first section for the demographic data and the second section reflected the knowledge of participants regarding meter dose inhaler device. The checklist was constructed to identify the practice of asthmatic patients during the uses of meter dose inhaler device in relation to international guidelines. A pilot study of instruments carried out for sixteen volunteers prior to the commencement of data collection and some correction was done for the questionnaire.

Statistical Analysis- Data analyzed used statistical program for the social sciences (SPSS) version 20 after cleaning and coded. Knowledge variables scored according to Liker's scale [12] very poor, poor, fair (moderate), good and very good. Descriptive analysis was made for background variables and the results presented in the form of percentage and frequency tables. Chi squire to test differences between variables such as meter dose inhaler step preparation, storage mouth rinse, and cleanness in relation to their education level was used and p-value<0.005 to test significance [13]. The ethical considerations were granted by ethical clearance from the institutional review board at Al-Neelain University, officially endorsed by the ethics committee in El-Shaab, Omdurman and Abu-Anga public hospitals and written consent from entire participants after explanation and full information.

RESULTS

Table 1 shows the characteristic background of 105 participants, in which 51% female and 49% male. Total 27% of participants at age group 36–45 years, 35% were workers and 31% with University education, in addition to 44% of participants experience asthma for 6 to 15 years.

Table 1: Characteristics back ground of participants (n = 105)

	Items	Frequency	Percentage (%)
Gender	Male	51	49.0
	Female	54	51.0
Age	18–25	13	12.0
	26–35	24	23.0
	36–45	28	27
	46–55	26	25
	56–65	14	13
	Occupation	Employee	22
Student		14	13
worker		37	35
Other		32	31
Level of education	Illiterate	15	14
	Primary	20	19
	Secondary	30	29
	Universal	33	31
	Post universal	7	07
Duration of asthma	1–5	27	26
	6–15	46	44
	16–30	30	28
	Above 30	2	02

Table 2 reflects the knowledge score of participants, who used meter dose inhaler device; which are very good about steps of inhalation dose, steps of care post inhalation, storage and clean the device respectively 77%, 44%, 79%, 43%, while participants had moderate level of knowledge, about preparation of the dose, replacement and cleaning mouthpiece with respective proportions of 63%, 68%, 60% in addition to 52% of the participants had poor knowledge about benefit of oral rinsing after puff.

Table 3 a & b shows the significant differences between levels of knowledge during preparation, inhalation dose, replacing and cleaning mouthpiece of the meter dose inhaler device versus level of education; P-values (0.000, 0.033, 0.001, 0.001 sequences), while insignificant differences about the steps of inhaler dose, storage, cleaning of the meter inhaler device and the rinse of the mouth after puff; P-values (0.203, 0.297, 0.353, 0.242 sequences).

Table 2: Level of knowledge among participants regard inhaler medication for management of Asthma using meter dose inhaler device (n=105)

Items	Very good(%)	Good(%)	Fair(%)	Very poor(%)
Steps of preparation	34	0	64	02
Steps of dose inhalation	77	18	05	0
Care steps post inhalation	44	37	19	0
Keeping (Storage) of the device	79	07	14	0
Benefit of oral rinsing after puff	08	0	36	56
Replacement	30	0	68	02
Mouthpiece cleaning	18	0	60	22
Device cleaning methods	43	21	14	22

Table 3a: Level of knowledge among participants regard using meter dose inhaler device versus level of education (n=105)

Items	Education level	Level of knowledge				Total	P-value
		Very good(%)	Good(%)	Fair(%)	Very poor(%)		
Steps of preparation	Illiterate	07	0.00	93	0	100	0.0
	Primary	05	0.00	95	0	100	
	Secondary	44	0.00	50	07	100	
	Universal	42.0	0.00	58	0	100	
	Post University	100.0	0.00	0	0	100	
Dose inhalation steps	Illiterate	47	40	13	0.00	100	0.203
	Primary	75	20	05	0.00	100	
	Secondary	80	17	03	0.00	100	
	Universal	88	9	03	0.00	100	
	Post University	86	14	0	0.00	100	
Steps follow dose inhalation	Illiterate	27	26	47	0.00	100	0.033
	Primary	40	25	35	0.00	100	
	Secondary	50	43	07	0.00	100	
	Universal	46	42	12	0.00	100	
	Post University	57	43	0	0.00	100	
Storage of Meter Dose Inhaler Device	Illiterate	80	07	13	0.00	100	0.297
	Primary	70	05	25	0.00	100	
	Secondary	93	0	07	0.00	100	

Universal	76	12	12	0.00	100
Post University	57	14	29	0.00	100

Table 3b: Level of Knowledge among Participants Regard Using Meter Dose Inhaler Device to Control bronchial Asthma versus Level of Education (n= 105)

Items	Educational level	Level of knowledge				Total	P-value
		Very good (%)	Good(%)	Fair(%)	Very poor(%)		
Cleaning of Meter Inhaler Device	Illiterate	20	27	13	40	100	0.353
	Primary	25	35	15	25	100	
	Secondary	47	17	16	20	100	
	Universal	55	15	12	18	100	
	Post University	72	14	14	0	100	
Rinse of mouth after Puff	Illiterate	0	0.00	20	80	100	0.242
	Primary	0	0.00	35	65	100	
	Secondary	13	0.00	34	53	100	
	Universal	12	0.00	46	42	100	
	Post University	0	0.00	43	57	100	
Replacing the Meter Dose Inhaler Device	Illiterate	0	0.00	93	07	100	0.001
	Primary	10	0.00	90	0	100	
	Secondary	33	0.00	67	0	100	
	Universal	39	0.00	58	03	100	
	Post University	86	0.00	14	0	100	
Cleaning Mouthpiece	Illiterate	0	0.00	60	40	100	0.001
	Primary	0	0.00	75	25	100	
	Secondary	17	0.00	63	20	100	
	Universal	27	0.00	55	18	100	
	Post University	71	0.00	29	0	100	

Fig. 1. shows practice of participants toward using meter dose inhaler device. All participants demonstrated correct practice regard remove the cap, hold the inhaler device, press the dose, hold breath for 8–10 seconds and replace the cap again. Also, more than 80% of participants demonstrated correct during shake the inhaler, hold it in the correct position and 78% took a

deep breath before inhaled the dose. In addition to greater than 40% of participants demonstrated correct steps about the following items; used inhale mouthpiece positioning, continuous breathing 3 to 5 seconds, repeating dose and rinsing mouth with water after a puff.

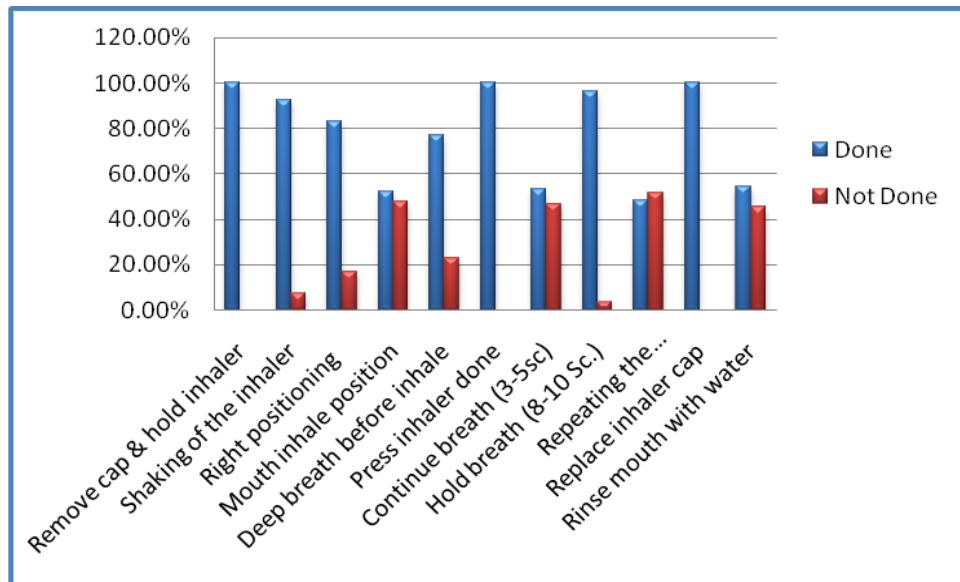


Fig. 1: Level of Participants Practice Regard Using Meter Dose Inhaler Device to Control Bronchial Asthma (n= 105)

DISCUSSION

Asthma is a public health problem not just for high-income countries; it occurs in all countries regardless of the level of development. Most asthma related deaths occur in low and lower-middle income countries [10,14]. Our study results reflected that more than 50% of the study populations were females and above quarter of participants their age group between 36 to 45 years. Most of them were worker and educated. In addition to 44% of the participants had an asthma duration of 6 to 15 years (Table 1). This study was similar study conducted in 2013 at El-shaab public hospitals, to assess the knowledge and behavior of asthmatic patients towards asthma [5].

Regard level of knowledge about meter dose inhaler device uses the study reflected that, most of the participants had a very good knowledge about uses inhaler dose, care post inhalation, storage and cleaning the device. While more than half of them had moderate level of knowledge for preparing dose, replacing inhaler device and cleaning mouthpiece and 56% of the participants had very poor knowledge about mouth rinse after puff (Table 2).

There was a highly significant difference between the level of knowledge and education; the post university level of education participants had the highest level of knowledge about preparation, inhalation dose, replacing and cleaning mouthpiece of meter dose inhaler device P-values sequences were (0.000, 0.033, 0.001, 0.001),

while statistically insignificant differences about the steps of inhaler dose, storage, cleaning of meter inhaler device and rinse of the mouth after puff; P values sequences were 0.203, 0.297, 0.353, 0.242 as shown in Tables 3a & 3b. So the education had positive effect on participants knowledge this agree with a study conducted in Bangladesh, Dhaka to assess knowledge about inhaler use among the chronic asthma patients in selected hospitals which showed that participant's level of knowledge was found to be associated with their educational status. Participants with higher education possessed more than the participants with lower education [15]. According to Nelson Mandela, "Education is the most powerful weapon, which can use to change the world." So it is very strong rational that the higher educated persons possess more knowledge than the participants who had lower education.

On the other hand the study reflected that the majority of participants performed correct practice during removing a cap, inhaler device press down and replace inhaler device cap, shaking inhaler device, right patient positioning, take deep breath before inhale and hold breath for eight to ten seconds, while some of them had moderate practice level for open mouth technique, continuous breathing and rinse mouth with water after puff (Fig. 1). We agreed with the study conducted in Khartoum by El-Shaab [5] that teaching Hospital to assess the knowledge and behavior of asthmatic patients towards asthma. The study showed that more than two thirds of the participants were able to demonstrate

correct use of the inhaler device. Also similar with a study carried in 2009 at Brazil, which evaluated knowledge and techniques for using prescribed inhalation devices among patients with asthma or COPD, which showed the 94.2% of patients committed at least one error which showed that their technique was inappropriate^[16] and disagree with the study, which conducted in Nigeria showed that the total percentage score of asthma knowledge significantly was satisfactory while the demonstration of inhaler techniques was very poor^[17].

CONCLUSIONS

Most of the participants had moderate knowledge about steps preparation, mouthpiece cleaning and replacement of the inhaler device. While some of them had poor knowledge about the benefit of oral rinsing after a puff. In addition, most of the participants had very good practice about the correct use of inhaler device, fewer of the participants had poor practicing about correct inhaler use; this revealed that the discrepancy between knowledge and practice. Proper technique was necessary in order to achieve adequate delivery of meter dose inhaler to the lungs.

In the future must be constructed an education program to enhance the knowledge for asthmatic patients regard uses of meter dose inhaler device and encourage care providers to use educational strategies and methods include individual teaching, small-group sessions, large-group lectures, checklists, video and audio tapes and booklets carried at units during patient's admission or on their clinic visit at community or make propaganda through televisions and social media.

ACKNOWLEDGMENTS

Our acknowledgement for Prof. Mustafa Numiri for advices and support, all staff at nursing college at Al-Neelain University; Khartoum, Sudan and for the study participants and data collectors team.

CONTRIBUTION OF AUTHORS

Research concept- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza

Research design- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza

Supervision- Dr. Hassanat E. Mustafa

Funding- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza, Badria A. Elfaki

Materials- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza, Badria A. Elfaki

Data collection- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza, Badria A. Elfaki

Data analysis and interpretation- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza, Badria A. Elfaki

Literature search- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza, Badria A. Elfaki

Writing article- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza, Badria A. Elfaki

Critical review- Dr. Hassanat E. Mustafa, Badria A. Elfaki

Article editing- Dr. Hassanat E. Mustafa, Badria A. Elfaki

Final approval- Dr. Hassanat E. Mustafa, Mishkat S.A. Rokza, Badria A. Elfaki

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