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

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ABSTRACT

Inadequate management of asthma can lead to physical handicap and death. The study aimedto assess knowledge and practice of asthmatic participants for use meter dose inhaler device. A descriptive study involved 105 participants, conducted at public hospitals in Khartoum state from July to October2014. Questionnaire and observational check list were used for data collection. The study enrolled (51%) female and (49%) male. Most of participants their age group ranged, between 36 to 45 years, (35%) were workers and (31%) received University education while 44 % had a chronic asthma. Level of participant's knowledge was a very good regard care and storage of the device; sequent (77% - 79%). There were(64%) had moderate level of knowledge for preparation dose (69%) replacing inhaler device and cleaning mouthpiece (60%), while 56% had very poor knowledge to rinse mouth after 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 correct technique of using inhaler device, position, removed, pressed replacement the cap, shaking inhaler device and took deep breath. While half of them had moderate skill level for opened mouth technique, continuous breathing and rinsed mouth after puffuse, and fewer of participants had poor technique during repeating the puff. Most of participants reflected moderate to poor level of knowledge and have very good practice for correct used inhaler meter device; this reveals 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 a significant social and physical handicap and can result

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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 is 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

Descriptive study was conducted at chest departments of 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. Questionnaire and check list 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 reflect the knowledge of participants regard meter dose inhaler device. Check list was constructed to identify the practice of asthmatic patients during uses of meter dose inhaler device in relation to international guidelines. Pilot study for instruments carried out for sixteen volunteers prior to commencement of data collection and some correction was done for questionnaire.

Statistical Analysis- Data analyzed used statistical program for social sciences (SPSS) version 20 after cleaned 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 results presented inform 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 significances [13].

The ethical considerations were granted by ethical clearance from the institutional review board at Al-Neelain University, officially endorsed by the ethical committee in El-Shaab, Omdurman and Abu-Anga public hospitals and written consent from entire participants after explanation and full information.

RESULTS

Table 1 shown characteristics background of 105 participants, (51%) female and (49%) male. (27%) of participants at age group 36- 45years (35%) were workers and (31%) with University education, in addition to (44%) of participants experience asthma for 6 to 15 years.

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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	27.0%
	46 – 55	26	25.0%
	56 – 65	14	13.0%
Occupation	Employee	22	21.0%
	Student	14	13.0%
	worker	37	35.0%
	Other	32	31.0%
Level of education	Illiterate	15	14.0%
	Primary	20	19.0%
	Secondary	30	29.0%
	Universal	33	31.0%
	Post universal	7	7.0 %
Duration of asthma	1 – 5	27	26.0 %
	6 – 15	46	44.0%
	16 – 30	30	28.0%
	Above 30	2	2.0%

Table 2 reflected 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 have moderate level of knowledge about preparation of the dose, replacement and cleaning mouthpiece with respectively proportions of 63% , 68%, 60% in addition to 52% of participants have poor knowledge about benefit of oral rinsing after puff.

Table 3a & b showed a 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 steps of inhaler dose, storage, cleaning of meter inhaler device and rinse of mouth after puff; P-values (0.203, 0.297, 0.353, 0.242 sequences).

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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%	0.0%	64.0%	2.0%
Steps of dose inhalation	77.0%	18 %	5.0%	0.0%
Care steps post inhalation	44.0%	37.0%	19.0%	0.0%
Keeping (Storage) of the device	79.0%	7.0%	14.0%	0.0%
Benefit of oral rinsing after puff	8.0%	0.0%	36.0%	56.0%
Replacement	30.0%	0.0%	68.0%	2.0%
Mouthpiece cleaning	18.0%	0.0%	60.0%	22.0%
Device cleaning methods	43.0%	21.0%	14.0%	22.0%

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	7.0%	0.00%	93.0%	0.0%	100%	0.000
	Primary	5.0%	0.00%	95.0%	0.0%	100%	
	Secondary	44.0%	0.00%	50.0%	7.0%	100%	
	Universal	42.0	0.00%	58.0%	0.0%	100%	
	Post University	100.0	0.00%	0.0%	0.0%	100%	
Dose inhalation steps	Illiterate	47.0%	40.0%	13.0%	0.00%	100%	0.203
	Primary	75.0%	20.0%	5.0%	0.00%	100%	
	Secondary	80.0%	17.0%	3.0%	0.00%	100%	
	Universal	88.0%	9.0%	3.0%	0.00%	100%	
	Post University	86.0%	14.0%	0.0%	0.00%	100%	
Steps follow dose inhalation	Illiterate	27.0%	26.0%	47.0%	0.00%	100%	0.033
	Primary	40.0%	25.0%	35.0%	0.00%	100%	
	Secondary	50.0%	43.0%	7.0%	0.00%	100%	
	Universal	46.0%	42.0%	12.0%	0.00%	100%	
	Post University	57.0%	43.0%	0.0%	0.00%	100%	
Storage of Meter Dose Inhaler Device	Illiterate	80.0%	7.0%	13.0%	0.00%	100%	0.297
	Primary	70.0%	5.0%	25.0%	0.00%	100%	
	Secondary	93.0%	0.0%	7.0%	0.00%	100%	

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	Universal	76.0%	12.0%	12.0%	0.00%	100%
	Post University	57.0%	14.0%	29.0%	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	20.0%	27.0%	13.0%	40.0%	100%	0.353
	Primary	25.0%	35.0%	15.0%	25.0%	100%	
	Secondary	47.0%	17.0%	16.0%	20.0%	100%	
	Universal	55.0%	15.0%	12.0%	18.0%	100%	
	Post University	72.0%	14.0%	14.0%	0.0%	100%	
Rinse of mouth after Puff	Illiterate	0.0%	0.00%	20.0%	80.0%	100%	0.242
	Primary	0.0%	0.00%	35.0%	65.0%	100%	
	Secondary	13.0%	0.00%	34.0%	53.0%	100%	
	Universal	12.0%	0.00%	46.0%	42.0%	100%	
	Post University	0.0%	0.00%	43.0%	57.0%	100%	
Replacing the Meter Dose Inhaler Device	Illiterate	0.0%	0.00%	93.0%	7.0%	100%	0.001
	Primary	10.0%	0.00%	90.0%	0.0%	100%	
	Secondary	33.0%	0.00%	67.0%	0.0%	100%	
	Universal	39.0%	0.00%	58.0%	3.0%	100%	
	Post University	86.0%	0.00%	14.0%	0.0%	100%	
Cleaning Mouthpiece	Illiterate	0.0%	0.00%	60.0%	40.0%	100%	0.001
	Primary	0.0%	0.00%	75.0%	25.0%	100%	
	Secondary	17.0%	0.00%	63.0%	20.0%	100%	
	Universal	27.0%	0.00%	55.0%	18.0%	100%	
	Post University	71.0%	0.00%	29.0%	0.0%	100%	

Fig. 1 Showed 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%) participants demonstrated correct during shake the inhaler, hold it on correct position and (78%) took 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 puff.

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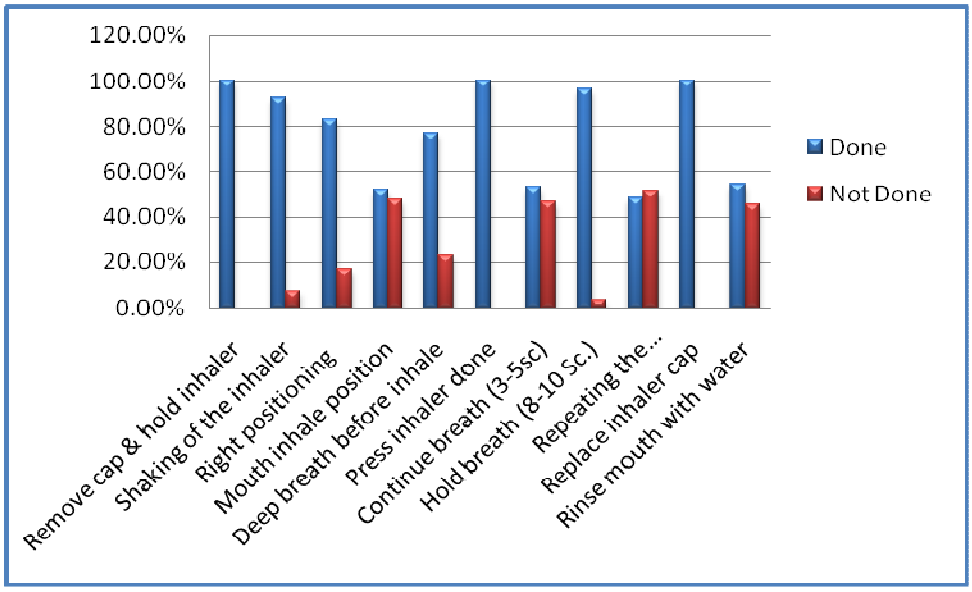

Fig. 1: Level of Participants Practice Regard Using Meter Dose Inhaler Device to Control Bronchial Asthma (n= 105)

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]. The study results reflected that more than fifty percent of the study populations were females and above of quarter of participants their age group between 36 to 45 years. Most of them are worker and educated. In addition to 44.0% of participants have asthma duration for 6 to 15 years (Table 1). This study was a similar to 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 participants have a very good knowledge about uses inhaler dose, care post inhalation, storage and cleaning the device. While more than half of them have moderate level of knowledge for preparing dose, replacing inhaler device and cleaning mouthpiece and 56% of participants have very poor knowledge about mouth rinse after puff (Table 2).

There was a highly significance difference between the level of knowledge and education; the post university level of education participants have highest level of knowledge about preparation, inhalation dose, replacing and cleaning mouthpiece of meter dose inhaler device P-values sequences are (0.000, 0.033, 0.001, 0.001), while statistically insignificance differences about steps of inhaler dose, storage, cleaning of meter inhaler device and rinse of mouth after puff; P values sequences are (0.203, 0.297, 0.353, 0.242) as showed on Tables (3a & 3b). So the education has positive effect on participants knowledge this agree with a study conducted at 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 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 have lower education.

On the other hand the study reflected that the majority off participants performed correct practice during removing cap, inhaler device press down and replace inhaler device cap, shaking inhaler device, right patient positioning, take deep breath before inhale and hold breath from 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). This agrees with study conducted in Khartoum at El-Shaab [5] 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

inhaler device. Also similar with 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 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 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 puff. In addition most of the participants had very good practice about the correct use of inhaler device, fewer of them participants had poor practicing about correct inhaler use; this reveals the discrepancy between knowledge and practice. Proper technique is necessary in order to achieve adequate delivery of meter dose inhaler to the lungs.

In the future must be constructed an education programs 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 patients admission or on their clinic visit at community or make propaganda through televisions and social media.

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