

Effect of Nursing Instructions for Asthmatic Patients on Local Side Effects of Inhaled Corticosteroids

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Abstract

Background: Asthma is a chronic respiratory disease characterized by recurrent attacks of breathlessness and wheezing which vary in severity and frequency from person to person. **Aim of the study:** To evaluate the effect of nursing instructions for asthmatic patients on minimizing local side effects of Inhaled Corticosteroids (ICS). **Research design:** Quasi experimental (pre – posttest) research design was utilized to conduct this study. **Setting:** The study was conducted at internal medical unit of Al-Badary Central Hospital, Assiut, Egypt. **Sample:** 90 males and females adult patients with asthma receiving ICS. **Tools of data collection:** **Tool (I)** Patient assessment sheet and **Tool (II)** Local side effects assessment sheet. **Results:** Most of the studied patients, (90.0%) had a poor level of knowledge about asthma. A significant decrease in local side effects of ICs; hoarseness, dysphonia, dry, sore throat, throat clearing, thirst, and dry cough, among the studied patients after implementation nursing instructions than before ($p < 0.01$). **Conclusion:** Implementation of the nursing instructions for asthmatic patients had a positive effect on minimizing the many local side effects of ICS as hoarseness, dysphonia, dry, sore throat, throat clearing, thirst, and dry cough. **Recommendation:** The booklet should be available for nursing team to increase their awareness and to provide patients with sufficient information for decreasing local side effects of ICS.

Keywords: Asthma, ICS, Local Side Effects & Nursing Instructions.

Introduction

Asthma affects an estimated 300 million individuals worldwide. It is a serious global health problem affecting all age groups, with increasing prevalence in many developing countries, rising treatment costs, and a rising burden for patients and the community. Asthma still imposes an unacceptable burden on health care systems, and on society through loss of productivity in the workplace and, especially for pediatric asthma, disruption to the family (WHO, 2020).

Asthma causes symptoms such as wheezing, shortness of breath, chest tightness and cough that vary over time in their occurrence, frequency and intensity. Risk factors for developing asthma are a combination of genetic predisposition with environmental exposure to inhaled substances and particles that may provoke allergic reactions or irritate the airways, such as indoor allergens (for example, house dust mites in bedding, carpets and stuffed furniture pollution and pet dander) outdoor allergens (such as pollens tobacco smoke, chemical irritants in the workplace, and air pollution) (GINA, 2020).

Corticosteroids are the first-line the mainstay treatment and the most effective treatment for asthma recommended by the Global Initiative Asthma Guidelines (GINA). ICS improve lung function and

quality of life, reducing asthma symptoms, disease progression, and related mortality (Kim et al., 2019).

ICS can cause local and systematic adverse effects. Systematic side effects are adrenal suppression, cataracts, fractures and diabetes, the systematic side effect depended on the amount of drug absorbed in to circulation. The common local side effects are from frequent use of ICS for longer period and high doses as hoarseness, dysphonia, dry, sore throat, throat clearing, candidiasis, sensation of the thirst, tongue hypertrophy, perioral dermatitis, pharyngitis, and dry cough (Hassen & Abo Haseba., 2016).

Nurses play a vital role in asthma management and perform a variety of vital functions in asthma care, including asthma education in the primary care setting and in hospitals. Nurses are at the front line of asthma management, and have the crucial role of early identification and management, also obtain information on how asthma affects patient's every day activities and self-concept, and educate patients about adverse effects result from use of ICS. It is the nurse duty to give correct and current information and remove barriers to care. Nurse has the responsibility to assess symptoms control, safe medication use and correct any information (Yousif et al., 2020).

Significance of the study

Prevalence of asthma in Egypt 6.7% (Tarraf et al., 2018) while the prevalence of asthma among

secondary school student In Assiut district was 8.7% (Sanousy et al., 2018). In El Badary Hospital, the average of asthmatic patients who admitted for treatment with inhaled corticosteroid was about 350 patients (El-Badarey Hospital information center record, 2016 -2018). From the researcher's clinical experience it has been observed that most asthmatic patients who treated with ICS complain from local side effects and they haven't enough knowledge to reduce those side effects so, this study was conducted to provide nursing instructions for asthmatic patients who treated with ICS to minimize their local side effects.

Aim of the study

To evaluate the effect of nursing instructions for asthmatic patients on minimizing local side effects of inhaled corticosteroids.

Patients & Methods

Research design

Quasi-experimental research (pre-post) one group test was used in this study.

Study variables

The independent variable in this study was the nursing instructions for asthmatic patients while the dependent variable was local side effects of inhaled corticosteroids.

Setting of the study

The study was conducted at internal medical unit of Al-Badary Central Hospital, Assiut, Egypt.

Study sample

A sample of 90 Asthmatic patients undergoing treatment with inhaled corticosteroids were included in this study. Their ages ranged between (18-65) years, from both sexes, and were willing to participate in this study.

Sample size

The sample was selected by using the following equation according to Steven K. Thompson (2012):

$$n = \frac{N \times p(1-p)}{\left[\left[N - 1 \times (d^2 \div z^2) \right] + p(1-p) \right]}$$

- N=total patient population size of 350 who treated with ICS at El-Badary hospital during years (2016-2018).
- Z = confidence levels is 0.95 and is equal to 1.96
- D= The error ratio is = 0.05
- P= The property availability ratio and neutral = 0.5

Tools of data collection

Two tools were utilized to collect pertinent data for this study:

Tool I: Patient assessment sheet

It was developed by the researcher based on literature review. This tool consisted of three parts:

(I) Patients' demographic characteristics: It was developed to assess demographic characteristics as age, sex, educational level, marital status, occupation, residence, and family history.

(II) Patient clinical data: It included asthma duration, ICS duration, presence of other chronic diseases, taking other medications and smoking.

(III) Patient's knowledge It was developed to assess patient knowledge about asthma, action of ICS, correct use of ICS, the local side effects of ICS, and dealing with local side effects of ICS.

Scoring system:

Total number questions of were 6 list questions, 2 grades awarded for the complete correct answer, 1 grade for the incomplete correct answer and zero for the incorrect answer. Total score was 12 degree.

Total knowledge score categorized in to 3 categories (onianwa et al, 2017).

- $\geq 75\%$ Good level
- 50% to 75% Fair level
- $<50\%$ Poor level.

Tool II: Local side effects assessment sheet:

It included 10 local side effects of ICS might occurred for asthmatic patient receiving ICS.

Scoring system

The researcher asked about the presence of each side effect of ICS. Each question has four responses from 1: 4

Never =1 Sometimes =2 Often =3 Always = 4

Developed nursing instructions for asthmatic patients:

The instructions were developed by the researcher after reviewing current national and international literature according to patients' needs. These instructions aimed to help in reducing local side effects of ICS. The developed nursing instructions consisted of three parts: First part involved knowledge about asthma, ICS and local side effects of ICS. Second part involved nursing instructions about how to prevent asthma attack and correct methods of using a spacer or holding device. The third part involved nursing instructions about prevention of local side effects of ICS by gargling with water and how to deal with each local side effects of ICS as nursing instructions for hoarseness, dysphonia, dry, sore throat, throat clearing, candidiasis, sensation of the thirst, tongue hypertrophy, perioral dermatitis, pharyngitis, and dry cough.

Methods

Ethical considerations

The study followed the common ethical guidelines of clinical research according to the principles of Helsinki Declaration, (1996) for medical research. The research proposal approved from

Ethical committee in the Faculty of Nursing, which included:

1. There was no risk for study subject during application of the research.
2. Oral consent was obtained from all patients who were participating in the study, after explaining the nature and purpose of the study.
3. Confidentiality and anonymity was assured.
4. Study subject had the right to refuse to participate and or withdraw from the study without any rational any time.
5. Study subject privacy was considered during collection of data.

Face validity

It was established by panel of five expertise (Medical and Nursing) who reviewed the tools for clarity, relevance, comprehensiveness, understanding, applicability and easiness for administrative, minor modifications were required.

Test reliability of the proposed tools were ascertained with cronbach's alpha = 0.88 and 0.76.

Pilot study

A pilot study was done on 10% (9 patients.) of the sample Test clarity and feasibility of the developed tools. Also, it provided an estimate of time needed to fill out the tools. There was no modification so the pilot study sample added to whole study sample.

Procedure

The study proceeded using the following phases:

Preparatory phase:

- An official approval to carry out the study obtained from the dean of Faculty of Nursing, Assiut University to the manger of El-Badary hospital.
- An official approval for data collection obtained from administrator of the El-Badary Hospital.
- The researcher met the selected patients; each patient was fully informed with the purpose and nature of this study and the informed consent was obtained from the patients. Base line data were collected by researcher using tools (I and II).

Implementation phase

- Data were collected during the period from January to July2019,
- The studied patients were given an educational colored booklet in clear Arabic language; which included nursing instructions for asthmatic patient in one session.
- Each session included 2 patients, and took about 40-60 minutes.
- The study was carried out daily except on Friday in the morning shift at medical department.
- At the end of the session, there was 5-10 min for discussion & feedback.

- The researcher used pictures, diagram, and role play to help them retain the learned material then give them a copy of the illustrated booklet.
- The researcher arranged with the patients the time and place for follow up after 6 weeks in the medical unit in El-Badary Hospital.
- The researcher ensured commitment of the patients to follow the nursing instructions weekly by telephone call once weekly.

Evaluation phase

- In this phase, the studied patients were reassessed after 6 week using (tool II) to evaluate the effect of implementing the nursing instructions on local side effects of ICS for asthmatic patients (presence and absence).
- The session took approximately 15 minutes in the previous mentioned setting.

Statistical design

Statistical analysis all the analyses were performed using SPSS (IBM version 22.0). To analyze the general data of subjects the researchers used the descriptive statistics and constituent ratio. For analyzing the occurrence side effects and patients knowledge scores the researchers utilized the Pearson chi-square and the paired t- tests. All p. values were two-tailed, and the significance level considered < 0.05.

Results**Part (I): Demographic characteristics of the studied patients.****Table (1): Frequency distribution of demographic characteristics of the studied patients (n=90).**

Demographic characteristics		N.	%
- Age	18<25	10	11.1
	25<35	12	13.3
	35<45	26	28.9
	45<55	19	21.1
	>55	23	25.6
	mean \pm SD	34.8 \pm 12.6	
- Sex	Male	50	55.6
	Female	40	44.4
- Level of Education	not educated	19	21.1
	read and write	22	24.4
	Primary	9	10.0
	Preparatory	10	11.1
	Secondary	8	8.9
	University	22	24.4
- Marital status	Single	10	11.1
	Married	63	70.0
	Divorced	1	1.1
	Widow	16	17.8
- Occupation	Not work	11	12.2
	Farmer	21	23.3
	Student	6	6.7
	Employee	15	16.7
	House wife	23	25.6
	Carpenter	8	8.9
	Painter	6	6.7
- Residence	Urban	35	38.9
	Rural	55	61.1
- Family History	Present	68	75.6
	Absence	22	24.4

Part (II): Clinical data of the studied patients.**Table (2): Frequency distribution of the studied patients according to their clinical data (n=90).**

Clinical data		N.	%
- Asthma duration	<5 years	54	60.0
	5<10 years	31	34.4
	>10 years	5	5.6
- mean \pm SD	5.93 \pm 3.1		
- ICS duration	1 year	54	60.0
	2 years	31	34.4
	3 years	5	5.6
- Mean \pm SD	5.92 \pm 3.3		
- Other medications	40	44.4	
- Smoking	41	45.6	

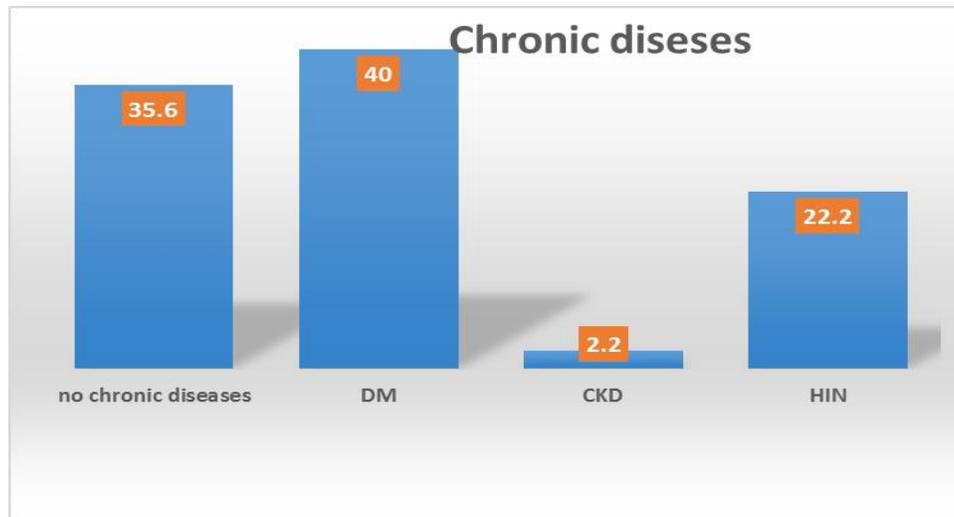


Figure (1): Frequency distribution of studied patients according to Chronic diseases (n=90).

Part (III): Patients' knowledge.

Table (3): Distributions of the studied patients according to their Knowledge about asthma (n=90).

Knowledge	Correct		In complete correct		In correct	
	N.	%	N.	%	N.	%
- Q1: Definition of asthma	2	2.2	50	55.6	38	42.2
- Q2: Risk factors of asthma	1	1.1	40	44.4	49	54.4
- Q3: Action of ICS	0	0.0	16	17.8	74	82.2
- Q4: Correct use of ICS	1	1.1	46	51.1	43	47.8
- Q5: Local side effects of ICS	1	1.1	40	44.4	49	54.4
- Q6: Deal with local side effects of ICS	0	0.0	20	22.2	70	77.8
- Total	mean ± SD			3.4 ± 2.2		

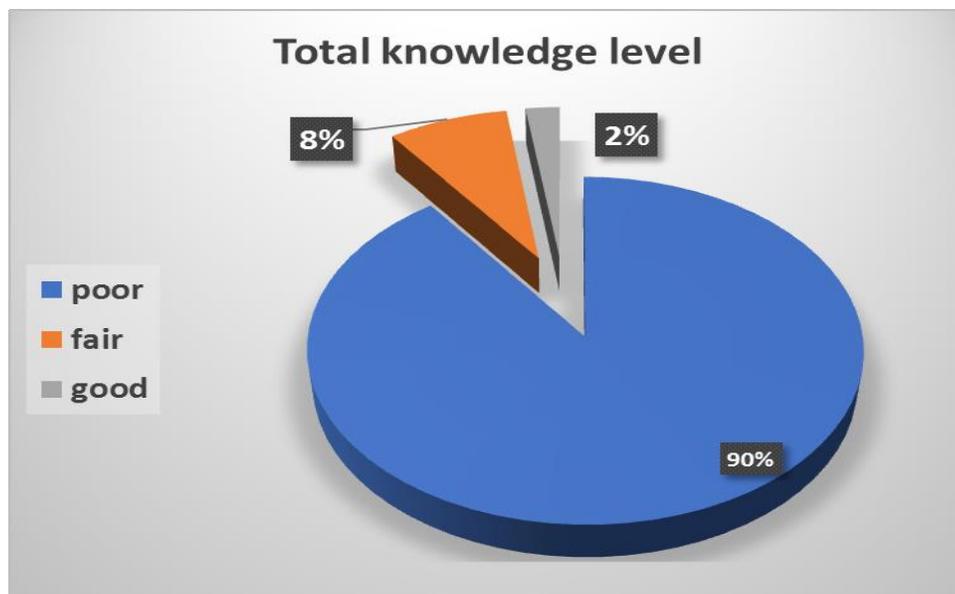
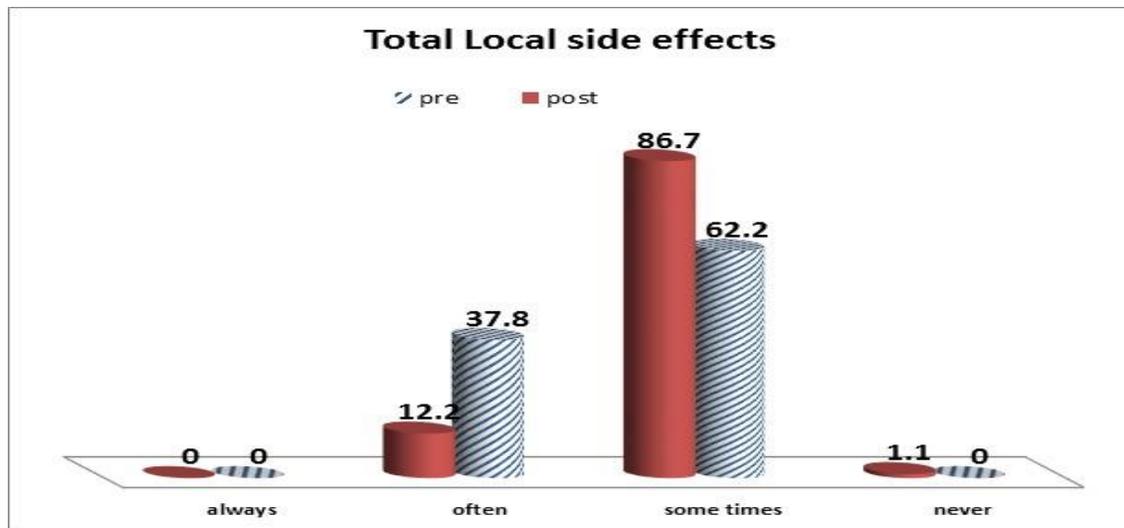


Figure (2): Frequency distribution of the studied patients according to their level of knowledge (n=90).



Part (IV) Local side effects of ICS

Figure (3): Comparison between local side effects of ICS pre and post application of the nursing instructions among the studied patient (n=90).

Table (4): Relationship between demographic characteristics and local side effects of ICs post nursing instructions implementation (n=90).

Demographic characteristics		Local side effect post test				P. value
		Never	Some times	Often	Always	
- Age group	18-25	0	9	1	0	0.001**
	25-35	0	11	1	0	
	35-45	0	16	10	0	
	45-55	0	13	6	0	
	>55	0	7	16	0	
- Sex	Male	0	31	19	0	0.568NS
	Female	0	25	15	0	
- Level of education	Not educated	0	8	11	0	0.066NS
	Read and write	0	11	11	0	
	Primary	0	5	4	0	
	Preparatory	0	8	2	0	
	Secondary	0	6	2	0	
	University	0	18	4	0	
- Marital status	Single	0	9	1	0	0.172NS
	Married	0	38	25	0	
	Divorced	0	1	0	0	
	Widow	0	8	8	0	
- Occupational status	Not work	0	8	3	0	0.676NS
	Farmer	0	11	10	0	
	Student	0	5	1	0	
	Employee	0	9	6	0	
	House wife	0	13	10	0	
	Carpenter	0	5	3	0	
	Painter	0	5	1	0	
Residence	Urban	0	28	17	0	0.586NS
	Rural	0	28	17	0	

Chi-square test

Ns: not significant $p. < 0.05$ **Significant $p. < 0.01$

Table (5): Relationship between local side effects of ICS and medical data of the studied patients post nursing instruction implementation (n=90).

Medical data		Local side effect post test				P. value
		Never	Some Times	Often	Always	
- Family history	Present	0	37	31	0	0.006**
- Other medication	Present	0	16	24	0	0.001**
- HIN	Present	0	6	14	0	0.0001**
- CKD	Present	0	1	1	0	0.615NS
- DM	Present	0	15	21	0	0.001**
- Smoking	Present	0	24	17	0	0.329 NS

Chi-square test Ns: not significant $p < 0.05$ **Significant $p < 0.01$ ***highly significant $p < 0.001$

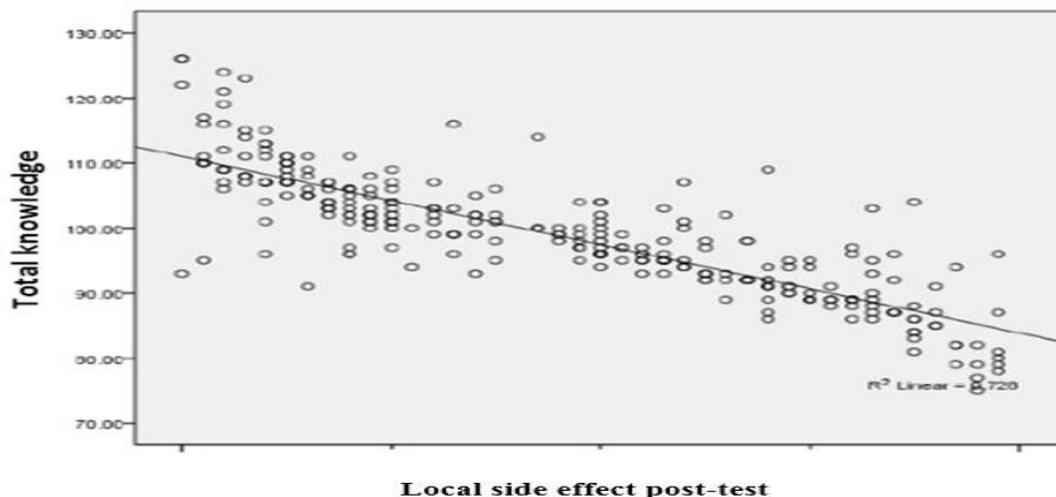
**Figure (4): Correlation between total knowledge score and their local side effects of ICs post implementing the nursing instruction among studied patients (n=90).**

Table (1): Shows that the mean age of studied patient's was (34.8 ± 12.6) . The highest percentage of them were male (55.6%), married, (70%), house wife (25.6 %), from Rural area and had a family history of asthma (75.6%).

Table (2): Reveals that the highest percentage of the studied sample (60%) suffered from asthma for less than 5 years and treated with for one year. Near half of patients taking other medications (44.4 %) and smoking (45.6%).

Figure (1): Shows that two fifth of the studied sample had diabetes mellitus. (40.0%), and one fifth (22.2%) had hypertension, while (35.6%) didn't suffer from any chronic diseases

Table (3): Shows that the highest percentage of studied patients their knowledge were incorrect regarding the action of ICS (82.2%), deal with local sides effect of ICS (77. 8%) and risk factor of asthma (54.4 %). The mean knowledge score of the studied sample was 3.4 ± 2.2

Figure (2): Shows that most of the studied patients, (90.0%) had a poor level of knowledge about asthma.

Figure (3): Significant decrease in the local side effects of ICs (hoarseness, dysphonia, dry, sore throat, throat clearing, thirst, and dry cough) among the studied patients after implementation the nursing instructions than before implementation ($p < 0.01$).

Table (4): Shows that there was no statistically significant difference between local side effects of ICS and demographic characteristics of the studied patient post nursing instruction implementation except age group ($p < 0.01$).

Table (5): Shows that there were statistically significant relations between local side effects and family history, taking other medication HIN and DM among the studied patients ($p < 0.001$).

Figure (4): There was no correlation between the total knowledge score and local side effects of ICS.

Discussion

ICS are widely used in asthma and chronic obstructive pulmonary disease (COPD), to improve symptoms. Local adverse effects of ICS include dysphonia, oral candidiasis, reflex cough, and

bronchospasm. These adverse effects are less common with low-dose ICS than with high-dose ICS (**Harper et al., 2019**).

Regarding demographic characteristics of the studied patients, the current study showed that the highest percentage of studied patients their age ranged between (35 to 45) years, more than half of them were males, This result agreed with **Dawood et al., (2019)** who reported that half of their studied participant were males, But these results disagreed with **Nafie et al., (2017)** who found that majority of studied patients were females. Regarding educational level, about half of studied patients were read and write and had university level of education this result agreed with: **Abd El-Wahab et al., (2016)** who reported that half of asthmatic patients had a university education level. But, **Yilmaz et al., (2016)** disagreed with these results and found that, more than half of the sample were graduated from primary schools.

The highest percentage of the study sample were, house wives and farmers which correlated with the nature of the rural areas, as they were mostly exposed to house dust mite, which agreed with **Tageldin et al., (2015)** who reported that less than half of female asthmatic patients were house wives and one fifth of asthmatic patients were farmers. Also, **Shamkuwar et al., (2015)** who reported that one third of asthmatic female patients were house wife but one third were retired.

The present study revealed that, more than half of study sample from rural area this result agreed with **Amin et al., (2019)** who showed that three quarters of their sample were from rural areas, But this result disagreed with **Sanousy et al., (2018)** who showed that higher prevalence rate of asthma was in urban regions than in rural residence.

Regarding clinical data, most of the studied patients of the current study had a family history of asthma this result agreed with **Ibrahim et al., (2019)** who showed that, near than half of the asthmatic studied patients had a family a history of bronchial asthma. Nevertheless, these results disagreed with **Elbanna et al., (2017)** who found that more than half of patients with asthma did not have a family history of bronchial asthma.

Regarding health history, the present study showed that the highest percentage of the studied patients were suffered from asthma for less than 5 years and use ICS for 1 year. This result agreed with **Baraka et al., (2020)** who reported that majority of patients had asthma duration that ranged from 2- 8years. However, these results disagree with **Bayomi et al., (2018)** who found that the duration of asthma and use ICS was more than ten years.

Regarding smoking, near half of patients with ICS were smokers, this result agreed with **Price et al., (2017)** who reported that near half of asthmatic patients were current or ex-smokers, however these results disagreed with, **Mohamed & Badran (2016)** who revealed that majority of the study participants with asthma had no smoking history.

Regarding chronic disease, the current study revealed that the two fifth of studied patients had DM and on fifth had hypertension this result supported by **Ahmed et al., (2020)** who demonstrated the highest percentage of the participant had diabetes. While, **Mabrouk et al., (2017)** found that more than one third of asthmatic patients were hypertensive.

Regarding patients knowledge most of studied patient's had a poor level of knowledge about asthma and ICS. From the researchers' point of view, this may be due to lack of provided knowledge given to this group of patients .Also, highest percentage of patient had low level of education. These had a great effect on their total level of knowledge. This result agreed with **Nguyen, et al., (2018)** who revealed that majority of the study participants with asthma their general knowledge about asthma and self-management of asthma were low.

Mohamed et al., (2020) agreed with the current study results they found that implementation of educational program had a positive effect on improving the asthmatic patients' knowledge, practices and self-management.

Regarding local side effects of ICS, the result of the present study showed significant decrease in local side effect of ICS (hoarseness, dysphonia, dry, sore throat, throat clearing, thirst, and dry cough) among the studied patients after implementation the nursing instruction than before implementation.

This result may be due to application of nursing instructions which helped in reducing the local side effects of ICS, as the nursing instruction included knowledge about the correct methods of using a spacer or holding device, prevention of local side effects of ICS by gargling with water to decrease drug depositions, and how to deal with each side effect. Also using pictures, diagram and role-play with discussion during teaching sessions helped the patients to retain the learned material in addition to follow up by the researchers through telephone to ensure the patients' compliance to implement the nursing instructions played an important role in reducing the local side effects of ICS.

In this regard, **Hashim et al., (2019)** stated that saltwater gargles can be an effective way to relieve discomfort from sore throat. Saltwater gargles are easy and cheap to make, Water temperature, as desired, lukewarm water or hot water. Also **Hassen & Abo Haseba, (2016)** reported that the asthmatic

patients were instructed to rinse their mouth with water after using ICSs to decrease the chance of having oral candidiasis. Congruent with the current study, **Yilmaz et al., (2016)** reported that asthmatic patients using ICS should be advised to rinse out their mouth with water, spitting out the rinse, and brush their teeth after using their device, which reduce the risk of developing a sore throat or hoarseness, in their study about the effect of a training program on oral health and behavior change in asthma patients.

In the same line, **Nikolaos et al., (2016)** concluded that rinsing the mouth and the oropharynx by gargling with water immediately after the use of inhaler to remove the locally deposited amount of steroid in the mucosa reduced the risk of developing a sore throat or hoarseness in their study about the new inhaled corticosteroids and voice problems.

Conclusions

Most of the studied patients had a poor level of knowledge about asthma. The nursing instructions for asthmatic patient had apposite effect on minimizing the local side effects of ICS.

Recommendation

The study recommended that Based on the results of the present study:

1. Patient should be provided with sufficient information about asthma and adverse effects result from use of ICS before discharge from the hospital.
2. Periodic monitoring of nurses, knowledge about asthma and ICS and practice to evaluate the level knowledge of nurses working in chest department.
3. Booklets should be available and distributed for nursing team to increase their level of knowledge and to provide patient with sufficient information for decreasing local side effects of ICS.
4. Replication of the study on a larger sample from different geographical area in Egypt.

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