

Evaluation of Self - Care Practices of Asthmatic Children at Suez Canal University Hospitals

Shaimaa Naeim AbdelRahman AbdelKhalek 1, Wafaa El-Sayed Ouda 2, Manal Farouk Mohamed 3*

(1) *Clinical Instructor, Technical Institute of Nursing, Suez Canal University, Ismailia, Egypt.*

(2) *Professor of Pediatric Nursing, Faculty of Nursing, Ain-Shams University, Cairo, Egypt.*

(3) *Associate Professor of Pediatric Nursing, Faculty of Nursing, Suez Canal University, Ismailia, Egypt*

Abstract

Background: Asthma is the most common chronic disease of childhood; it is a chronic inflammatory disorder of the airways characterized by recurrent reversible airway obstruction leads to airway hyper reactivity, which causes the airways to narrow. **Aim of the study:** to evaluate self-care practices of asthmatic children. **Research design:** A descriptive research design was used in the study. **Setting:** The study was conducted at pediatric Emergency Department and pediatric Outpatient Clinic at Suez Canal University Hospitals. **The study subjects:** included purposive sample of school aged children (40) with their accompanying mothers. **Tools for data collection:** Two tools were used; a structured interview questionnaire sheet, and observational checklists to assess studied children's knowledge and self-care practices regarding bronchial asthma. **Results:** The total mean score of satisfactory knowledge of studied asthmatic children was 11.3 ± 5.5 (71%) and the total mean score of satisfactory self -care practice of asthmatic children was 8.76% ($\bar{x} \pm SD 5.5 \pm 2.19$). **Conclusion:** The level of asthmatic children's knowledge was satisfactory but their self -care practices were unsatisfactory. **Recommendations:** Periodically assessment of factors affecting self- care practices for asthmatic children.

Keywords: Bronchial asthma – Knowledge- school aged children- self-care practices

1. Introduction

Bronchial asthma is a chronic inflammatory disease of the airway causing hyperresponsiveness, mucosal edema, and mucus production. This inflammation ultimately leads to recurrent episodes of asthma symptoms: cough, chest tightness, wheezing, and dyspnea. child with asthma

may experience symptoms free periods alternating with acute exacerbations that last from minutes to hours or day (**Hickman et al., 2018**).

Asthma affected an estimated 262 million people in 2019 and caused 461000 deaths and the primary cause of school absences, and the third leading cause of

hospitalization in children younger than 15 years old (WHO, 2021).

The underlying causes of childhood asthma aren't fully understood. A combination of complex and incompletely understood environmental and genetic interactions, these factors influence both its severity and its responsiveness to treatment (Zubair et al., 2018).

There are two types of asthma, an extrinsic (atopic) and intrinsic (non-atopic). Extrinsic asthma result from an inflammatory response of the airway caused by mast cell activation; Eosinophil infiltration and epithelial slugging. An attack is triggered by environmental allergen (dust, pollen, animal dander and foods). Intrinsic asthma is less common than extrinsic, making up about 10% of all asthmatics. Intrinsic asthma is defined by a lack of positive skin prick test (SPT) to common allergens and lack of circulating specific IgE. (Nagaraju, 2014).

The National Asthma Education and Prevention Program has classified asthma as intermittent, mild persistent, moderate persistent and severe persistent. These classifications are based on severity symptoms and lung function tests. Asthma is

considered intermittent if symptom occur on fewer than 2 days a week; do not interfere with normal activities. Nighttime symptoms occur on fewer than 2 days a month. Lung function tests (spirometry and peak expiratory flow [PEF]) are normal (John Pope and Elizabeth, 2018).

Mild persistent symptoms of bronchial asthma more than twice a week but less than once a day with night time. Symptoms three to four times a month, minor limitation to normal activities because of symptoms, peak expiratory flow rate or FEV1>80% predicted, and variability of peak expiratory flow rate or FEV1 20-030% (Des Jardins and Burton, 2016).

While moderate persistent characterized by daily symptoms and night time symptoms more than once a week but not daily, some limitation to normal activities because of symptoms, and peak expiratory flow rate or FEV1 60- 80% predicted, and variability of peak expiratory flow rate or FEV1> 30% (Everard et al., 2015).

Asthma is considered severe when there are continual daytime symptoms with frequent night time symptoms often daily, extreme limitation to normal activities

because of symptoms, poor to no control of symptoms, peak expiratory flow rate of FEV1 <60% predicted, and variability of peak flow rate or FEV1 > 30% (**Lessard et al., 2018**).

There's no cure for asthma in children, the main goals of asthma management are to optimize control of asthma symptoms and reduce the risk of asthma exacerbations, while minimizing medication adverse effects. There are two main types of asthma medications; **Quick-relief medications**; help with sudden symptoms and taken for fast help during an asthma attack. In addition to long acting medication to prevent airway inflammation and keep asthma under control (**Hansa, 2021**).

A child with well-controlled asthma should be able to participate in work, school, play, and sports without limitation due to breathing. The four essential components of asthma management are; pediatric patient education, control of asthma triggers, monitoring for changes in symptoms or lung function, and pharmacologic therapy (**Hockenberry et al., 2018**).

Nurses who are involved with children in home, clinic, or school play an important role

in helping children and their families learn to live with the condition and managing the disease effectively to avoid hospitalization or interference with family life, physical activity, and school attendance (**Mckinney et al., 2017**).

Self-care training is one of the important methods to promote health in children with asthma through active participation. Self-care thus consists of a variety of care activities to promote physical, mental and emotional health in order to maintain life and prevent disease (**Abdelkader, 2019**)

Significance of the study:

According to **Mohammed et al. (2020)**, the morbidity and mortality rates of asthma in childhood demonstrate an alarming increase in the prevalence of asthma and its complication. Moreover, bronchial asthma has become a leading reason for pediatric hospital admissions as the prevalence of asthma among school age children is 12.5%. Many studies on self-management for asthmatic children had significant impact on controlling their disease, so this study was conducted to evaluate self-care practices of studied asthmatic children.

The aim of the study:

Evaluate self-care practices of asthmatic children at Suez Canal University Hospitals.

Research questions

1. Is the knowledge level of studied asthmatic children regarding bronchial asthma satisfactory?
2. Is the level of self-care practices of studied children regarding bronchial asthma satisfactory?

2. Subject and Methods

Study design: A descriptive design was used in the study.

Study setting

The study was conducted at Pediatric Emergency Department and Pediatric Outpatient Clinic in Suez Canal University Hospitals.

The sample of the study:

A purposive sample of school aged children (40) with their accompanying mothers or caregiver who were selected from the previously mentioned settings within 6 months' period under the following **inclusion criteria**; Asthmatic children from both genders, their age ranged from 6-12 years, with confirmed diagnosis of bronchial asthma.

Exclusion criteria: children with cystic

fibrosis and other chest diseases, and free from other physical or mental diseases.

Tools of data collection:

Tool I: A structured interview questionnaire

It was developed by the researchers, based on scientific literature and included three parts:

Part one: Concerned with characteristics of the studied children, their mother's characteristic and housing condition

Part two: Child's knowledge related to bronchial asthma

Scoring system

The scoring system was developed by the researchers. each correct answer was scored 1 point and zero for uncorrected one. The total score was 59 (100%). The total score of child's knowledge was classified as follows: Satisfactory $\geq 50\%$ and Unsatisfactory $< 50\%$.

Part three: reported knowledge regarding self-care practices questionnaire to assess studied children reported self-care practices. It included safety measures to avoid asthmatic attack (10 items), hygiene care (4 items),

reported self-practices regarding medication (9 items), regular outpatient clinic follow up (4 Items).

Scoring system

The scoring system was developed by the researchers, Independent reported self-care practices was scored two points, partial independent reported self-care practices was scored one point and dependent reported self-care practices was scored zero point.

Tool (II): Observational checklists

Observational checklists were adopted from **GINA, (2016) and Abd El-Naeim et al. (2014)**, to evaluate children' actual self-care skills by direct observation individually regarding inhaler and nebulization procedure.

Scoring system

The scoring system was developed by the researchers each correct step that done completely took two points, done incompletely took one point and zero for not done or done incorrectly.

Studied children's self-care skills classified as; satisfactory if self-care skills more than 65 %, partial satisfactory if self-care skills 50-65 % and unsatisfactory if self-care skills < 50 %.

Validity of the study tools:

The study tools were tested for its face and content validity, comprehensiveness and applicability. Also, determine whether the included items were comprehensive, understandable, applicable, clear and suitable to achieve the aim of the study by 5 expertise from the Pediatric Nursing and Medicine Departments at Suez Canal University.

Reliability of the study tools:

It was done using Cronbach's alpha coefficient test to assess the internal consistency of the tools and its value was (0.86) for knowledge items (structured interview questionnaire), (0.91) for self -care practices items (observational checklists).

Pilot study

A pilot study was carried out after the development of the study tools before starting the data collection, including 10% of the sample size (4 children). It was carried out to check the validity, clarity and applicability of the study tools. Based on the results of the pilot study, the necessary modification was done namely, ambiguous items were omitted, other items were added and others were

modified and the final form was developed according to the subject's responses. The pilot study subjects were excluded from the study sample.

Fieldwork:

The study was carried out over three months during the period from the first of September 2019 to the end of November 2019. The researchers were available 4 days/week (Saturday, Monday, Wednesday and Thursday) from 9 am to 12 pm (modified according to the children and their mothers' readiness and time. The researchers interviewed the children and their mothers individually and in small groups according to their availability. The purpose of the study was explained briefly to children and obtained their consent. The researchers based on children condition within 30-40 minutes filled the tools of data collection.

Ethical considerations:

All ethical issues by Scientific Research Ethical Committee at Faculty of Nursing in Suez Canal University were taken into consideration during all phases of the study; the researchers maintained an anonymity and confidentiality of the subjects. The inclusion of children in the study was voluntary. The

aim of the study was explained to all mothers with their children before participation and obtained their informed consent and assent from studied children.

The children were notified that they could withdraw at any time the research; also, they assured that the information obtained during the study would be confidential and used for the research purpose only.

Statistical design:

The collected data was coded, organized, tabulated and analyzed using Statistical Package for the Social Sciences (SPSS version 20). The suitable statistical tests were used according to the type of data. Chi Square test (X^2) was used for categorical data. Correlations were used to test relationships between different variables. P value was set at <0.05 for significant results

The following statistical techniques were used:

- Percentage
- Mean score degree (\bar{x})
- Standard deviation (SD)
- Paired t test
- Proportion probability of error (P-value)

3. Results

Table (1) illustrates that more than half of

the studied children (62.5%) were males, most of them (85.0%) aged 6 - <9 years and 55.0% of them were the first child. Majority of them (90.0%) at primary school level.

Figure (1) shows that all of mothers were educated as 85% and 15% of them were secondary and university education respectively while 92.5% and 7.5% of mothers were housewives and employed respectively.

Table (2) shows that bronchial asthma was diagnosed among 90% of studied children at age less than 4 years. Great majority of them (97.5%) suffered of asthma since ≥ 3 years. Frequency of occurrence of asthma attack was every two weeks among 65% of them, while 60% of the studied children asthma attack occurs mainly at winter. Most of them (85.0%) admitted at hospital before and were absent from school due to asthma attack.

Table (3) shows that family members ranged from 5-6 among 72.5% of children's families and 55% of the studied children had family history for bronchial asthma; fathers, mothers and grandparents had bronchial asthma among 27.5%, 12.5 and 15% of the studied children respectively.

Table (4) reveals that, mean score of satisfactory knowledge regarding bronchial

asthma was 11.3 ± 5.5 with average percent (71). while children's knowledge regarding self-care practices to avoid asthma attack, personal hygiene, medication and outpatient clinic follow up were 1.23, 3.3, 0.8, 0.2 respectively.

Figure (2) shows that, the total satisfactory knowledge was 5% while total unsatisfactory knowledge was 95%.

Table (5) clarifies that mean score of satisfactory self-care skills of studied children related to the use of airbrush and nebulizer for asthma management was 0.58 ± 2.17 and 4.68 ± 2.9 respectively.

Figure (3) shows that, the total satisfactory level of self-care skills was 11.7% while total unsatisfactory level of self-care skills was 88.3%.

4. Discussion

Asthma is one of the most common chronic diseases in pediatric patient, it is more common in children than in adults. (**Boshra et al., 2019**).

The asthmatic children must follow certain self-care practices to achieve optimal control for asthma attack and prevent complications.

Self-care practices are activities that children can conduct by themselves or with the help of their parents. So, the asthmatic child needs to re-regulate nutrition, treatment and physical activity using drug and monitoring trigger factors to evaluate the outcome of self-care practices (**Hashim et al., 2022**).

Concerning the characteristics of the studied children, the present study revealed that the majority of studied children aged 6 - <9 years, and more than half of them were males. These findings agree with a study done by **Fouda et al. (2015)** entitled “Effect of Family Empowerment on the Quality of Life of School-Aged Children with Asthma Attending Pediatric Outpatient Clinics of Tanta University and El-Mehalla El-Koubra Chest Hospital” where the $\bar{x} \pm SD$ of the age of the children was 8.91 ± 2.52 and more than half of them were males. This is explained by **Fuseini and Newcomb (2017)**, who mentioned that males have an increased allergic inflammation and serum IgE. level compared to females. Males also have dysanapsis, smaller airway diameters relative to lung volumes compared to females, making males more likely to have asthma symptoms than males.

These findings are incongruent with those of **El-Morshedy (2014)**, who carried out a study entitled “Quality of Life for Children Suffering from Bronchial Asthma” and found that, more than one third of the studied children aged less than five years and more than half of them were females. These results might be due to the differences in the study setting and subjects.

Regarding to children’s mothers’ characteristics, the present study shows that most of studied children’s mothers were secondary educated and housewives. These findings in the same line of **Ebrahim et al. (2020)**, who carried out a study entitled “Nursing interventions for School Age Children with Bronchial Asthma in a Rural Area” and found that more than half of the mothers were secondary school and housewives.

These findings are incongruent with those of **Hassan et al. (2018)**, who conducted a study entitled “Discharge Plan for Mothers to Cope with their Children Suffering from Bronchial Asthma” and found that slightly less than half of mothers were highly educated and working. These results might be due to differences in the sample size and

study setting.

The present study finding showed that most of studied children begun asthma symptom at age less than 4 years, this nearly similar to **Hassan and Hagrass (2017)**, who found in their study about "Prevalence of Bronchial Asthma in Primary School Children" that approximately 70.2% of children with asthma begun symptoms before 2years age.

Moreover, the present study revealed that duration of illness for great majority of the studied asthmatic children was more than three years. This matching with **Kocaaslan and Akgün Kostak, (2019)**, Who found in their study about "Effect of Disease Management Education on the Quality of Life and Self-Efficacy Levels of Children with Asthma" that mean duration since disease diagnosis was 4.46 ± 2.38 years.

Current study findings illustrated that more than half of studied children had frequency of asthma attack every two weeks, this was incontrary with **Sommanus et al. (2022)**, who studied "Effects of an Asthma Education Camp Program on Quality of Life and Asthma Control among Thai Children with Asthma: A Quasi-Experimental Study" and

found that Most studied children had moderate persistent asthma followed by mild persistent asthma. Theses might be due to differences in sample size.

In relation to the family history of asthma, the current study illustrated that slightly more than half of the studied children have a familial positive history of asthma from father and grandparents. This result was similar to **Fouda et al. (2015) and Boshra et al. (2019)**, who conducted study on " Prevalence of Bronchial Asthma in primary School Students in Assiut " and found that there was a significant association between the presence of bronchial asthma and positive family history of asthmatic children (P value = 0.001).

Regarding the studied children's total mean score knowledge level about bronchial asthma. The results showed that nearly all the studied children had unsatisfactory level of knowledge. These findings supported by **Eissa et al. (2020)**, who studied " Outcome of An Educational Program on Bronchial Asthma Self-Management" and reported that there was a significant difference between pre and post program ($P < 0.001$) as knowledge of the studied sample increased from 27.8% to

77.3 %.

Regarding total knowledge of reported self-care practices of studied children about bronchial asthma, the current study reported that great majority of the studied children had unsatisfactory total level of reported self-care practices. These findings supported by **Kocaaslan and Akgün Kostak (2019)**, Who stated that there were statistically significant differences between children's ability to independently use asthma medications and daily activities pre and post the educational intervention program.

Considering children's total mean score self-care skills in using inhaler treatment the present study revealed that the majority of studied children had unsatisfactory level, as 47% of them can use only nebulizer. This result agreed with **Eissa et al. (2020)**, who reported that 41.2% of studied sample had good technique for inhaler treatment.

These findings could be explained due to the majority of the children expressed their

needs for training courses regarding asthma self-care practices to improve their information and practical skills because they not have enough information about asthma self-care practice before.

5.Conclusion:

In the light of the study finding, it can be concluded that, the level of asthmatic children's knowledge was satisfactory but their self -care practices were unsatisfactory.

6.Recommendations:

- Continuous assessment of asthmatic children's self- care practices.
- Further researches are required involving larger study sample of children suffering from bronchial asthma in order to generalize the results.
- Developing educational intervention program for improving self-care practices of asthmatic children

Table (1): Distribution of the studied children according to their characteristics (n=40)

| Children's characteristics | No. | % |
|-------------------------------|-----------|-------------|
| Gender | | |
| Male | 25 | 62.5 |
| Female | 15 | 37.5 |
| Age (in years): | | |
| 6 - <9 | 34 | 85.0 |
| 9 - ≤12 | 6 | 15.0 |
| $\bar{x} \pm SD$ | 7.55±1.56 | |
| Child Ranking: | | |
| First | 22 | 55.0 |
| Second | 14 | 35.0 |
| Third | 4 | 10.0 |
| Children' school level | | |
| Primary | 36 | 90.0 |
| Preparatory | 4 | 10.0 |

Figure (1): Percentage distribution of the studied children's mothers according to their characteristics.

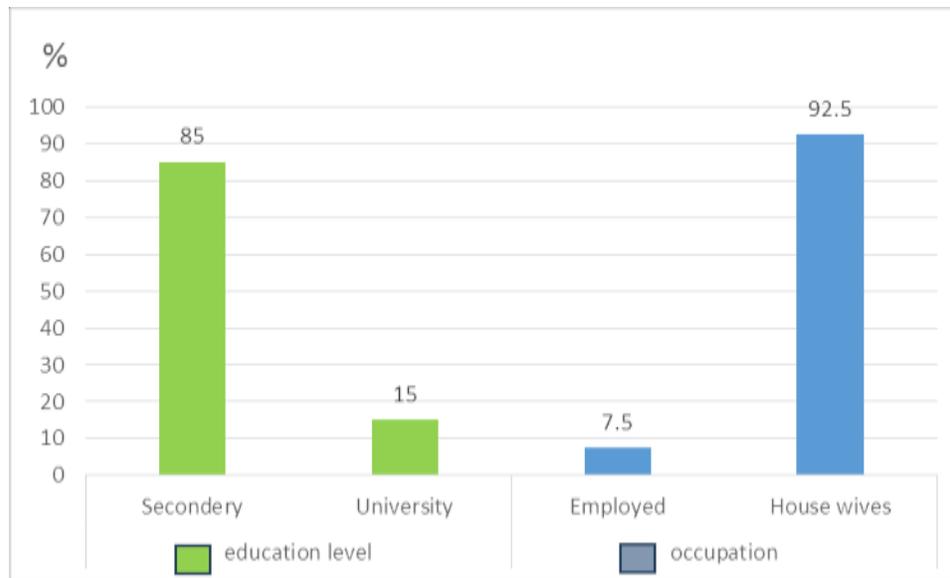


Table (2): of the studied children according to history of their bronchial asthma (n=40)

| Variables | No. | % |
|--|-----------|-------------|
| Child's age when symptoms of asthma appear in years | | |
| <4 | 36 | 90 |
| ≥4 | 4 | 10 |
| Duration of the child's asthma in years | | |
| <3 | 1 | 2.5 |
| ≥3 | 39 | 97.5 |
| Frequency of occurrence of asthma attack | | |
| Two weeks | 26 | 65.0 |
| One month | 12 | 30.0 |
| Once at two months | 2 | 5.0 |
| Timing of asthma attack occurs | | |
| At night | 6 | 15.0 |
| Any time | 34 | 85.0 |
| Seasons of asthma attack occurs | | |
| Winter | 24 | 60.0 |
| Winter and spring | 16 | 40.0 |
| Previous hospitalization for child due to asthma attack | | |
| Yes | 34 | 85.0 |
| No | 6 | 15.0 |
| Number of previous hospitalization (n= 34) | | |
| Once | 23 | 57.5 |
| Twice | 8 | 20.0 |
| Thrice | 3 | 7.5 |

Table (3) Distribution of the studied children according to their family history of bronchial asthma (n=40)

| Variables | No. | % |
|--|-----|-------------|
| Family members | | |
| 3-4 | 9 | 22.5 |
| 5-6 | 29 | 72.5 |
| > 6 | 2 | 5.0 |
| Family history of bronchial asthma: | | |
| Yes | 22 | 55.0 |
| No | 18 | 45.0 |
| Family member's affected: | | |
| Father | 11 | 27.5 |
| Mother | 5 | 12.5 |
| Grand parents | 6 | 15.0 |

Table (4) Distribution of the studied children's total mean score satisfactory knowledge level about bronchial asthma (n=40)

| Items | $\bar{x} \pm SD$ | Average percent % |
|--|------------------|-------------------|
| Total studied children's knowledge regarding bronchial asthma | 11.3 \pm 5.5 | 71 % |
| Total studied children's reported knowledge regarding self-care practices for bronchial asthma: | | |
| Practices to avoid bronchial asthma attack | 1.23 \pm 1.23 | 12 % |
| Practices for personal hygiene | 3.3 \pm 0.9 | 75 % |
| Practices for medication | 0.8 \pm 0.27 | 0 % |
| Practices for outpatient clinic follow up | 0.2 \pm 0.40 | 20 % |

Figure (2): Percentage distribution of the studied children's total satisfactory knowledge regarding bronchial asthma

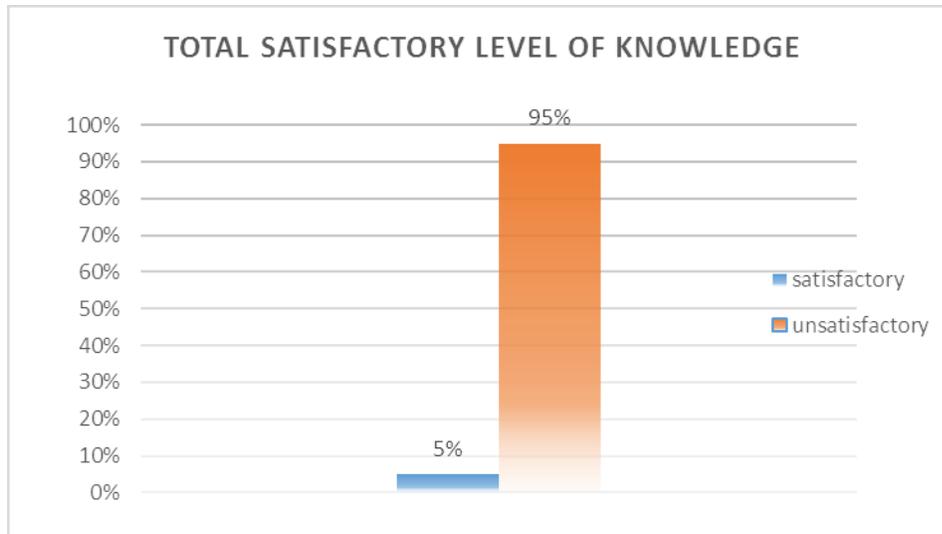
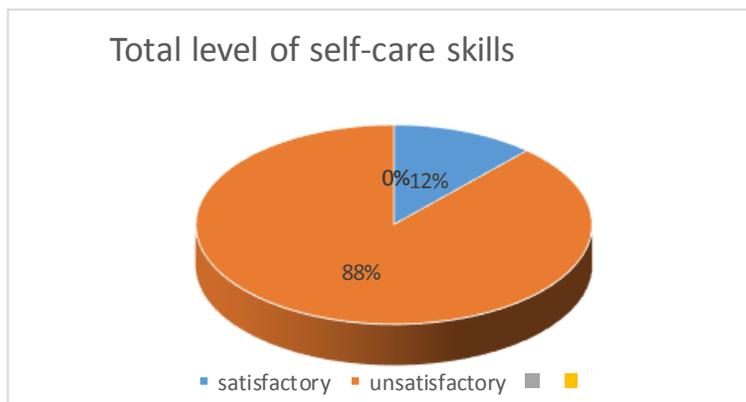


Table (5) Distribution of the studied children’s satisfactory self-care skills level about bronchial asthma (n= 40)

| Items | $\bar{x} \pm SD$ | Average percent % |
|---|------------------|-------------------|
| Self-care skills for usage of airbrush | 0.58 ± 2.17 | 0% |
| Self-care skills for usage of nebulizer | 4.68 ± 2.9 | 47% |

Figure (3) Percentage distribution of the studied children's total self -care skills



7. References

- Abd El-Naeim E., Ibrahim I., and Amin M. (2014):** Discharge Plan for School Aged Children having Bronchial Asthma. (unpublished doctorate thesis), faculty of Nursing, Ain Sham university, Pp:72-80.
- Abdelkader R. (2019):** Self-Care Behavior Assessment of Fragile School-Age Children: An Application of Orem's Self-Care Framework. *Global Journal of Health Science*, 11(2): 1-11.
- Boshra M., Ahmed M., and Raafat D. (2019):** Prevalence of Bronchial Asthma in Primary School Students in Assiut. *Journal of Current Medical Research and Practice*, 4(1): 77.
- Des Jardins T., and Burton G. (2019):** Clinical Manifestations & Assessment of Respiratory Disease E-Book, Asthma, 8th ed, Elsevier Health Sciences, Canada. Pp:218-241
- Ebrahim N., Soliman N., and Mohamed O. (2020):** Nursing interventions for School Age Children with Bronchial Asthma in a Rural Area. *Egyptian Journal of Health Care*, 11(3): 196-207.
- Eissa H., Farahat T., Hegazy N., and Barakat A. (2020):** Outcome of An Educational Program on Bronchial Asthma Self-Management. *The Egyptian Journal of Hospital Medicine*, 81(3): 1699-1703.
- El-Morshedy, S. (2014).** Quality of Life for Children Suffering From Bronchial Asthma. Unpublished master thesis, Faculty of Nursing, Ain Shams University, Pp:86.
- Everard M., Wahn U., Dorsano S., Hossny E., and Le Souef P. (2015):** Asthma Education Material for Children and Their Families; a Global Survey of Current Resources. *World Allergy Organization Journal*, 8(1): 1.
- Fouda M., El-Zeftawy A., and Khalil M. (2015):** Effect of Family Empowerment on the Quality of Life of School-aged Children with Asthma Attending Pediatric Outpatient Clinics of Tanta University and E l-Mehalla El-Koubra Chest Hospital. *IJAR*, 3(4): 346-360.
- Fuseini H., and Newcomb D. (2017):** Mechanisms Driving Gender Differences in Asthma. *Current allergy and asthma reports*, 17(3): 1-9.

Global Initiative for asthma (GINA), (2016): Global Strategy for Asthma Management and Prevention. Available at www.Ginasthma.org. Accessed at: 28/12/2019.

Hansa D. (2021): Childhood Asthma. Available at <https://www.webmd.com/asthma/children-asthma>. Accessed at 15/12/2021.

Hashim H., Ismail A., Abd Elraouf M., Saber M., and Hassan H. (2022): Knowledge and Self-Care Management Practice Among Asthmatic Children (6-12 Years): An Educational Intervention Study. *The Egyptian Journal of Hospital Medicine*, 88(1): 2599-2605.

Hassan S., Esmat O., and Mohamed H. (2018): Discharge Plan for Mothers to Cope with their children suffering from Bronchial Asthma. *IOSR Journal of Nursing and Health Science*, 7(2): 24.

Hassan A., and Hagrass S. (2017): Prevalence of Bronchial Asthma in Primary School Children. *American Journal of Medicine and Medical Sciences*, 7(2): 67-73.

Hickman R., Alfes C., and Fitzpatrick J. (2018): Handbook of Clinical Nursing:

Medical-surgical Nursing, Springer, USA, Pp:48-51.

Hockenberry M., and Wilson D. and Rodgers C (2018): Wong's nursing care of infants and children-E-book, The child with respiratory dysfunction, In; Patricia C (eds), 11th ed, Elsevier Health Sciences, Canada, Pp:924-939.

John Pope A., and Elizabeth T. (2018): Classification of Asthma. Retrieved from <https://www.uofmhealth.org/health-library/hw161158>. Accessed at 4/11/2019.

Kocaaslan E. and Akgün Kostak M. (2019). Effect of Disease Management Education on the Quality of Life and Self- Efficacy levels of Children with Asthma. *Journal for Specialists in Pediatric Nursing*, 24(2): e12241.

Lessard D., Trivedi M., Patel J., Kremer T., Byatt N., Phipatanakul W., Pbert L., and Goldberg R. (2018): School Nurse Asthma Program Reduces Healthcare Utilization in Children with Persistent Asthma. *Journal of Asthma*, 55(10): 1131-1137.

McKinney E., James S., Murray S., Nelson K., and Ashwill J. (2017): Maternal-child

nursing-e-book, 6th ed, Elsevier Health Sciences, Canada, Pp:1152-1162.

Mohammed M., Abdel-Akher A., Shokry D., and Elnaggar S. (2020): Prevalence of Bronchial Asthma among School Aged Children in Elmaraghah Center in Sohag Governorate. *The Medical Journal of Cairo University*, 88(15): 1097-1101.

Nagaraju K. (2014): Manual of pediatric Allergy., Jaypee brothers medical, london, Pp:112-118.

Sommanus S., Sitcharungsi R., and Lawpoolsri S. (2022): Effects of an Asthma Education Camp Program on Quality of Life

and Asthma Control among Thai Children with Asthma: A Quasi-Experimental Study. *In Healthcare*, 10 (8) :1561.

WHO. (2021): available at <https://www.who.int/news-room/fact-sheets/detail/asthma>. Accessed at 15/12/2021.

Zubair M., Kumar M., Khan M., Sehgal S., Jaithliya T., and Tiwari A. (2018): Asthma: an Overview. *European Journal of Biomedical*, 5(5): 919-924.