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Mothers' health education to prevent Coronavirus in their children have Bronchial Asthma

Samah Abdallah Mohamed Amer[1], Nadia Medany Helaly Mohamed[2] , Fatma Ahmed Elsobkey[3]

1Assistant Professor of Pediatric Nursing, Faculty of Nursing-Benha University.
2Assistant Professor of Pediatric Nursing, Faculty of Nursing-Alexandria University.
3Assistant Professor of Pediatric Nursing, Affiliation 1 Faculty of Nursing-Benha University, Affiliation 2 Al-riyada College for Health Science

Abstract
Background: *The most common chronic lung disease in childrenis bronchial asthma.* ***Aim:*** *To evaluate effect of mothers' health education to prevent coronavirus in children with bronchial asthma.* ***Design:*** *A quasi-experimental design was utilized.* ***Setting:*** *The study was conducted at Outpatient Clinic of Benha University Hospital, Benha Teaching Hospital, and Benha Specialized Pediatric Hospital.* ***Sample:*** *A convenience sample of 80 mothers and their children have asthma.* ***Tools of data collection:*** *structured interview sheet; baseline characteristics of mothers and children, mothers' knowledge regarding bronchial asthma questionnaire.* ***Result:*** *the result of the present study revealed that mothers had satisfactory knowledge, and practiceafter health education implantation.****Conclusion:*** *Health education was effective and help mothers to prevent coronavirus among their children with bronchial asthma.* ***Recommendation:*** *continuous health education should be implemented for mothers to prevent coronavirus in children with bronchial asthma.*
Keywords: *health education, bronchial asthma, coronavirus*

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I. Introduction:

Asthma is the most common chronic disease in childhood and affects an estimated 300 million individuals worldwide (National Institute of health,2018). Asthma is a chronic inflammation of airways in the program lungs. The inflammation makes the airways vulnerable to episodes of difficult breathing (asthma attacks). Common triggers include allergies, colds, and exercise. Asthma is managed by controlling inflammation with drugs, avoiding triggers when possible and using medications to treat asthma attacks (Mayo Clinic Staff,2021).

According to the 2019 Global Initiative for Asthma (GINA), asthma is "a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness, and cough that vary over time and in intensity, together with variable airflow limitation." Chronic inflammation is associated with airway hyperresponsiveness and recurrent symptoms that are often worse at night or early in the morning. Variable airflow limitation is caused by bronchial smooth muscle contraction, mucosal edema, and formation of "mucus plugs" (Byrne, et al, 2019).

In early 2020, after a December 2019 outbreak in China, the World Health Organization identified SARS-CoV-2 as a new type of coronavirus. The outbreak quickly spread around the world. A coronavirus is a kind of common virus that causes an infection in your nose, sinuses, or upper throat **(WebMD, 2021).**

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus.Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow). The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol-based rub frequently and not touching your face (World Health Organization, 2020).

According to the American Academy of Pediatrics children represent about 12% of all COVID-19 cases. Research suggests that children younger than ages 10 to 14 are less likely to become infected with the

virus that causes COVID-19 compared to people age 20 and older. Hospitalization rates for children are also much lower than for adults. However, if children are hospitalized, they need to be treated in the intensive care unit as often as hospitalized adults, according to research from the Centers for Disease Control and Prevention (CDC, 2021).

In addition, children chronic, such as diabetes and asthma, are at higher risk of serious illness with COVID-19. Children who have congenital heart disease, genetic conditions or conditions affecting the nervous system or metabolism are also at higher risk of serious illness with COVID-19(Mayo Clinic Staff, 2021).

Child with asthma, the COVID-19 pandemic may be causing some additional concern and worry. The Centers for Disease Control and Prevention (CDC) states that patients with moderate to severe asthma could be at greater risk for more severe disease. COVID-19 can affect the respiratory tract, cause an asthma attack, and possibly lead to pneumonia and respiratory disease (Texas children Hospital, 2020).

It is very important to control asthma especially in spread of coronavirus. The main goal is to control asthma to avoid asthma attack and preventingthe child for needing emergency care. Children having asthma should take adequate precaution of their optimal health.which includes physical distancing from people outside their households, isolating from people with symptoms, and avoiding asthma triggers. It is a good idea for children' mothers with asthma to make sure they have asthma medicines at home and to call for refills when the inhaler is getting close to empty (Owusu-Ansah, 2020).

It is vital for mothers to learn how identify asthma triggers and take steps to avoid them. Asthma cannot be cured, but with appropriate treatment it is usually possible to achieve and maintain good asthma control. Education consists of information about the diagnosis and nature of the disease, available treatments, drug inhalation techniques, measures used to reduce exposure to the factors triggering asthma attacks and exacerbations and monitoring of disease control. Patients should have a personal written asthma action plan covering controller treatment and measures to be taken in case of exacerbations (Byrne, et al, 2019).

Moreover, mothers should inform about preventing measures that include Avoiding asthma triggers such as tobacco smoke, respiratory infections, dust mites. Encouraging the child to wash hands often with soap and water or by using an alcohol-based hand sanitizer. Avoiding crowds and contact with sick persons or have any infection (Texas children Hospital, 2020).

Significance of the Study:

The Center of Disease Control and Prevention stated that persons have chronic lung disease include asthma and allergies are at high risk for developing coronavirus than healthy persons. Therefore, the study conducted to prevent coronavirus in children have asthma.Asthma is the third leading cause of hospitalization among children under the age of 15**(**American Lung Association, 2020). Asthma mortality rates are higher in lower and lower-middle income countries, it has been accepted as a major public health problem in all countries. The goal of treatment of asthma is to control the disease with minimal drug and to reach an appropriate quality of life for patients. Asthma control has two main goals the first one is clinical control and the second one is limitation or reduction of future risk of adverse outcomes. Actions to reach both objectives must be taken concurrently for a successful control. In the case of children, the disease control should lead to the absence of symptoms in the performance of a normal life without limitation (at school, in recreation, sport), standardization of lung functions, allowing a good development height and weight, and of course to prevent mortality caused by the disease, which unfortunately still exists.

It is very important to prevent lung infection in children with asthma therefore; education regarding coronavirus for mothers having children with asthma is more necessary to avoid further complication.However, there is insufficiency of information regarding coronavirus. The aim of the study was to provide mothers with efficient education to prevent coronavirus.

Aim of the Study:

The study aim was to evaluate the effect of mothers' health education to prevent coronavirus in their children have Bronchial Asthma.

Research Hypotheses:

The study results were testing the following hypotheses: Mothers who received health education will have higher mean score of knowledge and practice to prevent coronavirus in their children have Bronchial Asthma.

Subjects and Method:

Research Design: A quasi- experimental research design was utilized to conduct the current study.

Setting: The study carried out in the outpatient Clinic of Benha University Hospital, Benha Teaching Hospital and Benha Specialized Pediatric Hospital, which Affiliated to the Ministry of Health.

Sample:
None probability convenience sample was used to collect the data from (80) mothers and their children the samples were collected from previous setting.

Tools of Data Collection:

Tool I:
Structured questionnaires were used to collect the data. The questionnaires were designed by the researcher after reviewing related literature consisted of five parts: Part 1: characteristics of the studied children as age and gender Part 2: characteristics of the study.
Part 1: characteristics of the studied children as age, sex, and birth order.
Part 2: characteristics of the studied mothers as age, educational level, occupation, and residence.
Part 3: mothers' knowledge related to asthma: general knowledge of asthma.
Part 3: Children asthma questionnaire: that include question about asthma attack, asthma triggers, and treatment.

Tool II: Asthma control questionnaire: developed by **(Juniper, et al, 1999).** To measure asthma control as defined by international guidelines; namely, that the goal of management should be to minimize asthma symptoms(nighttime waking, symptoms on waking, activity limitations, shortness of breath, and wheezing) in the past week and to respond to 6 questions on a 7-point scaleand about the frequency of using short-acting beta2 agonists. The seventh item is the percent-of-predicted FEV1 before bronchodilator, which is recorded by a clinician. The ACQ score is the mean of the 7 items, which gives all items equal weight. An ACQ score has a range from 0 (totally controlled) to 6 (severely uncontrolled). frequency of using short-acting beta2 agonists. The seventh item is the percent-of-predicted FEV1 before bronchodilator, which is recorded by a clinician. The ACQ score is the mean of the 7 items, which gives all items equal weight. An ACQ score has a range from 0 (totally controlled) to 6 (severely uncontrolled).

Tool III: Child asthma checklist for practice: This checklist was developed by **Asthma & Allergy Foundation of America New England Chapter**, includes items that help in caring of asthma as avoiding or Controlling Allergens dust mites, avoiding or controlling irritants tobacco smoke: (triggers asthma symptoms; causes children to have more respiratory and ear infections, and to need more asthma medication, practices asthma management care, and cleaning and maintenance.

Scoring for performance: Each step was assigned to two score levels, which are: done was scored (2), and not done scored (1). The total score was categorized into either competent (from 70% and more) or incompetent (less than 70%)

Tool IV: Mothers' knowledge and practice regarding COVID-19: Developed by researcher with simple Arabic language that include question about ways of spread coronavirus, protection, and prevention of the virus.

Validity and reliability of study tools:
Content validity was ascertained by a group of experts (5) including3 Pediatric Nursing, 2 Physiotherapy. Their opinions were stimulated regarding to the tools format layout, consistency, scoring system. The tools content was verified regarding to the knowledge accuracy, relevance and competence. Reliability of all items of the tools were done. The reliability test of was established by using the Cronbach alpha to assess internal consistency construct validity. Cronbach alpha r= 0.86 and 0.84.

Administrative design:
An official approval was obtained from the administrators of the study settings to carry out the study. A clear explanation was given about the aim, nature, importance, and expected outcomes of the study. Pilot study: A pilot study was conducted on 10% of the total study subjects(8mothers) to test the clarity and practicability of the tools, and suitability of the setting. The pilot study sample is then excluded from the main study sample as there were no modifications on the tools.

Ethical considerations:
Approval to conduct the study was obtained from the director of the previous selected setting. All mothers who agreed to participate and were informed about the study aim and their rights according to research ethics to participate or not in the study. Then, they gave their consent to participate in the study.

Field work:
The study was carried out from beginning of July2020 to the end of September 2020, covering a period of 3 months. Official approvals and letters to conduct this study were obtained from the Dean of Faculty of Nursing to Director of Benha University Hospital, Benha Teaching Hospital and Benha Specialized Hospital. To fulfill the aim of the current study the health education was constructed in four phases: interviewing and assessment, planning, implementation, and evaluation.

Health Education related to coronavirus:
The health education was designed by the researcher after extensive review of related literature.

The first part of the health education was conducted in outpatient clinic. It focused on gave the mothers description about coronavirus, assessed her knowledge, and practice about coronavirus.

The second part of the health education involved provision of health education activities, provided by the researcher included a half-hour session with each mother. Post follow-up care after 4weeks post-visit of each child during each follow-up to reinforce the mother's knowledge, and practice which provided during first part of the program.

Assessment Phase:

This phase encompassed interviewing the participant to collect baseline data, at the beginning of the interview the researchers greeted the participation, introduced herself to each participant included in the study, explained all information about the study purpose, duration, and activities and taken oral consent. The average time for the completion of each participant interview was around (30-45minutes). Average number collected was 10 participant/day. The total sample was divided into 8 groups according to their hospital then every hospital group divided into subgroups included 5 participants for each session.

Planning Phase: Based on the results obtained from the assessment phase and relevant review of literature, a booklet about coronavirus health education was designed by the researchers. This was prepared in simple Arabic language to suit mothers' level of understanding and distributed to all recruited mothers. As well as different methods of teaching and instructional media were determined.

Implementation Phase:

The researchers visited the previously mentioned settings five days/week (Sunday and Wednesday) in the University hospital; (Monday and Tuesday) in the Specialized hospitals and (Saturday) in Teaching Hospital, from 11.00 Am to 2.00 Pm. The average time consumed to fill in the tools was 30-45 minutes. The health education was conducted in 4 sessions each session took approximately 30 to 45 minutes, during this time the mothers were able to provide interventions that included all knowledge and practice regarding coronavirus. The health education included illustrated Arabic booklet involve instructions to improve mothers' knowledge, and practice regarding coronavirus, and the posttest done after four weeks from the health education implementation. The theoretical part of the educational guideline was presented in three sessions in the form of lectures/discussions, followed by the practical part which consisted of two sessions in the form of demonstration and redemonstration using role play, simulator, real objects, discussions, and brainstorming. The researchers used effective media of conveying information as, power point presentations and posters. A guideline handout was developed and offered for mothers as a reference to be used after guideline implementation.

Evaluation Phase:

The mothers' knowledge and practice was evaluated after 1 month from implementation of health education used tool 1 (part 3), tool III, and tool IV. The researcher evaluated and compared the effect of health education on mothers' knowledge, and practice pre and after 1 month.

Table (1): Number and Percentage distribution of children according to socio-demographic characteristics

Items	N	%
Age:		
3 < 6 years	10	10.4
6- < 9 years	31	38.8
9 – 12 years	39	48.8
Mean ±SD	8.950 ± 2.42	
Sex:		
Male	51	63.8
Female	29	36.2
Birth order:		
First	15	18.8
Second	37	46.2
Third	28	35.0

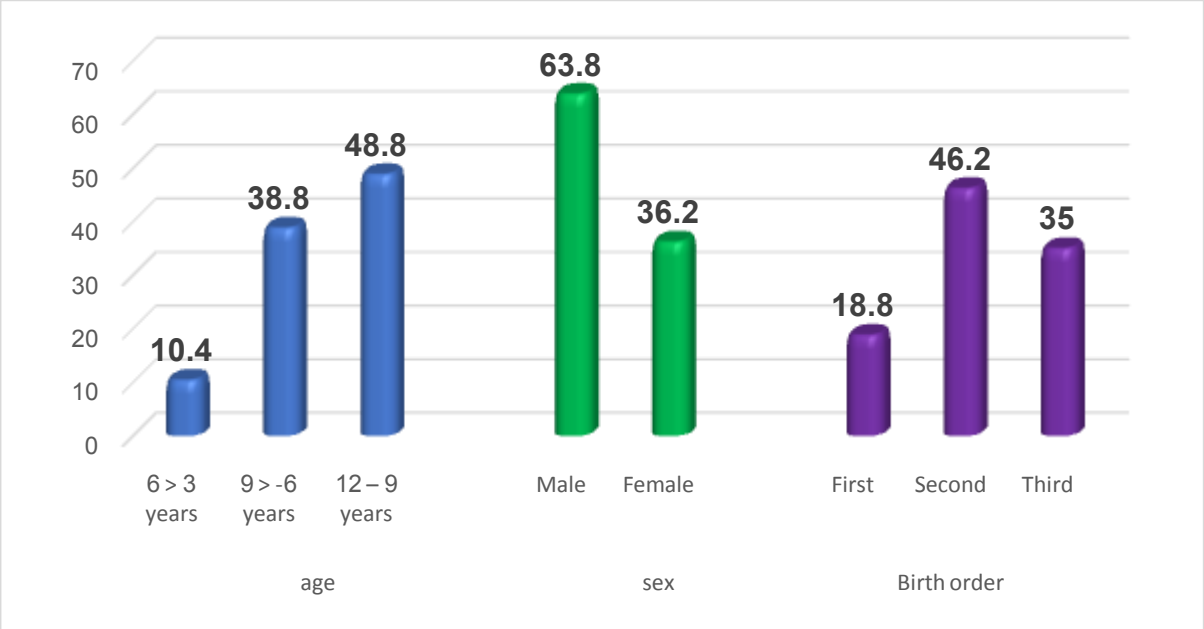

Figure (1): Socio-demographic characteristics of children.

Table(1) and figure (1) Showed that 48.8% of children had age between 9-12 years old with mean age 8.950 ± 2.42, more than half (63.8%) of them were male. As regard birth order 46.2% were the second birth.

Table (2): Number and Percentage distribution of mothers according to socio-demographic characteristics

Items	N	%
Age:		
20 < 26 years	29	36.2
26 < 30 years	20	25.0
30 – <35 years	23	28.8
35 or more	8	10.0
Education Level		
Primary	12	15.0
Secondary	45	56.2
High educated	23	28.8
Residence		
Rural	60	75.0
Urban	20	25.0

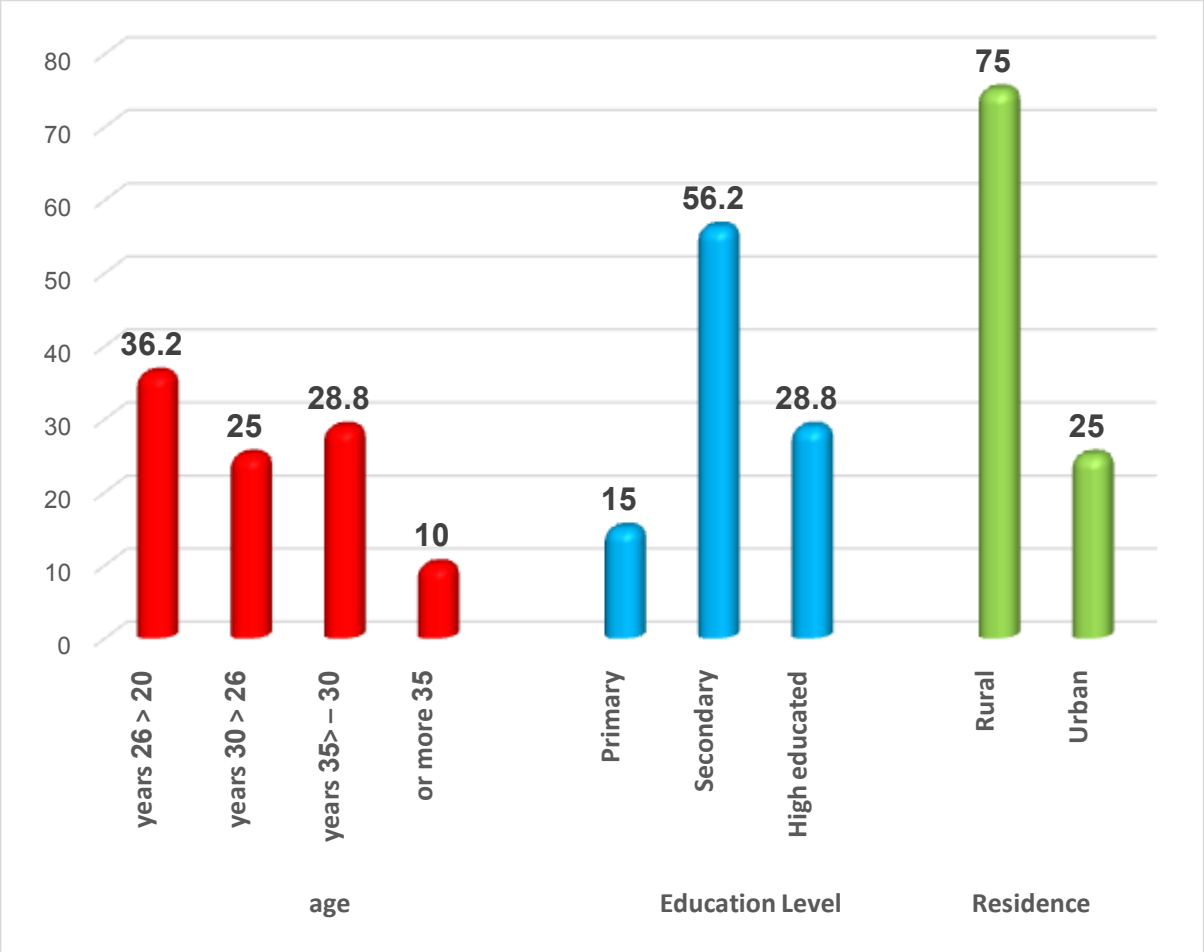

Figure (2): Mothers characteristics

Table (2) and figure (2) illustrated that 36.2% of mother had age between 20 < 26 years. As regard educational level more than half (56.2%) of them had secondary school. this table also showed that nearly three quarter (75.0%) of them from rural area.

Table (3): Number and Percentage distribution of children according to history of asthma

Items	N (80)	%
Duration of Asthma		
< 1 years	7	8.8
>1 years	40	50.0
>3 years	33	41.2
Frequency of asthma		
Day Time	5	6.3
Night	33	41.3
Both	42	52.4
Severity of asthma:		
Mild intermittent	8	10.0
Mild persistent	32	40.0
Moderate	40	50.0
Family History:		
Sibling	13	16.3
Parents	44	55.0
Grand mother or father	23	28.2

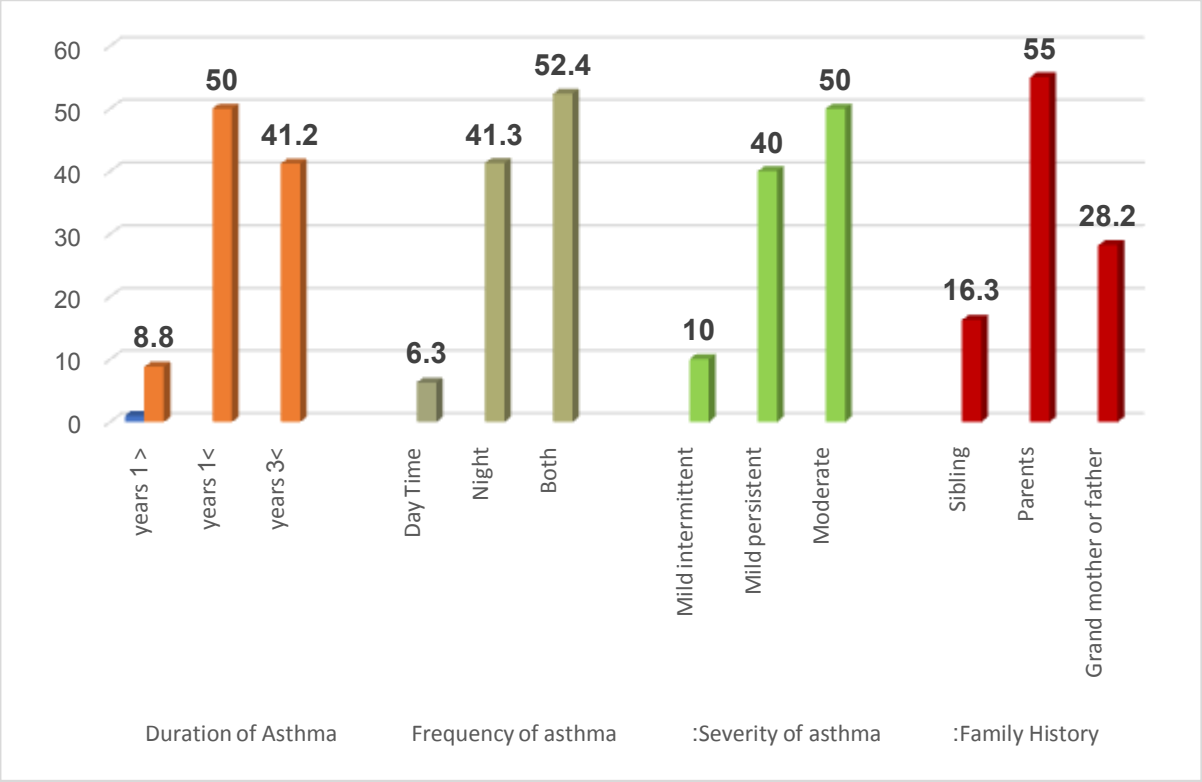

Figure (3): distribution of children according to history of asthma

Table (3) and figure (3) indicated that half (50.0%) of children had moderate asthma and duration of asthma was more than one year. More than half (52.0% and 55.0% respectively) had asthma during day & night time and had parents' history of asthma.

Table (4): Comparison studied Mothers knowledge score regarding to asthma at pre and post from implementation of program (n=80).

Items	Knowledge of Asthma pre						Knowledge of asthma after 4 weeks						X^2	p
	Incorrect		Correct but incomplete		Correct incomplete		Incorrect		Correct but incomplete		Correct incomplete			
Symptoms of asthma	11	13.7	32	40.0	37	46.3	7	8.8	20	25.0	53	66.2	16.46	0.002
Mechanism of asthma	10	12.5	49	61.3	21	26.3	6	7.4	13	16.3	61	76.3	9.43	>0.005
Asthma triggers	11	13.7	21	26.3	48	60.0	5	6.3	20	25.0	55	68.8	15.23	.004
Complications of asthma	7	8.8	44	55.0	29	36.2	8	10.0	18	22.5	54	67.5	52.54	<0.001
Symptoms of severe asthma attack	17	21.3	39	48.8	24	30.0	7	8.8	13	16.2	60	75.0	48.52	. <0. 001

Table (4): illustrated that, more than half (61.3% & 55.0% respectively) of mothers had incomplete answer toward Mechanism of asthma and complication respectively in pre intervention while 76.3 &67.5% respectively of mothers had complete answer after 4 weeks. There was an improvement in their knowledge in most items after 4 weeks of intervention compared with pre- intervention, knowledge a highstatistically significant difference ($p < 0.001$).

Table (5): Comparison of Mothers knowledge score regarding to covid19 at pre and post from implementation of program (n=80).

Items	Knowledge about Covid 19				Knowledge after 4 weeks				X^2	p
	Incorrect		Correct		Incorrect		Correct			
	N	%	N	%	N	%	N	%		
Covid-19 virus transmitted through the air	53	66	27	33.8	10	12.5	70	87.5	10.93	<.005
it possible to transmit the infection from a person with Covid-19 to a child	55	68.8	25	31.2	10	12.5	70	87.5	4.39	>.005
Is it possible to transmit the infection from people with Covid-19 before their symptoms appear during the incubation period	52	65.0	28	35.0	14	17.5	66	82.5	5.78	>.005
When is a child most contagious during his illness	39	48.8	41	51.3	24	30.0	56	70.0	1.73	>.005
When the result of a covid-19 sample is negative for a child it means that there is no risk of transmitting the infection from the child to others	41	51.2	39	48.8	14	17.5	66	82.5	1.63	>.005

Table (5): showed that, more than half (66%, 68.8%, 65.0% and 51.2 respectively) of mothers had incorrect answer toward Covid-19 virus transmitted through the air, possible to transmit the infection from a person with Covid-19 to a child and When the result of a covid-19 sample is negative for a child it mean that there is no risk of transmitting the infection from the child to others respectively in pre intervention while 87.5 and 82.5 respectively of mothers had correct answer after 4 weeks . There was an improvement in their knowledge in all items after 4 weeks of intervention compared with pre- intervention, knowledge with a high statistically significant difference ($p < 0.005$).

Table (6): Comparison studied Mothers knowledge about practice score regarding to covid19 at pre and post from implementation of program (n=80).

Items	Knowledge about practice pre						Knowledge about practice after 4 weeks						X^2	P
	Incorrect		Correct but incomplete		Correct incomplete		Incorrect		Correct but incomplete		Correct incomplete			
	N	%	N	%	N	%	N	%	N	%	N	%		
How asthma control during covid 19	42	52.5	32	40.0	6	7.5	4	5.0	10	12.5	66	82.5	63.12	<0.001
How know the asthma is well control	46	57.5	24	30.0	10	12.5	4	5.0	17	21.3	59	73.8	11.22	>.005
When seek emergency for the child with asthma	38	47.5	32	40.0	10	12.5	0	0.0	31	38.8	49	61.3	21.20	<0.001
Do you know with covid 19, what is the best form of asthma medication	31	38.8	43	53.7	6	7.5	0	0.0	26	32.5	54	67.5	48.17	<0.001
How prevent the child from having an asthma attack during the pandemics	34	42.5	33	41.3	13	16.2	6	7.5	15	18.8	59	73.8	32.82	<0.001
What other precautions can take who have children with asthma during the covid 19 pandemic	42	52.5	32	40.0	6	7.5	8	10.0	16	20.0	56	70.0	33.78	<0.001
What are the points that must be followed to reduce the rate of transmission of covid-19 among children	42	52.5	27	33.8	11	13.7	8	10.0	15	18.8	57	71.2	48.42	<0.001
How to treat a child who had symptoms compatible with Covid-19 and had a negative sample	23	28.8	40	50.0	17	21.2	7	8.8	20	25.0	53	66.3	37.62	<0.001
What are the measures that may contribute to reducing risks to children	44	55.0	28	45.0	8	10.0	8	10.0	20	25.0	52	65.0	46.27	<0.001

Table (6): illustrated that, more than half (52.5% , 57.5& 55.0% respectively) of mothers had incorrect answer toward how asthma control during covid 19, how know the asthma is well control, What precautions can take who have children with asthma during the covid 19 pandemic, What are the points that must be followed to reduce the rate of transmission of covid-19 among children and what are the measures that may contribute to reducing risks to children respectively in pre intervention while 82.5, 73.8, 70.0, 71.2&65.0% respectively of mothers had complete answer after 4 weeks . There was an improvement in their knowledge in most items after 4 weeks of intervention compared with pre- intervention, knowledge with a high statistically significant difference ($p < 0.001$).

Table (7): Comparison studied Mothers about asthma control questionnaires regarding to covid19 at pre- and post-from implementation of program (n=80).

Items	Pre		After 4 weeks		X2	P
	N	%	N	%		
In the past 4 weeks, how often did your asthma prevent you from getting as much done at school or at home?						
-All of the time	19	23.8	0	0.0		
- Most of the time	31	38.8	20	25.0		<0.001
- A little of the time	26	32.4	36	45.0	46.00	
- None of the time	4	50.0	24	30.0		
During the past 4 weeks, how often have you had shortness of breath?						
- More than once a day	24	30.0	0	0.0		
- Once a day	35	43.8	0	0.0	37.47	<0.001
- 3 to 6 times a week	21	26.2	10	12.5		
- Once or twice a week	0	0.0	48	60.0		
- Not at all	0	0.0	22	27.5		
During the past 4 weeks, how often did your asthma symptoms (wheezing, coughing, and shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?						
- 4 or more times a week	34	42.5	0	0.0		
- 2 t0 3 night a week	22	27.5	0	0.0		<0.001
- 1 night a week	15	18.8	13	16.3	52.85	
- less than 1 night a week	9	11.2	34	42.4		
- Not at all	0	0.0	33	41.3		
During the past 4 weeks, how often have you used your reliever medication (such as salbutamol)?						
- 3 or more times a day	20	25.0	0	0.0		
- 1 or 2 times per day	39	48.8	0	0.0		<0.001
- 2 or 3 times per week	21	26.2	11	13.8	21.82	
- Once a week or less	0	0.0	34	42.4		
- Not at all	0	0.0	35	43.8		
How would you rate your asthma control during the past 4 weeks?						
- Not controlled	9	11.2	0	0.0		<0.005
- Poorly controlled	22	27.5	0	0.0	17.44	
- Somewhat controlled	49	61.3	15	18.8		
- Well controlled	0	0.0	32	40.0		
- Completely controlled	0	0.0	33	41.2		

Table (7): This table presented that, there was a highly statistically significant differences in asthma control questionnaires at post intervention as compared to pre intervention (P<0.001).

II. Discussion:

Asthma in Egypt is considering a common health problemin childhood in which cause morbidity, mortality, and hospitalization. In addition, children with asthma are at high risk with COVID-19 that lead to asthma attack, pneumonia, and acute respiratory problems. Moreover, (CDC, 2020). Listed that asthma as a prognostic factor for COVID- 19 outcomes such as morbidity and mortality. Therefore, the aim of this study was to evaluate the effect of mothers' health to prevent coronavirus in their children have Bronchial Asthma.

Health education play important role in disease prevention and improve level of knowledge. Health education interventions should be directed to humans at high risk of COVID-19. Therefore, knowledge about COVID-19 increase significantly.Children have asthma are at high risk to have coronavirus (Castro- Rodriguez, 2020).& (Chhiba, et al,2020). Also, (Abrams & Szefler, 2020).Stated that coronavirus result in sever problem and complication for children with asthma.

The result of the present study revealed that the majority of the studied sample are males. (Asthma and Allergy Foundation of America, 2021). Mention that, male sex is at high risk of coronavirus. The majority of the studied sample two third of them from urban area table (2). That may be inconsistent with level of knowledge of them. Moreover, (Bekele, et al, 2020). Who stated that knowledge of whose live in urban area are more than who live in rural area. Also, (Sinha, et al, 2020). Mentioned that Low standard of living increases the risk of coronavirus.Crowded living spaces increase COVID- 19 viral transmission, and lack of access to care reduces the ability to have COVID- 19 screening/testing (Baggett, et al, 2020).

The main goal for mothers to keep asthma under control to avoid asthma attack that would lead hospitalization. Severe wheezing, consistent coughing, rapid breathing and tightness in the chest and neck are common signs of an asthma attack (Mitchell, 2020).The study conducted by (Moeller, 2021). Emphasized that controlled asthma attack and reduce asthma triggers low risk of having Covid 19.

In relation to, preventive measures include regular hand washing with soap and water or alcohol- based sanitizer, avoidance of people who are sick, physical distancing, avoidance of travel, and regular cleaning with disinfection of high- touch surfaces (Licari, et la, 2020). CDC recommends for wearing a cloth face mask in places where it is hard to keep a 6-foot distance from others to help stop the spread of illness. If the child not wearing a face mask, cough/sneeze into the child elbow or a tissue. When use a tissue, throw it away. In either case, wash hands after cough or sneeze.

COVID- 19 is characterized by rapid and widely transmission that occur by contact with infected human (Shereen, et al, 2020). In relation to mode of transmission of COVID- 19, the present study table (5), illustrated that, the mothers' knowledge is incorrect before the program while, after program they have correct knowledge. This result is in the contrast with the study conducted by (Abuhammad, 2020). Revealed that the majority of mothers stated that mode of transmission of COVID- 19 by droplet infection. Also, (Lu, et al 2020). Stated that Covid-19 transmitted through saliva, and airborne droplets during cough or sneeze.

Regarding mothers 'knowledge about coronavirus table (6), the study revealed that there wasa highlysignificantlythis result at the same result with (Al-Hanawi, et al, 2020). This result indicated that mothers who have a sufficient asthma knowledge report fewer emergency department visits, fewer hospitalizations, and improvements in their child's asthma control.

The researcher point of view emphasized on the importance of health education programs regarding knowledge and practice of coronavirus that requiring to care of their children with asthma where childcare was the first responsibility of mothers. This further support the study hypothesis. Augmenting the results of current study, it evident that education has a vital role in improving mothers' knowledge and practice toward coronavirus for caring of their children having asthma. Moreover, the result of the present study revealed that mothers' knowledge and practice were improved after program implementation. This could attribute to the fact that the importance and effectiveness of education program in enhancing mothers' knowledge and practice which play significant role in the quality of care providing and effective outcomes.

III. Conclusion:

Based on the results of the present study, it can beconcluded that, Health education was effective and help mothers to prevent coronavirus among their children with bronchial asthma.

Recommendation:

-Educational programfor mothers aimed to increase knowledge about COVID- 19 in children.

- Booklets should be available and distributed in all health care centers to all mothers about COVID- 19and health-related practices.

-Health education interventions should be directed to children at high risk of contracting COVID-19.

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