

Effect of Nursing Instructions about COVID-19 Preventive Measures on Knowledge and Reported Practice of Hospitalized School Age Children

*Hoda Wahid Amer ¹, Hanem Abdullah Mohamed ²

¹Lecturer of Pediatric Nursing, Faculty of Applied Medical Sciences, Nursing Department-Misr University for Science & Technology, Cairo, Egypt.

²Lecturer of Pediatric Nursing Department, Faculty of Nursing, Cairo University, Cairo, Egypt.

Abstract

Background: COVID-19, novel coronavirus, has been identified by the World Health Organization as a pandemic that causes highly transmittable respiratory disease. Lack of awareness about COVID-19 preventive measures represents a global threat. The aim of the current study was to evaluate the effect of nursing instructions about COVID-19 preventive measures on knowledge and reported practice of hospitalized school age children.

Materials and Methods: One group pre-posttest quasi-experimental design was utilized to carry out the current study. *Setting:* The study was conducted in the medical wards at Cairo University Specialized Pediatric Hospital (CUSPH). *Sample:* A purposive sample of 100 hospitalized school age children was included in the study. *Data Collection Tool:* Structured interview questionnaire designed by the researcher contained seventy-eight questions related to children's demographic data, general knowledge about COVID-19, symptoms, modes of transmission, treatment and prevention was used.

Results: More than half of the children's ages ranged from 10 to 12 years, they were males and ranked as first child. The results of the current study revealed that there were statistically significant differences in total mean score of children's knowledge before and after receiving nursing instructions and total mean score of children reported-practices

Conclusion: School age children had insufficient knowledge about novel COVID-19; along with low standards of reported-practices. After nursing instructions, higher total mean scores were detected regarding their knowledge and reported-practices. **Recommendations:** Pediatric nurses must provide awareness and public knowledge regarding the novel COVID-19 with simple Arabic illustrative educational booklets and posters about COVID-19 for all children in all health care settings to prevent the spread of this pandemic disease.

Key Words: COVID-19, Nursing Instructions, Pandemic, Knowledge, Practice, School Age Children.

*Please, cite this article as Amer HW, Mohamed HA. Effect of Nursing Instructions about COVID-19 Preventive Measures on Knowledge and Reported Practice of Hospitalized School Age Children. Int J Pediatr 2020; 8(6): 11449-465. DOI: [10.22038/ijp.2020.48150.3877](https://doi.org/10.22038/ijp.2020.48150.3877)

*Corresponding Author:

Hoda Wahid Amer, Faculty of Applied Medical Sciences, Nursing Department-Misr University for Science & Technology, Cairo, Egypt.

Email: hoda.hassan@must.edu.eg

Received date: Apr.15, 2020; Accepted date: May.20, 2020

1- INTRODUCTION

Respiratory tract infections including sinusitis, bronchitis and pneumonia are caused by different types of bacteria and viruses (1). Thomas and Bomar (2019) documented that the predominant virus in respiratory tract infections is rhinovirus; there are other viruses such as influenza virus, coronavirus and adenovirus (2). Huang et al. (2020) highlighted that the enveloped positive-sense single stranded RNA viruses, Coronaviruses, are large family of viruses commonly distributed among humans and mammals. The well-known human coronaviruses, hCoV-229E, OC43, NL63, and HKU1 cause a wide range of respiratory tract infections (3). Elnagar et al. (2017), and Lai et al. (2020) clarified that clinical manifestations include elevated body temperature, chest tightness, muscle weakness and pneumonia, in complicated cases respiratory failure may occur (4, 5).

Peeri et al. (2020) added that deadly respiratory tract infections were caused by two Corona viruses epidemics (SARS-CoV), and (MERS-CoV) with over 10% and 37% mortality rates, respectively (6). The WHO (2020) declared that Novel coronavirus (COVID-19) was discovered in December, 2019, in Wuhan, China, after the emergence of large number of patients showing pneumonia of undefined cause (7). Patients were admitted to intensive care units due to respiratory distress that led to death in several cases (8). COVID-19 was identified as beta coronavirus genus after analyzing patients' swab samples using whole genome sequencing techniques and real time polymerase chain reactions. According to WHO on 24 April 2020, the total number of confirmed COVID-19 cases worldwide were 2,626,321 with a total 181,938 deaths. While in Egypt, the total number of confirmed COVID-19 cases was 3,891 with a total 287 deaths (9). Cao et al. (2020) indicated that after the analysis of

44,672 cases on 11 February 2020, it was found that about 0.9% of the infected cases were less than ten years old; while around 1.2% ranged from ten to twenty years old. The rate of transmission increases concurrently with the increase in the number of infected children and teenagers (10). Hockenberry and Wilson (2015) stated that school age children are more highly labile to infectious diseases than any other age group due to their poor-existing immunity along with low standard hygienic practices such as contact with unclean surfaces, touching their face, bad coughing or sneezing etiquette and eating contaminated food (11).

In accordance with Marcdante and Kliegman (2019) who stated that school age children are capable of understanding and thinking about new tasks, at the concrete operational stage, they are able to develop reason-result relationship and solve problems and they can learn about new concepts (like disease) and tasks (self-care and protection) (12). COVID-19 has been identified as a highly transmissible human-to-human disease via droplets resulting from coughing or sneezing (8). In the same context, Liu et al. (2020) and Sohrabi et al. (2020) reported that lacking awareness about the control of COVID-19 represents a major health threat. Increasing awareness and defensive behaviors help in the containment of the disease (13, 14).

Wilson and Rodgers (2016) indicated that nurses play an essential role in increasing level of awareness of patients toward different diseases through providing information and practices that should be performed for prevention and control of diseases' spread; thus making the environment a safer place (15). Providing sufficient knowledge to patients through nursing instructions helps in the containment and protection against COVID-19 transmission. Thus, the main purpose of the current study was to assess the knowledge and reported-practice of the

school aged children toward COVID-19 before and after nursing instructions.

1-1. Significance of the study

COVID-19 is a novel coronavirus that causes highly infectious respiratory disease transmitted through salivary droplets of an infected person while sneezing or coughing. It was declared by the WHO (2020) to be a pandemic that negatively impacts quality of life and mortality rates; causing mild respiratory illness that could lead to severe respiratory distress requiring emergency admission. In Egypt, total number of confirmed COVID-19 cases was 3,891 with a total 287 deaths. The empirical evidence from research is very scanty regarding the effect of children's awareness and knowledge about COVID-19 on the containment of the pandemic. However, considering preventive measures is crucial in the prevention against infections and other complications. Therefore, the current study results will shed light on the role of pediatric nursing health education on increasing levels of knowledge and practices of COVID-19 preventive measures of hospitalized school age children. Thus, the main aim of the current study was to:

- Evaluate the effect of nursing instructions about COVID-19 preventive measures on knowledge and reported practice of hospitalized school age children.

1-2. Research hypotheses

- School age children will have higher total mean score of knowledge after receiving nursing instructions regarding COVID-19 than before it.
- School age children will report better practices related to COVID-19 preventive measures after receiving nursing instructions than before it.

2- MATERIALS AND METHODS

2-1. Research design

One group pre-posttest quasi-experimental design was conducted to achieve the aim of the study. A quasi-experimental design is one type of effective research design that is very helpful to the true experimental design except for either complete laboratory control on the extraneous variables that might affect the results or randomization, which affects the generalizability of the results, in accordance to Polit and Beck (16).

Setting: The study was conducted in the medical wards at Cairo University Specialized Pediatric Hospital (CUSPH).

Sample: A purposive sample of 100 school age children who attended the medical wards at CUSPH participated in the current study.

2-2. Inclusion criteria

- School age children hospitalized for at least one week.
- Children 6-12 years-old.
- Children from medical wards only.

2-3. Exclusion criteria

- Any child with conditions that interfere with the cognitive or physical ability of the children (down syndrome, disturbed level of consciousness, ADHD, etc.).

2-4. Ethical Considerations

Complete description of the purpose and nature of the study were provided to the children and their mothers to obtain their oral approval to participate in the current study. The study did not involve any interventions; only preventive measure and practices announced by WHO were taught to the children. Children and their mothers were informed that participation in the study is voluntary. The researcher informed mothers and children about their

rights to withdraw from the study. Confidentiality was assured to the children.

2-5. Data Collection Tool

Structured interview questionnaire: It was developed by the researcher after extensive review of the related literature; it contained seventy-eight (78) questions and consisted of five parts:

Part I: Demographic characteristics of school age children, it involves 8 questions such as the child's age, diagnosis, duration of admission, level of education, etc.

Part II: General knowledge about COVID-19, which included 14 questions about causes, country of origin, characteristics, severity, infective, hereditary disease, etc.

Part III: It contained 11 questions related to knowledge about symptoms (such as cough, fever, shills, difficulty in breathing... etc.) and methods of transmission of COVID-19 (such as close personal contact, contacting contaminated surfaces, coughing or sneezing, etc.).

Part IV: It contained 8 questions related to knowledge about treatment and prevention of COVID-19 such as presence of active treatment, alternative treatment, vaccine, methods for prevention, complying with methods of prevention, etc.

Part V: Reported-practice related to COVID-19, which included 37 questions distributed into 4 major areas of preventive practices: 1) self-protective practices included 6 questions, 2) travel and during school preventive measures which included 10 questions; 3) life style and general preventive measures that included 11 questions, and 4) how to protect others from Corona practices which included 10 questions).

2-6. Scoring system

Scoring system for knowledge assessment was 66 scores. Each complete answer obtained two scores, incomplete one was given one score and the wrong answer or no response received a score of zero. The total score was converted to 100% and then categorized as follows: the total score of knowledge less than 50% (less than score of 33) was considered as unsatisfactory while a score of 50% and more (score of 33) was considered as satisfactory level of knowledge. Reported-practice received a score of 37. Each done response was given one score, no response was given zero. The total score was converted to 100% and then categorized as following: the total score of reported practices less than 50% (score less than 18.5) was considered as unsatisfactory while score of 50% and more (18.5 score) was considered as satisfactory level.

2-7. Validity and reliability

Data collection tool was reviewed by 3 experts in pediatric nursing to test the content validity of the tool. The tool was examined for content coverage, clarity, relevance, applicability, wording, length, format, and overall appearance. The experts agreed on the content of the tool, but recommended minor language changes that would make the information clearer and more precise. The suggested changes were made. Reliability of tools was performed to confirm its consistency using Cronbach's alpha and the result was 0.86 reliability.

2-8. Pilot study

Pilot study was conducted on 10% (10 children) to assess the feasibility, objectivity, applicability, clarity, adequacy, and content validity of the study tools and time required to fulfill it and to determine possible problems in the methodological approach or instrument. The results of the pilot study were used to test the proposed statistical and data analysis methods. The tool was completed

without difficulty, adding support to the validity of the instrument. Children involved in the pilot study were included in the main study sample.

2-9. Data collection procedure

Official permission was received from the director of Cairo University Specialized Pediatric Hospital (CUSPH) then from the director of medical wards to obtain official permission for the researcher to collect the required data. The researcher discussed clear explanations about the aim and nature of the study for each mother and their hospitalized school aged child who fulfilled inclusion criteria on individual basis. An oral approval was obtained from each mother and child to gain their acceptance as well as cooperation. The interview was conducted for all hospitalized school age children to fill in the tool in the medical wards nursing room; during the interview when the children felt tired the researcher gave them break time and then continued the interview. The researcher filled the tool in 45-60 minutes twice: once before nursing instructions and once after one week of nursing instructions for filling their knowledge and reported practices. The researcher conducted one nursing instruction session for each child individually with an overview about COVID-19, symptoms, methods of transmission and preventive measures using poster and practical explanation for each child in a 60-90 minute period. The data was collected from December 2019-March 2020.

Nursing instructions included both poster theoretical knowledge and practical preventive measures, the poster included the following information (17):

- Hands should be washed regularly with soap and water for at least 20 seconds, and then rub with rubbing alcohol even if they seem clean when coughing or sneezing, mouth and nose should be

covered using disposable tissue, and it should be discarded after use.

- In case disposable tissues are out of reach, cough or sneeze into your elbow.
- Contact your healthcare practitioner if you feel any of the following symptoms: fever, cough and difficulty in breathing, especially if you have been to any of the countries with COVID-19 outbreak.
- Avoid close contact with people showing any respiratory tract infections, especially if they have been to any of the countries with COVID-19 outbreak.
- Avoid contact with animals in COVID-19 outbreak areas.
- Avoid eating uncooked food including raw meat, fish, and eggs.
- Avoid drinking unpasteurized milk.

2-10. Statistical analysis

The collected data was tabulated, and summarized. A statistical package for social studies (SPSS software version 21.0) was used for statistical analysis of data. Data was computerized and analyzed using appropriate descriptive and inferential statistical tests to test the research question. Qualitative data were expressed as frequency and percentage. Means and standard deviation were performed for every variable and comparison between means was done using paired t-test. Correlation among variables was done using correlation coefficient. Level of significance at $p < 0.05$ was used as the cut of value for statistical significance.

3- RESULTS

Table-1 revealed that children's age ranged from 10 to 12 years old (62%, $n=62$) with mean of 9.70 ± 1.95 years, the mean and SD were calculated from the

frequency distribution and not from the actual age measurements because the questionnaire reported age categories not actual mean age. More than half (62%, n=62) of them were males and (48%, n=48) of them were ranked as first child. More than half (56%, n=56) of the school age children were admitted for more than two weeks and they were residents of rural

areas. Three, four and more numbers of children in the family had both equal percentages (32%, n=32). The minority (10%, n=10) of the children's level of education was second grade primary school. The highest percentage (30%, n=30) of the children's families had previous history of bronchial asthma.

Table-1: Percentage Distribution of the Characteristics of Children (n=100).

Children Characteristics	Number	%
Age/years		
6 to > 8	14	14
8 to > 10	24	24
10 to 12	62	62
Mean \pm SD	9.70 \pm 1.95	
Gender		
Male	62	62
Female	38	38
Child rank		
First	48	48
Second	38	38
Third	14	14
Duration of admission		
Less than 2weeks	44	44
More than two weeks	56	56
Place of residence		
Urban	38	38
Rural	56	56
Slums	6	6
Number of children in the family		
One	8	8
Two	28	28
Three	32	32
Four and more	32	32
Child' Level of Education		
First grade primary school	20	20
Second grade primary school	10	10
Third grade primary school	20	20
Fourth grade primary school	12	12
Fifth grade primary school	20	20
Sixth grade primary school	18	18
Diagnosis		
Bronchial asthma	30	30
Blood disease	6	6
Gastroenteritis	10	10
Bronchitis	8	8
Cardiac disease	8	8
Pneumonia	22	22
Kidney stone	10	10
Chronic constipation	6	6

SD: Standard deviation.

Table-2 indicates that more than three quarters (76%, n=76) of the children have heard about Corona virus before nursing instructions. The majority (80%, n=80) did not have sufficient information about the characteristics of Corona virus. More than half (54%, n=54) of the children were not aware of the cause of Corona virus disease; while more than a third (48%,

n=48) thought that the corona virus does not cause infectious disease. After one week of nursing instructions, (100%, n=100) of the children were fully aware of Corona virus, the cause of the disease and that COVID-19 causes infectious disease; while (84%, n=84) became fully oriented about the disease characteristics.

Table-2: Percentage Distribution of Children's Knowledge about COVID-19 before and after Nursing Instructions (n=100).

Items	Before nursing instructions						After nursing instructions					
	Complete		Incomplete		Wrong		Complete		Incomplete		Wrong	
	N	%	N	%	N	%	N	%	N	%	N	%
Have you heard about Corona disease?	76	76	14	14	10	10	100	100	0	0	0	0
Are you interested in learning about Corona disease?	52	52	26	26	22	22	92	92	4	4	4	4
Is Corona a disease that affects the Middle East only?	24	24	40	40	36	36	94	94	6	6	0	0
Is Corona an old disease that disappeared and has returned during these years?	14	14	20	20	66	66	90	90	4	4	6	6
Corona is a new disease that not much is known about its characteristics	12	12	80	80	8	8	84	84	12	12	4	4
Corona is a disease that will increase in severity and become widespread in the near future	44	44	36	36	20	20	78	78	16	16	6	6
Corona is a seasonal disease	34	34	38	38	28	28	82	82	14	14	4	4
The cause of Corona disease is a virus	26	26	54	54	20	20	100	100	0	0	0	0
Corona is an infectious disease	30	30	48	48	22	22	100	100	0	0	0	0
Corona is a heredity disease	18	18	26	26	56	56	88	88	8	8	4	4
I know someone who is infected with Corona	12	12	8	8	80	80	92	92	6	6	2	2
Is there a vaccine against Corona?	20	20	16	16	64	64	78	78	8	8	14	14
Do you think Corona has obvious symptoms?	28	28	12	12	60	60	92	92	8	8	0	0
Can you identify a person with the Corona disease	32	32	10	10	58	58	84	84	10	10	6	6

N=number.

Table-3 reveals that more than half (52%) of the school aged children did not consider cough to be one of the symptoms of corona; while more than three quarters (74%, 72% and 78%, respectively) believed that fever, shills and shortage of breath are not symptoms; whereas the vast majority (96% and 84% in order) did not consider difficulty in breathing and shortness of breath to be one of the

symptoms. After one week of nursing instructions, (100%, n=10) of the school age children completed their knowledge about cough and shortness of breath to be symptoms of corona; while the majority (84%, 88%, 92% and 86%, respectively) considered fever, difficulty in breathing, chills and shortage of breath to be symptoms of corona.

Table-3: Percentage Distribution of Children's Knowledge about COVID-19 Symptoms before and after Nursing Instructions (n=100).

Items	Before nursing instructions						After nursing instructions					
	Complete		Incomplete		Wrong		Complete		Incomplete		Wrong	
	N	%	N	%	N	%	N	%	N	%	N	%
Fever	6	6	20	20	74	74	84	84	4	4	12	12
Cough	28	28	20	20	52	52	100	100	0	0	0	0
Difficulty in breathing	0	0	4	4	96	96	88	88	12	12	0	0
Shortness of breath	10	10	6	6	84	84	100	100	0	0	0	0
Chills	20	20	8	8	72	72	92	92	0	0	8	8
Shortage of breath	12	12	10	10	78	78	86	86	10	10	4	4

N=number.

In **Table-4**, more than half (60%, n=60) of children believed that COVID-19 could not be transmitted through coughing and sneezing; while more than three quarters (78%) were not aware about transmission through contact with contaminated object or surface. Less than half (46%, and 44% in order) thought that practice of hygiene has no role in the transmission and did not consider transmission through close

personal contact. After one week of nursing instructions, highest percentages (100%, 90%, 86% and 82%, correspondingly) completed their knowledge about transmission of virus through close personal contact, practice of good hygiene, transmission through coughing or sneezing and contact with a surface with viral particles.

Table-4: Percentage Distribution of Children's Knowledge about Methods of Transmission of COVID-19 before and after Nursing Instructions (n=100).

Items	Before nursing instructions						After nursing instructions					
	Complete		Incomplete		Wrong		Complete		Incomplete		Wrong	
	N	%	N	%	N	%	N	%	N	%	N	%
Coughing & sneezing (droplet)	34	34	6	6	60	60	86	86	6	6	8	8
Practicing good cough etiquette	28	28	26	26	46	46	90	90	0	0	10	10
Close personal contact	26	26	44	44	30	30	100	100	0	0	0	0
Contact with contaminated object or surface.	0	0	22	22	78	78	82	82	14	14	4	4
Lack of hygiene (hand wash-dry hands)	28	28	26	26	46	46	90	90	0	0	10	10

N=number.

Table-5 reveals that more than a third (44%) of the children did not comply with methods for prevention; while more than half (60%) considered that there is a treatment; more than two-thirds (78%) considered that there is a vaccine. After nursing instructions, the vast majority

(86%, 82%, and 84%, respectively) of school-aged children corrected their information concerning absence of specific treatment and vaccine for the current disease and considered complying with preventive methods.

Table-5: Percentage Distribution of Children's Knowledge about Treatment and Prevention of COVID-19 before and after Nursing Instructions (n=100).

Items	Before nursing instructions						After nursing instructions					
	Complete		Incomplete		Wrong		Complete		Incomplete		Wrong	
	N	%	N	%	N	%	N	%	N	%	N	%
No specific treatment	34	34	6	6	60	60	86	86	6	6	8	8
Medical care can treat most of the symptoms.	26	26	44	44	30	30	100	100	0	0	0	0
Currently no vaccine	0	0	22	22	78	78	82	82	14	14	4	4
Early stages of vaccine development.	28	28	26	26	46	46	90	90	0	0	10	10
Found active treatment against the disease	52	52	48	48	0	0	100	100	0	0	0	0
Alternative medicine (herbs) can treat the disease	28	28	32	32	40	40	70	70	18	18	12	12
Know methods of prevention of Corona	24	24	20	20	56	56	88	88	12	12	0	0
Comply with methods of prevention	30	30	44	44	26	26	84	84	4	4	12	12

N=number.

Table-6 shows the majority (80%, n=80) of the children did not consider washing hands for at least 20 seconds; while more than two thirds (76% and 78% in order) did not cover coughs or sneezes and wash hands before handling food. More than half (68% and 60% correspondingly) did not wash their hands after using the toilet and after coughing or sneezing. After

nursing instructions, (100%) considered washing hands after using the toilet and the majority (92%, 80% and 82% in order) considered washing hands for at least 20 seconds, before handling food and after coughing or sneezing; while more than two thirds (78%) considered covering coughs or sneezes.

Table-6: Percentage Distribution of Children's Reported-Practice Regarding Self Protection Against COVID-19 before and after Nursing Instructions (n=100).

Items	Before nursing instructions				After nursing instructions			
	Done		Not done		Done		Not done	
	N	%	N	%	N	%	N	%
Cover coughs & sneezes with disposable tissue	24	24	76	76	78	78	22	22
Washing hands for at least 20 seconds with water and soap and drying them thoroughly:	20	20	80	80	92	92	8	8
Heating or handling food	22	22	78	78	80	80	20	20
After using the toilet	32	32	68	68	100	100	0	0
After coughing, sneezing, blowing your nose or wiping children's noses	40	40	60	60	82	82	18	18
After caring for sick people.	38	38	62	62	76	76	24	24

N=number.

Table-7 demonstrates that more than half (66%, 66%, 58% and 52%, correspondingly) of the children avoided close contact with people suffering respiratory infections, did not consider washing their hands after caring for sick people, agreed that people with respiratory infection should practice good cough etiquette and anyone feeling unwell should not go to school or work; while more than two thirds (76%) disagreed with washing their hands after caring for sick people and going to the doctor if they suffered from

fever, coughing and difficulty breathing. After nursing instructions, (100%) were aware that people with respiratory tract infections should follow good cough etiquette; while the vast majority (86%, 82%, 96% and 90%, respectively) considered avoiding close contact with people with acute respiratory tract infections, washing hands after caring for sick people, if anyone feels unwell they should not go to school or work and going to the doctor if they develop any symptoms.

Table-7: Percentage Distribution of Children's Reported-Practice Regarding Travel and School Preventive Measures before and after Nursing Instructions (n=100).

Items	Before nursing instructions				After nursing instructions			
	Done		Not done		Done		Not done	
	N	%	N	%	N	%	N	%
Travel Precautions:								
Avoid close contact with people suffering acute respiratory infections	66	66	34	34	86	86	14	14
Wash hands for at least 20 seconds with water and soap and dry them thoroughly:								
Before eating or handling food	32	32	68	68	100	100	0	0
After using the toilet	70	70	30	30	94	94	6	6
After coughing, sneezing, blowing your nose or wiping children's noses	58	58	42	42	86	86	14	14
After caring for sick people	60	60	40	40	100	100	0	0
Avoid close contact with sick farm animals or wild animals.	34	34	66	66	82	82	18	18
People with symptoms of acute respiratory infection should practice good cough etiquette	72	72	28	28	100	100	0	0
School precautions								
As always, anyone who is unwell should not be at school or at work.	58	58	42	42	100	100	0	0
If you develop symptoms including fever, coughing and difficulty breathing you should go to the doctor.	52	52	48	48	96	96	4	4
	24	24	76	76	90	90	10	10

Table-8 documents that all children (100%) were not aware about the use of cool-mist humidifier for better breathing; less than two thirds (74% and 72% in order) agreed with not using products containing nicotine or tobacco and staying away from sick people. More than half (58%, n=58) of the children were avoiding touching their face. The majority (80%, n=80) agreed on wearing a mask when

surrounded by sick people. After one week of nursing instructions, all children (100%) were aware of staying away from sick people, avoid touching their face and wearing a protective mask. The majority (84%) agreed with avoiding using nicotine-containing products while more than two thirds (78%) considered using cool-mist humidifier for better breathing.

Table-8: Percentage Distribution of Children's Reported-Practice Regarding Lifestyle and General Precautions before and after Nursing Instructions (n=100).

Items	Before nursing instructions				After nursing instructions			
	Done		Not done		Done		Not done	
	N	%	N	%	N	%	N	%
Lifestyle								
Use a cool-mist humidifier to add moisture to the air. This can help you breathe more easily.	0	0	100	100	78	78	22	22
Use of any products that contain nicotine or tobacco, such as cigarettes, e-cigarettes, and chewing tobacco.	74	74	26	26	84	84	16	16
General precautions								
Take over-the-counter and prescription medicines only.	52	52	48	48	86	86	14	14
Drink enough fluid to keep your urine pale yellow.	52	52	48	48	92	92	8	8
Keep all follow-up visits. This is important.	46	46	54	54	100	100	0	0
Stay away from people who are sick.	72	72	28	28	100	100	0	0
Stay away from places where there are animals that may carry the virus.	26	26	74	74	70	70	30	30
Do not eat meat or fish in areas of a corona virus outbreak. If you must eat fish or meat, make sure that it is cooked very well.	56	56	44	44	76	76	24	24
Wash your hands often with soap and water.	36	36	64	64	100	100	0	0
Avoid touching your mouth, face, eyes, or nose.	58	58	42	42	100	100	0	0
Wear a mask to protect yourself if you are around people who are sick or might be sick.	80	80	20	20	100	100	0	0

N=number.

Table-9 show that more than half of the children (52%) agreed with leaving home only when seeking medical care; while the more than two thirds (78%) were not considering making sure that all people in the household wash their hands. More than half (54% and 68%, respectively) were not aware of contacting healthcare providers if they have infection and staying in a separate room if they are sick. After

nursing instructions, all children (100%) completed their knowledge regarding contacting healthcare providers if they have infection and making sure that all household members wash their hands regularly; while the majority (92% and 82%, correspondingly) considered leaving home only when seeking medical care and staying in a separate room and use a different bathroom if possible.

Table-9: Percentage Distribution of Children's Reported-Practice Regarding How to Protect Others from COVID-19 Before and After Nursing Instructions (n=100).

Items	Before nursing instructions				After nursing instructions			
	Done		Not done		Done		Not done	
	N	%	N	%	N	%	N	%
You protect others if:								
You have symptoms; take steps to prevent the virus from spreading to others.	38	38	62	62	86	86	14	14
You think you have a corona virus infection, contact your health care provider right away. Tell your health care team that you think you may have a novel corona virus infection.	46	46	54	54	100	100	0	0
Stay home. Leave your house only to seek medical care.	52	52	48	48	92	92	8	8
Do not travel while you are sick.	34	34	66	66	100	100	0	0
Wash your hands often with soap and water.	54	54	46	46	100	100	0	0

Children and Covid-19

Stay away from other members of your household.	28	28	72	72	94	94	6	6
Stay in your own room, separate from others. Use a different bathroom.	32	32	68	68	82	82	18	18
Make sure that all people in your household wash their hands well and often.	22	22	78	78	100	100	0	0
Cough or sneeze into a tissue or your sleeve or elbow. Do not cough or sneeze into your hand or into the air.	58	58	42	42	100	100	0	0
Wear a facemask.	16	16	84	84	100	100	0	0

N=number.

From **Table-10**, it was evident that there was statistically significant difference between school age children's knowledge

level before and after COVID-19 nursing instructions ($P < 0.05$).

Table-10: Comparison between Children's Level of Knowledge Before and After Nursing instructions (n=100).

Items	Satisfactory		Unsatisfactory		X ²	P-value
	No	%	No	%		
Before	16	16	84	84	1.74	0.016*
After	91	91	9	9		

*Statistical significant at $P < 0.05$, χ^2 : chi-square.

Table-11 there was a high statistically significant difference between total mean score of knowledge for school-aged children before and after nursing instructions ($P < 0.05$). Also, there was

statistically high significant difference between comparing total mean score of children's reported-practices before and after nursing instructions ($P < 0.05$).

Table-11: Comparison between Total Mean Score of Knowledge and Reported Practice for Children Before and After Nursing Instructions (n=100).

Children's total mean knowledge scores					
Items	Minimum	Maximum	Mean \pm SD	t-test	P-value
Before	12	46	20.86 \pm 0.623	- 36.12	0.001*
After	39	64	54.57 \pm 0.527		
Children's total mean reported-practices scores					
Items	Minimum	Maximum	Mean \pm SD	t-test	P-value
Before	5	19	12.98 \pm 3.40	-39.51	0.001*
After	23	37	32.01 \pm 3.33		

*Statistical significant at $P < 0.05$.

4- DISCUSSION

The aim of the current study was to evaluate the effect of nursing instructions about COVID-19 preventive measures on knowledge and reported practice of

hospitalized school age children. The knowledge of children in the at hand study in relation to symptoms of COVID-19 was not correct before the conduction of nursing instructions. These results were similar to those of Sivakumar (2020) who

surveyed through internet the knowledge available among Indian people about signs of COVID-19 and found that the only sign mentioned by 95% of the subjects was fever (18). The results of the current study revealed that after nursing instructions, school age children were knowledgeable about the prominent symptoms of COVID-19 like coughing, fever, shortness of breath and failure to breathe. Symptoms taught to the children in the current study were in accordance to the WHO (2020) which declared that elevated body temperature, non-productive cough, body aches and shortness of breath are the main symptoms of COVID-19 infection (19). From the researchers' point of view, as this virus was totally new to the Egyptian public including the children, it was difficult for them to know such information especially for hospitalized children who have no regular access to mass media or any kind of educational sessions on the novel COVID-19 viral infection.

The present study showed that, after nursing instructions, the vast majority of children knew that coughing or sneezing and contact with contaminated surfaces are of the main routes for the transmission of the disease. The previously mentioned result was supported by Wang and Du (2020) who reported that salivary droplets resulting from coughing or sneezing can travel up to 1 - 2 meters and settle on different surfaces causing infection (20). These results also appear to be congruent with those of Sivakumar (2020) who found that 80% of people believed that COVID-19 is transmitted through air (18). In relation to knowledge about treatment and prevention, more than half of the hospitalized children had wrong beliefs about the availability of treatments and COVID-19 vaccine. This finding is not unexpected and the researcher looked at it as the COVID-19 was in the first stage and still known to the people as CORONA virus infection, people were confused

between it and the old CORONA virus that appeared in Saudi Arabia a few years ago and thought if it is an old disease there should be an available vaccine and treatment. Participants were given sufficient information through nursing instructions about the novel COVID-19, unavailability of antiviral treatments and vaccines; however, there are some supportive treatments that can be used for the relief of symptoms as anti-pyretic medications, analgesics along with appropriate fluid intake. The new information that was gained by children after nursing instruction was supported by Chen et al. (2020), who stated that there is no efficient antiviral medication available for COVID-19 infection; however, patients can follow general measures for management such as resting in bed, use of supportive medications and proper body hydration (21).

Regarding school age children's reported-practices for self-protection against COVID-19, the current study showed that the majority of children did not wash their hands with soap and water for at least 20 seconds; more than half were not aware of washing hands after using the toilet, contacting sick people and covering their mouth or nose when coughing or sneezing. This can be explained from different aspects; firstly, children in hospital area have a limited number of bathrooms in the whole ward (10 toilets) that serve more than 40 children and their mothers so it was very difficult for them to practice hand washing in such a limited number of bathrooms every time as per the hygienic instruction. Secondly, the children themselves were tired and sick, because of the illness process and may feel it burdensome to do that. Finally, children in hospital as well as their mothers may think that the hospital is a sterile area or their administration of antibiotics would protect them from any infection.

The highest percentage of participants considered hand-washing measures after nursing instructions. The newly gained knowledge by children in this study on hand hygiene and hygienic practices after the session were in accordance with the WHO (2020) that emphasizes proper and consistent hand washing measures help in the prevention against COVID-19 infection (22). In the same line, McGuinness et al. (2018) in a systematic review on hand washing and hygienic practices' effect on acute respiratory infections in school age children concluded that hand hygiene interventions in childcare, school and domestic settings can reduce respiratory tract infection morbidity (23). Also, Ge et al. (2020) who stated that hand washing with soap for at least 20 seconds after contact with infected suspects or contaminated surfaces along with hand disinfection using 70% ethyl alcohol help in the protection against infection (24).

Concerning school age children's travel and school preventive measures during COVID-19 outbreak, less than half of the children were not aware of the risk of being in close contact with people suffering from respiratory tract infections and going to school or work if feeling unwell. These results were similar to those of Nooh et al. (2020) who presented awareness in Aljouf, Saudi Arabia on new Corona virus. The researchers concluded that knowledge regarding method of transmission and preventive measures was low and needed to be upgraded through sessions that raise awareness as well as information of the population to control the disease (25). After nursing instructions, school aged children were fully alert about the role of human-to-human contact in the management of COVID-19 transmission. This result was congruent with Wimalawansa (2020) who stated that COVID-19 is a highly infectious disease that can be contracted through avoiding

near contact with infected people, crowded areas along with lack of proper ventilation (26). In the current study, majority of the hospitalized children before and after nursing instructions were convinced to use facemasks for protection when surrounded by infected people. This result was concurrent with Sivakumar (2020) who found that majority (80%) of the included sample of Indian people believed that facemask can prevent infection of COVID-19 (18). Along with Wimalawansa, (2020) who stated that facemasks are shielding tools designed for the filtration of viral and air-born particulates; however, it is not suggested to be used when not in close contact with sick people or crowded areas (26). From the researchers' point of view, children's information before nursing instructions could be explained within the framework of Piaget and Inhelder (2013) and Morss (2020) who stated that school age children's thinking process has logical order; cause and effect, they can deduce general rules from observation.

In this situation, a child in the hospital has two observations: (1) doctors and nurses wear a facemask (2) nurses and doctors wear masks in the hospital while they are in contact with ill people. The children arrived to one deduced general role: facemask can prevent infection (27, 28). Concerning lifestyle and general precautions, approximately half of the children were aware of staying at home and seeking medical care when feeling unwell; however, less than a third had no problem with the use of cigarettes. After one week of nursing instructions, the majority of the participants corrected their thoughts regarding the previously mentioned measures. In a systematic review conducted by Vardavas and Nikitara (2020) on COVID-19 and smoking, the authors agreed on the relation of smoking as a factor for the bad prognosis of COVID-19 (29).

In regards to coughing and sneezing etiquette, more than half of the school age children were not alert to the hazard of touching the face, not sneezing into their elbow or tissue. Similarly, Nooh et al. (2020) who found that Saudi people who attended the health awareness on COVID-19 had low knowledge on proper sneezing and coughing techniques into the elbow (25). Majority of the participants were knowledgeable about coughing and sneezing etiquette after nursing instructions. The behavior of the children was very normal and can be explained as the practice of coughing or sneezing into elbow was not well known among people before COVID-19. This result was concurrent with Lai et al. (2020), who stated that keeping a distance while sneezing and coughing, using disposable tissues and sticking to the preventive measures stops the transmission of infection specifically within hospitals (5).

Comparing the results before and after nursing instructions, it was found that there was a statistically significant difference in the children's knowledge before and after nursing instructions. Significant positive statistical difference was found between children's total mean score of knowledge before and after nursing instructions along with highly positive statistically significant difference between children's total mean score of reported practices before and after nursing instructions. All the results regarding knowledge and practices of children after nursing instructions were in accordance with Jin et al. (2020) who developed a rapid advice guideline for the diagnosis and treatment of novel coronavirus, to help clinicians and public health practitioners in diagnosing, treating and preventing the newly faced pandemic (30). Also, the results of the current study of children reported practices as well as knowledge matches in many points with de Sequera Ortiz et al. (2020) who developed a

protocol to prevent COVID-19 among renal dialysis patients and among the safe practices for the prevention of infection spread (31). From the researchers' point of view, after finishing nursing instructions the children were able to perform self-preventive and general precautionary measures correctly. It is very important to note that the results regarding the changed knowledge and practices of children which is not an usual occurrence, knowing that the governments of the countries in the world, WHO, clinicians and scientists plus the populations all over the world are discovering and learning about COVID-19's causes, signs, mode of infection, clinical manifestations, treatment and preventive measures. The complete information about this viral infection is still evolving and will continue to evolve in the coming few months (if we are lucky) or even years and that means constant change in the knowledge and practice, not only for the children but also for the universe will take place.

5- CONCLUSION

From the current study, we can conclude that the school age children had insufficient knowledge about novel COVID-19, along with low standards of reported-practices. After nursing instructions concerning COVID-19 characteristics, symptoms, modes of transmission and preventive measures, higher total mean scores were detected regarding their knowledge and reported-practices.

6- RECOMMENDATIONS

As the researcher found that the studies are very scanty and this area (children's awareness research about COVID-19) is new to health care researchers, especially pediatric nurses, the current study recommends that:

- Mass awareness programs on the novel COVID-19 be implemented to reduce the

infection spread rate especially among hospitalized children.

- Simple Arabic illustrative educational booklets and posters about COVID-19 should be produced and provided for all children in medical wards and outpatient clinics.

- Research duplication on larger representative sample that promotes generalizability of the results on population.

- Consultation centers should be established where proper knowledge and practices are provided regarding any pandemic.

- In case people cannot reach consultation centers, hotlines should be available 24 hours for providing proper information about any concerns.

7- ACKNOWLEDGEMENTS

The authors are thankful to the mothers and their children for their participation and cooperation in the current study and helping in completing this scientific work.

8- CONFLICT OF INTEREST: None.

9- REFERENCES

1. Zu ZY, Jiang MD, Xu PP, Chen W, Ni QQ, Lu GM, et al. Coronavirus disease 2019 (COVID-19): a perspective from China. *Radiology*. 2020 Feb 21:200490.
2. Thomas M, Bomar PA. Upper respiratory tract infection. InStatPearls [Internet] 2019 Dec 16. StatPearls Publishing.
3. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *The Lancet*. 2020 Feb.15; 395(10223):497-506.
4. Elnagar SA, Amin FM, Alseraty WH. Effectiveness of Planned Teaching Guidelines on Nursing Students Regarding Middle East Respiratory Syndrome. *J. Nurs. Health Sci*. 2017; 6(4):42-8.
5. Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh

PR. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges. *International journal of antimicrobial agents*. 2020 Feb 17:105924.

6. Peeri NC, Shrestha N, Rahman MS, Zaki R, Tan Z, Bibi S, et al. The SARS, MERS and novel coronavirus (COVID-19) epidemics, the newest and biggest global health threats: what lessons have we learned? *International journal of epidemiology*. 2020 Feb 22.

7. World Health Organization. Rational use of personal protective equipment for coronavirus disease (COVID-19): interim guidance, 27 February 2020. World Health Organization; 2020.

8. Jiang F, Deng L, Zhang L, Cai Y, Cheung CW, Xia Z. Review of the clinical characteristics of coronavirus disease 2019 (COVID-19). *Journal of General Internal Medicine*. 2020 Mar 4:1-5.

9. World Health Organization. Coronavirus disease 2019 (COVID-19): situation report, 95.

10. Cao Q, Chen YC, Chen CL, Chiu CH. SARS-CoV-2 infection in children: Transmission dynamics and clinical characteristics. *Journal of the Formosan Medical Association*. 2020; 119(3):670.

11. Hockenberry MJ, Wilson D. *Wong's essentials of pediatric nursing*. 2015.

12. Marcante KJ, Kliegman RM. *Nelson Essentials of Pediatrics*. 8th ed. Philadelphia, PA: Elsevier; Normal development. 2019.

13. Liu J, Liao X, Qian S, Yuan J, Wang F, Liu Y, et al. Community Transmission of Severe Acute Respiratory Syndrome Coronavirus 2, Shenzhen, China, 2020. *Emerg Infect Dis*. 2020;26(6). doi: 10.3201/eid2606.200239.

14. Sohrabi C, Alsafi Z, O'Neill N, Khan M, Kerwan A, Al-Jabir A, et al. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *Int J Surg*. 2020;76:71-6. doi: 10.1016/j.ijsu.2020.02.034.

15. Wilson D, Rodgers CC. *Wong's essentials of pediatric nursing-e-book*. Elsevier Health

Sciences; 2016 Sep 1.

16. Polit D, Beck C. Essentials of nursing research: Appraising evidence for nursing practice. 7th. ed., Lippincott and Williams: London; 2017.

17. WHO Regional Office for the Eastern Mediterranean. Coronavirus disease 2019 (COVID-19): Protect yourself and others. 2020. EMCSR255E.pdf

18. Sivakumar B. Educational Evaluation Survey on Corona Virus 19 (An Awareness)–South India. *Studies in Indian Place Names*. 2020; 40(70):228-34.

19. World Health Organization. Severe acute respiratory infections treatment centre: practical manual to set up and manage a SARI treatment centre and a SARI screening facility in health care facilities. World Health Organization; 2020.

20. Wang J, Du G. COVID-19 may transmit through aerosol. *Ir J Med Sci*. 2020 Mar 24. doi: 10.1007/s11845-020-02218-2.

21. Chen ZM, Fu JF, Shu Q, Chen YH, Hua CZ, Li FB, et al. Diagnosis and treatment recommendations for pediatric respiratory infection caused by the 2019 novel coronavirus. *World J Pediatr*. 2020 Feb 5. doi: 10.1007/s12519-020-00345-5.

22. World Health Organization. Water, sanitation, hygiene and waste management for COVID-19: technical brief, 03 March 2020. World Health Organization; 2020.

24. Ge ZY, Yang LM, Xia JJ, Fu XH, Zhang YZ. Possible aerosol transmission of COVID-19 and special precautions in dentistry. *Journal of Zhejiang University-SCIENCE B*. 2020:1-8.

25. Nooh HZ, Alshammary RH, Alenezy JM, Alrowaili NH, Alsharari AJ, Alenzi NM, et al. Public awareness of coronavirus in Al-Jouf region, Saudi Arabia. *Z Gesundh Wiss*. 2020 Feb 13:1-8. doi: 10.1007/s10389-020-01209-y. [Epub ahead of print].

26. Wimalawansa SJ. Global Epidemic Of Coronavirus—Covid-19: What Can We Do To Minimize Risks. *European Journal of Biomedical*. 2020; 7(3):432-8.

27. Piaget J, Inhelder B. The growth of logical thinking from childhood to adolescence: An essay on the construction of formal operational structures. Routledge; 2013 Nov 5.

28. Morss J. The Concept of Developmental Stage: Hall, Freud, and Piaget. In *Oxford Research Encyclopedia of Psychology*. 2020, Feb 28.

29. Vardavas CI, Nikitara K. COVID-19 and smoking: A systematic review of the evidence. *Tobacco induced diseases*. 2020;18: 20.

30. Jin YH, Cai L, Cheng ZS, Cheng H, Deng T, Fan YP, Fang C, Huang D, Huang LQ, Huang Q, Han Y. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). *Military Medical Research*. 2020;7(1):4.

31. de Sequera Ortiz P, Quiroga Gili B, de la Fuente GDA, et al. Protocol against coronavirus diseases in patients on renal replacement therapy: Dialysis and kidney transplant [Protocolo de actuación ante la epidemia de enfermedad por coronavirus en los pacientes de diálisis y trasplantados renales] [published online ahead of print, 2020 Apr,7]. 2020. oi:10.1016/j.nefro.2020.03.010.