

Effect of Educational Guidelines Program about COVID-19 Precautions on Children and Their Caregivers

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Background: One of the most impactful communicable diseases present today is COVID-19. Children are one of the groups of society vulnerable to infection with the Corona virus. Hence, awareness programs about COVID-19 precaution guidelines for children and their caregivers may play an important role in reducing the spread of infection. The study aimed to evaluate the effect of educational guidelines program about COVID-19 precautions on knowledge and practices of children and their caregivers. **Research Design:** A quasi-experimental research design was utilized (pre and posttest). **Setting:** The study was conducted at pediatric outpatient clinic of Tanta Main University Hospital which includes Hematology, Chest, Neurology, Renal, Hepatic, Genetic, Endocrinal and Diabetes Departments. **Sample:** A purposive sampling approach of sixty children between 8-15 years of age and their caregivers were included from the previously mentioned setting. Two tools of data collection were used (Children and their Caregivers structured interview and Children and their Caregivers reported practice checklist). **Results:** the total mean score of children and their caregivers regarding knowledge and practice about COVID-19 and its precaution guidelines had improved after the program implementation with positive correlation between children's caregivers and children's knowledge and practice pre and post educational guidelines program. **Conclusion:** children and caregivers who received the educational guidelines program regarding COVID-19 and its precaution guidelines had higher levels of knowledge and practices on posttest than pretest. **Recommendations:** Continuous educational and awareness programs about COVID-19 and precaution guidelines must be provided periodically to help children and their caregivers to improve their knowledge and practice, therefore limit spread of infection.

Keywords: *Children, Caregivers, Educational guidelines, COVID-19, Precautions.*

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Introduction

Coronaviruses are a diverse family of viruses that can cause illnesses ranging from the common cold to more serious conditions. A new coronavirus that emerged in late 2019 spread quickly around the world, causing a global pandemic. The virus was given the designation severe acute respiratory syndrome coronavirus. A COVID-19 infection can result in asymptomatic infection, minor respiratory symptoms, severe pneumonia with acute respiratory distress syndrome, and multiorgan failure. At the end of June, 2022, almost 13.8 million children had tested positive for Coronavirus infection associated with severe acute respiratory syndrome since the pandemic began, making up 18.7% of all cases. Outbreaks connected to health care, as well as instances where pupils may have contracted a disease from teachers or other school personnel. Unvaccinated people are at higher risk (Wang L, et al.,2022, American academy of pediatrics., 2023)

Whether the child exhibits symptoms or not, transmission is still possible. Children who also have neurologic disorders, metabolic disorders, congenital heart disease, obesity, diabetes mellitus, chronic pulmonary diseases, immunosuppression in sickle cell disease, or who are not up to date on their COVID-19 vaccinations are more likely to experience severe illness, require hospitalization, intensive care, or mechanical ventilation, and die. The COVID-19 virus can infect children of all ages. Both boys and girls are equally impacted. Children with symptomatic COVID-19 infection present with a variety of clinical syndromes, including gastroenteritis, croup, pneumonia, bronchiolitis, influenza, and the common cold. Children and adolescents presented clinically with

(fever, cough, shortness of breath, myalgia, rhinorrhea, sore throat, headache, nausea/vomiting, abdominal pain, diarrhea, loss of smell or taste, infant may express as solid food aversion or refusal and loss of taste (Hoang A, et al.,2020,Chua G, et al., 2021)

Children with fever, cough, myalgia, and tiredness frequently have viral infections; therefore, testing for influenza, para influenza, adenovirus, metapneumovirus, respiratory syncytial virus, and COVID-19 is required. For accurate COVID-19 screening, enzyme-linked immunosorbent assays (ELISAs), immunoglobulin (Ig) G and IgM tests, and real-time polymerase chain reaction (RT-PCR) are needed. Swabs are frequently utilized to clean the nasopharynx, throat, or nares. In most cases, chest radiography is not required unless the child exhibits symptoms of pneumonia, such as a fever, cough, abnormal pulmonary examination results, or both. The COVID-19 virus can be avoided through immunization (children aged 6 months to 5 years and 6 and older should receive the Pfizer-BioNTech and Moderna mRNA COVID-19 vaccines, respectively; those aged 12 and older should receive the Novavax vaccine), hand hygiene, environmental sanitization, personal protective equipment, the avoidance of secondhand smoke, social exclusion, and isolation of infected individuals (Lee B and Jr.W 2020, Li W,et al.,2020)

Children with limited oral intake, ongoing fever, deteriorating dyspnea, especially when resting, and lethargy, especially in newborns or kids with comorbid conditions, are all signs that should be treated right away. The management of COVID-19 is often supportive, but may need progressively complex procedures, such as

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endotracheal intubation or oxygen therapy delivered through a nasal cannula. For kids with mild symptoms and stable vital signs, outpatient care is recommended, with appropriate follow-up within 48 hours if symptoms worsen. Hospitalization is necessary for kids who show up with erratic vital signs, shock, or respiratory distress (Bi Q, et al., 2020, Rosenberg E, et al 2020)

The nurse is crucial in educating care givers about the COVID-19 preventive recommendations, which instill in children good hygiene habits. This entails washing hands thoroughly, using hand sanitizer, highlighting the value of personal hygiene, avoiding any form of social gathering, and taking into account a social distance of at least a meter from other people, especially if they prefer to play with other children. Teach children how to wash their hands properly, especially in between their fingers and under their fingernails. Teach the children to wash their hands thoroughly with excellent soap before touching their face or chewing. Use an alcohol-based hand massage or often wash hands with soap and water for at least 20 seconds. Whenever the child sneeze, cough, or touch something that is likely to be touched by others, such as a door handle, they should wash hands (Center for Disease Control and Prevention, 2022, Roy D, et al.,2020)

The nurse should instruct the child to cover his or her mouth and nose with a tissue or flexed elbow while coughing and sneezing. Take out the used tissue and immediately wash your hands with soap and water or a hand rub that contains alcohol. Allow the child to play and read, and make use of these activities as teaching tools for young children. Include kids in indoor activities as well. Clean the child's toys at least once every day. Keep a well-

ventilated home, sweep the floor and frequently touch things at least once every day. Avoiding close contact and keeping a distance from anyone who is contagious or exhibiting flu, fever, or cold-like symptoms, as well as from wild animals. Children with fevers, coughs, or running noses shouldn't be allowed to associate with anyone, especially the elderly or grandparents. A mask must be worn at all times to protect against infection, and the nurse should show the child how to put one on and take it off correctly (Goni M, Hasan H.,et al,2019) It is important to provide the child with a healthy meal and plenty of water. Give the child vegetables, cheese, egg yolks, and citrus fruits (orange, lemon, and grapefruit) that are high in vitamin C, as well as legumes, lentils, beans, and nuts that are high in zinc .If the child has a fever, cough, or having trouble breathing, you should see a doctor as soon as you can. Keep in touch with the child's educational institution, which includes keeping in touch with the child's teacher. Parents may t need to ask questions, seek assistance, and remain aware (Shahali, et al., 2023)

Significance of the study

COVID-19 can affect children of any age. Children who have COVID-19 infection may have no symptoms or a moderate sickness, but certain children are at risk of developing severe disease that could lead to hospitalization, admission to a pediatric intensive care unit, use of invasive mechanical ventilation, and even death. Children's physical and emotional health have affected by their hospitalization during the COVID-19 pandemic. Nursing care is intended to address issues relating to a child's particular symptoms and conditions, inform children and their care givers about the causes, risks, and precautions associated with preventing and limiting the spread of disease, and

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offer psychological support to the children and their families to help them cope with their concerns about the COVID-19 (Laws R. 2020), so the study aimed to evaluate the effect of educational guidelines program about COVID-19 and its precaution guidelines on children and their caregivers.

Aim of study was to evaluate the effect of educational guidelines program about COVID-19 precaution on knowledge and practices of children and their caregivers.

Research Hypotheses:

- **H1:** Children and their caregiver who receive educational guidelines program are expected to have higher level of knowledge
- **H2:** Children and their caregivers who receive the educational guidelines program are expected to have higher level of practice on posttest than pretest.

Subject:

Research Design:

A quasi-experimental research design was utilized(pre and post test)

Setting:

The study was carried out at pediatrics' outpatient clinic in the second floor of the comprehensive clinic of Tanta Main University Hospital. The pediatrics' outpatient clinic includes Hematology, Chest, Neurology, Renal, Hepatic, Genetic diseases, Endocrinal diseases and Diabetes Departments.

Sampling:

A purposive sampling approach of sixty children between 8-15 years of age and their caregivers were collected from the previously mentioned setting. The sample size was based on the following parameters confidence level

error level 5% type I error 0.05 and power of test 95%.

Inclusion criteria of studied children:

- Age from 8-15 years.
- Children who are educated (literate)

Exclusion criteria:

- Children who are illiterate
- Children who have a physical handicap (especially of hands) or mental illness

Tools of data collections

Two tools were utilized in the study as the following:

Tool (1): Children and their Caregivers structured interview:

It was developed by the researchers in Arabic language after reviewing literatures and it was filled by children and their caregivers (Marliyn J., et al 2022, Abdeldaim D. and Elghazally N. 2021)

It included three parts:

- **Part (1):** Sociodemographic characteristics of the studied children which consisted of their age, gender, level of education, residence.
- **Part (2):** Sociodemographic characteristics of the studied caregivers which consisted of their age, gender, level of education, marital status, relation to the child and occupation.
- **Part (3):** Children and caregivers' knowledge regarding COVID-19 and its precaution guidelines that included, meaning of COVID-19, incubation period, the high risk groups, mode of transmission, signs & symptoms, the difference between COVID-19 and influenza, complications and precaution guidelines which included hand

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washing technique (standard steps, when we should wash hands), standard steps for wearing and taking off mask, continuous disinfection of shared surfaces, good ventilation of places, etiquette of sneezing and coughing, ways to boost immunity, keeping a safe distance between us and others, avoiding handling, hugging, kissing, crowding, unsafe handling of animals without wearing personal protective equipment, preventing contaminated hands touching the nose, mouth, and eyes and immunization.

Scoring System:

Children and their caregivers' knowledge were graded as follows:

- Complete answer was scored (2)
- Incomplete answer was scored (1)
- Wrong answer or didn't know was scored (0)

Total score of children and their caregiver's knowledge were categorized as follows:

- 50-↓60% was graded (poor)
- 60-↓70% was graded (fair)
- 70-100% was graded (good).

Tool II "Children and their caregivers reported practice checklist" (Isba. R., et al, 2020, Gettings J., et al, 2021)

It was created by the researcher to evaluate the performance (practice) level of children and their caregivers. It included 3 precaution procedures including standard hand washing, wearing and taking off mask following infection control strategies. Each procedure was listed in the form of standard steps or items.

The children and their caregivers' reported practice were graded as follows:

- Correctly done was scored (1)
- Incorrectly done or not done was scored (0)

The total reported practice scores (children or caregivers) were classified as follows:

- Satisfactory if score was > 60%
- Unsatisfactory if score was ≤ 60%

Method

Administrative process:

An official permission for data collection was obtained from the Dean of the Faculty of Nursing, to the director of the comprehensive clinic of Tanta Main University Hospital

Ethical and legal considerations:

Ethical approval to conduct the study was taken from scientific research ethical committee at the Faculty of Nursing code number (number of approval was 179-12-22).

- Nature of the study didn't cause any harm or pain to the entire sample.
- Confidentiality and privacy regarding the data collection were taken into consideration.
- Children and their caregivers provided informed consent related to their acceptance to participate in the study. They were told that they can withdraw from the study at any time.

Tools Development:

Two tools were used for data collection.

Validity:

The validity of the study was evaluated by a jury of five expert professors in pediatric nursing field to check the

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relevance, coverage and uniqueness of the questions and the calculated content validity index (%) of each item was 94%.

Content reliability:

To assess reliability, the study Tools (I and II) was tested by the pilot subjects at first session for calculating Cronbach's Alpha which was 0.891.

A Pilot study:

A pilot study was carried out on six children and their caregivers (10%) to test clarity, visibility and applicability of the study. Tools and the necessary modifications were done. Those children and their caregivers were excluded from total sample of the study.

Phases of the research

The present research was conducted at four phases of implementing educational guidelines program including assessment, planning, implementation and evaluation.

1) Assessment phase:

The researcher conducted meeting with children and their caregivers who participated in the research in order to explain the aim of the research, to assess knowledge and practice before implementing educational guidelines program about precaution of Covid 19 (Tool I and II).

2) Planning phase:

Based on the results of a requirements analysis and a study of relevant literature, a training curriculum for children and their caregiver was developed. Which included the following:

- a) Setting specific objectives of the educational guidelines program.
- b) Preparation of the content of educational guidelines program.
- c) Different methods and materials for educational guidelines program were used including interactive

lectures, power point presentations, pictures, books and posters

3) Implementation phase:

The researchers were available two days per week from 9:00 am till 12:00 pm in the morning shift at the pediatrics' outpatient clinic to collect the data for the pretest, precaution guidelines session implementation, and posttest. The data were collected through interview with the children and their caregivers one by one.

▪ **Pretest** was carried out by the researchers before introducing the educational guidelines program through doing an interview to all studied subjects (children and their caregivers) one by one who meet inclusive criteria after obtaining oral consent from them to collect the baseline data and to assess knowledge and practice of the children and their caregivers regarding COVID-19 and its precaution guidelines.

This phase included two steps, **the first step:** the researchers distributed the questionnaire sheet between children and their caregivers individually; the content of the sheet was explained to all of them and were filled individually by them. The questionnaire sheet contained the socio demographic data of children and their caregivers that involved **closed ended questions (multiple choices)** regarding COVID-19, and precaution guidelines to assess for the first time their basic information and knowledge to cover (tool I). This step took about 10 minutes for both child and caregiver.

▪ **The second step:** the researchers asked children and their caregivers individually to demonstrate steps of procedures including standards of hand washing using the role modeling method, wearing and

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taking off mask using sterile masks which were distributed by the researchers to children and their caregivers to assess for the first time their level of practice based on checklist for each precaution procedure and the researchers gave a score for each procedure step or item to fulfill (tool II). This step took about 10 minutes for both child and caregiver.

- ◆ Ten children and their caregivers were included in each of the six groups
- ◆ The educational guidelines program consisted of two sessions, each session lasted about 10 minutes
- ◆ A variety of teaching techniques were employed, lectures, group discussions, and demonstrations.
- ◆ The researchers explained this information to the child and caregiver using educational brochures which were distributed to them. The researchers took about 10 minutes to fulfill this stage with each child and caregiver.
- ◆ Data was gathered on the course of one year from November 2020 up to November 2021

Educational guidelines program was conducted on three sessions.

- **The first session focused on:** definition, incubation period, the high risk groups, mode of transmission
- **The Second Session** focused on signs and symptoms, complications of COVID-19 and precaution guidelines.
- **The Third session** focused on demonstration and redemonstration of standard steps of hand washing, wearing and taking off mask.

On post-test phase:

4) Evaluation phase

The same assessment methods were used to reassess children and their caregivers' knowledge and practice immediately after educational guidelines program, and these results were in comparison to pre-test levels. Using tool (I, II)

Statistical analysis

With the use of the IBM SPSS software package version 20.0, data were input into the computer and analyzed. IBM Corp., Armonk, New York Number and percentage were used to describe qualitative data. The normality of the distribution was examined using the Kolmogorov-Smirnov test. The range (minimum and maximum), mean, standard deviation, and median were used to characterize quantitative data. At the 5% level, significance of the results was determined. Four tests were used: Wilcoxon signed ranks test for abnormally distributed quantitative variables and comparison between two periods, paired t-test for comparison between two periods, McNemar and marginal homogeneity test for analyzing significance between the various stages, and Pearson coefficient test for correlating two normally distributed quantitative variables. WhiteSE.2019

Results

Table (1): This table illustrates the percentage distribution of the studied children's caregivers according to their socio-demographic characteristics. It was found that the majority of studied children's caregivers (86.7%) were female. Regarding the age of the studied children's caregivers it was found that more than half of them 53.3% their age ≥ 35 with Mean \pm SD 35.75 ± 7.07 . More than one third of them (40%) had the secondary school compared to (20%) were illiterate. The majority of studied

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children's caregivers was married and house wife (86.7% and 60.7%) respectively.

Table (2): This table represents the percentage distribution of the studied children according to their socio-demographic characteristics. More than half (63.3%) of the studied children were males. Regarding their age more than half of them (60%, 53.3%) respectively their age ≥ 10 with Mean \pm SD (10.50 ± 1.83) and had preparatory school. More than two thirds (66.7%) of them were reside in rural area.

Table (3): This table shows the mean scores of children and their caregiver's knowledge about COVID-19 precautions. The Total mean score regarding knowledge about precaution guidelines for children's caregivers pre the educational guidelines program were (19.03 ± 7.60) and post educational guidelines program improved and became (38.37 ± 3.93), also regarding children's the total knowledge precautions pre the educational guidelines program were (12.18 ± 6.87) and post educational guidelines program improved and became (38.47 ± 4.18), It was found that there were statistical significance difference pre and post educational guidelines program among children's caregivers and the children regarding (knowledge about COVID-19, precaution guidelines to prevent infection with COVID-19 ($P < 0.001^*$)).

Table (4): This table decelerates percentage distribution of children and their caregiver's knowledge levels about COVID-19 precautions. There were statistical significance difference among children and children's caregivers ($P < 0.001^*$) as it was found that the majority of them (95%) had good knowledge Post educational guidelines program compared to (33.3%) of them had fair knowledge pre educational guidelines program and

regarding knowledge about COVID-19 disease among child's it was found that the majority of them (91.7%) had good knowledge post educational guidelines program compared to only (13.3%) of them had fair knowledge pre educational guidelines program. Regarding overall knowledge about precaution guidelines there were statistical significance difference among children's and children's caregivers ($P < 0.001^*$) as it was found that the majority of them (96.7%) had good knowledge post educational guidelines program compared to (16.7%) of them had fair knowledge pre educational guidelines program and among children's it was found that the majority of them (95%) had good knowledge post educational guidelines program compared to only (3.3%) of them had fair knowledge pre educational guidelines program.

Figure (1): This figure displays total knowledge levels among children's about COVID-19 precautions. There were statistical significance difference among children's caregivers ($P < 0.001^*$) as related to children's care givers it was found that the majority of them (about 98%) had good knowledge post educational guidelines program compared to near to (90%) of them had poor knowledge pre educational guidelines program.

Figure (2): This figure displays total knowledge levels among children's about COVID-19 precautions. It was found that there were statistical significance difference among children's knowledge ($P < 0.001^*$). It was found that the majority of them had good knowledge post educational guidelines program, while the most of them had poor knowledge pre educational guidelines

Table (5): This table reveals reported practices of children and caregivers about COVID-19 precautions. The

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mean score according to children's caregivers overall practice pre educational guidelines program were (41.43 ± 22.85) and became (98.45 ± 7.66) post educational guidelines program, while the mean score according to children's overall practice pre educational guidelines program were (30.36 ± 22.65) and became (97.02 ± 10.60) post educational guidelines program. It was found that there were statistical significance difference ($P < 0.001^*$) among children's caregivers and children's related to (The correct way to wash hands with soap and water, The correct way to wear a medical mask, The correct way to take off and dispose of the medical mask)

Figure (3): This figure clarifies levels of total reported practice among children's caregivers about COVID-19 precautions. Regarding the overall practice it was found that there were statistical significance difference among children's and children's caregivers as among child's caregiver it was found that the majority of them (about 96 %) of them had satisfactory practice post educational guidelines

program compared to (about 73%) of them had unsatisfactory practice pre educational guidelines program

Figure (4): This figure clarifies Levels of total reported practice among children's about COVID-19 precautions. Regarding the overall practice it was found that there were statistical significance difference among children's as it was found that the majority of them (about 93%) of them had satisfactory practice post educational guidelines program compared to about (80%) of them had unsatisfactory practice pre educational guidelines program.

Table (6): This table shows the correlation between total knowledge and total practice among children's caregivers and children about COVID-19 precautions. There was positive correlation between total knowledge and overall practice as there was improving in the knowledge of the children's caregivers and the children's leads to improving in their practice. It was found that there were statistically significant difference ($P < 0.001^*$) pre and post educational guidelines program

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Table (1): Percentage distribution of the studied children's caregivers according to their socio-demographic characteristics (n = 60)

First: Personal data of the children's caregivers	No.	%
Gender		
Male	8	13.3
Female	52	86.7
Age		
<35	28	46.7
≥35	32	53.3
Min. – Max.	23.0 – 50.0	
Mean ± SD.	35.75 ± 7.07	
Median	38.0	
Educational level		
Illiterate	12	20.0
Read and write	4	6.7
The primary school	0	0.0
The preparatory school	0	0.0
The secondary school	24	40.0
Bachelor degree	16	26.7
Post graduate studies	4	6.7
Marital status		
Single	4	6.7
Separated	0	0.0
Divorced	0	0.0
Widowed	4	6.7
Married	52	86.7
Kinship with the child		
The father	8	13.3
The mother	40	66.7
The grandfather	8	13.3
The grandmother	0	0.0
The uncle	4	6.7
The aunt	0	0.0
Occupation		
Teacher	6	7.1
House wife	34	60.7
Farmer	10	16.7
Engineer	5	8.3
Accountant	3	5.0
Carpenter	2	3.6

Table (2): Percentage distribution of the studied children according to their socio-demographic characteristics (n = 60)

First: Personal data of the children	No.	%
Gender		
Male	38	63.3
Female	22	36.7
Age		
<10	24	40.0
≥10	36	60.0
Min. – Max.	8.0 – 14.0	
Mean ± SD.	10.50 ± 1.83	
Median	10.0	
Educational level		
Illiterate	0	0.0
Read and write	0	0.0
The primary school	28	46.7
The preparatory school	32	53.3
Place of residence		
Rural	40	66.7
Urban	20	33.3

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Table (3): Mean scores of children and their caregivers knowledge about COVID-19 precautions

	Children's caregivers (n = 60)			Children (n = 60)		
	Pre	Post	t (p)	Pre	Post	t (p)
1. knowledge about COVID-19 disease						
Min. – Max.	0.0 – 7.0	5.0 – 10.0	15.210* ($<0.001^*$)	0.0 – 7.0	5.0 – 10.0	19.515* ($<0.001^*$)
Mean ± SD.	4.33 ± 2.19	9.23 ± 1.43		3.53 ± 1.76	8.67 ± 1.70	
Median	5.0	10.0		3.0	10.0	
2. knowledge about precaution guidelines to prevent infection with COVID-19						
1. Washing hands with soap and water or rubbing them with alcohol-based disinfectants						
Min. – Max.	0.0 – 7.0	6.0 – 10.0	11.501* ($<0.001^*$)	0.0 – 10.0	4.0 – 10.0	17.958* ($<0.001^*$)
Mean ± SD.	4.50 ± 2.46	8.88 ± 1.40		3.0 ± 2.0	8.98 ± 1.58	
Median	5.50	10.0		3.0	10.0	
2. Personal hygiene and healthy environmental habits						
Min. – Max.	0.0 – 4.0	2.0 – 4.0	11.381* ($<0.001^*$)	0.0 – 4.0	2.0 – 4.0	12.181* ($<0.001^*$)
Mean ± SD.	1.70 ± 1.18	3.75 ± 0.57		1.67 ± 1.02	3.52 ± 0.65	
Median	2.0	4.0		2.0	4.0	
3. Wearing and taking off mask						
Min. – Max.	0.0 – 10.0	9.0 – 14.0	13.248* ($<0.001^*$)	0.0 – 10.0	8.0 – 14.0	18.831* ($<0.001^*$)
Mean ± SD.	6.28 ± 3.04	12.58 ± 1.80		4.18 ± 3.37	12.97 ± 1.92	
Median	8.0	14.0		5.0	14.0	
4. Social distancing						
Min. – Max.	0.0 – 3.0	2.0 – 4.0	19.000* ($<0.001^*$)	0.0 – 3.0	2.0 – 4.0	28.367* ($<0.001^*$)
Mean ± SD.	1.20 ± 0.92	3.73 ± 0.58		0.40 ± 0.67	3.55 ± 0.65	
Median	1.0	4.0		0.0	4.0	
5. Strengthening immunity						
Min. – Max.	1.0 – 6.0	4.0 – 6.0	9.791* ($<0.001^*$)	0.0 – 5.0	3.0 – 6.0	15.924* ($<0.001^*$)
Mean ± SD.	3.45 ± 1.44	5.52 ± 0.62		1.83 ± 1.72	5.63 ± 0.66	
Median	4.0	6.0		2.0	6.0	
6. Receiving vaccines against COVID-1						
Min. – Max.	0.0 – 4.0	2.0 – 4.0	8.414* ($<0.001^*$)	0.0 – 4.0	2.0 – 4.0	13.555* ($<0.001^*$)
Mean ± SD.	1.90 ± 1.74	3.90 ± 0.44		1.10 ± 1.49	3.82 ± 0.57	
Median	2.0	4.0		0.0	4.0	
Total knowledge about precaution guideline						
Min. – Max.	5.0 – 30.0	29.0 – 42.0	16.508* ($<0.001^*$)	2.0 – 29.0	28.0 – 42.0	26.501* ($<0.001^*$)
Mean ± SD.	19.03 ± 7.60	38.37 ± 3.93		12.18 ± 6.87	38.47 ± 4.18	
Median	22.0	40.0		13.0	40.0	

t: Paired t-test

p: p value for comparing between **Pre** and **Post**

*: Statistically significant at $p \leq 0.05$

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Table (4): Percentage distribution of children and their caregiver's knowledge levels about COVID-19 precautions

	Child's caregiver (n = 60)					Child (n = 60)				
	Pre		Post		Test of Sig (p)	Pre		Post		Test of Sig (p)
	No.	%	No.	%		No.	%	No.	%	
1. Knowledge about COVID-19 disease										
Poor (<60%)	36	60.0	1	1.7	MH= 117.000* (<0.001*)	48	80.0	3	5.0	MH= 109.000* (<0.001*)
Fair (60-<70%)	20	33.3	2	3.3		8	13.3	2	3.3	
Good (70-100%)	4	6.7	57	95.0		4	6.7	55	91.7	
2. Knowledge about precaution guidelines to prevent infection with COVID-19										
1. Washing hands with soap and water or rubbing them with alcohol-based disinfectants										
Poor (<60%)	30	50.0	0	0.0	MH= 104.500* (<0.001*)	56	93.3	3	5.0	MH= 113.500* (<0.001*)
Fair (60-<70%)	19	31.7	2	3.3		3	5.0	0	0.0	
Good (70-100%)	11	18.3	58	96.7		1	1.7	57	95.0	
2. Personal hygiene and healthy Environmental habits:										
Poor (<60%)	49	81.7	4	6.7	McN= 39.510* (<0.001*)	56	93.3	5	8.3	McN= 49.020* (<0.001*)
Fair (60-<70%)	0	0.0	0	0.0		0	0.0	0	0.0	
Good (70-100%)	11	18.3	56	93.3		4	6.7	55	91.7	
3. Wearing and taking off masks:										
Poor (<60%)	40	66.7	0	0.0	MH= 116.500* (<0.001*)	46	76.7	2	3.3	MH= 112.500* (<0.001*)
Fair (60-<70%)	15	25.0	2	3.3		11	18.3	2	3.3	
Good (70-100%)	5	8.3	58	96.7		3	5.0	56	93.3	
4. Social distancing										
Poor (<60%)	56	93.3	4	6.7	McN= 48.167* (<0.001*)	58	96.7	5	8.3	McN= 51.019* (<0.001*)
Fair (60-<70%)	0	0.0	0	0.0		0	0.0	0	0.0	
Good (70-100%)	4	6.7	56	93.3		2	3.3	55	91.7	
5. Strengthening immunity										
Poor (<60%)	28	46.7	0	0.0	MH= 98.000* (<0.001*)	43	71.7	1	1.7	MH= 118.000* (<0.001*)
Fair (60-<70%)	20	33.3	4	6.7		13	21.7	3	5.0	
Good (70-100%)	12	20.0	56	93.3		4	6.7	56	93.3	
6. Receiving vaccines against COVID-19										
Poor (<60%)	39	65.0	3	5.0	McN= 32.237* (<0.001*)	51	85.0	5	8.3	McN= 44.022* (<0.001*)
Fair (60-<70%)	0	0.0	0	0.0		0	0.0	0	0.0	
Good (70-100%)	21	35.0	57	95.0		9	15.0	55	91.7	
Overall knowledge about precaution guidelines										
Poor (<60%)	49	81.7	0	0.0	MH= 122.000* (<0.001*)	58	96.7	0	0.0	MH= 119.500* (<0.001*)
Fair (60-<70%)	10	16.7	2	3.3		2	3.3	3	5.0	
Good (70-100%)	1	1.7	58	96.7		0	0.0	57	95.0	

McN: McNemar test

MH: Marginal Homogeneity Test

p: p value for comparing between Pre and Post

*: Statistically significant at $p \leq 0.05$

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Figure (1): Total knowledge levels of children's caregivers' knowledge about COVID-19 precautions

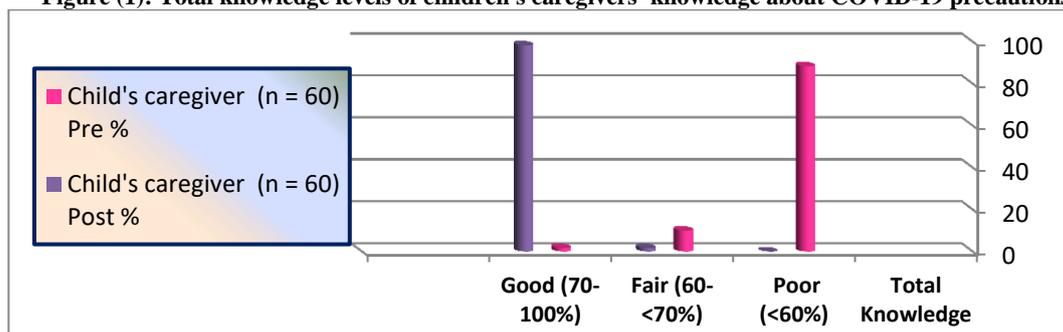


Figure (2): Total knowledge levels of children's knowledge about COVID-19 precautions

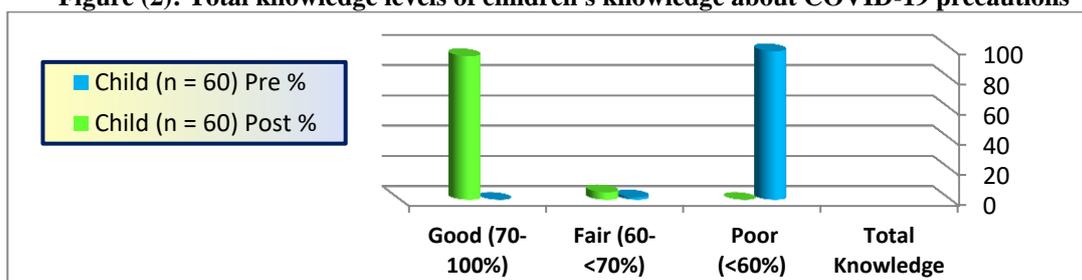


Table (5): Reported practices of children and their caregivers about COVID-19 precautions

Reported practice checklist about applying some precaution guidelines to prevent infection with covid-19	Child's caregiver (n = 60)			Child (n = 60)		
	Pre	Post	Z (p)	Pre	Post	Z (p)
The correct way to wash hands with soap and water						
Total score (0 – 24)						
Min. – Max.	8.0 – 22.0	14.0 – 24.0	6.794* (<0.001*)	0.0 – 23.0	14.0 – 24.0	6.682* (<0.001*)
Mean ± SD.	13.67 ± 3.98	23.83 ± 1.29		11.0 ± 4.98	23.50 ± 2.20	
Median	12.0	24.0		11.0	24.0	
% score	56.94 ± 16.57	99.31 ± 5.38		45.83 ± 20.76	97.92 ± 9.16	
The correct way to wear a medical mask						
Total score (0 – 20)						
Min. – Max.	0.0 – 18.0	7.0 – 20.0	6.608* (<0.001*)	0.0 – 18.0	6.0 – 20.0	6.776* (<0.001*)
Mean ± SD.	5.67 ± 6.68	19.63 ± 2.02		3.60 ± 5.42	19.33 ± 2.59	
Median	2.0	20.0		0.0	20.0	
% score	28.33 ± 33.38	98.17 ± 10.12		18.0 ± 27.11	96.67 ± 12.94	
The correct way to take off and dispose of the medical mask						
Total score (0 – 12)						
Min. – Max.	0.0 – 9.0	2.0 – 12.0	6.553* (<0.001*)	0.0 – 9.0	3.0 – 12.0	6.760* (<0.001*)
Mean ± SD.	3.87 ± 3.49	11.67 ± 1.56		2.40 ± 3.35	11.50 ± 1.74	
Median	6.0	12.0		0.0	12.0	
% score	32.22 ± 32.22	97.22 ± 12.99		20.0 ± 27.92	95.83 ± 14.52	
Overall practice						
Total score (0 – 56)						
Min. – Max.	10.0 – 46.0	32.0 – 56.0	6.732* (<0.001*)	0.0 – 50.0	32.0 – 56.0	6.692* (<0.001*)
Mean ± SD.	23.20 ± 12.79	55.13 ± 4.29		17.0 ± 12.68	54.33 ± 5.94	
Median	17.0	56.0		14.0	56.0	
% score	41.43 ± 22.85	98.45 ± 7.66		30.36 ± 22.65	97.02 ± 10.60	

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Z: Wilcoxon signed ranks test

p: p value for comparing between Pre and Post

*: Statistically significant at $p \leq 0.05$

Figure (3): Levels of total reported practice among children's caregivers about COVID-19 precautions

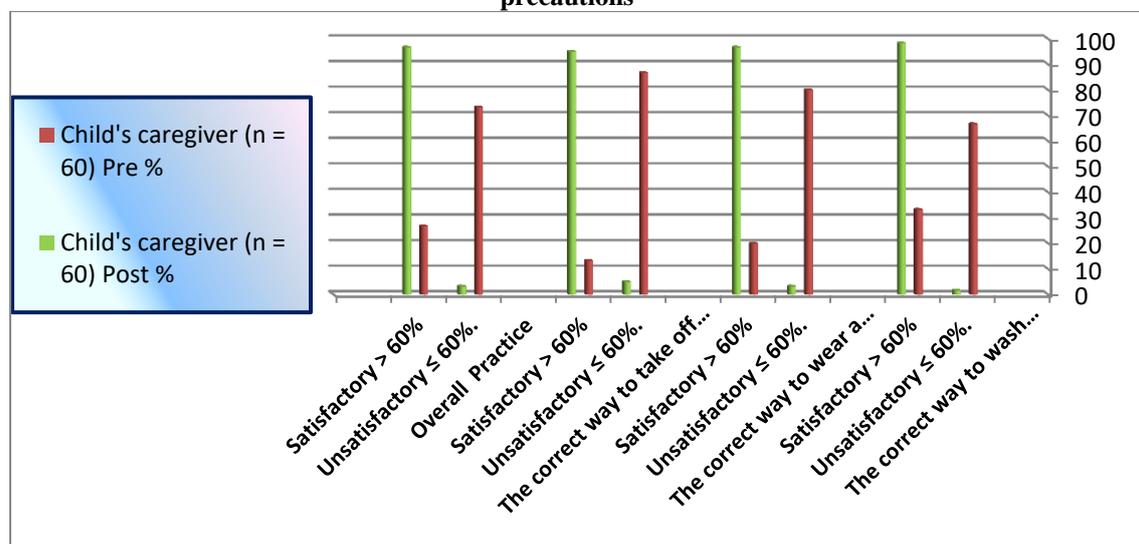


Figure (4): Levels of total reported practice among children's caregivers about COVID-19 precautions

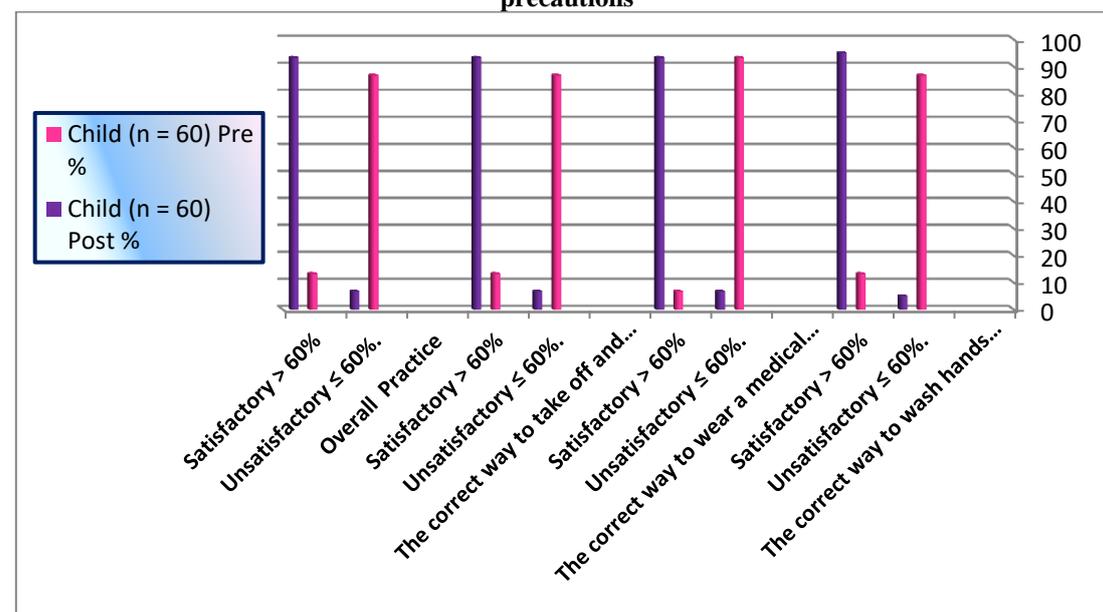


Table (6): Correlation between total knowledge and total practice among children's caregivers and children about COVID-19 precautions (n =60)

		Total Knowledge			
		Child's caregiver		Child	
		r	p	r	P
Total practice	Pre	0.644*	<0.001*	0.379*	0.003*
	Post	0.412*	<0.001*	0.596*	<0.001*

r: Pearson coefficient

*: Statistically significant at $p \leq 0.05$

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Discussion:

Coronavirus disease 2019 (COVID-19) is a respiratory viral infection brought on by the single-stranded RNA coronavirus 2 (SARS-CoV-2). The virus is believed to transmit primarily by close contact (it can be passed from hands to eyes, nose, or mouth), as well as respiratory droplets (created when an infected person coughs or sneezes). From a simple cold to more serious illnesses including bronchitis, pneumonia, severe acute respiratory distress syndrome, multi-organ failure, and even death, clinical symptoms can range from mild conditions like a cold (World Health Organization 2020)

The WHO released the COVID-19 preventive guideline on February 27, 2020, with recommendations for preventing the illness. The most effective preventive measures advocated by the community include routine hand washing and disinfection, refraining from touching one's eyes, nose or mouth, covering one's mouth or nose with a serviette or elbow when coughing or sneezing, using a medical mask, especially when there are respiratory symptoms, considering a safe disposal and maintaining a social distance of at least one meter from the person experiencing symptoms (Lynn R., et al 2021)

Regarding knowledge of children and their care givers about COVID_19, the study revealed that children and their caregivers had higher level of knowledge about COVID-19 and its precaution guidelines to prevent infection with COVID-19 on posttest than pretest. These results may be due to the efficacy of educational guidelines program about COVID-19 precaution guidelines on children and their caregivers on enhancing their knowledge due to the use of simple effective teaching and illustrative methods and materials

This was consistent with the findings of Alqahtani (2017), who discovered that students' baseline understanding of COVID-19 was poor prior to educational workshop sessions but knowledge rose following those workshops. These findings was on the same line with Joshi et al., (2020) who reported that three -quarters of the studied sample presented good knowledge and awareness about COVID-19 post educational guidelines program. Also, Zhong et al, (2020) reported that the studied sample was more knowledgeable and had optimistic attitudes after interventions. The study also was congruent with Fenget et al, (2020) who reported that there was an improvement in secondary school students' knowledge compared to preprogram knowledge. When comparing awareness of COVID-19 among secondary school students before and after the program's adoption, there was a highly statistically significant difference.

Also the study illustrated that there were a statistically significance difference between pre and post educational guidelines program among the children and their caregivers regarding reported practice about (hand washing, wearing, taking off and dispose the medical mask). This may be due to the effect of the educational guidelines program on enhancing good practice regarding COVID-19 precaution guidelines through demonstration and redmonstration of the task with well-illustrated colored brochures. This was in the same line with Abdeldaim and Elghazally, (2021) who stated that there was an improvement in knowledge and practices after implementing an educational guidelines program. Also Al-Dossary et al, (2020) who stated that there were higher preventive practices

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in dealing with COVID-19 post-intervention.

In addition, Alzoubi et al, (2020) found that higher levels of practice regarding the disease protective measures were present after the intervention. While this was in contrast with Adesegun et al, (2020) who reported that more than three-quarters of the respondents had good practices and Chen et al, (2021) cleared that the majority of the sample had satisfactory practices pre-intervention (28-30). The study revealed that there were statistically significant positive correlation between child's caregiver and child overall knowledge and overall practice. This may be due to the effect of educational guidelines program in enhancing child's caregiver and child overall knowledge that is reflected in promoting good practice. This was in the same line with Mbachu et al, (2020) who mentioned that there was a significant correlation between knowledge and practice of all studied sample and knowledge should be improved to enhance the use of preventive practices.

Additionally, the study was consistent with Ayedet et al, (2023) findings, who noted a strong statistically significant beneficial correlation between participants' overall knowledge scores, attitudes, and practices both in the workplace and after a month of program implementation. According to Shaikh and Likhite(2020), there are large disparities in children's knowledge and their use of preventive actions.

Conclusion:

Based on the results of the present study, it can be concluded that children and their caregivers who received the educational guidelines program regarding COVID-19 and its precaution guidelines had higher levels

of knowledge and practices on posttest than pretest

Recommendations:

The following recommendations can be suggested:

Continuous educational and awareness programs about COVID-19 and precaution guidelines must be provided periodically to help children and their caregivers to improve their knowledge and practice, therefore limit spread of infection.

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