

Mothers' Protective Measures toward their Children Against COVID-19 Pandemic.

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Abstract

Background: Coronavirus Disease 19 (COVID 19) pandemic is a major public health crisis that has harmed the well-being of children worldwide. Several protective measures have been recommended to halt the spread of the viruses and its associated mortality especially for children. **Aims:** the study aims to assess mothers' protective measures toward their children from COVID-19 pandemic. **Subject and method: Design;** A descriptive research design was used for this study. **Setting:** The study was conducted at the Out-Patient Department of El-Raml Children's Hospital (Wingat) at Alexandria. **Subjects:** A convenient sample of 200 mothers having children from one to six years. **Tool:** One tool was used for data collection: Mothers' protective measures to their children from COVID-19 interview schedule. **Results:** the present study revealed that nearly two thirds of the mothers (63%) have fair knowledge of the protective measures for their children against covid 19. Moreover, 61.5 % of those mothers provided moderate protection level to their children from covid 19. **Conclusion:** the results of this study concluded that more than half of the mothers obtained fair score of knowledge as well as moderate score of protective measures toward their children regarding COVID-19 pandemic. **Recommendations:** The study highlights the need for an educational program, workshops, and videos \booklets conducted for mothers to improve their protective measures for their children regarding COVID-19 pandemic emphasizing the instructions about steps of hand washing and how to wear and remove the mask.

Keywords: protective measures, children, COVID-19.

Introduction

Coronavirus Disease (COVID-19) is currently a global health threat and public health emergency of international concern. It is an infectious disease caused by a newly discovered Severe Acute Respiratory Syndrome Coronavirus (SARSCoV-2) (Zhou et al., 2020). The pandemic of COVID-19 virus was first reported in the city of Wuhan of China in late December 2019. COVID-19 has been described as a pandemic by the World Health Organization (WHO) on January 30, 2020 (WHO, September 2020; WHO, June 2020). Globally WHO reported that, there have been 191,773,590 confirmed cases of COVID-19, including 4,127,963 deaths and a total of 3,568,861,733 vaccine doses have been administered in July 2021. In Egypt, the total number of confirmed cases of COVID-19 from 3 January 2020 to 22 July 2021 were 283,862 with 16,465 deaths and a total of 5,056,303 vaccine doses have been administered on 12 July 2021. According to the American of pediatrics, children represent

about 12% of all COVID-19 cases (WHO Coronavirus (COVID-19) Dashboard, 2021).

Coronavirus Disease can affect children at any age and young people directly through respiratory droplets during coughing and sneezing and indirectly by physical contact of contaminated surfaces as hands, food, or object as well as touching of oral, nasal, mucous membranes (Center for Disease Control and Prevention [CDC], 2020). COVID-19 virus may also survive on surfaces for a few hours to several days; and it is characterized by rapid transmission (Henawy et al., 2020; WHO, June 2020).

Children can become infected and develop symptoms of COVID-19, from two to 14 days after their exposure to the virus but these symptoms usually are mild in nature. They may show flu like symptoms such as fever, cough and cold. Other symptoms can include shortness of breath, chest pain or pressure, muscle or body aches, headache, loss of taste or smell. Moreover, they may have gastrointestinal symptoms like vomiting and diarrhea, and infants may have difficulty in

feeding. Symptoms requiring urgent medical attention include difficulty breathing/fast or shallow breathing and grunting, difficult breastfeeding, blue lips or face, chest pain or pressure, confusion, inability to awaken/not interacting (WHO, June 2020). Severe cases can lead to cardiac injury, respiratory failure, acute respiratory distress syndrome, and death. (WHO, September 2020; WHO, June 2020).

Coronavirus Disease has great impacts on children's general health, well-being, and their development through exposure to the virus and consequent infection (Araujo et al., 2020). It can disrupt the environments in which children grow and develop (The Alliance for Child Protection in Human Train Action, 2020). Furthermore, some children who have been infected do not have any symptoms. Despite infected children being asymptomatic they may have high viral loads in their nasopharynx. (Kam et al., 2020 ; Tang et al., 2020 ; Zhang et al., 2020 ; WHO, September 2020). Therefore, it is important to protect children and youth as they represent 52% of the Egyptian population and are considered among the vulnerable groups to COVID-19 (United Nations International Children's Emergency Fund, 2020)

COVID-19 has got no effective cure; yet early recognition of symptoms and timely seeking of supportive care and preventive practices will enhance protection from the disease. Furthermore, vaccination and adherence to protective measures can combat the spread of the virus (WHO, June 2020).

Despite the unprecedented national measures in combating the pandemic of COVID-19, the success or failure of these efforts is largely dependent on public behavior, specifically, public adherence to protective measures established by the government which is of prime importance to prevent the spread of the disease. Mothers' adherence to protective measures plays an essential role in controlling the spread of the viruses. The adherence is affected by their knowledge and practices (Henawy et al., 2020). Protective measures should include continuous hand washing, use of alcohol-based hand sanitizer with at least 60% alcohol before getting onto the bus and disinfecting any touched surfaces that contact with child in the transportation, and keeping

doors and windows open in closed crowded area. Mothers must wash their hands and children's hands with soap and water for at least 20 seconds especially after blowing nose, coughing, sneezing, going to the bathroom and before eating or preparing food. Moreover, the mothers should wear personal mask and wear their children face shield in any crowded areas and during the contact with a healthcare provider (Licensing and Regulatory Affairs, 2020). The United Nations International Children's Emergency Fund (UNICEF) is hard working with the WHO, governments, and partners to equip mothers, children, and their families with the knowledge and practices regarding protective measures to prevent the spread of COVID-19 (WHO, June 2020).

Pediatric nurses play a vital role in raising community awareness and practices to stop the nation wide spread of COVID-19 through education of mothers and their children about the mode of transmission of COVID-19 and protective measures such as avoiding contact with contaminated hands, surfaces and objects, in addition to washing hands, keeping physical distances, taking precautions while coughing/sneezing, using an alcohol-based rub and vaccination (Peck, 2020; Abd-Elrazek, 2020; WHO, June 2020). Pediatric nurses can also have an important role in emphasizing the importance for children to eat balanced diet, get enough sleep and exercise regularly which will help them to establish strong immune system to protect them from COVID-19 (National Association of School Psychologist, 2020).

Aim of the study

This study was aimed to assess mothers' protective measures toward their children against COVID-19 pandemic.

Research Question

What are the mothers' protective measures toward their children against COVID-19 pandemic?

Subjects and Methods

Study Design:

A descriptive research design was used to conduct the current study.

Setting:

This study was carried out at the Out-Patient Department of El-Raml Children Hospital (Wingat) at Alexandria.

Subjects:

A convenient sample of 200 mothers having children who fulfilled the following criteria comprised the study subjects:

- 1- Age ranges from 1 up to 6 years.
- 2- Free from any immunological impairment.
- 3- Their children didn't have COVID-19 previously.

Sample Size Determination:

The sample size was calculated by taking variability of proportion of 28.5% from the average of 210 mothers and their children who attended to outpatient department per three months in the hospital. Open Epi software package was used for the determination of sample size and design effect of 1.5 at error margin of 5%, Expected frequency of 50 % with confidence level 95%. The final minimum sample size was calculated as 137 mothers. After considering 10% non-response rate for any unpredictable events, the final required sample size was 200 mothers.

Tool:

One tool was used to collect necessary data:

Mothers' Protective Measures toward their Children against COVID-19 Pandemic Interview Schedule:

This tool was developed by the researchers after reviewing recent and relevant literature according to guidelines for the community of COVID-19, by the Centers for Disease Control and Prevention (CDC, 2021) and World Health Organization (WHO, 2021), to assess mothers' protective measures toward their children against COVID-19 pandemic. It included three parts:

Part I: Characteristics of Mothers and Their Children:

It was divided into two parts:

- A: Characteristics of Mothers**, such as age, level of education, occupation, marital status, number of children, income, type of family, residence, and socioeconomic level.
- B: Characteristics of Children**, such as child's age and gender.
- **Socioeconomic level** was calculated based on El-Gilany et al. 2012, It is an updated system of Fahmy and El-Sherbini 1983, for measurement of socioeconomic status in health research in Egypt. Socioeconomic level score was calculated based on residence, level of education, monthly income, family size and crowded index. It was classified into

four categories which were very low, low, middle, and high levels, depending on the quartiles of the score calculated.

Part II: Mothers' Knowledge Regarding COVID-19 pandemic Interview Schedule:

it included six domains namely, definition and danger of COVID 19, clinical manifestations (signs and symptoms), incubation period, mode of transmission, risk groups, treatment, and vaccination. Each domain had different items. The response of each item scored as; Yes (2), No or don't know (1). The total score of mothers' knowledge items was summed up and ranged from 27-54. After that, the total score of mothers' knowledge was converted into a qualitative manner as follows:

- **Poor knowledge:** ranged from 27 <36 scores.
- **Fair knowledge:** ranged from 36 < 45 scores.
- **Good knowledge:** ranged from 45 ≤ 54 scores.

Part III: Mothers' Protective Measures toward their children against COVID-19 Pandemic Interview Schedule:

it included the following: protective measures regarding COVID-19; General precautions, hand hygiene measures, face mask measures, and increase child immunity. Mothers' protective measures were assessed based on Likert scale as follows; always (3), sometimes (2), and never (1). The total score of mothers' protective measures items was summed up and ranged from 46-138. After that, the total score of mothers' protections was converted into a qualitative manner as follows.

- **Low protection level:** ranged from 46 <77 scores.
- **Moderate protection level:** ranged from 77 <108 scores.
- **High protection level:** ranged from 108 ≤ 138 scores.

Methods

- Approval from the Research Ethics Committee of Faculty of Nursing, Alexandria University was obtained before conducting the study.

- Permission was obtained from the responsible authorities of the previously mentioned setting to conduct the study after explaining the aim of the study.
- Study tool was developed by the researchers in Arabic after thorough reviewing of recent and relevant literature.
- Study tool was submitted to a jury of five experts in the pediatric nursing field to test the content validity. Based on their comments, necessary modifications were done. The tool validity was 98.5%.
- Reliability of the tool was ascertained using Cronbach's Coefficient Alpha Test ($r=0.868$).
- A pilot study was carried out on 20 mothers (10% of the sample) to test the clarity and feasibility of the tool; and no modification was required. Those mothers and their children were excluded from the study subjects.
- Every mother was individually interviewed to collect the necessary data while attending in the waiting area of the out-patient department.
- Each interview session for every mother and his /her child lasted approximately for 15-20 minutes.
- Data were collected over a period of four months starting from the beginning of March 2021 till the end of June 2021.

Ethical Considerations:

- Written informed consent was obtained from every mother after explaining the aim of the study, her voluntary participation, and the right to withdraw from the study at any time.
- Mothers were ascertained about confidentiality of their data.
- Anonymity was considered.

Statistical Analysis

After data were collected, they were coded and transferred into specially designed formats to be suitable for computer feeding using statistical software SPSS version 25. Following data entry, checking and verification processes were carried out to avoid any errors during data entry. Microsoft Office Excel software was used to calculate the total scores of mothers' knowledge and protection provided to their

children. It was also used to construct the needed graphs.

Regarding descriptive statistics, numbers, percentages, minimum and maximum were used for describing and summarizing qualitative and quantitative data. Mean (**M**) was used to measure central tendency in statistical tests of significance. Moreover, standard deviation (**SD**) was an average of the deviations from the mean and used for measuring the degree of variability in a set of scores.

Concerning analytical statistics, the Chi-Square test and Monte Carlo test were used to test the association between the variables. While the Pearson correlation coefficient (ρ =rho) test was used to measure correlation. Where the minimum value of each measure is -1 and the maximum value of each measure is +1 and (0) value indicates no correlation between X & Y. Furthermore, positive values (greater than 0) indicate positive or direct correlation (increase X increase Y - decrease X decrease Y). While negative values (less than 0) indicate negative or inverse correlation (increase X decrease Y).

Results

Table I illustrates socio-demographic characteristics of mothers. It was found that 40.5 % of mothers' age ranged from 30 to less than 40 years. The same table illustrates that the majority of mothers (94%) were married, and more than half (61.5%) had secondary school diploma. Concerning occupation, it was found that slightly more than half of mothers (55.5%) were working. The same table shows that the majority of mothers (92.5%) lived in urban areas. Regarding family socioeconomic level, it was found that, slightly more than half of the mothers (52%) had low socioeconomic level.

Table II illustrates characteristics of children. It was found that half of children (50%) aged from 5 to 6 years old with mean 4.53 ± 1.883 . Regarding children's sex, it was noticed that more than half of them were female (57.5%).

The main source of mothers' information about COVID -19 was illustrated in **Figure (1)**. It was found that all mothers (100%) had their information about COVID-19 from television, and more than two thirds (70.5%) had their information from family and friends.

Furthermore, 27.5% had their information from medical staff and only 19.5% had their information from their work colleagues.

Table III portrays mothers' knowledge regarding COVID-19 pandemic. It was found that more than three quarters of mothers (89.5%) reported that COVID-19 virus is infectious disease and slightly more than half of them (52%) reported COVID -19 causes respiratory disease either mild like common cold or severs as pneumonia. Furthermore, less than half of them (34.5%) stated that COVID-19 can live on surface for many hours, and slightly more than half (52%) reported that COVID-19 is dangerous. Concerning sign and symptoms of COVID-19, it was found that more than three quarters of mothers 79.5% and 81% reported fever and myalgia respectively and only 10% of them reported runny nose. The same table illustrates that more than half of the mothers (65%) reported signs and symptoms of COVID-19 appear after 14 days.

Regarding methods of transmission of COVID-19, it was found that 82% of mothers reported COVID-19 transmitted by direct contact with respiratory droplets of infected person and 57% reported COVID-19 transmitted by direct contact with infected surfaces. Furthermore, less than half of mothers (40%) reported that COVID-19 transmitted via air born. Concerning risk group of COVID-19 it was found that eighty eight percent of mothers reported that old age was the group at risk for COVID-19, followed by children and people with chronic diseases (86%). Additionally, three quarter of mothers (75%) stated that health care workers were also a risk group for COVID-19. Regarding vaccination and treatment, the majority of mothers (90.5 %) reported that an effective vaccine against the virus is currently available and 29.5% of them reported an effective treatment against the virus is currently available.

Figure (2) portrays that, nearly two thirds of mothers (63%) had fair knowledge on protective measures to their children against COVID-19 pandemic while 35.5% have good knowledge.

Table (IV) illustrates that more than three quarters of mothers (80.5%) sometimes washed their hands and the hands of their children with soap and water, while, more than half of them (53.5%) never used hand sanitizer. Moreover,

only 10.0 % of mothers always cleaned and disinfected objects and surface that contact with the child. Regarding Putting on face shield in public places, nearly three quarters of mothers (71.5%) never wore their children face shields, while more than one third (39.0 %) always wore face mask to their children in public places. Concerning avoiding touching eyes, nose, and mouth, more than three quarters (81%) never did it. In addition to that only 5% of mothers covered mouth and nose with tissue or handkerchief when cough or sneeze. Moreover 80.5% of mothers never maintained an appropriate social distance to their children. Furthermore, 7.0%, 45.0% and 32.0% of mothers always avoided crowded area, washed vegetables and fruits, and increased the child immunity respectively.

Table (V) shows the mothers protective measures concerning hand hygiene toward their children. It was revealed that, all mothers (100%) always wet child's hand with running water and apply enough soap to cover all surfaces of hands and wrist. However, more than half of mothers never rubbed their children's hands together briskly and thoroughly and never dried their hands after washing them (52.5 and 55.5% respectively). Regarding time of performing hand hygiene to their children, unfortunately 100.0%, 88.5% and 75.0% of mothers never washed their children's hands after coughing, sneezing and nasal discharge, after contact with surfaces nor after back to home respectively. Nearly three quarters of mothers (73.5%) always performed hand hygiene for their children for 20 seconds and more.

Table (VI) presents mothers' protective measures concerning wearing face mask toward their children. Unfortunately, it was noticed that all mothers (100%) never cleaned their hands by rubbing it with an alcohol or by washing it with soap and water before wearing their children face mask. In addition to that most of them never checked the mask before wearing it (in case it is torn e.g.) and never ensured not touching the mask while using it (93.5% and 92% respectively); and 65% of mothers never insured the proper side of the face mask outward.

As regards removing the face mask, it was portrayed that 100.0% and 95.5 of mothers never washed their hands before and after

removing their children's masks respectively. However, nearly three quarters of them (71.5 %) sometimes removed the two straps from the back of their child head or ears, without touching the front of the mask. Furthermore, it was found that nearly three quarters of mothers (74.0%) used the face mask to their children more than once.

Concerning when mothers wear their children face mask, slightly more than one third of them sometimes wore it to their children outside home and in transportation (33.5 to each other). Moreover, nearly half of mothers (48.5%) always wore their children face mask when they came to health care services.

Concerning mothers' protective measures to increase child immunity, **table (VII)** illustrates that 68.5% and 60.5% of mothers sometimes provided healthy food and increased fluid and water intake to their children respectively. On the other hands, practicing exercises and providing vitamins supplementations were never introduced to 75.0% and 66.5% of children respectively. Nearly the same percentages of mothers always provided psychological support and boosted enough sleep to their children (23.0 and 23.5% respectively). Moreover, nearly half of mothers (49.5%) sometimes avoided providing antibiotic to their children to increase their immunity.

Figure (3) illustrates that 61.5 % of mothers provided moderate protection level to their children against COVID-19 pandemic while 38.5% have low protection level.

Table (VIII) represents total score of mothers' knowledge regarding COVID-19 pandemic in relation to their socio-demographic characteristics. It was found that nearly one quarter of mothers (23.5%) whose age ranged from 30<40 years had fair knowledge. Additionally, 60.0% of mothers who had fair knowledge were married. Regarding education level, the highest percentage score (43.9%) of mothers who obtained fair knowledge score had secondary school or diploma. Concerning occupation, 20.5% of mothers were working and had good knowledge about COVID-19. Moreover, more than half of mothers (58.0%) who obtained fair knowledge score lived in urban areas and 34% of them had good score.

Regarding family income, 19.0 % of mothers who obtained good score of knowledge had insufficient income while 16.5% of them had sufficient income. Regarding family type, 20.5% of mothers who had good knowledge had nuclear families compared to 15.0% who had extended families. The table also illustrates a statistically significant relation found between the studied mothers' knowledge total score and their socioeconomic levels ($p=0.043$).

Table (IX) portrays the mothers' protection level to their children regarding COVID-19 pandemic in relation to their socio-demographic characteristics. It was noticed that slightly more than one quarter of mothers (25.5%) whose age ranged from 30 < 40 years of age obtained moderate protection to their children. In addition to that, more than half of them (57.5%) who were married provided moderate protection to their children. This table also illustrates that 36.5% of mothers who had secondary school or diploma obtained moderate protection compared to only 3.5% of mothers who could read and write.

Concerning occupation, more than one third of working mothers (38.5%) provided moderate protection to their children. Additionally, 57.0% of mothers were living in urban areas and had moderate protection to their children. Additionally, there was a significant relationship between the mother's protection level and their socioeconomic level ($P=<0.001$). The table also illustrates a statistically significant relation found between the studied mothers' total score of protection and their socioeconomic levels ($p<0.001$).

Table (X) represents correlation between socio-demographic characteristics of mothers and their total score of knowledge and protection level to their children. It was illustrated that negatively weak correlation was found between mothers' marital status, education level, occupation, residence, family types and their total score of knowledge. The correlation was not statistically significance. On the other hand, there was positively weak correlation with mothers' age, family income, and their total score of knowledge with no statistical differences found.

The same table also portrayed a positively weak correlation between mothers' age, marital status, family income, and their total score of

protection from COVID-19 without statistically significant differences. However, there was a positive correlation between socioeconomic levels and total score of mother's knowledge and protection levels with statistically significant difference found ($P < 0.001$ and $p =$

0.001 respectively). Moreover, there is a negatively weak correlation between mothers' education level, occupation, residence, family types, and their total score of protection to their children with no statistically difference found.

Table (I): Socio-Demographic Characteristics of Mothers (n=200).

Mothers' Characteristics	No	%
Age / years		
• 20 < 30	58	29.0
• 30 < 40	81	40.5
• ≥ 40	61	30.5
Mean\pm S.D.	35.07 \pm 6.436	
Marital status		
• Married	188	94.0
• Divorced	6	3.0
• Widow	6	3.0
Mother's education		
• Read and write	12	6.0
• Primary school	31	15.5
• Preparatory school	34	17.0
• Secondary school/Diploma	123	61.5
Occupation		
• Housewives	89	44.5
• Working	111	55.5
Residence		
• Urban	185	92.5
• Rural	15	7.5
Family income		
• Sufficient	101	50.5
• Insufficient	99	49.5
Family types		
• Nuclear	104	52.0
• Extended	96	48.0
Socio economic level:		
• Very low	29	14.5
• Low	104	52
• Moderate	67	33.5
• High	0	0

Table (II): Characteristics of Children (n=200).

Children's Characteristics	No	%
Age / years		
• 1 < 3	35	17.3
• 3 < 5	64	31.7
• 5 \leq 6	101	50.0
Mean\pm S.D.	4.53 \pm 1.883	
Sex		
• Male	85	42.5
• Female	115	57.5

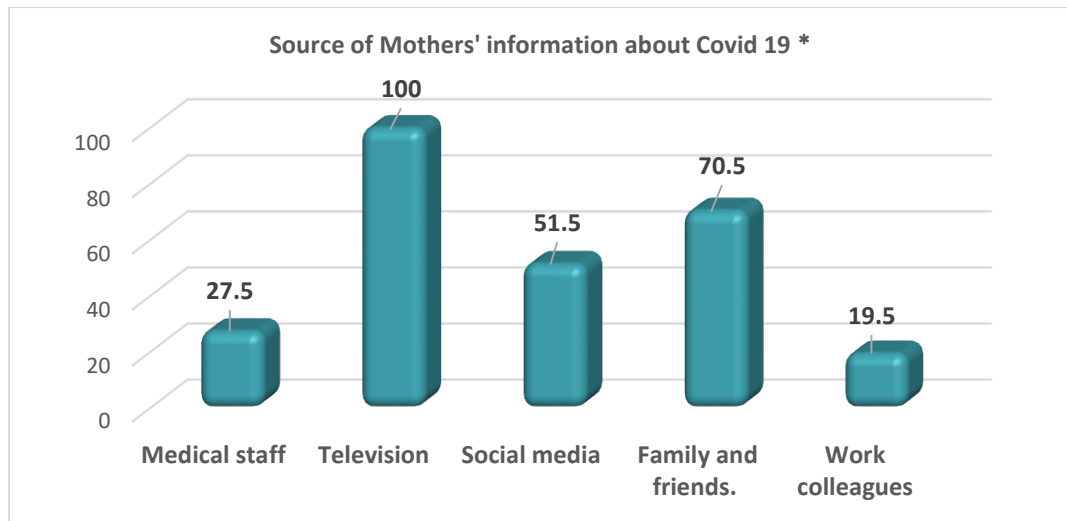


Figure (1): Main Source of Mothers' Information about COVID-19.

* More than one answer

Table (III): Mothers' Knowledge Regarding COVID -19 Pandemic (n=200).

Mothers' knowledge	Yes		No	
	No	%	No	%
- COVID-19 virus is infectious disease.	179	89.5	21	10.5
- COVID-19 causes respiratory disease either mild like common cold or severs as pneumonia.	104	52.0	96	48.0
- Covid -19 can live on surface for many hours.	69	34.5	131	65.5
- Covid -19 is dangerous.	104	52.0	96	48.0
Sign and symptoms of COVID- 19:				
- Fever	159	79.5	41	20.5
- Dry cough	124	62.0	76	38.0
- Runny nose	20	10.0	180	90.0
- Dyspnea	121	60.5	79	39.5
- Sore throat	124	62.0	76	38.0
- Myalgia	162	81.0	38	19.0
- Headache	133	66.5	67	33.5
- Diarrhea	131	65.5	69	34.5
- Loss of test and smell	142	71.0	58	29.0
Appearance of sign and symptom of COVID-19:				
- Before 14 days	70	35.0	0	0.00
- After 14 days	130	65.0	0	0.00
Methods of transmission by:				
- Direct contact with respiratory droplets of infected person.	164	82.0	36	18.0
- Direct contact with infected surfaces	114	57.0	86	43.0
- Via air born	80	40.0	120	60.0
- Food	101	50.5	99	49.5
- Animals	111	55.5	89	44.5
Risk groups for COVID-19:				
- Old age people	176	88.0	24	12.0
- Chronic disease	172	86.0	28	14.0
- Children	172	86.0	28	14.0
- Health care workers	150	75.0	50	25.0
- Adult	106	53.0	94	47.0
- Pregnant women	153	76.5	47	23.5
Vaccination and treatment				
- An effective treatment against the virus is currently available	59	29.5	141	70.5
- An effective vaccine against the virus is currently available.	181	90.5	19	9.5

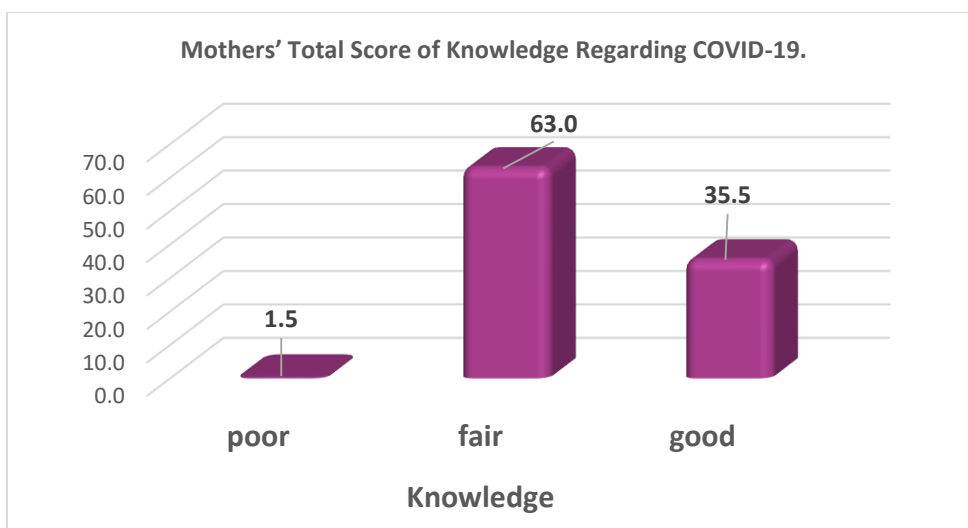


Figure (2): Mothers' Total Score of Knowledge Regarding COVID-19 Pandemic.

Table (IV): Mothers' Protective Measures Concerning General Precautions Against COVID -19 Pandemic (n=200).

Mothers' Protective Measures (General precaution)	Always		Sometimes		Never	
	No	%	No	%	No	%
- Continuous hand washing with soaps and water.	39	19.5	161	80.5	·	0.0
- Use hand sanitizer containing at least 60% alcohol, for at least 20 seconds in case of no water and soap available.	3	1.5	90	45.0	107	53.5
- Clean and disinfect objects and surface that contact with the child.	20	10.0	44	22.0	136	68.0
- Putting on face shield in public places.	28	14.0	29	14.5	143	71.5
- Putting on facemasks in public places.	78	39.0	59	29.5	63	31.5
- Avoid direct touch with persons.	21	10.5	82	41.0	97	48.5
- Avoiding touching eyes, nose, and mouth.	3	1.5	35	17.5	162	81.0
- Cover mouth and nose with tissue or handkerchief when cough or sneeze.	10	5.0	86	43.0	104	52.0
- Maintaining an appropriate social distance between the child and yourself with anyone with symptoms one meter.	23	11.5	16	8.0	161	80.5
- Avoid crowded area (social gathering).	14	7.0	112	56.0	74	37.0
- Washing vegetables and fruits with soaps and water.	90	45.0	106	53.0	4	2.0
- Increase the child immunity.	64	32.0	62	31.0	74	37.0

Table (V): Mothers Protective Measures Concerning Hand Hygiene to their Children Against COVID -19 Pandemic (n=200).

Mothers' Protective Measures (Hand Hygiene):	Always		Sometimes		Never	
	No	%	No	%	No	%
Steps of Hand Washing with Soap and Water:						
- Wet your hand with running water	200	100.0	·	0.0	·	0.0
- Apply enough soap to cover all surfaces of hands and wrist	200	100.0	·	0.0	·	0.0
- friction and rub hands together briskly and thoroughly at least 20 sec.	37	18.5	58	29.0	105	52.5
- Rinse hand and wrist under running water	170	85.0	30	15.0	·	0.0
- Dry hand and wrist with clean tissue for one use.	30	15.0	59	29.5	111	55.5
Time of Hand Hygiene.						
- After coughing, sneezing and nasal discharge.	·	0.0	·	0.0	200	100.0
- Before and after using bathroom	32	16.0	168	84.0	·	0.0
- After contact with surfaces	·	0.0	23	11.5	177	88.5
- Before and after eating	44	22.0	91	45.5	65	32.5
- After back to home	·	0.0	50	25.0	150	75.0
Duration of Hand Hygiene.						
- Less than 20 sec.	53	26.5	·	0.0	·	0.0
- 20 sec. and more.	147	73.5	·	0.0	·	0.0
Total	200					

Table (VI): Mothers Protective Measures Concerning Face Mask to their Children against COVID -19 Pandemic (n=200).

Mothers' Protective Measures (Face Mask)	Always		Sometimes		Never	
	No	%	No	%	No	%
How to wear face mask:						
- Before touching the mask, clean the hands by rubbing it with an alcohol or by washing it with soap and water.	·	0.0	·	0.0	200	100.0
- Check the mask for it not to be torn or hole.	·	0.0	13	6.5	187	93.5
- Determine the top of the mask which the metallic strip is present.	59	29.5	80	40.0	61	30.5
- Insure the proper side of the face mask outward	32	16.0	38	19.0	130	65.0
- Cover mouth and nose fully making sure there is no gap.	61	30.5	91	45.5	48	24.0
- Press the metallic strip to fit the shape of the nose.	62	31.0	79	39.5	59	29.5
- Do not touch the mask while using it, if you do wash your hand.	·	0.0	16	8.0	184	92.0
How to remove the face mask:						
- Scrub the hands with an alcohol or wash them with soap and water.	·	0.0	·	0.0	200	100.0
- Remove the two straps from the back of the head or ears, without touching the front of the mask.	57	28.5	143	71.5	·	0.0
- When removing the mask, lean forward and pull the mask away from your face without touching the front of it.	34	17.0	39	19.5	127	63.5
- Medical masks are used only once; Dispose of the mask immediately after taking it off, and it is preferable to throw it in a closed waste bin.	28	14.0	24	12.0	148	74.0
- Wash your hand after touch the mask.	·	0.0	9	4.5	191	95.5
When wearing face mask to your children						
- Outside home	45	22.5	67	33.5	88	44.0
- Closed and crowded area	6	3.0	105	52.5	89	44.5
- In transportation	35	17.5	67	33.5	98	49.0
- In health care surfaces	97	48.5	74	37.0	29	14.5

Table (VII): Mothers’ Protective Measures toward Increase their Children’s Immunity (n=200).

Mothers’ Protective Measures (Increase child immunity)	Always		Sometimes		Never	
	No	%	No	%	No	%
- Healthy food	20	10.0	137	68.5	43	21.5
- Increase fluid and water	43	21.5	121	60.5	36	18.0
- Psychological support	46	23.0	90	45.0	64	32.0
- Boost enough sleep to child.	47	23.5	153	76.5	0	0.00
- Exercise practices	24	12.0	26	13.0	150	75.0
- Vitamin supplementation	14	7.0	53	26.5	133	66.5
- Avoid antibiotics	7	3.5	99	49.5	94	47.0

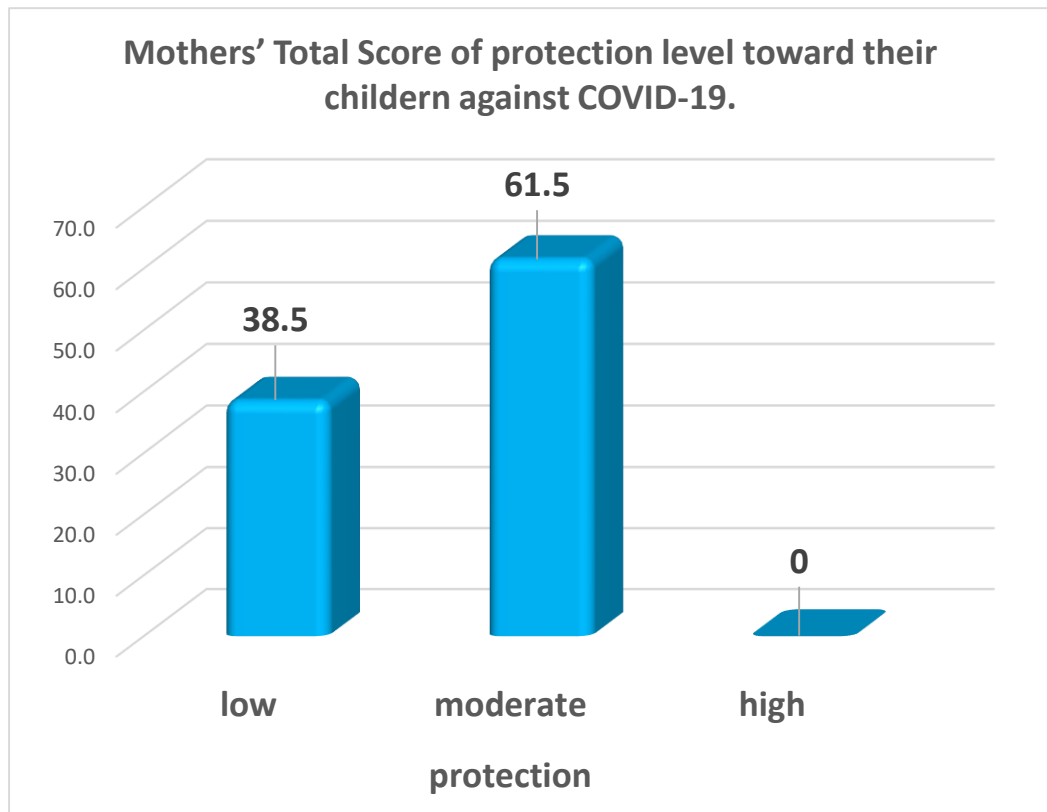


Figure (3): Mothers’ Total Score of Protection Level toward their Children against COVID-19 Pandemic.

Table (VIII): Total Score of Mothers' Knowledge Regarding COVID-19 Pandemic in Relation to their Socio-Demographic Characteristics (n=200).

Socio-Demographic Characteristics.	Knowledge						c ²	p
	Poor (n=1)		Fair (n=128)		Good (n=71)			
	No.	%	No.	%	No.	%		
Age (years)								
20 < 30	0	0.00	43	21.5	15	7.5	5.108	0.226
30 < 40	1	0.5	47	23.5	33	16.5		
≥ 40	0	0.00	38	19.0	23	11.5		
Marital status								
Married	0	0.00	120	60.0	68	34.0	32.979	0.053
Divorced	0	0.00	4	2.0	2	1.0		
Widowed	1	0.50	4	2.0	1	0.50		
Education level								
Read and write	0	0.00	9	8.5	3	1.5	8.622	0.196
Primary school	0	0.00	15	7.5	16	8.0		
Preparatory school	0	0.00	18	9.0	16	8.0		
Secondary school or diploma	1	0.5	86	43.0	36	18.0		
Occupation								
Working	1	0.50	69	34.5	41	20.5	1.079	MCp 0.427
Housewife	0	0.00	59	29.5	30	15.0		
Residence								
Urban	1	0.50	116	58.0	68	34.0	1.827	MCp 0.162
Rural	0	0.00	12	6.0	3	1.5		
Family income								
Sufficient	1	0.50	67	63.5	33	16.5	1.614	0.455
Insufficient	0	0.00	61	30.5	38	19.0		
Family type								
Nuclear	1	0.50	62	31.0	41	20.5	2.513	0.233
Extended	0	0.00	66	33.0	30	15.0		
Socioeconomic level								
Very low	1	0.5	22	11.0	6	3.0	12.561*	MCp=0.043*
Low	0	0.00	72	36.0	32	16.0		
Moderate	0	0.00	34	17.0	33	16.5		
High	0	0.00	0	0.00	0	0.00		

 χ^2 : Chi square test

MC: Monte Carlo

*: Statistically significant at $p \leq 0.05$

Table (IX): Mothers' Protection Level to their Children Regarding COVID-19 Pandemic in Relation to their Socio-Demographic Characteristics (n=200).

Socio-Demographic Characteristics	Level of protection						c ²	p
	Low (N=77)		Moderate (N=123)		High (N=0)			
	No.	%	No.	%	No.	%		
Age (years)								
20 < 30	24	12.0	34	17.0	0	0.00	0.293	0.868
30 < 40	30	15.0	51	25.5	0	0.00		
≥ 40	23	11.5	38	19.0	0	0.00		
Marital status							0.144	MCp 0.451
Married	73	36.5	115	57.5	0	0.00		
Divorced	2	1.0	4	2.0	0	0.00		
Widowed	2	1.0	4	2.0	0	0.00		
Education level							0.953	MCp 0.812
Read and write	5	2.5	7	3.5	0	0.00		
Primary school	11	10.5	20	10.0	0	0.00		
Preparatory school	11	10.5	23	11.5	0	0.00		
Secondary school or diploma	50	25.0	73	36.5	0	0.00		
Occupation							0.046	0.830
Working	42	21.0	69	38.5	0	0.00		
Housewife	35	17.5	54	27.0	0	0.00		
Residence							0.015	0.901
Urban	71	35.5	114	57.0	0	0.00		
Rural	6	3.0	9	8.5	0	0.00		
Family income							0.001	0.973
Sufficient	39	19.5	62	31.0	0	0.00		
Insufficient	38	19.0	61	30.5	0	0.00		
Family type							0.092	0.762
Nuclear	39	19.5	65	32.5	0	0.00		
Extended	38	19.0	58	29.0	0	0.00		
Socio economic level:							31.532*	<0.001*
Very low	22	11.0	7	3.5	0	0.00		
Low	44	22.0	60	30.0	0	0.00		
Moderate	11	5.5	56	28.0	0	0.00		
High	0	0.00	0	0.00	0	0.00		

χ²: Chi square test MC: Monte Carlo *: Statistically significant at p ≤ 0.05

Table (X): Correlation between Mothers' Socio-Demographic Characteristics and their total Score of knowledge and Protection level to their Children Regarding COVID- 19 Pandemic (n=200)

Socio-demographic characteristics of mothers		Mothers' Knowledge	Mothers' level of protection
Age	R	0.092	0.029
	P	0.096	0.343
Marital status	R	-0.117	0.025
	P	0.099	0.721
Education level	R	-0.117	-0.031
	P	0.098	0.667
Occupation	R	-0.024	-0.015
	P	0.739	0.831
Residence	R	-0.088	-0.009
	P	0.217	0.902
Family income	R	0.069	0.002
	P	0.333	0.974
Family types	R	-0.074	-0.021
	P	0.298	0.764
Socio economic level	R	0.370*	0.228*
	P	<0.001*	0.001*

r: Pearson coefficient

*: Statistically significant at p ≤ 0.05

Discussion

COVID-19 pandemic presents serious challenges among pediatric population. It has harming effect on children's health, physical and psychological well-being. Preventive measures play an essential role in reducing infection rates and controlling the spread of COVID-19 in children due to the weakness of child immune system (**Abuhammad ., (2020)**). So, the current study was conducted to assess mothers' protective measures toward their children against COVID-19 pandemic.

It was noticed from the current study findings that slightly more than half of mothers reported that COVID-19 was dangerous. This finding is in line with **Abdelhafiz et al., (2020)**, who found that more than three-quarters of mothers considered the Coronavirus dangerous. This could be justified by the fact that COVID-19 is highly infected and rapidly spread through droplets which cause the death of a large number of the world's population in a short time. Regarding sign and symptoms of COVID-19 the present study revealed that, myalgia is the most sign reported by mother followed by fever and headache. On the contrary, **Abuhammad., (2020)** cited that fever was the most observed clinical sign reported followed by cough.

The present result revealed that, television is the main source of information for mothers followed by family and friends. This contradicts the findings of **Abuhammad., (2020) and Alzoubi et al. (2020)** who illustrated that social media is the main source of information about COVID-19. Furthermore the current study is inconsistent with the finding of **Erfani et al ., (2020)** who reported that participants had sources of information from social media, scientific articles, journals, and healthcare workers.

It is crucial for mothers to understand how COVID-19 is transmitted in order to follow the appropriate protective measures for their children. Regarding mode of transmission, the current study findings displayed that the majority of mothers mentioned that droplets are the major route of COVID-19 transmission. This result might be due to the fact that COVID-19 disease was first identified during

the outbreak as a severe acute respiratory syndrome. This finding is in agreement with **Abuhammd, (2020)**.

Concerning treatment of COVID-19, nearly three quarter of mothers reported that there is no effective treatment against the COVID-19. This finding is supported by **Chinazr et al., (2020)** and **Ludvigsson, (2020)**, who reported that there is no treatment for COVID-19 and the treatment depends upon nonpharmacological treatment support. This could be justified by COVID-19 like many other viral infections which have no specific drug for treatment and only depend upon symptomatic and supportive treatment.

Regarding mother's general precaution of protective measures of COVID-19, the finding of the present study showed that less than one-quarter of mothers washed their hand as well as their children's hand continuously with soap and water. This result contradicts the finding of **Shahbaznejad, (2021)**, who conducted study about clinical characteristics and outcomes of COVID-19 in children in Northern Iran. He found that the majority of mothers washed their hands frequently. The present study also revealed that, more than half of mothers responded that they never used hand sanitizers containing at least 60% alcohol, never cleaned nor disinfected objects and surface that children are in contact with nor put shields on their children faces in public places. This result could be explained in the light of that nearly half of mothers in current study stated: face shield should only be worn in health care center. Moreover, this could be attributed to slightly more than half of mothers have low socioeconomic status, and they may believe that wearing face shield and using hand sanitizer might not prevent the spread of COVID-19. The finding is contradicting with the result of **Shahbaznejad, (2021) and Aldaja et al, (2020)** who mentioned that the majority of mothers disinfected indoor surfaces and handles regularly. Moreover, the present study also was incongruent with the findings of **Aman and Masood, (2020)** who found that mothers are routinely cleaning and disinfecting surfaces. In addition, more than three quarter of mothers' response were never regarding avoiding touching eye, nose and mouth, and maintain appropriate social distance. This

result is contradicting with **Naser et al., (2020)**, **Zhong et al., (2020)**, **Azlan, et al., (2020)** and **Geldsetzer, (2020)**. The current study revealed that, more than one-third of mothers reported that they and their children were committed for wearing face masks in public places. This result was not supported by the result of **Shahbaznejad, (2021)** who found that the majority of mothers wore masks and gloves when leaving their houses. Regarding hand hygiene it was found that, nearly three-quarters of mothers always washed their hands and their children's hands for 20 seconds and more. On the same line, **Shahbaznejad et al., (2021)** were found.

This study revealed that, more than half of mothers had fair knowledge on protective measures of their children from COVID-19. This could be attributed to more than half of the mothers' education level was secondary diploma. Moreover mothers' knowledge about COVID-19 was mainly from mass media such as television which is the best outlet for gathering health information and fast approach to reach people in their home. Similarly, **Naser et al., (2020)** cited that participants had moderate level of knowledge about COVID-19. On the other side, **Khalil and Mohamed (2020)** found that one-third of mothers had fair level of knowledge regarding COVID-19 pandemic. Regarding protective measures, more than half of mothers had moderate level of prevention. This could be related to the effort of the Egyptian government in deploying early protective measures as well as its openness in sharing and publishing the most up-to-date information regarding the ongoing pandemic situation. Similar findings were reported by **Diluca and Souli., (2020)** and **Geldsetzer., (2020)**.

The finding of the present study highlighted that, slightly more than one- third of mothers who had good knowledge regarding COVID-19 where living in urban areas compared to very small percentage of mothers who were living in rural areas. This could be explained by the availability and accessibility of health care services in urban areas in addition to wide spread of technology and social media. This finding is in harmony with the finding of **Shahbaznejad., (2021)**, who stated that

mothers who lived in urban areas had better knowledge than rural areas.

It is worth noting that in the current study the lower preventive measures related to issues that required in-depth knowledge such as steps of children's hand hygiene, steps of wearing and removing mask were found. So it is vital to note that we need great deal of efforts at all levels by the government, including public awareness campaigns regarding how to apply those protective measures accurately.

Finally, the children cannot advocate for themselves, and therefore all stakeholders, including parents and governments, have the responsibility of applying protective measures against COVID-19 to ensure the safety of children.

Conclusion

According to findings of the present study, it can be concluded that more than half of mothers obtained fair score of knowledge as well as moderate score of protective measures toward their children regarding COVID-19 pandemic. Some important protective measures were not effectively applied by the mothers toward their children in the current study.

Recommendations

In the light of the findings of current study, the following recommendations are suggested:

- The study highlights the need for an educational program, workshops, and videos \booklets conducted for mothers to improve their protective measures for their children regarding COVID-19 pandemic emphasizing the instruction about steps of hand washing and how to wear and remove the mask.

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