# Mothers' Preventive Measures of COVID-19 among Their Primary School Children

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## Abstract

**Background**: In epidemics such as COVID-19, major changes need to be made to the population's behavior to prevent infection and stop disease transmission. **Aim of the study:** assess mothers' preventive measures of COVID-19 among their primary school children. **Research design:** A descriptive analytical research design was used to conduct this study. **Setting:** The study was conducted at Al-Munira Comprehensive Clinic affiliated to General Authority for Health Insurance, Cairo Branch. **Sample**: A purposive sample comprised from 379 of primary school children and their mothers. **Tools:** Two tools were used for data collection, **First tool:** Structured interviewing questionnaire divided into five parts, **Part I:** Socio demographic characteristic of mothers, **part II:** Health history of primary school children, **part III:** Mothers' knowledge about covid 19, **part IV:** Mothers' attitude toward covid 19 and **part V:** Mothers' reported practices of preventive measures toward covid 19. **Second tool:** Physical assessment sheet of the child. **Results:** 57.8% of mothers had satisfactory knowledge about COVID19, 79.4% of them had positive attitude toward covid 19 and 71.8% of them had good practice toward follow preventive measures. **Conclusion:** There was highly statistically significant correlation between total score of knowledge, practice and attitude regarding COVID-19, and there was statistically significant relation between mothers' reported practice of preventive measures and children's health condition. **Recommendations**: Development and implementation of Health education programs for mothers to improve their knowledge, promote positive attitude and better practices for prevention of covid 19 among their primary school children.

**Keywords:** Mothers' Preventive Measures, COVID-19, and Primary School Children.

## Introduction:

Coronaviruses are a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and severe acute respiratory syndrome (SARS). A novel coronavirus (COVID-19) was identified in 2019 in Wuhan, China. This is a new coronavirus that has not been previously identified in humans **(Velavan et al., 2020).**

In the United States and throughout the world, fewer cases of COVID-19 have been reported in children than in adults. While children comprise 22% of the US population, approximately 14% of all cases of COVID-19 reported to the Centers for Disease Control and Prevention (CDC) were among children (as of September 27, 2021). Most cases in children are mild, and treatment consists of supportive care **(Shapiro et al.,2021)**. According to MPIDR COVERAGE database ,0.3% (over 8.700) deaths reported in children under 20 years of age, 60% occurred among ages 10-19 and 40% among children ages 0-9 (as of May 2021) **(Riffe et al., 2021).**

Common symptoms of COVID-19 are fever, dry cough, and breathing shortness. Muscle aches, sputum production, and sore throat are some of the less common symptoms. The virus is mainly spread from infected persons through small droplets when coughing or sneezing. The COVID-19 incubation period is in the range of 2–14 days. The mortality rate is estimated to be between 2 and 5% but varies depending on the infected person's age and health condition. Children are the most important carriers of COVID-19 due to the absence of clear clinical symptoms in them **(Zare-Zardini et al., 2020).**

Children are not the face of this pandemic, but they risk being among its biggest victims. This is a universal crisis and, for some children, the

impact will be lifelong. Moreover, the harmful effects of this pandemic will not be distributed equally. They are expected to be most damaging for children in poorest countries, and in the poorest neighborhoods, and for those in already disadvantaged or vulnerable situations **(Brief, 2020).**

Community health nurse has an important role in Providing information on COVID-19 and nonpharmaceutical interventions, reassuring residents that fears are valid, but that panic should be avoided, offering the flu vaccine, providing education about prevention, working with local government to review and improve emergency operations plans, engaging key stakeholders to help support COVID-19 preparation efforts, reviewing CDC guidance, exploring how to support the needs of employees and high-risk populations in communities and developing plans to support a highly vulnerable population. Through her work in home health agencies, clinics, nonprofit organizations, schools, and government organizations, community health nurse is part of community's first line of defense in the war against coronavirus disease **(Schwerdtle et al., 2020).**

**Significance of the study:**

Global spread of covid-19 included Egypt, as the first case was recorded in Egypt on February 14, 2020. The total number of confirmed cases on the First of May 2020, were 5895, with fatality rate of 6.9%. Children were affected like other age groups, but total incidence were less than 10% of the total confirmed cases (during May 2020) **(Mostafa et al., 2020).**

**Aim of the Study:**

The aim of the study is to assess mothers' preventive measures of covid 19 among their primary school children through:

- Assessing mothers' knowledge about COVID-19 disease.

- Assessing mothers' attitude about COVID-19 disease.

- Assessing mothers' reported practices of preventive measures toward COVID-19.

**Research questions:**

- What is the mothers' level of knowledge about COVID-19 as a disease?

- What is the mothers' attitude about COVID-19 as a disease?

- What are the mothers' reported practices toward prevention of COVID-19 disease among their primary school children?

- Is there a relation between mothers' knowledge about COVID-19 disease and their socio demographic characteristics?

- Is there a relation between mothers' knowledge and their reported practices of preventive measures toward COVID-19 disease?

- Is there a relation between mothers' attitude about COVID-19 disease and their socio demographic characteristics?

- Is there a relation between mothers' attitude and their reported practices of preventive measures toward COVID-19 disease?

- Is there a relation between mothers' reported practices of preventive measures toward COVID-19 and their children's health condition?

**Materials and Method**

**Study Design**

A descriptive analytical research design was used to conduct this study.

**Study Setting**

The study was conducted at Al-Munira Comprehensive Clinic affiliated to General Authority for Health Insurance, Cairo Branch**.**

**Subjects and methods:**

Subjects and methods of this study were portrayed under the following four designs as follows:

I. Technical design
II. Administrative design
III. Operational design
IV. Statistical design

### I. Technical Design:

The technical design included research design, setting, subject and tools for data collection.

### Research design:

A descriptive analytical research design was used to conduct this study.

### Setting:

The study was conducted at Al-Munira Comprehensive Clinic affiliated to General Authority for Health Insurance, Cairo Branch. This clinic serves many districts at Cairo and has high attendance rate of mothers accompanied with their primary school children.

### Sampling:

A purposive sample comprised from 379 of primary school children and their mothers attending health insurance clinic were chosen according to an including criteria. Previous attendance rate in the previous year (2020) was 27000 cases.

### Criteria of Sample Selection:

Primary school children aged from 6-11years old, attending to health insurance clinic for any health conditions.

### Sample size calculation

Using Steven and Thompson equation to calculate the sample size from the next formula **(Steven & Thompson, 2012)**

$$n = \frac{Np(1-p)}{(N-1)(d^2/z^2) + p(1-p)}$$

N= Population (27000)
Z= Confidence Level 95% (1.96)
P= Probability (50%)
d= Margin of Error (0.05)
So, sample size (n)=379

## Tools of data collection

### First tool: An interviewing questionnaire

This tool was designed by the investigator and translated into Arabic language based on literature review. It includes the following parts:

**Part I:** A Socio demographic characteristic of mothers as age, marital status, educational level, job, family income(monthly), number of family members, and residence.

**Part II:** Health history of primary school children.

**Part III:** Mothers' knowledge about covid 19 among primary school children. It includes meaning, causes, signs and symptoms, modes of transmission, incubation period, high risk people, complications, preventive measures, and source of information. It includes 9 closed ended questions from Q15to Q23.

❖ **Scoring system:**

For mothers 'knowledge, chosen the correct answer was scored (two) and incorrect answer or didn't know was scored (one). All items were summed up, total score=16, knowledge score was divided into **(satisfactory) level** (≥50%) if ranged from (8 to 16) and **(unsatisfactory)** level (<50%) ranged from (1 to < 8), the question related to source of information excluded from scoring system.

**Part IV:** Mothers' attitude toward covid 19 among primary school children. It includes 17 closed ended questions from Q24 to Q40.

❖ **Scoring system:**

For mothers' attitude, chosen agree answer was scored (three), neutral answer was scored (two) and disagree answer was scored (one). All items were summed up, total score =51, attitude score was divided into (positive) (≥50%) ranged from (26 to 51) and (negative) (< 50%) ranged from (17 to 25).

**Part IV:** Mothers' reported practices of preventive measures toward covid 19. It includes items regarding public gatherings, crowded places, hugs and handshakes, social distancing, washing hands, face mask, healthy habits, environmental sanitation, good ventilation, healthy food, good nutrition, personal hygiene, sharing personal belongings and staying at home when feeling unwell. It includes 18 closed ended questions from Q41to Q58.

❖ **Scoring system:**

For mothers' reported practice, chosen done answer was scored(two) and not done answer was scored (one), while Q1and Q2 are inverse. All items are summed up, total score =36 and practice score were divided into **good practice** toward preventive measures (≥60%) ranged from (22to36) and **poor practice** toward

preventive measures (<60%) ranged from (1 to <22) .

**Second tool: Physical assessment sheet** to assess primary school child health condition.

**Scoring system:**

**A-**Anthropometric measurements& vital signs

including measurement of weight by digital scale, height by meter, BMI through using calculator as the weight (in kilograms) divided by the square of the height (in meters) and measurement of vital signs by using thermometer and digital blood pressure monitor.

**B-**Physical health status

If the child had any problems, it was scored (two) and if there weren't any problems it was scored (one). All items are summed up, total score=26 and health condition score were divided into **good** health condition, if the total score ranged from (1 to <13) with score of (<50%) of total problems and **bad** health condition, if the total score ranged from (13 to 26) with score of (≥50%) of total problems.

**Content Validity and reliability**

**Cronbach's Alpha reliability analysis.**

| Tool | Reliability Reliability Coefficient | Cronbach's Alpha | Validity Self-validate | Content valiantly | Internal consistency |
|---|---|---|---|---|---|
| Knowled Age | 0.875 | 0.946 | 0.949 | 0.939 | Good |
| Practice | 0.971 | 0.896 | 0.979 | 0.932 | Good |
| Attitude | 0.810 | 0.876 | 0.879 | 0.869 | Good |
| Total | 0.833 | 0.839 | 0.895 | 0.852 | Good |

**Ethical Consideration:**

Prior to the pilot study ethical approval was obtained from the scientific research ethical committee of faculty of nursing Ain Shams university, an official permission was taken from the authoritative personnel at previously setting after explaining the purpose and the nature of the study. The investigator emphasized that the participation in the study is entirely voluntarily; anonymity and confidentiality was assured

through coding the data and they have the right to withdraw at any time without giving any reason.

**II. Administrative Design**

Approval to carry out this study was obtained from Dean of Faculty of Nursing, Ain Shams University and official permission was obtained from the director at mentioned health insurance clinic for conducting the study.

### III. Operational Design

The operational design includes preparatory phase, pilot study, and field work.

### Preparatory phase

The investigator reviewed current and past, local, and international related literature and theoretical knowledge of various aspects of the study using books, articles, journals, and internet to prepare the tools of data collection.

### Pilot study

The pilot study was conducted on 10% (37) of primary school children and their mothers to test clarity, applicability of the tools and determine the time needed for data collection. The time needed to fill out the tool was about 20 minutes. The pilot study was included in study sample.

### Field work

- Approval to carry out this study was obtained from Dean of Faculty of Nursing, Ain Shams University and official permission was obtained from the director at Al-Munira Comprehensive Clinic for conducting the study.

-The actual field work took about four months from March 2022 to June 2022 at previous mentioned health insurance clinic.

-The investigator introduced herself firstly and the purpose of the study was simply explained to mothers who agreed to participate in the study prior to any data collection

- The investigator collected data from mothers of primary school children

- The investigator visited health insurance clinic 2 days/week alternately from 9am-1pm by the investigator and took time for each mother about 20 minutes, meeting average from 12- 13 mothers per day at mentioned health insurance clinic until the determined sample size collected.

-The investigator role in completing the questionnaire was to facilitate the understanding of any confusing or difficult question for the mother.

### IV. Statistical Design:

Recorded data were analyzed using the statistical package for social sciences, version 22.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage. The tests that were done include Chi-square(x2), One-sample t-test, Pearson's correlation coefficient (r) and Probability (P-value).

– P-value <0.05 was considered significant.
– P-value <0.001 was considered as highly significant.
– P-value >0.05 was considered insignificant.

## Results:

**Table (1):** represents the socio-demographic characteristics of the studied mothers. It reveals that, 46.6% of the studied mothers were in the age group 30-<40 years with mean age 33.41±8.67, regarding marital status 76% of the studied mothers were married, regarding education 31.9% were secondary education, regarding job 66.4% were housewife, as for the income <2000 LE was 45.1%, while the crowding index was 53.8% were fair. In addition, 92.1% their residence was urban.

**Figure (1): r**epresents the total knowledge score regarding COVID-19. It reveals that, 57.8% of them had satisfactory knowledge, meanwhile 42.2% of them had unsatisfactory knowledge.

**Figure (2):** reveals the attitude of studied mothers toward COVID-19. It reveals that, 79.4% of them had positive attitude, while 20.6% of them had negative attitude.

**Figure (3):** represents the total score of practice of studied mothers toward preventive measures of COVID-19. It reveals that, 71.8% of them had good practice toward follow preventive measures; meanwhile 28.2% of them had poor practice toward follow preventive measures.

**Figure (4):** views the health condition among studied children. It reveals that, 79.4% of them had good health condition; meanwhile 20.6% of them had bad health condition.

**Table (2):** presented that, there were highly statistically significant correlation between total score of knowledge and total score of practice regarding COVID-19. It reveals that there is positive correlation between total score of knowledge and total score of practice with (r-value 0.571 at p-value<0.001).

**Table (3):** presented that, there were highly statistically significant correlation between total score of practice and total score of attitude regarding COVID-19. It reveals that there is positive correlation between total score of practice and total score of attitudes with (r-value 0.471 at p-value<0.001).

**Table (4):** presented that, there were highly statistically significant correlation matrix between total score of knowledge, practice and attitude regarding COVID-19. It reveals that there is positive correlation

between total score of knowledge, practice and attitude with (r-value 0.571, 0.569 and 0.471 respectively at (p-value<0.001).

**Table (5):** presented that, there were highly statistically significant correlation between total score of practice and total score of health condition. It reveals that there is positive correlation between total score of practice and total score of health condition with (r-value -0.349 at p-value<0.001).
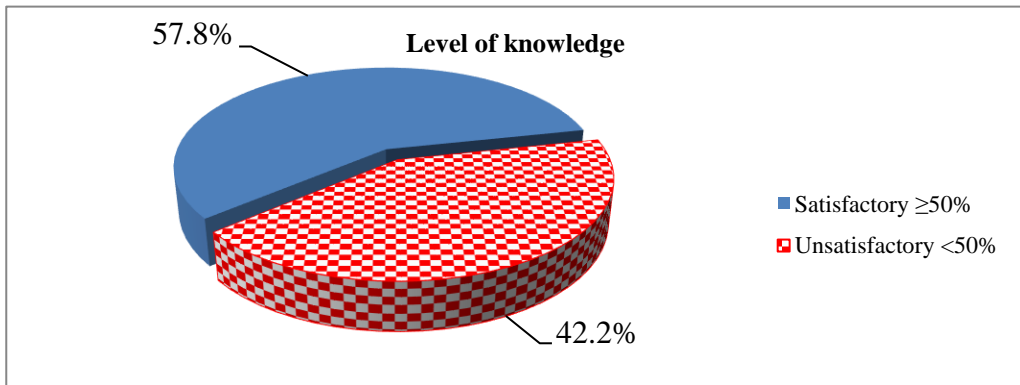
**Table (1):** Number and Percentage Distribution of the Studied Mothers according to their Socio-Demographic Characteristics (N=379).

| Socio-demographic characteristics | No. | % |
|---|---|---|
| **Age (year)** | | |
| <20 years | 9 | 2.4 |
| 20-<30 years | 120 | 31.7 |
| 30-<40 years | 177 | 46.6 |
| >40 years | 73 | 19.3 |
| Mean±SD | 33.41±8.67 | |
| **Marital Status** | | |
| Separate | 19 | 5.0 |
| Married | 288 | 76.0 |
| Widowed | 21 | 5.5 |
| Divorced | 51 | 13.5 |
| **Educational Level** | | |
| Not read or write | 42 | 11.1 |
| Read and write | 54 | 14.2 |
| Primary education | 45 | 11.9 |
| Secondary education | 121 | 31.9 |
| University | 80 | 21.1 |
| Post graduate education | 37 | 9.8 |
| **Job** | | |
| Government | 73 | 19.3 |
| Private | 50 | 13.2 |
| Housewife | 252 | 66.4 |
| Retired | 4 | 1.1 |
| **Family Income (Monthly)** | | |
| <2000 LE | 171 | 45.1 |
| 2000-<4000 LE | 167 | 44.1 |
| >4000 LE | 41 | 10.8 |
| **Number of family members** | | |
| Three | 72 | 19.0 |
| >Three | 307 | 81.0 |
| **Number of house rooms** | | |
| One | 12 | 3.2 |
| Two | 213 | 56.2 |
| ≥Three | 154 | 40.6 |
| **Crowding index** | | |
| Fair (Up to 2) | 204 | 53.8 |
| Crowded (2 up to 3) | 127 | 33.5 |
| Very crowded (3 or more) | 48 | 12.7 |
| **Residence** | | |
| Urban | 349 | 92.1 |
| Rural | 30 | 7.9 |

**Figure (1):** Percentage Distribution of the Studied Mothers regarding their total Knowledge Score about COVID-19 (N=379).
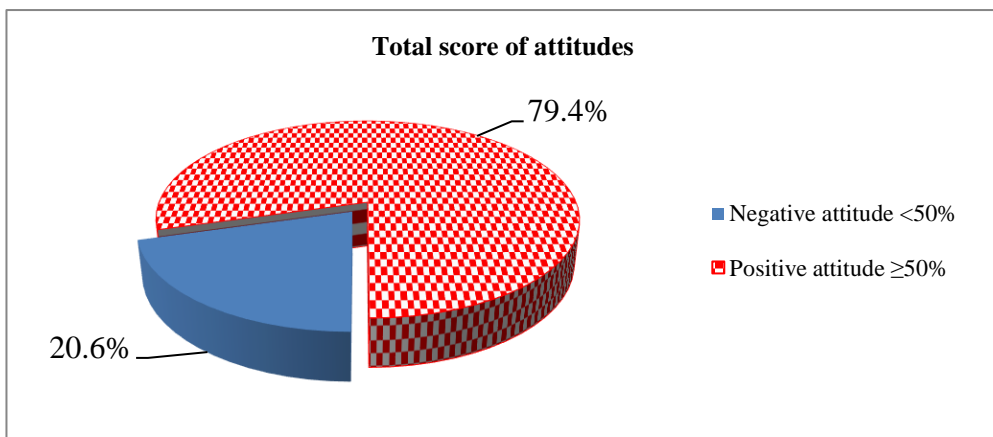


**Figure (2):** Percentage Distribution of the Studied Mothers according to their total Attitude Score Level toward COVID-19.
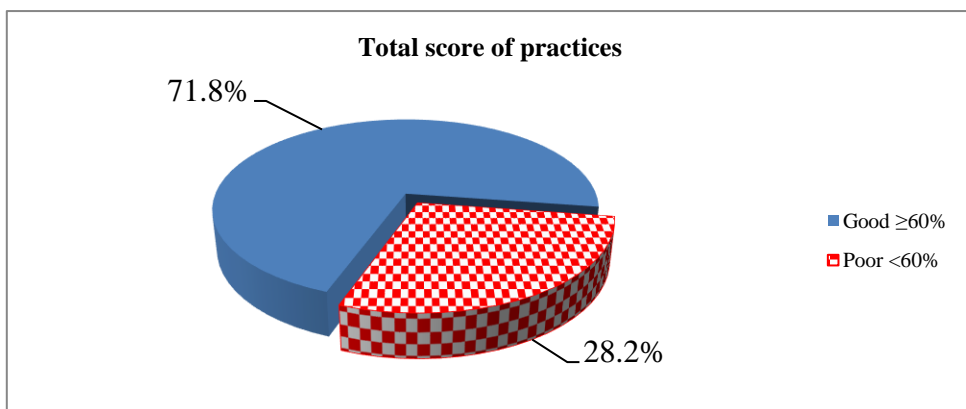


**Figure (3):** Percentage Distribution of the Studied Mothers according to their total Score of Practice toward Follow Preventive Measures of COVID-19 (N=379).
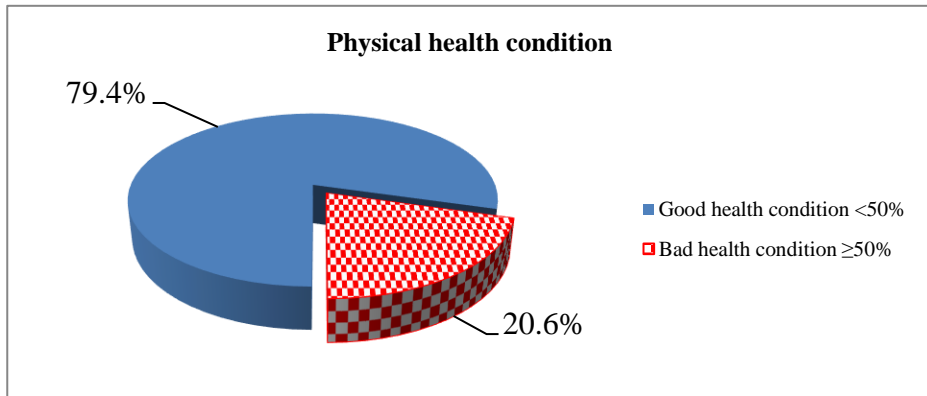
**Physical health condition**

79.4%

20.6%

- Good health condition <50%
- Bad health condition ≥50%

**Figure (4):** Percentage Distribution of the Studied Children according to their total Physical Health Assessment.

**According to research question no. 5:** Is there a relation between mothers' knowledge and their reported practices about the preventive measures toward COVID 19 disease?

**Table (2):** Correlation between total score of knowledge and total score of practice regarding COVID-19 (N=379).

| | Total score of practice | | |
|---|---|---|---|
| **Total score of knowledge** | N<br>379 | r<br>0.571 | p-value<br><0.001** |

r-Pearson Correlation Coefficient.     *p-value <0.05 significant correlation;     **p-value <0.001 highly significant

**According to research question no. 7:** Is there a relation between mothers 'attitude and their reported practices about the preventive measures toward COVID-19 disease?

**Table (3):** Correlation between total score of practice and total attitude regarding COVID-19 (N=379).

| | Total score of attitude | | |
|---|---|---|---|
| **Total score of practice** | N<br>379 | r<br>0.471 | p-value<br><0.001** |

r-Pearson Correlation Coefficient.     *p-value <0.05 significant correlation;     **p-value <0.001 highly significant

**Table (4):** Correlation between total score of knowledge, total score of practice and total attitude regarding COVID-19 (N=379).

| | | Total score of knowledge | Total score of practice | Total score of attitude |
|---|---|---|---|---|
| **Total score of knowledge** | r<br>p-value<br>N | | 0.571<br><0.001**<br>379 | 0.569<br><0.001**<br>379 |
| **Total score of practice** | r<br>p-value<br>N | 0.571<br><0.001**<br>379 | | 0.471<br><0.001**<br>379 |
| **Total score of attitudes** | r<br>p-value<br>N | 0.569<br><0.001**<br>379 | 0.471<br><0.001**<br>379 | |

r-Pearson Correlation Coefficient.     *p-value <0.05 significant correlation;     **p-value <0.001 highly significant

**Table (5):** Correlation between total score of practice and total score of health condition (N=379).

| | | Total score of practice |
|---|---|---|
| **Total score of health condition** | r | -0.349 |
| | p-value | <0.001** |
| | N | 379 |

r-Pearson Correlation Coefficient.     *p-value <0.05 significant correlation;    **p-value <0.001 highly significant

## Discussion:

In late 2019, the emergence of a novel human coronavirus, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), triggered a global COVID-19 pandemic and posed a health threat of unknown magnitude worldwide **(Fikadu et al., 2021).** Preventive measures are most effective weapon that society has against this virus. Important COVID-19 prevention and control measures include getting vaccinated, washing hands, wearing mask, avoiding crowds, maintaining physical distance, avoid large gatherings, stay home when feeling sick, cover mouth when coughing or sneezing, clean frequently touched objects and surfaces regularly and good ventilation of home **(Güner et al., 2020).**

Regarding number and percentage distribution of the studied mothers according to their socio-demographic characteristics **Table (1).** The current study revealed that regarding the studied mothers' age, less than half of studied mothers aged from thirty to less than forty years old with mean age 33.41±8.67. This result was in the same line with the study carried out by **Abuhammad, (2021)** who conducted a study in Jordan to assess "Parents' knowledge and attitude towards COVID-19 in children" and revealed that mean age of participants was 33 years old.

Regarding the studied mothers' marital status, more than three quarters of studied mothers were married. This result was in the same line with **Badr et al., (2021)** who conducted study about "Mothers' Protective Measures toward their Children Against COVID-19 Pandemic at El-Raml Children's Hospital (Wingat) at Alexandria, Egypt" and reported that 90% of studied mothers were married.

As regard to the studied mothers' level of education more than one third of them had secondary school education. This result was incompatible with **Aronu et al., (2021),** who conducted study about "COVID-19: Knowledge of mode of spread and preventive practices among mothers attending a tertiary health institution at Southeast Nigeria" and revealed that 52.5% of studied participants had tertiary education. Also, this result in contrast with the study carried out by **Afolabi et al., (2022)** who assessed "Adherence to COVID-19 preventive measures among pregnant women in Nigeria: an initiative towards safe motherhood in an emerging global health priority" and reported that 81.2% had tertiary education.

This discrepancy may be due to difference between the study samples, settings, and socioeconomic status.

Regarding occupation of the studied mothers, more than two thirds of them were housewives. This result was compatible with a study carried out by **Goshiye et al., (2022),** who assessed "Knowledge, Attitude, and Practice towards COVID-19 among Mothers in Dessie Town, Northeast Ethiopia, 2020" and revealed that 65.4% was housewives.

Regarding residence, the majority of studied mothers' residence (92.1%) were from urban area. This result was in the same line with **Kunnoet al., (2022),** who carried out astudy entitled "Knowledge, attitudes, and practices related to the COVID-19 pandemic among pregnant women in Bangkok, Thailand" and revealed that all of participants' settlement (100%) were in urban.

Regarding percentage distribution of the studied mothers regarding their total knowledge score about COVID-19 **Fig. (2),** this study represented that more than half of studied mothers had satisfactory knowledge score levels. This result was in the same line with **Besho et al., (2021)** who assessed "Knowledge, attitude and practice toward corona virus infection among pregnant women attending antenatal care at public hospitals in three wollega zones, Ethiopia" and reported that 60% of the pregnant women who attended secondary school and were urban residents were more likely to have good

knowledge about COVID-19. Also, this result was compatible with **Kamal et al., (2020)** who conducted a study to assess "Knowledge, attitude, and practice toward COVID-19 among pregnant women in a tertiary care hospital during the COVID-19 outbreak at India" and reported that 83.3% of pregnant women were knowledgeable about COVID-19.

As regards percentage distribution of the studied mothers according to their total attitude score level toward COVID-19 **Fig. (3),** the present study revealed that the majority of them had positive attitude regarding COVID-19. This result was compatible with **Ali et al., (2022)** who carried out a study to assess "Knowledge, Attitude, and Practice toward Corona Virus Infection among Pregnant Women Attending Antenatal Care Clinics at Kafrelsheikh, Egypt" they reported that 82.6% of pregnant women had good knowledge and positive attitude concerning the coronavirus pandemic. Also, this study was in the same line with **Erfani et al., (2020)** who conducted a study entitled "Knowledge, attitude and practice toward the novel coronavirus (COVID-19) outbreak: a population-based survey in Iran and reported that 66.3% of studied women had positive attitude, and excellent practice concerning the COVID-19 prevention.

The current study represented that more than two thirds of studied mothers had a good practice toward follow preventive measures of COVID-19 **Fig. (4).** This result was in the same line with **Ayele et al., (2021)** who assessed "Knowledge and practice to prevent COVID-19 and its associated factors among pregnant women in Debre Tabor Town Northwest Ethiopia, a community-based cross-sectional study", they reported that 83.7% of studied pregnant women had a good practice toward preventive measures of COVID-19.

In contrast, the study conducted by **Nwafor et al., (2020)** who assessed "Knowledge and practice of preventive measures against COVID-19 infection among pregnant women in a low-resource African setting at Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Ebonyi State", and revealed that the 70% of practice of the preventive measures among the participants were poor.

**From investigator point of view,** this may be due to awareness about the pandemic and the simplicity of applied preventive measures which can be considered as a routine daily work.

Regarding percentage distribution of the studied children according to their total physical health assessment **Fig. (5),** the current study revealed that the majority of studied children had good health condition. This result was in the same line with **Li et al., (2021)** who "studied public health preventive measures and child health behaviors during COVID-19: a cohort study at Canada" and reported that 88.1% of studied children had good health conditions.

**In the opinion of the investigator,** this result may be due to the highest percentage live in urban area where the health care facilities are more accessible.

Regarding correlation between total score of knowledge and total score of practice regarding COVID-19 **Table (18),** the present study showed that there was highly statistically significant correlation between total score of knowledge and total score of practice regarding COVID-19. It reveals that there is positive correlation between total score of knowledge and total score of practice. This result was in the same line with **Al-Hanawi et al., (2020)** who studied Knowledge, attitude and practice toward COVID-19 among the public in the Kingdom of Saudi Arabia: a cross-sectional study and reported that there was statistically significant correlation between total knowledge score and practice regarding COVID-19. Also, this result agreed with **Yue et al., (2021)** who conducted a study to assess "Knowledge, attitudes and practices of COVID-19 among urban and rural residents in China: a cross-sectional study" and reported that participants' total practice was significantly related to the participants' total knowledge regarding COVID-19.

**From investigator point of view,** this result may be due to that with high knowledge levels there will be optimistic attitude and practice regarding COVID-19 preventive measures and the levels of attitude and practice improved with the knowledge improvement.

As regard to correlation between total score of practice and total attitude regarding COVID-19 **Table (19),** the current study revealed that there was highly statistically significant correlation between total score of practice and total score of attitudes regarding COVID-19. It reveals that there

is a positive correlation between total score of practice and total score of attitudes. This result was compatible with **Abdelhafiz et al., (2020)** who carried out a study to assess "Knowledge, perceptions, and attitude of Egyptians towards the novel coronavirus disease (COVID-19): a cross-sectional survey" and revealed that there was a statistically significant relation between participants' levels of attitude and their levels of practice regarding COVID-19 pandemic. Also, this result was in the same line with **Al-Hanawi et al., (2020)** who carried out a study about "Knowledge, attitude and practice toward COVID-19 among the public in the Kingdom of Saudi Arabia: a cross-sectional study "and they found that there was statistically significant correlation between participants total attitude score and practice regarding COVID-19.

**From an investigator's point of view,** this result may be attributed to the participants' positive attitude which reflects on their level of practice.

Regarding correlation between total score of knowledge, total score of practice and total attitude regarding COVID-19 **Table (20),** the present study revealed that there was highly statistically significant correlation between total score of knowledge, practice and attitude regarding COVID-19. It reveals that there is positive correlation between total score of knowledge, practice and attitude. This result was compatible with **Anikwe et al., (2020)** who assessed "Coronavirus disease 2019: Knowledge, attitude, and practice of pregnant women in a tertiary hospital in Abakaliki, southeast Nigeria" and reported the existence of a positive correlation between attitudes/practice of COVID-19 and level of knowledge among the individuals they studied.

Also, these findings agreed with **Zhang, et al., (2020)** who carried a study entitled "Knowledge, attitude and practice regarding COVID-19 among health care workers in Henan, China" and reported that there was a positive correlation between participants knowledge, attitude and practice of a participants towards the disease.

**From an investigator's point of view,** this result may be due to that the attitude and practice of a person towards the disease are dependent on their knowledge of the disease.

Regarding correlation between total score of practice and total score of health condition **Table (22),** the current study revealed that there was highly statistically significant correlation between total score of practice and total score of health condition. It reveals that there is a positive correlation between total score of practice and total score of health condition. This study was compatible with **Araújo et al., (2021)** who conducted a study to assess "the potential impact of the COVID-19 pandemic on child growth and development: a systematic review at Belo Horizonte, Brazil" and reported that the total score of COVID-19 preventive practices reflects positively on children health condition. Also, this result was in the same line with **Abuhammad, (2021)** who reported that the total children health condition was related to total COVID-19 preventive practices.

**From an investigator's point of view,** this result may be due to applying preventive measures help in protection from acquiring infection, preventing disease transmission from mothers to their children and ending the disease transmission cycle.

## Conclusions:

The current study sample showed that, 46.6% of the studied mothers were in the age group 30-<40 years with mean age 33.41±8.67, 57.8% of them had satisfactory knowledge about covid 19, 79.4% of them had positive attitude toward covid 19 and 71.8% of them had good practice toward follow preventive measures of covid 19.There was highly significant correlation between total score of knowledge and total score of practice regarding covid 19. There was a highly statistically significant correlation between total score of attitudes and total score of practice regarding covid19. There was a highly statistically significant correlation between total score of knowledge, attitude and practice regarding COVID-19. There was a statistically significant relation between level of mothers' practice of preventive measures and level of children's health condition.

## Recommendations:

Based on the findings of this study, following points are recommended:

▪ Development and implementation of health education program for mothers to improve their knowledge, promote positive attitude, and better practices for prevention of covid 19 among their primary school children.

▪ Increase mothers' awareness about infectious diseases and methods of improving health of their children through educational sessions, brochures, and booklets.

▪ Activating the role of the health care provider in health care centers to increase public awareness toward covid 19 disease and its preventive measures.

**Future research conducting about:**

▪ Comparative study to assess mothers' preventive measures of covid 19 among their children in urban and rural areas.

▪ More researches are needed for assessment of mothers' knowledge and practice toward infected children with covid 19.

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