# Mothers' precautions for their children's protection from COVID-19 Pandemic

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## Abstract

***Background:*** *Coronavirus is a major public health crisis that has adverse consequences on health systems globally. Considering the key role that mothers play in their children's life, their knowledge and practice regarding the protection against COVID-19 is paramount in mitigating its spread. The study* ***aims*** *to identify mothers' precautions for their children's protection from COVID-19 pandemic.* ***Setting:*** *The study was conducted in the Pediatric Outpatient Clinic, Shoe for Africa Children Hospital at Moi Teaching and Referral Hospital in Eldoret, Kenya.* ***Subjects****: A convenient sample of 400 mothers having children from birth to 12 years were included in the study.* ***Tool:*** *One tool named Mothers' Precautions for Their Children's protection from COVID-19 Pandemic Interview Schedule was used for data collection.* ***Results:*** *Cleaning and disinfection of surface areas were the most precaution measures used by mothers (65.55±32.45) followed by personal protective equipment (61.38±18.96). However, adequate rest and sleep as well as types and elements of nutrition were the least category of protective measures used by them (18.06±4.62 and 28.84±9.13).* ***Conclusion:*** *It was concluded from this study that mothers were highly caring for their children's protection from COVID-19 pandemic through cleaning and disinfection of surface areas precaution measures followed by the use of personal protective equipment, physical activity and hygienic measures. While, they were caring least regarding adequate rest and sleep, nutrition, adherence to social distancing and proper indoor ventilation.* ***Recommendations:*** *Governmental and non-governmental organizations efforts should be integrated to enhance the awareness of the mothers regarding the preventive measures for protection from COVID-19 pandemic.*

**Keywords:** Precautions, Mothers, Children, Protection, COVID-19 Pandemic

## Introduction

Coronavirus Disease (COVID-19) is a novel pneumonia which is highly contagious between humans (Wang et al., 2021). The World Health Organization (WHO) declared COVID-19 outbreak as a global pandemic in March 2020. In Africa, the prevalence was 6,078,908 cases and 150,145 deaths (Worldometer, 2021). Children in Egypt were also affected like any other age groups, but the total incidence was less than 10% of reported cases (Mostafa et al., 2020).

Children's manifestations of COVID-19 include cough, difficulty in breathing, fever, body aches, vomiting, diarrhea and loss of taste or smell. As

disease progresses, dyspnea and cyanosis occur. Moreover, pneumonia may develop and progress rapidly in serious cases causing respiratory failure (WHO, 2019).

Transmission of the virus occurs directly by inhalation of volatile droplets emitted by infected individuals. Whereas, indirect transmission occurs through physical contact between contaminated surfaces and oral, nasal, or ocular mucous membranes of the subjects (Cianetti et al., 2020). There is overwhelming evidence of asymptomatic and pre-symptomatic transmission of COVID-19 which totally disrupt the public health strategies to control the infection (Balasubramanian et al., 2020). So, a variety of preventive strategies were highly recommended by WHO as frequent hand washing, maintaining social distancing, avoiding public gatherings besides using Personal Protective Equipment (PPE) such as face masks (Degu et al., 2021).

Mothers act as advocate in their children's health as their role is the key in the protection against COVID-19 (Kimura et al., 2021). Apart of their role is following the precautions that are elaborated by WHO (Esposito & Principi, 2020). Mothers have to observe the behavior of their children, instruct them to practice good respiratory hygiene and monitor them closely for flu-like symptoms. Besides, they ought to contact a healthcare provider immediately if any respiratory illness is observed. The compliance of mothers with such precautions are essential for reducing the spread of COVID-19 (Centers for Disease Control and Prevention [CDC], 2021). From this perspective, the current study aimed to shed the light on mothers' precautions that are employed in their children's protection from COVID-19.

## AIM OF THE STUDY

The aim of the present study was to identify mothers' precautions for their children's protection from COVID-19 pandemic.

## RESEARCH QUESTION

What are the mothers' precautions for their children's protection from COVID-19 pandemic?

## Materials and Methods

### Study design:

A descriptive research design was utilized in this study.

### Setting:

The study was conducted in the Pediatric Outpatient Clinic (POC) of Shoe for Africa Children Hospital at Moi Teaching and Referral Hospital (MTRH) in Eldoret, Kenya.

### Subjects

Epi info program v 7.0 was used to estimate the sample size using the following parameters: expected frequency of errors 50%, margin of error 5%, and Confidence coefficient 95%. The minimum sample size was 359. A convenient sample of 400 mothers was selected for possible non response or withdrawal. Age of children ranged from birth to 12 years. Children with COVID-19 and chronic illness were excluded from study.

### Tool

One tool was used for data collection which was Mothers' Precautions for Their Children's protection from COVID-19 Pandemic Interview Schedule. It was

developed by the researcher after reviewing recent and relevant literature (WHO, 2020; CDC, 2020). It included three parts: **Part 1;** Socio-demographic characteristics of mothers such as age, educational level, and occupation. **Part 2;** Characteristics and medical data of children such as age, sex and birth order. **Part3;** Mothers' precautions for their children's protection from COVID-19 which comprised seven basic precautionary measures such as use of PPE, nutrition, social distancing, hygiene, physical activity and rest, cleaning and disinfection of surfaces, playing equipment as well as cleaning of groceries and proper indoor ventilation.

## METHOD

-Approval from the Ethical Research Committee of the Faculty of Nursing at Alexandria University was obtained and sent to the directors of MTRH. Also, a written approval was obtained from the Ethical Research Committee of MTRH/Moi University Institutional Research and Ethics Committee in Eldoret, Kenya to facilitate data collection.

-The tool was developed by researcher and was tested for its content and construct validity and it was 90%. Reliability of the tool was also ascertained using the Cronbach's Alpha test to measure its internal consistency and it was 0.768

-A pilot study was carried out on 40 mothers (10% of the subjects) to test clarity and feasibility of the tool.

-Every mother was interviewed individually to collect the necessary data in the waiting room of the outpatient clinic. The interview session lasted for approximately 15 minutes. Data was collected over three months extending from February 2022 to April 2022.

### Statistical analysis

-Data were analyzed using IBM SPSS software package version 20.0. **(**Armonk, NY: IBM Corp**).** Qualitative data were described using number and percent. Mean percentage scores of mothers' precaution measures were calculated. Significance of the obtained results was judged at the 5% level. **Kolmogorov-Smirnov** was used to verify the normality of distribution. **Mann Whitney test** and **Kruskal Wallis** tests were used for abnormally distributed quantitative variables. **Post Hoc (Dunn's multiple comparisons test** for pairwise comparisons and **Cronbach's Alpha** was also used.

### Ethical considerations

- Written and verbal informed consent was obtained from mothers for their participation after explaining the aim of the study. Also, Confidentiality of data and Anonymity of subjects were maintained.

### Results

Table (I) illustrates the socio-demographic characteristics of mothers and their children. It was found that the age of nearly half of mothers ranged from 20 to less than 30 years (49.3%) with mean age of 29.84±7.43 years. It was also shown that three-quarters of mothers finished secondary or diploma education (77.5%). Almost equal percent of mothers were either housewives (51.0%) or employed (49.0%). It was also revealed from this table that the age of slightly less than half of children were below 2 years (47.5%). While, the ages of the lowest percent of children were ranging from 8 to less than 10 years (6.7%) with the mean age of 4.05±3.66 years. Furthermore, more than half of children were female

(56.2%). Regarding birth order, 45.2% of children were first born, while 26.2% of them were in the second order.

Table (II) presents mothers' protective measures for their children's protection from COVID-19 pandemic. It was revealed that cleaning and disinfection of surfaces was the most precaution measure used by mothers (65.55±32.45) followed by use of PPE, physical activity and hygienic measures (61.38±18.96, 57.19±34.07 and 56.4±11.88 respectively). However, precaution measures related to adequate rest and sleep, types and elements of nutrition, adherence to social distancing and proper indoor ventilation had the lowest means (18.06±4.62, 28.84±9.13, 30.53±8.77 and 39.50±12.84 respectively).

Table (III) illustrates the relationship between the mean percentage scores of mothers' precaution measures and their ages. It was shown that there were significant differences between mothers' age and certain precaution measures such as cleaning and disinfection, types and elements of nutrition as well as overall precaution measures (P<0.001 for each), where the mean percentage scores of younger mothers were more than the mean percentage scores of older ones. For instance, mean percentage scores were the highest among mothers whose ages were less than 20 years (100±0.00, 34.37±40.17 and 67.19±2.08 respectively) and those whose ages ranged from 20 to less than 30 years (74.51±31.09, 30.51±8.21 and 57.86±11.67 respectively).

Table (IV) clarifies the relationship between mean percentage scores of mothers' precaution measures and their educational levels. It was revealed from this table that there were significant differences between mothers' educational levels and their precaution measures such as PPE, hygienic measures, cleaning and disinfection, proper indoor ventilation, types and elements of nutrition, social distancing in addition to overall precaution measures (P<0.001 for each), where the mean percentage scores of mothers who had university education (91.3±7.9, 76.4±5.2, 72.8±21.3, 46.2±9.4, 42.5±17.5, 51.1±4.9 and 62.7±6.0 respectively) were higher than those who had other educational levels.

Relationship between mean percentage scores of mothers' precaution measures and their occupation is displayed in Table (V). It was illustrated from this table that the mean percentage scores of employed mothers regarding certain categories of precaution measures such as cleaning and disinfection, physical activity and rest as well as overall precaution measures (72.88±32.61, 67.36±35.42 and 56.88±12.53 respectively) were more than those who were housewives and significant differences were shown (P<0.001, P<0.002 and P<0.001 respectively). While, the mean percentage scores of housewives regarding PPE, hygienic measures and social distancing (65.0±18.04, 58.22±11.57 and 32.36±9.21 respectively) were more than mean percentage scores of those who were employed and the differences also were statistically significant (P<0.001, P<0.006 and P<0.001 respectively).

## Discussion

Coronavirus is a major public health crisis that has adverse consequences on health systems globally (Gebru et al., 2021). Mothers play important role in their children's protection against COVID-19 to minimize its spread (Harapan et al., 2022). The results of the current study revealed that cleaning and disinfection of surfaces and groceries were the most precaution measures used by mothers (Table II). This could be attributed to availability of water and soap as more than three-quarters of mothers were using them for cleaning surface areas.

Moreover, the information about COVID-19 high morbidity and mortality rates, led to an atmosphere of panic among mothers worldwide which brought significant changes in Kenyan mothers' hygienic behaviors. Therefore, they follow the precaution measures of cleaning and disinfection for the prevention from COVID-19 (Oluoch-Aridi et al., 2020). The present findings were also supported by mothers' awareness regarding WHO recommendations which stated that cleaning and disinfection of frequently touched surfaces, playing equipment and groceries could reduce virus load and prevent its transmission (WHO, 2020). Similarly, Kwok et al. (2020) reported that cleaning and disinfection of surfaces were the most precaution measures used by mothers during the pandemic. On contrast, Brown et al. (2021) found that high percentage of mothers had shown low adherence to cleaning and disinfection.

The present study revealed that there were statistically significant differences between mothers' age and cleaning and disinfection, types and elements of nutrition as well as overall precaution measures (Table III). For instance, younger mothers who were less than 20 years were more committed to these precaution measures, than older ones. These current findings might be related to the quick access to information by young mothers regarding the outbreak through mass media besides their readiness to accept behavior changes in order to power the fight against COVID-19 (Degu et al., 2021). Moreover, Temesgan et al. (2022) stated that young mothers usually have better educational attainment than older ones which enable them to be highly knowledgeable about the protective measures. Also, young mothers have information seeking behaviors and are more eager to seek knowledge than older ones on precaution measures related to cleaning and disinfection as well as nutritional requirements of their children. The current findings were supported by Sun et al. (2020) who clarified presence of positive correlation between young age and adherence to COVID-19 precaution measures. While the findings of Abeya et al. (2021) concluded that adherence to COVID-19 protective measures increases with mothers' age.

Education is a substantial factor that affect mothers' adherence to COVID-19 protective measures. In this regard, statistical significant differences were illustrated in this study between mothers' educational level and their precaution measures such as PPE, hygienic measures, cleaning and disinfection, proper indoor ventilation, types and elements of nutrition as well as social distancing, plus overall precaution measures. Where, the mothers with high educational level were more committed to these precaution measures compared to their counterparts (Table IV). This might be explained in the light of having more awareness by mothers with higher educational level regarding the susceptibility and severity of COVID-19. In addition, they also have better understanding of public health measures. These findings were in favor of the study that had been done by Olajumoke et al. (2022) who cited that mothers with higher level of education were associated with high level of adherence to protective measures against COVID-19.

Concerning mothers' occupation, it was shown form the current study that there were statistically significant differences between mothers' occupation and certain categories of precaution measures such as cleaning and disinfection, physical activity and rest as well as overall precaution measures. Where, it was found that employed mothers were more committed to these categories than those who were

housewife (Table V). This could be related to enforcement of these protective measures in mothers work place which increase their commitment regarding such measures in their homes (Ditekemena et al., 2021). Moreover, employed mothers are financially empowered and can easily get access to COVID-19 information through media and internet (Parvin et al., 2022). They also might have a fixed routine schedule due to their working hours leading to positive impact on their children's physical activity and rest. These present results were in harmony with Baral et al. (2022) who reported that employed mothers experienced maximum level of precaution measures compared to housewives. Inconsistently, Keyworth et al. (2021) stated that employed mothers were less likely to adequately follow precaution measures because of the burden of having to work at home while taking care of their children.

## Conclusion

It was concluded from this study that mothers were highly caring for their children's protection from COVID-1D pandemic in cleaning and disinfection of surfaces of protective measures followed by use of PPE, physical activity and hygienic measures. While, they were least caring regarding adequate rest and sleep, nutrition, adherence to social distancing and proper indoor ventilation.

## Recommendations

Based on the previous findings and conclusion, the following recommendations are suggested:

1. Government and non-governmental organizations should be integrated to raise awareness of mothers regarding preventive measures for protection from COVID-19.
2. Conducting evidence-based health educational programs for mothers that are emphasizing all precaution measures towards protection from COVID-19.
3. Media messages should be continuously updated to be in line with the declared recommendations of WHO.

**Table (I): Socio-Demographic Characteristics of Mothers and their Children.**

| Characteristics of Mothers and their children | No. (n=400) | % |
|---|---|---|
| **Mothers' Characteristics** | | |
| **Age (years)** | | |
| - <20 | 16 | 4.0 |
| - 20- | 197 | 49.3 |
| - 30- | 140 | 35.0 |
| - 40- | 41 | 10.2 |
| - 50 and above | 6 | 1.5 |
| Min. – Max. | 18.0 – 55.0 | |
| Mean ± SD. | 29.84 ± 7.43 | |
| **Educational level** | | |
| - Illiterate | 12 | 3.0 |
| - Read and write | 13 | 3.2 |
| - Primary education | 45 | 11.3 |
| - Secondary/ Diploma education | 310 | 77.5 |
| - University education | 20 | 5.0 |
| **Occupation** | | |
| - Housewife | 204 | 51.0 |
| - Employed | 196 | 49.0 |
| **Number of children** | | |
| - 1 | 142 | 35.5 |
| - 2 | 109 | 27.2 |
| - 3 | 67 | 16.8 |
| - 4 | 49 | 12.2 |
| - 5 and above | 33 | 8.3 |
| **Children's Characteristics** | | |
| **Child's Age (years)** | | |
| - <2 | 190 | 47.5 |
| - 2- | 30 | 7.5 |
| - 4- | 66 | 16.5 |
| - 6- | 36 | 9.0 |
| - 8- | 27 | 6.7 |
| - 10 – 12 years | 51 | 12.8 |
| **Min. – Max.** | 0.10 – 12.0 | |
| **Mean ± SD.** | 4.05 ± 3.66 | |
| **Gender** | | |
| - Male | 175 | 43.8 |
| - Female | 225 | 56.2 |
| **Birth order** | | |
| - First | 181 | 45.2 |
| - Second | 105 | 26.2 |
| - Third | 57 | 14.3 |
| - Fourth | 35 | 8.8 |
| - Fifth and more | 22 | 5.5 |
| **Educational level** | | |
| - Not enrolled to school yet | 190 | 47.5 |
| - Play school/ Nursery | 90 | 22.5 |
| - Primary school | 120 | 30.0 |

**Table (II) Mothers' Precautions Measures for their Children's Protection from COVID-19 Pandemic.**

| Mothers Protective Measures | No. (n=400) | % | Mean ± SD |
|---|---|---|---|
| - Personal protective equipment **(n=210)** | 210 | 100% | 61.38 ± 18.96 |
| - Hygienic measures | 400 | 100.0 | 56.46 ± 11.88 |
| - Cleaning and disinfection of surfaces | 400 | 100.0 | 65.55 ± 32.45 |
| - Proper indoor ventilation | 400 | 100.0 | 39.50 ± 12.84 |
| - Types and elements of nutrition | 400 | 100.0 | 28.84 ± 9.13 |
| - Adherence to social distancing | 400 | 100.0 | 30.53 ± 8.77 |
| - Physical activity **(n=210)** | 129 | 61.4 | 57.19 ± 34.07 |
| - Adequate rest and sleep | 290 | 72.5 | 18.06±4.62 |

**Table (III): Relationship between the Mean Percentage Scores of Mothers' Precaution Measures and their Ages**

| Mean Percentage Scores of Mothers' Precaution Measures | Age (years) | | | | | *Test (H)* | *Significance (P)* |
|---|---|---|---|---|---|---|---|
| | **<20** | **20-** | **30-** | **40-** | **50 and above** | | |
| **Personal Protective Equipment** | – | 63.32 ± 19.40 | 61.85 ± 17.71 | 55.88 ± 21.37 | 60.42 ± 16.61 | 4.018 | 0.260 |
| **Hygienic Measures** | – | 58.55 ± 11.67 | 55.86 ± 11.71 | 54.41 ± 12.92 | 51.04 ± 8.31 | 5.211 | 0.157 |
| **Cleaning and Disinfection** | 100.0 ± 0.0 | 74.51 ± 31.09 | 56.72 ± 30.86 | 44.99 ± 26.53 | 30.86 ± 4.49 | 64.603 | **<0.001*** |
| **Proper Indoor Ventilation** | – | 41.12 ± 12.04 | 37.24 ± 13.08 | 41.91 ± 13.37 | 41.67 ± 12.91 | 5.764 | 0.124 |
| **Types and Elements of Nutrition** | 34.37 ± 4.17 | 30.51 ± 8.21 | 27.35 ± 9.75 | 24.23 ± 8.53 | 26.67 ± 16.33 | 39.276 | **<0.001*** |
| **Social Distancing** | – | 30.73 ± 8.65 | 30.73 ± 8.62 | 30.04 ± 10.07 | 27.38 ± 5.38 | 1.150 | 0.765 |
| **Physical Activity and rest** | – | 59.63 ± 34.82 | 53.18 ± 32.99 | 65.60 ± 35.19 | 42.86 ± 28.57 | 4.581 | 0.205 |
| **Overall Precaution Measures** | 67.19±2.08 | 57.86±11.67 | 50.53±12.74 | 47.38±11.62 | 40.13±6.36 | 63.277 | **<0.001*** |

H: H for Kruskal Wallis test *: Statistically significant at $p \leq 0.05$

**Table (IV): Relationship between Mean Percentage Scores of Mothers' Precaution Measures and their Educational Level**

| Mean Percentage Scores of Precaution Measures | Educational level | | | | | *Test ( H)* | *Significance (p)* |
|---|---|---|---|---|---|---|---|
| | **Illiterate** | **Read and Write** | **Primary Education** | **Secondary/Diploma Education** | **University Education** | | |
| **Personal Protective Equipment** | 46.4±15.7 | 31.9±9.1 | 35.8±11.9 | 66.1±12.9 | 91.3±7.9 | 106.670 | **<0.001*** |
| **Hygienic Measures** | 48.2±8.6 | 42.4±11.6 | 43.3±6.0 | 58.4±9.5 | 76.4±5.2 | 88.551 | **<0.001*** |
| **Cleaning and Disinfection** | 47.8±24.5 | 48.1±31.6 | 52.1±33.7 | 68.4±32.4 | 72.8±21.3 | 32.893 | **<0.001*** |
| **Proper Indoor Ventilation** | 28.6±9.4 | 36.1±13.2 | 37.1±12.7 | 40.1±12.9 | 46.2±9.4 | 10.817 | **<0.001*** |
| **Types and Elements of Nutrition** | 26.9±9.7 | 25.6±7.6 | 25.2±6.8 | 28.7±7.9 | 42.5±17.5 | 25.979 | **<0.001*** |
| **Social Distancing** | 26.5±5.4 | 21.4 ± 0.0 | 23.2 ± 3.6 | 30.9± 7.0 | 51.1± 4.9 | 79.917 | **<0.001*** |
| **Physical Activity and Rest** | 28.6 ± 0.0 | 64.3 ± 34.6 | 85.5± 28.9 | 53.3 ± 33.3 | 50.1± 29.1 | 27.707 | **<0.001*** |
| **Overall Precaution Measures** | 41.9±12.6 | 43.7±14.3 | 48.1±13.3 | 55.6±12.2 | 62.7±6.0 | 41.801 | **<0.001*** |

H: H for Kruskal Wallis test *: Statistically significant at $p \leq 0.05$

**Table (V): Relationship between Mean Percentage Scores of Mothers' Precaution Measures and their Occupation**

| Mean Percentage Scores of Precaution Measures | Occupation | | *Test (U)* | *Significance (p)* |
|---|---|---|---|---|
| | **Housewife** | **Employed** | | |
| **Personal Protective Equipment** | 65.0 ± 18.04 | 55.64 ± 19.06 | 3922.50* | **<0.001*** |
| **Hygienic Measures** | 58.22 ± 11.57 | 53.66 ± 11.91 | 4147.50 | **<0.006*** |
| **Cleaning and Disinfection** | 58.05 ± 30.60 | 72.88 ± 32.61 | 15954.50 | **<0.001*** |
| **Proper Indoor Ventilation** | 39.81 ± 13.09 | 39.02 ± 12.48 | 5199.0 | 0.727 |
| **Types and Elements of Nutrition** | 28.35 ± 10.35 | 29.32 ± 7.74 | 18133.50 | 0.074 |
| **Social Distancing** | 32.36 ± 9.21 | 27.61 ± 7.17 | 3665.50 | **<0.001*** |
| **Physical Activity and Rest** | 50.78 ± 31.67 | 67.36 ± 35.42 | 4155.0 | **<0.002*** |
| **Overall Precaution Measures** | 51.65±12.53 | 56.88±12.53 | 15562.0 | **<0.001*** |

U: Mann Whitney test *: Statistically significant at $p \leq 0.05$

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