Original Article

Mothers' Perception of COVID-19 Infection in Their Under-Five Children Presenting in a Tertiary Health Institution in South-East Nigeria and Associated Factors

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Abstract

Background: Maternal attitude to health-seeking behavior of their under-five children in the COVID-19 pandemic is not well-known. **Objectives:** This study is aimed at determining mothers' perception of COVID-19 pandemic among their under-five children and associated factors. **Methodology:** This is a prospective and observational study carried out in two health institutions in South-East Nigeria. **Results:** Most subjects, 243 (65.3%) noted that someone without showing symptoms of COVID-19 could transmit the virus. Of the mothers of children under-five, 271 (72.8%) highlighted the possibility of COVID-19 infection in the under-five. A small number of participants 53 (14.2%) showed awareness that people should cough into their elbows as a way of preventing the transmission of COVID-19. A small number of participants, 160 (43.0%) had a good perception of COVID-19. Majority of mothers who were married, 148 (44.7%) showed a good perception of COVID-19 when compared with those who were single, 12 (29.3%); however, this is not significant, ($\chi^2 = 3.550$, $P = 0.060$). A large number of participants who have attained tertiary education, 92 (48.9%) had a good perception of COVID-19 which is higher than that seen in mothers with secondary education 68 (37.0%) ($\chi^2 = 5.444$, $P = 0.020$). Participants who were 30–34 years had 1.8 times higher odds of good perception of COVID 19 compared with mothers who were more than 35 years (adjusted odds ratio = 1.803, 95% confidence interval = 1.026–3.170). **Conclusion:** Although most mothers affirm that a child could be infected by COVID-19, a small number of them actually had a good perception of COVID-19 infection. Good perception of COVID-19 among the under-five is enhanced by the high level of education and age of 32–34 years.

Keywords: Health-seeking behavior, mothers, perception, under-five children

Introduction

COVID-19 pandemic is noted to affect all ages including the under-fives. Bhuiyan *et al*.[1] noted in their systematic review that children under the age of 5 years are worst affected by the pandemic.[1] Similarly, a systematic review and meta-analysis conducted by University of New South Wales (UNSW) Sydney, showed that although children under 5 years old were likely to recover from the infection, half of those infected were mainly under the age of 1 year with over 50% of the infected under-fives showing symptoms.[2] There is therefore an urgent need for surveillance for a better understanding of the pattern and distribution of COVID-19 infection in the under-five. A study among 2143 patients in China with evidence of COVID-19 showed that infants present with the highest fatalities (32%) with those between the age of 1 and 5 years making up (28.8%). Fifty percent of children with severe cases were below the age of one.[3-5]

Similarly, infants are susceptible to infectious disease, especially at the early months of their existence. This is further

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worsened by their poorly developed immune system. Besides, some new-borns delivered by mothers who had COVID-19 infection had shown evidence of confirmed COVID-19 infection just after delivery.[6-8]

The novel coronavirus (COVID-19) pandemic has imposed a heavy burden on maternal and U-5 health causing total disorganization to the health system.[6] For instance, since the advent of COVID-19 pandemic, it has been reported that efforts geared toward reduction in maternal and child health mortality have reduced by about 51·9% and efforts in curbing maternal and child death have declined by 10%–50%.[9]

Recently, it has been estimated that majority of mid-income and developing countries such as India, Indonesia, Nigeria, and Pakistan records about 766,180 maternal and child deaths, with a 31% increase before COVID-19 pandemic. This is due to poor antenatal visits and management of common childhood illnesses at home.[10,11]

Maternal attitude toward health-seeking of their under-five children is in developing countries.[11,12] Prior to the COVID-19 menace, the desire for mothers to cater for their children is dented by the poor health system which is inaccessible, unavailable, or unaffordable for millions of women. In the course of the corona pandemic, health service utilization and management of common infections in children have reduced drastically. The mothers of child-bearing age are surely afraid of bringing their children to the hospital for fear of COVID 19.[11,12] Notwithstanding, efforts have increased greatly in the prioritization of essential services, such as childhood immunization and management of common childhood emergencies to some extent.[12]

Regrettably, once the pandemic is over, health management systems will require a lot of recovery and advocacy for children, with a very high reinvigoration on the demand for routine child care. It is obvious that once this laxity in health-seeking behavior among the mothers persists with the attendant reduction in health coverage, it will be a very herculean task to reinstate the health system to the pre-COVID-19 era.[13] There are misconceptions on mothers perception of COVID-19 in their under-five children. Many felt it is just a mild viral infection, while some thought the mortality is even exaggerated. The source of infection, means of spread, and management options remain a mirage to these mothers.[11-13]

Since the outbreak of the menace of COVID-19, much is unknown about how mothers care for their ill children in South-East Nigeria, in addition, the impact of this pandemic on maternal and child health has not been documented. There is no study anywhere in the South-East Nigeria on maternal perception of COVID-19. This study is therefore aimed at determining mothers' perception of the COVID-19 pandemic among their under-five children.

Methodology

Study area

This is a prospective and observational study, in two health institutions in South-East Nigeria namely Enugu State University Teaching Hospital Enugu and Nnamdi Azikiwe University Teaching Hospital Nnewi; over a 2-month period. These hospitals are referral centres for several health facilities in South-east Nigeria.

Study population

This was a survey of 398 mothers of children aged 59 months and below seen at immunization clinic, outpatient clinic, and children emergency ward over a 2-month period. Mothers of children who are <5 years were recruited consecutively into the study.

Sample size estimation

This was determined using the following formula:

$N = Z^2P\ (I - P)/D^2$

A minimum sample size of 372 was obtained after 2% attrition.

Study design

A prospective study that assessed mothers' perception of COVID-19 infection among the under-five children. Information on the cardiac disease was ascertained from the records of the participants, and these were entered in a well-structured questionnaire. The questionnaire contains details such as demographic variables, socioeconomic variables, extracardiac correlates, syndromic correlates, weight and height of the participants, and diagnosis of the particular cardiac lesion.

The objectives of the study were communicated to the mothers while details on the questionnaire were explained in a very simple language. Mothers who gave consent and whose children were <5 years were included in the study while those whose children were above the age of five were excluded.

Data collection

A semi-structured, pretested, interviewer-administered questionnaire designed by the researchers was used for data collection. The questionnaire was administered to the mothers by research assistants. The outcome variables were the proportions of mothers of the under-five children with varying perceptions of COVID-19 pandemic. The questionnaire contains mother's sociodemographics; child's age, educational level of both mother and father, parity, marital status of the mothers, and occupation of father and mother as independent variables.

Ethical approval

Ethical clearance was obtained from the research and ethical committee of the Enugu State University College of Medicine. (Reference number: ESUTP/C-MAC/RA/034/Vol 1/266).

Data analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) software version 25 (Chicago,USA). Frequencies and proportions were analyzed using the categorical variables, whereas mean and standard deviation were analyzed by means of continuous variables. Binary

logistic regression was ascertained by means of Chi-square and multivariate analysis. *P* value was set at <0.05.

Results

Table 1 shows the sociodemographic characteristics of the participants. Their mean age was 31.6 ± 6.8 years. The highest number of mothers, 156 (41.9%), were 30 years and below while the lowest number, 43 (11.26%) were between 35 and 39 years. Majority of participants 331 (89.0%) were married. Furthermore, majority of the respondents, 188 (50.5%) attained tertiary education and 2 (0.5%) had no formal education. A good number of the mothers, 213 (57.3%) were self-employed while the least proportion, 57 (15.3%) were unemployed.

Table 1: Demographic variables of the subjects

Subjects	Frequency (*n*=372), *n* (%)
Age of mothers	
Mean±SD	31.6±6.8
Age of respondents in groups (years)	
<30	156 (41.9)
30-34	124 (33.3)
35-39	43 (11.6)
More than 40	49 (13.2)
Ethnicity	
Igbo	352 (94.6)
Hausa	6 (1.6)
Yoruba	4 (1.1)
Others*	10 (2.7)
Number of children	
I child	89 (23.9)
2-4 children	245 (65.9)
≥5 children	38 (10.2)
Marital status	
Married	331 (89.0)
Never married	33 (8.9)
Widowed	2 (0.5)
Divorced/separated	6 (1.6)
Educational attainment	
No formal education	2 (0.5)
Primary	12 (3.3)
Secondary	170 (45.7)
Tertiary	188 (50.5)
Employment status	
Not employed	57 (15.3)
Self-employed	213 (57.3)
Government parastatals	102 (27.4)
Education husband	
No formal education	3 (0.8)
Primary education	12 (3.2)
Secondary education	192 (51.6)
Tertiary education	165 (44.4)
Husband employment status	
Unemployed	16 (4.3)
Self-employed	273 (73.4)
Salaried employment	83 (22.3)

*Minority tribes. SD: Standard deviation

Table 2 shows the characteristics of the children. Majority of the children, 227 (57.0%) were <8-day-old while the least proportion, 73 (18.3%) were aged between 1 and 5 years. Majority of the children, 56.5% were males.

Table 3 demonstrates mothers' perception of COVID-19. A good number of the mothers, 210 (65.3%) believed that someone without showing symptoms of COVID-19 could transmit the virus. A greater percentage of mothers, 271 (72.8%) noted that a child could be infected with COVID-19. A good number of the participants, 238 (64.0%) acclaimed that malaria is the most common disease in Enugu and Nnewi. Most mothers of the under-fives 270 (72.6%) believe that both health workers and patients should wear face masks in the hospital as a way of preventing the transmission of COVID-19. A small number of mothers 43 (14.2%) believe that people should cough into their elbows as a way of preventing the transmission of COVID-19. A small percentage of mothers, 160 (43.0%) had a good perception of COVID-19.

Table 4 depicts the factors associated with a good perception of COVID-19 infection among the respondents. A higher proportion of married respondents, 148 (44.7%) had a good perception of COVID-19 compared with their unmarried counterparts who were single, 12 (29.3%) however this was statistically significant, ($\chi^2 = 3.550$, $P = 0.038$). A significantly higher proportion of the respondents who have attained tertiary education, 48.9% had a good perception of COVID-19 when compared with those who attained secondary education and less, 37.0% ($\chi^2 = 5.444$, $P = 0.020$).

Table 5 depicts the predictors of good perception of COVID-19 among mothers of the under-fives. Mothers who were 30–

Table 2: Demographic and socioeconomic characteristics of the children

Variable	Frequency (*n*=372), *n* (%)
Age of child	
<8 days	227 (57.0)
8 days-1 year	73 (18.3)
1-5 years	72 (18.1)
Time gap before presentation (days)	
1	150 (40.3)
2	70 (18.8)
3	50 (13.4)
More than 3	102 (27.5)
Gender	
Male	210 (56.5)
Female	162 (43.5)
Perception of the attitude of health workers	
Good/friendly	325 (87.4)
Poor	47 (12.6)
Spent more money in hospital than before the COVID era	
Yes	101 (27.2)
No	271 (72.8)

COVID: Coronavirus disease

Table 3: Mothers perception of coronavirus disease 2019 infection

Variable	Frequency (n=372), n (%)
Someone could transmit corona without showing symptoms	
Yes	243 (65.3)
No	129 (34.7)
A child be infected with COVID-19	
Yes	271 (72.8)
No	101 (27.2)
Most common illness in Enugu and Nigeria	
Malaria (correct)	238 (64.0)
Corona	134 (36.0)
Face mask for all hospital staff and patients could prevent transmission of COVID-19	
Yes	270 (72.6)
No	102 (27.4)
Frequent washing of hands with soap and water could prevent transmission of COVID-19	
Yes	245 (65.9)
No	127 (34.1)
Maintaining at least one meter distance between oneself and others could prevent transmission of COVID-19	
Yes	223 (59.9)
No	149 (40.1)
Coughing into elbow could prevent the transmission of COVID-19	
Yes	53 (14.2)
No	319 (85.8)
Perception of COVID-19	
Good	160 (43.0)
Poor	212 (57.0)

COVID-19: Coronavirus disease 2019

34 years were 1.803 times more likely to have good perception of COVID-19 compared with mothers who were more than 35 years of age (adjusted odds ratio = 1.803, 95% confidence interval = 1.026–3.170).

Discussion

This study is aimed at determining the perception of COVID-19 infection by mothers of under-five children.

We noted in this study, that a good number of mothers were aware that COVID-19 could affect their under-five children. A study has documented laboratory-confirmed COVID-19 disease among one thousand, two hundred and fourteen children who were <5-year-old, with 7% of them presenting with severe disease requiring intensive-care-intervention.[14] Moreover, newborn from COVID-19 infected mothers had also been infected with COVID-19 with certain mortality.[14-17]

Furthermore, Ibrahim *et al*.[18] noted that majority of the children afflicted by the COVID-19 pandemic are under the age of 5 years. This age range also agrees to that reported in China,[19] Iran,[20] and the rest of the world.[21]

Although most mothers affirm that a child could be infected by COVID-19, a small number of them had a good perception of the infection in the under-five. This finding varies with that of Goudah *et al*.[22] who noted a higher value of perception of COVID-19 among mothers. The reportage of Goudah *et al*.[22] differs from ours because the latter used pregnant mothers in their study population. It is surprising that despite the high level of education of mothers in this study, their perception level is low. This could be enhanced by information dissemination on the reality of COVID-19 infection in under-five children.

The majority of the mothers were of the opinion that someone without symptoms of COVID-19 could transmit the virus to their under-five children. The high level of education attained by the mothers who participated in this study could explain the high level of awareness seen in this study.

It is seen in this study that mothers who were 30–34 years were about twice likely to have a good perception of COVID-19 compared with mothers who were more than 35 years of age.

Besides, mothers with tertiary education had a good perception of transmission of COVID-19 infection on their under-five children than those who had secondary education. Studies have shown that low awareness of preventive measures seen in mothers of younger age, single mothers, and people with a lower level of education may be related to this lack of awareness of the pandemic.[23,24]

A large number of mothers believe that both health workers and patients should wear face masks in the hospital as a way of preventing transmission of COVID-19 to their under-five children. The efficacy of wearing facemasks in curbing the spread of infection has waned especially from improper

Table 4: Factors influencing good perception of coronavirus disease 2019 in others of under five

Variable	Good perception of COVID-19 ($n=372$)		χ^2	*P*
	Yes, *n* (%)	No, *n* (%)		
Age of respondents (years)				
<30	64 (41.0)	92 (59.0)	8.535	0.038
30-34	64 (51.6)	60 (48.4)		
≥35	32 (34.8)	60 (65.2)		
Number of children				
1 child	41 (46.1)	48 (53.9)	0.446	0.800
2-4 children	103 (42.0)	142 (58.0)		
More than and equal to 5 children	16 (42.1)	22 (57.9)		
Marital status				
Married	148 (44.7)	183 (55.3)	3.550	0.060
Single**	12 (29.3)	29 (70.7)		
Educational attainment				
Tertiary education	92 (48.9)	96 (51.1)	5.444	0.020
Secondary education and less	68 (37.0)	116 (63.0)		
Employment status				
Unemployed	31 (54.4)	26 (45.6)	4.611	0.100
Self-employed	83 (39.0)	130 (61.0)		
Salaried employment	46 (45.1)	56 (54.9)		
Educational attainment of husband				
Tertiary education	73 (45.9)	86 (54.1)	0.178	0.673
Secondary education and less	75 (43.6)	97 (56.4)		
Husband employment status				
Unemployed	4 (57.1)	3 (42.9)	2.112	0.348
Self-employed	103 (42.4)	140 (57.6)		
Salaried employment	41 (50.6)	40 (49.4)		

**Never married, widowed, separated/divorced. COVID-19: Coronavirus disease 2019

Table 5: Predictors of good perception of coronavirus disease 2019 among the respondents

Subjects	AOR	*P*	95% CI (lower-upper)
Mother's age (years)			
<30	1.247	0.445	0.708-2.198
30-34	1.803	0.041	1.026-3.170
≥35	1		
Marital status			
Married	1.785	0.118	0.864-3.687
Single**	1		
Educational attainment			
Tertiary education	1.499	0.107	0.916-2.453
Secondary education and less	1		
Employment status			
Unemployed	1.788	0.108	0.880-3.631
Self-employed	1.071	0.953	0.583-1.774
Salaried employment	1		

**Never married, widowed, separated/divorced. AOR: Adjusted odds ratio, CI: Confidene interval

use of face masks and lack of compliance.[25] A study in Australia, had revealed that among the three methods used in preventing this infection, adherence to the use of mask was the lowest.[26,27]

Conclusion

Although most mothers affirm that a child could be infected by COVID-19 a small number of these mothers had a good perception of COVID-19 infection. Good perception of COVID-19 among the under-five is enhanced by the high level of education and age of 30–34 years.

Limitation

A wider nation-wide study would have given the paper a better shape.

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Conflicts of interest

There are no conflicts of interest.

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