

Knowledge, Attitude, and Practices of Mothers towards Children Immunization during COVID-19 Pandemic

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Abstract

Background: Parental knowledge, practice, and attitudes towards vaccination are important factors in predicting a child's immunization status especially during COVID quarantine. **Aim of the study:** This study was conducted to assess mothers' knowledge, attitude, and practice regarding children immunization during COVID Pandemic at Hafr- Al-Batin City. **Subjects and method:** Descriptive analytical cross-sectional was performed from 30 June 2020 until 25 July 2020. 126 Mothers who had at least one child at the immunization period were included in the study using convenience and snowball sampling methods. An online questionnaire was used by the researchers to obtain the necessary data. This questionnaire consisted of four parts was designed to gather the participants' data. **Part 1;** Socio-demographic characteristics, **Part 2;** Mothers' knowledge about childhood immunizations during COVID 19, **Part 3;** Mothers' practices about children's immunizations, and **Part 4;** Mothers Attitude toward infants' immunizations during COVID 19 pandemic. **Result:** slightly less than half (46%) of the mothers has a good level of knowledge. Also, the majority (84.2%) of the mothers had a satisfactory level of practice. 41.3% of the mother disagree that vaccination side effects are dangerous, about two-thirds (65.1%) of them strongly agree that COVID causes a delay in immunization, and about half of them (50.8) strongly agree on fear from going to child Vaccination during COVID. **Conclusion:** about half of the mothers have a good level of knowledge and the majority of them had a satisfactory level of practice. Moreover, about two-thirds of them strongly agree that COVID causes a delay in immunization.

Keywords: Knowledge, Attitude, Practices, Mothers, COVID-19, Pandemic, Children Immunization

Introduction:

WHO recommends that all routine vaccinations be administered as scheduled, even during the COVID-19 pandemic. There is currently no evidence that the COVID-19 pandemic poses any specific risk linked to vaccination. Evidence for other infectious diseases is therefore applied. This evidence suggests that potential contact with an infectious disease is not a contraindication for routine immunization ^(1,2). Routine immunization sessions should continue to the extent possible and as permitted within the local COVID-19 response context. However, standard infection prevention measures should be in place to minimize the risk of COVID-19 transmission to all staff and visitors to the health facility. Children must receive all the vaccines scheduled at birth and in the first two years of life ^(3,4). These vaccines may vary according to national recommendations. Any interrupted immunization services for any age groups should be resumed and catch-up vaccinations offered as quickly as possible. Timely vaccination is key to protect young and old from serious and life-threatening infectious diseases, and to avoid the accumulation of unvaccinated groups and potential loss of community immunity ⁽⁵⁻⁷⁾. In the Kingdom of Saudi Arabia The basic vaccinations identified in the Vaccination

Certificate, from birth until the first grade, aim to protect children in the Kingdom and all target groups in the community against diseases targeted by immunization, to maintain the Kingdom polio-free, and to get rid of measles, rubella, and mumps, as well as reducing the infection rates of other diseases targeted by immunization. ⁽⁸⁾

Within the framework of the keen interest shown by the Ministry of Health (MOH) to achieve these objectives and to remind families or parents of their children vaccination dates to follow them up, the Ministry herein presents the approved version of the National Immunization Schedule, with effect from January 1st, 2013⁽⁸⁾.

Immunizations are an essential health service that protects susceptible individuals from vaccine-preventable diseases (VPD). By providing timely immunizations, individuals and communities remain protected and the likelihood of a VPD outbreak decreases. Preventing a VPD outbreak not only saves lives but requires fewer resources than responding to the outbreak and helps reduce the burden on a health system already strained by the COVID-19 pandemic ⁽⁶⁾. According to the global immunization division CDC report, the global parental Attitude and knowledge regarding immunization services were low and parents have negative beliefs about

measles and vaccination programs^(9, 10). Thus, Parental attitudes and beliefs about vaccines are an important factor in predicting a child's immunization status, especially during COVID quarantine. This study shall provide vital data on mothers' knowledge, attitude, and practice regarding infants' immunization during COVID quarantine at Hafr- Al-Batin City of the eastern province of Saudi Arabia.

Aim of the study:

This study was conducted to assess mothers' knowledge, attitude, and practice regarding children immunization during COVID Pandemic at Hafr- Al-Batin City.

Subjects & Methods:

Research Design: Descriptive analytical cross-sectional was performed from 30 June 2020 until 25 July 2020. The study was conducted at, Hafr- Al-Batin city.

Subjects: 126 Mothers who had at least one child at the immunization period were included in the study using convenience and snowball sampling methods.

The tool of the study: an online questionnaire was used by the researchers to obtain the necessary data. A semi-structured questionnaire consisted of four parts was designed to gather the participants' data. **Part 1:** Socio-demographic characteristics such as age, marital status, educational level, economic status, mothers' occupation, Means of

transportation, and Time taken to health centers. **Part 2:** Mothers' knowledge about infants' immunizations during COVID 19. This part including 10 questions with a scoring system as follows; Correct and complete answer was scored (2), Correct and incomplete answer was scored (1), and don't know or incomplete answer was scored (0). Total scores for mothers' knowledge were 20. It was calculated and classified as follows: ↓60% were considered poor knowledge, from 60-↓75% were considered fair knowledge, and 75-100% were considered good knowledge. **Part 3:** Mothers' practices about infants' immunizations during COVID 19. This part including 11 questions. Three levels of scoring for each question were used: Correct and complete answer was scored (2), Correct and incomplete answer was scored (1), and don't know or incomplete answer was scored (0). Total scores for mothers' knowledge were 22. Total scores of mothers' practice were calculated and classified as follows: ↓60% were considered unsatisfactory practice and > 60 were considered a satisfactory practice **Part 4:** Mother's Attitude toward infants' immunizations during COVID 19 pandemic. The mother's attitude is measured using a 5 Likert scale ranging from strongly agree to strongly disagree.

Method:

Official approval from the dean of the college of applied medical science was obtained to conduct the study. The actual complete participation via an online questionnaire was considered as an approval to participate in the study. The questionnaire was translated into the Arabic language by the researcher. The questionnaire is disseminated through students' accounts on social media (Facebook, WhatsApp, and so on) who directly disseminate it to their mothers, sisters, and relatives. At the start of the questionnaire, the purpose of the study and the confidentiality of data is stated. Then the researcher stated that when they complete the questionnaire and make submit, this considers an agreement to participate in the study. A pilot study was done before embarking in the field of work on 10% of total subjects to ascertain the clarity and applicability of the study tools. The pilot subjects were excluded from the study sample.

Anticipated ethical issues

Informed consent from participants was assured when they completing the online questionnaire and submit it. The right of the participant to withdraw at any time or continue in the study was protected. The research purpose was clarified to the participants before answering the

questions. The participant was not at risk during the study. The anonymity of participants was protected and confidentiality was assured.

Statistical analysis: The data were coded, entered, revised, tabulated, and analyzed using SPSS (version 20). Descriptive statistics (frequency numbers and Percentages), mean and standard deviation were calculated. Paired t-tests were used to analyze the relationships; statistical significance was set at a P-value < 0.05%.

Results

Table 1 represents the characteristics of the studied children and their mothers. It was found that nearly two-thirds of the studied children (67.4%) were males. Concerning their age, it was clear that about two-thirds of them (66.2%) above 12 months and the rest below 12 months. The finding revealed that the vast majority of children (93.7%) hadn't any chronic disease. The table also revealed that the age of nearly three quarters (77 %) of the mothers was between 20-<30. Slightly more than two-thirds of them (66.2%) were in university education and more than three-quarters of them were employed. Slightly more than half of them reported low income.

Table 2 illustrate the immunization details of children. Slightly less than two-thirds of the mother (60.3%) stated that

their source of knowledge about vaccination is health professionals. Most of them (95.2%) had child immunization cards and 95.1% of them mentioned that they vaccinated the child in a Governmental health center. Moreover, slightly more than two thirds (69.8%) of children were immunized totally.

Table 3 explains total knowledge and practice among studied mothers. It was obvious that slightly less than half (46%) of the mothers had a good level of knowledge and about one-third of them (36.5%) had a fair level. Also, the majority (84.2%) of the mothers had a satisfactory level of practice.

Table 4 represents mothers' attitudes toward infants' immunizations during COVID Quarantine. The table explained that more than two thirds (69.8%) of the mothers strongly agreed on the favorable opinion regarding immunization, nearly about three quarter (73.0%) of them strongly agreed that immunization is important, and slightly less than two thirds (60.3%) of them strongly agreed that vaccination is safe. Furthermore, about two-thirds (65.1%) of them strongly agreed that immunization maintains child health, about one-third (30.2%) of them strongly agreed that immunization prevents disease transmission, and about one-third of them disagreed that immunization harms child

health. Also, 41.3% of the mother disagreed that vaccination side effects are dangerous, while 73.0% of them disagreed that immunization gives immunity against COVID, about two thirds (65.1%) of them strongly agreed that COVID causes a delay in immunization, and about half of them (50.8%) strongly agreed on fear from going to child Vaccination during COVID. Moreover, 65.1% of the mothers strongly agreed that child wears a face shield when going to immunization, 73.0% of them disagreed that vaccination increase a child's risk of becoming infected with COVID-19 or of developing the disease, 31.7% of them disagreed that COVID-19 a contraindication for vaccination, and 41.3% of them were uncertain that the BCG vaccine protects against COVID-19.

Table (5) illustrates the most common causes of vaccination delay. More than half of mothers (55.6%) stated that the most common causes of vaccination delay were child sickness. 19.0 % of them related common causes of vaccination delay to forgotten immunization time.

Table 6 illustrates the relation between mothers' socioeconomic characteristics and total knowledge and practice. The highest score of knowledge was in the age >40 whereas the highest score of practice was in the age between 30 - < 40. Regarding mothers' educational level, the

highest mean of knowledge and practice was in the postgraduate group. Additionally, the highest score of knowledge and practice was in the moderate level of income with a mean of 15.36 ± 2.6 and 16.81 ± 3.2 respectively. Concerning marital status, the highest mean of knowledge and practice was in the widow mothers group with a mean of $17.0 \pm .00$ and $19.0 \pm .00$ respectively. While the employed mothers have the highest score of knowledge and practice with a mean of 14.28 ± 2.1 and 17.35 ± 2.9 respectively. There was a statistically significant correlation between mothers' socioeconomic characteristics and total knowledge and practice. Moreover, the highest score of knowledge was found to be among moderate-income levels whereas the highest score of practice was found at the low-income level. Also, the table illustrates that the employed mother has a high score of knowledge, while the unemployed mother has a high score of practice.

Table 1: Socio-demographic characteristics of the study participant.

Socio-demographic characteristics of the studied children and their mothers	Study Participant (n=126)	
	No	%
characteristics of the studied children		
Sex:		
Males	85	67.4
Females	41	32.6
Age in months:		
< 1	8	6.3
1 < 6	6	4.8
6 < 12	16	12.7
> 12	96	66.2
Mean ± SD	4.95 ± 1.61	
Presence of chronic disease		
- Yes	8	6.3
- No	118	93.7
Mothers characteristics		
Age (years)		
20 < 30	77	61.1
30 < 40	35	27.8
> 40	14	11.1
Educational level:		
- Illiterate	12	9.5
- Moderate	8	6.3
- High	16	12.7
- University	86	68.3
- Postgraduate	4	3.2
Employment:		
- Yes	98	77.8
- No	28	22.2
Marital status		
- Married	124	98.4
- Widow	2	1.6
Income level		
- Low	66	52.4
- Moderate	22	17.5
- High	38	30.2

Table (2): Immunization details of children

Immunization details of children	Studied children (n=126)	
	No	%
Source of knowledge about vaccination:		
Health professionals	67	60.3
Neighbors	2	1.6
Relatives	14	11.1
TV	2	1.6
Internet	32	25.4
Presence of immunization card:		
Yes	120	95.2
No	6	4.8
Place of immunization:		
- Governmental	116	92.1
- Private	10	7.9
Child status of immunization:		
- Total	88	69.8
- Partial	38	30.2

Table 3: Total knowledge and Practice of Studied Mothers

Total knowledge and Practice	Studied mothers (n=126)	
	No.	%
Levels of total knowledge:		
Good	58	46.0
Fair	46	36.5
Poor	22	17.5
Total knowledge scores:		
Range	11-19	
Mean ±SD	14.25 ± 2.56	
Levels of total practice:		
Unsatisfactory practice	20	15.8
Satisfactory practice	106	84.2
Total practice scores:		
Range	11- 21	
Mean±SD	16.96 ± 2.867	

Table 4: Mother's Attitude toward Children Immunizations during COVID Pandemic.

Mothers Attitude toward infants' immunizations	Studied mothers (n=126)				
	Strongly Agree	Agree	Uncertain	Disagree	Strongly disagree
	No (%)	No (%)	No (%)	No (%)	No (%)
Favorable opinion on immunization	88(69.8)	36(28.6)	2 (1.6)	-	-
Immunization is important	92(73.0)	34(27.0)	-	-	-
Vaccination is safe	76(60.3)	42 (33.3)	8(6.3)	-	-
Immunization maintain child health	82(65.1)	24(19.0)	20(15.9)	-	-
Immunization prevent disease transmission	38(30.2)	36 (28.6)	40(31.7)	6(4.8)	-
Immunization harms child health	2(1.6)	2(1.6)	52(41.3)	40(31.7)	30(23.8)
Immunization gives immunity against COVID	16(12.7)	92(73.0)	18(14.3)	-	-
COVID 19 causes a delay in Immunization	82(65.1)	24(19.0)	10(7.9)	8(6.3)	2(1.6)
Vaccination side effects are dangerous	4 (3.2)	4 (3.2)	48(38.1)	52(41.3)	18(14.3)
Fear from going to child Vaccination during COVID 19	64 (50.8)	50 (39.7)	-	4(3.2)	8(6.3)
The child wears a face shield when going to Immunization	82(65.1)	24(19.0)	10(7.9)	8(6.3)	2(1.6)
vaccination increase a child's risk of becoming infected with COVID-19 or of developing the disease	16(12.7)	92(73.0)	18(14.3)	-	-
COVID-19 a contraindication for vaccination	2(1.6)	2(1.6)	52(41.3)	40(31.7)	30(23.8)

Table 5: Causes of Vaccination Delay other than COVID-19

Causes of vaccination delay	Studied mothers (n=126)	
	No	%
Forgotten immunization time	24	19.0
Child sickness	70	55.6
Social cause	12	9.5
Absence of vaccination	18	14.3
Mother sickness	2	1.6
Total	126	100.0

Table 6: Relation between Mothers' Socioeconomic Characteristics and Total Knowledge and Practice.

Socioeconomic characteristics	Total knowledge	Total practice	T p-value
Mean \pm Std. Deviation			
Mother age			
- 20 >30	14.27 \pm 2.59	16.87 \pm 2.97	24.405
- 30 < 40	13.88 \pm 2.37	17.42 \pm 2.64	.000*
- >40	15.07 \pm 2.81	16.35 \pm 2.79	
Educational level			
- Illiterate	14.0 \pm .000	16.0 \pm .000	45.508
- Moderate	13.50 \pm 2.44	14.75 \pm 2.65	.000*
- High school	14.75 \pm 3.33	17.12 \pm 1.40	
- University	14.18 \pm 2.54	17.34 \pm 3.07	
- Post graduate	16.0 \pm .000	18.5 \pm 2.88	
Income level			
- Low	13.81 \pm 2.6	17.60 \pm 2.7	22.563
- Moderate	15.36 \pm 2.6	16.81 \pm 3.2	.000*
- High	14.36 \pm 2.1	15.94 \pm 2.6	
Marital status			
- Married	14.20 \pm 2.5	16.93 \pm 2.8	46.147
- Widow	17.0 \pm .000	19.0 \pm .000	.000*
Employment			
- Yes	14.28 \pm 2.1	17.35 \pm 2.9	32.869
- No	14.24 \pm 2.6	16.8 \pm 2.8	32.869

*Correlation is significant at the 0.05 level.

Discussion

Household isolation and COVID-19 illness in families with new-born children, combined with disruption to vaccine supply, healthcare staffing shortages, and enhanced infection prevention procedures, are likely to significantly reduce opportunities for timely delivery of routine immunizations^(11,12). Parental knowledge, practice, and attitudes towards vaccination are an important factor in predicting a child's immunization status, especially during COVID quarantine. Our research revealed that the majority of mothers' knowledge was good and fair. Besides, the practice of the majority of them was satisfactory. From the researchers' point of view, this result may be related to the efforts of the Ministry of Health in the Kingdom of Saudi Arabia in awareness of the community about the importance of childhood vaccination during the COVID pandemic. Also, there is a significant correlation between mothers' education and their knowledge and practice where the majority of the mothers who A higher university education have a high score of knowledge and practice. A higher educational level, of no doubt, helps the parents to understand the educational messages. Moreover, such parents have better chances to come across considerable knowledge about immunization in the

media. This results in agreement with **Yousif et al. (2013)**⁽¹³⁾, they found a significant association between parents' educational level and knowledge and attitudes on childhood immunization.

The main source of information regarding immunization among totally immunized children was found to be health personnel. This was similar to the findings of a study conducted by **M.M. Angadi (2013)**⁽¹⁴⁾. From the researchers' point of view, this is since vaccination information is usually given for mothers by health professional-just before infants/ children taking vaccines with each immunization sessions or at the time of antenatal checkups. Vaccination uptake among the study subject was high and the majority of children have immunization cards. However, this study has shown that the majority of mothers vaccinated their children in a governmental health center. This result may be explained in the light of the mother conception that if a vaccine is promoted by the government and recommended by consultant pediatricians, the vaccine was perceived to be important and necessary. In the present study, it was found that immunization status was not significantly associated with other factors such as maternal education, children's sex, and socioeconomic status. This result in line with **M.M. Angadi (2013)**⁽¹⁴⁾. From

the researchers point of view this result may be attributed to the continuous encouragement and enforcement of the Ministry of Health in the Kingdom of Saudi Arabia to all mothers to continue children during the COVID pandemic. Also, the Ministry of Health reminding parents of the vital need to protect their children against serious vaccine-preventable diseases, even as the COVID-19 pandemic continues.

The majority of mothers had expressed positive attitudes towards immunization. In general, the idea of vaccines, particularly against life-threatening infections was perceived positively whereas the majority of them agreed that immunization is important, safe, and maintain child health. Similar findings were reported by **E Bystrom et al.** (2017)⁽¹⁵⁾. This result may be related to the continuous awareness from the medical and nursing staff at all children and maternity health centers about the advantages and importance of childhood vaccination. Also, the majority of mothers disagree that vaccination increase a child's risk of becoming infected with COVID-19 or of developing the disease, and also they disagreed that COVID-19 was a contraindication for vaccination. On the other hand, the majority of them have a negative attitude towards immunization during the COVID-

19 pandemic whereas the majority of the mothers had feared going to child vaccination during the COVID-19 pandemic, and this lead to delay in immunization as mothers stated. The mothers' negative attitude towards immunization during the COVID-19 pandemic may be explained in well-child of parental concerns about potentially exposing their children to COVID-19 during well child visits. Furthermore, the mothers explaining that the most common cause of vaccination delay other than COVID-19 was child sickness. childhood researcher point of view, this may be related to parent communication with health staff in cases of children sickness and they know that vaccination is contraindicated during children illness. Moreover, most of the mothers agreed that the child should wear a face shield when going to immunization. Mothers following to universal precaution is to protect their children from COVID-19 and this in agreement with the recommendation of the Ministry of Health in the Kingdom of Saudi Arabia for immunization during the COVID-19 pandemic⁽¹⁶⁾. Also WHO illustrated that parents can be informed that although it is important to provide timely vaccinations, their mothers need to follow guidance by national and local governments on COVID-19 preventive

measures ⁽⁶⁾ The mothers' good knowledge is reflected in their attitude as the majority of the mothers disagreed that BCG vaccine protect against COVID-19 and also the majority of them disagree that immunization gives immunity against COVID-19. This may be related to the high level of mothers' education and their continuous reading about COVID 19 as it is a novel infectious disease. Also, social media play important role in increasing mother awareness about COVID 19 pandemic.

Conclusions:

The total level of knowledge of slightly less than half of the mothers was good and about one-third of them were fair. Also, the majority of the mothers had a satisfactory level of practice. Almost two-thirds of the mothers strongly agree that COVID causes a delay in immunization, and about half of them strongly agree on fear from going to child Vaccination during COVID.

Recommendation

1. Ministry of Health in the Kingdom of Saudi Arabia should continue to increase parent awareness about childhood immunization.
2. Health care providers should emphasize and assure the parent about the importance of continuing children vaccination during the COVID 19 pandemic.
3. Health care providers should emphasize to the parent about the importance of following the universal precaution in children's vaccination during the COVID 19 pandemic.

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