

Parents' Knowledge and Beliefs about COVID-19 Vaccine Among Children at Al-Baha City- Kingdom of Saudi Arabia

Ragaa Gasim Ahmed Mohammed¹ & Maysa Saber Mohamed Ismail²

¹. Assistant Professor in Pediatric Nursing, Faculty of Applied Medical Sciences, Nursing Department, Albaha University, Saudi – Arabia

². Assistant Professor in Pediatric Nursing, Faculty of Nursing, Pediatric Nursing Department, Damanhour University, Egypt.

Abstract

Background: Coronavirus Disease 2019 is a respiratory disease caused by severe acute respiratory syndrome – coronavirus2. In 2019, COVID-19, a novel coronavirus, has triggered a new respiratory ailment pandemic in Wuhan, China. In December 2020, the Kingdom of Saudi Arabia has begun the distribution of the Pfizer-BioNTech COVID-19 vaccination for children, making it the first Arab country to do so. Studies have shown that many variables impact parents' decisions to vaccinate their children. **Aim:** was to assess parents' knowledge and beliefs about the COVID-19 vaccine for children at Al-Baha city- Kingdom of Saudi Arabia. **Design:** Descriptive cross-sectional research design was conducted using simple random sampling on 268 parents at Al-Baha city- KSA, who have children aged between 12-18 years old, during the period from September to December 2021. **Tools of data collection:** Questionnaire sheet which consists of three parts **Part I:** to assess socio-demographic characteristics of studied sample. **Part II and III:** to determine parents' knowledge and belief concerning the covid-19 vaccine for children. **Results:** 86.2% of children in the study sample received the two doses of COVID-19 vaccination. There is a significant relationship between knowledge and beliefs about the COVID19 vaccine, also, between child sex and parents' knowledge, and between the source of COVID-19 vaccine information, and parents' knowledge. **Conclusion:** Most parents have good knowledge about COVID19 for children, and there is a significant correlation between child sex, source of COVID-19 vaccine information, and parents' knowledge. **Recommendations:** Educational training program for parents of children to increase knowledge and modify their beliefs about covid19 and to reduce the incidence of it.

Keywords: *Beliefs, Children, COVID19 vaccines, Knowledge & Parents'*

Introduction

In most nations, the COVID-19 outbreak was unexpected and unanticipated. Spread worldwide between January and March 2020 (Almhizai et al., 2021). Coronavirus 2019 (abbreviated as "COVID-19") is a serious respiratory infection triggered by the novel coronavirus and was first noticed in December 2019 in Wuhan, China (Ebrahim Elshall & Mohamed Shokry, 2021). From December 31, 2019, to June 11, 2020, the COVID-19 epidemic resulted in around 7.15 million infections and over 408,000 fatalities. The epidemic has put a burden on global health systems, impacting both high and low-income people (Fatmi et al., 2020). COVID-19 (SARS-CoV-2) has remained declared a Public Health Emergency of International Concern by the (WHO) on February 1, 2020. So far, more than 200 nations, including Asia, Europe, North America, and the Middle East, have verified cases (Alyami et al., 2020). The COVID-19 epidemic has amplified the racial, ethnic, and socioeconomic inequalities that are inherent throughout the community health sector

(American psychological association, 2020). Age is a very crucial factor in determining infection seriousness and mortality (Zare-Zardini et al., 2020) Coronavirus Disease 2019 (COVID-19) is a respiratory disease caused by severe acute respiratory syndrome – coronavirus2 (SARS-CoV-2). Headache and fatigue are the most common post-COVID symptoms. But children can have problems with their cardiovascular, respiratory, neurodevelopmental, cognitive, and mental health problems after contracting COVID-19. A multi-layered mitigation strategy is key to a harmless go back to school and includes a range of preventative measures, such as vaccination, wearing masks, social isolation, testing, ventilation, hand washing, covering coughs and sneezing, staying home when sick, and more (Didović et al., 2021).

Children may be very susceptible to the biopsychosocial stressors of an epidemic, while schools are closed, routines and good activities in kids may change, such as natural action, sufficient nutrition, or good quality sleep patterns, conceivably to a lesser extent possible to occur.

Between children, everything changes. They can't play outside like they used to (Almhizai et al., 2021). Xiaogan, Hubei Province stated the first sick infant (3 months old baby) who showed symptoms of fever on January 26, 2020. Later, on January 28, 2020, a case of an infected baby was registered in Wuhan, China, where COVID-19 occurred originally (Zare-Zardini et al., 2020).

From June 20 to July 31-2021, the hospital admission rate amongst the unimmunized adolescents (aged 12-17) was 10.1 times greater than the immunized adolescents (Delahoy, et al., 2021). Global efforts to accelerate COVID-19 vaccine development have been implemented to control the epidemic, the efficacy of the developed vaccines have been tried and validated in adults, and clinical efforts to create a vaccination that is risk-free in lower categories of age are presently underway (Aldakhil et al., 2020). New viral strains have emerged, as well as less effective vaccine ations; a larger rate of vaccination will be necessary to attain herd immunity (Elharake et al., 2020). In the United States, two vaccinations have been given emergency approval, one of which is for children under the age of 12 as of June 2021. Up to 22% of the American residents, involving children in immunization efforts and strategies, is considered essential to enhancing community protection (Alfieri et al., 2021).

On September 13, 2021, the United Kingdom announced the COVID-19 vaccination for all individuals between the ages of 12 and 15 years. However, an interdisciplinary approach, consisting of flexible immunization services with appropriately trained personnel, will be essential in guaranteeing vaccine uptake among children with special needs has increased (Aiano et al., 2021). Ongoing discussions suggest that vaccines for under 12 years old children may be available as late as 2021 (Points, 2020). The American Academy of Pediatrics and the Centers for Disease Control and Prevention have recommended vaccination for children older than 12 years since May 2021. At the end of August 2021, 13% of babies under 18 years old in the United States have been fully vaccinated (Ioannidis, 2021).

Vaccination is the most effective strategy to combat a pandemic like COVID-19 (Huynh, et al., 2021). Several variables have been identified as contributing to the increased reluctance to pollinate. The deficiency of attention to the seriousness of the infection also contributes to the frequency (Mahmoud, et al, 2021). Several medical findings have stated that, unlike adults, COVID-19, newborns have a mild sickness and a decreased morbidity rate. For example, a retrospective study in Saudi Arabia of 88 pediatric patients with COVID-19 reported that most of these hospitalized children experienced

relatively mild symptoms, with only a very small number (n = 7.8%) becoming severely ill (Almugti et al., 2021).

In 2019, the World Health Organization (WHO) highlighted vaccine reluctance as one of the top ten global health issues, owing to misconceptions regarding vaccination effectiveness and safety (Riad et al., 2021). Studies have shown that factors that influence a parent or guardian's decision to vaccinate their children include vaccine or disease-specific factors (eg, perceived vaccine efficacy, perceived vaccine safety, perceived susceptibility to disease), parent/guardian-specific reasons (race/background, education, income, knowledge about vaccines, experience, faith in government, beliefs that risks outweigh benefits, etc.) or other factors (patient-provider relationship, school immunization requirements, group values or social norms, policies, media (Points, 2020).

If a sufficient proportion of the population accepts the COVID-19 vaccination, it might be a crucial element to reducing the epidemic's spread (Brandstetter et al., 2021). Vaccinations are one of the most important public health interventions for preventing the spread of serious diseases (Fridman, et al, 2021). For children and teens, the decision is made by proxy, parents, or guardians, and some children are unable to be vaccinated for medical reasons or because vaccines are not readily available (Points, 2020).

The health belief model in many prior types of research was frequently employed as a framework for vaccine acceptability. Currently, we have designed and validated a belief scale for COVID-19 vaccinations with Cronbach's Alpha of (0.862) the four-factor model, which includes Perceived Susceptibility and Severity, has good validity (4 items), benefits assumed (3 items), Vaccination Obstacles (3 items), and action indicators (2 items), in which the content's reliability and validity were assessed in previous research (Huynh, et al., 2021)

Significance of the study:

In reply to the coronavirus disease 2019 (COVID-19) epidemic, schools are locked, therefore normal psychosocial development and happiness of children, companionship, and social interaction are essential, and so school procedures are essential coping mechanisms through children obtained vaccines. To the best of the researchers' knowledge, there is no research study about parents' knowledge and beliefs about the COVID-19 vaccine among children at Al-Baha city; therefore, it is vital to undertake this research.

The significance of the study lies in the fact that research focusing on the assessment of parents' knowledge and beliefs about COVID-19 among

children was lacking so the researcher conducted this study to determine it.

Aim of the study

The aim of this study is:

To assess the parents' knowledge and beliefs about the COVID-19 vaccine among children at Al-Baha city.

This aim will be achieved through the following objectives:

- To assess parents' knowledge and beliefs about COVID19 vaccine among children at Al-Baha city.
- To examine the presence of a relationship between parents' knowledge, and beliefs about COVID19 vaccine among children and socio-demographic characteristics.

Research questions:

Q1: What is the level of parents' knowledge and beliefs about the COVID19 vaccine among children at Al-Baha city?

Q2: Is there are a relationship between parents' knowledge, and beliefs about the COVID19 vaccine for children and socio-demographic characteristics?

Materials and Method

Research Design:

A cross-sectional design was used in the current study.

Setting:

The study was conducted at Al-Baha city in the kingdom of Saudi Arabia. It comprises six cities are Beljarshy, Amandaq, Almekhwah, Al-aqiq, Gilwa, and Al-Baha city is the city middle of the area. The province includes 31 administrative centers and has a resident of 533,001. Corresponding to the General Authority for Statistics (GASat)- Kingdom of Saudi Arabia, the total of registered families at Al-Baha city is (17406).

Subjects: The population of this study was parents who in Al-Baha city and have children aged 12-18 years old.

Sample technique:

Probability sampling methods.

Sample Type:

Simple random sampling

Sample Size:

It was calculated by using EPI info7 software based on the total number of registered families in the General Authority for Statistics-KSA (17406), with 5.0% an acceptable margin of error and 95.0% confidence level. The final sample size was 376 families. (268 completed the questionnaire, 32 completed the pilot test, 76 refused to participate).

Tool of data collection

Questionnaire sheet: it was used for collecting the data of the study. It consists of three parts

Part I: It was designed to assess socio-demographic characteristics such as parent sex, father age, mother age, father education level, mother education level, child sex, child school level, child number of doses received, and source of COVID19 vaccine information.

Part II: It was designed questionnaire to determine the parents' knowledge about the COVID 19 vaccine, including the definition of the COVID 19 vaccine, causes, incidence, signs and symptoms, diagnosis and investigation, treatment, and care of it. This information is gained from a textbook, journal, and WHO 2020.

Part III: It was designed questionnaire to determine the parents' vaccination beliefs, concerning COVID-19, over the 12-item scale created on four extents of the Health Beliefs Model (HBM), with Perceived Susceptibility and Severity (4 items), Perceived Benefits (3 items), and Barriers to Vaccination (3 items), and Cues to Action (2 items); each question has 3 choices (Agree, disagree, and I'm not sure) only one is correct. Part 3 is from the tools adopted from (Huynh, et al., 2021) and modified by researchers.

Scoring system of parents' vaccination knowledge:

The scoring system used for the knowledge part was divided into two items:

Correct answer received 1

Incorrect answer received zero

- Parents' knowledge about COVID19 vaccine. It consisted of 10 items. The correct knowledge item was scored one while the incorrect one was scored zero.

- Knowledge of parents was considered:

Good if the percent score was (75 % < 100 %),

Fair if the percent score was (% < 75%),

And poor if the percent score was (\leq 50 %).

Scoring system of parents' beliefs regarding vaccination:

For measuring the 12-point immunization beliefs, answers to items were documented on 3-point-Likert scales with one point fixed at agreeing, 2 points for disagreeing, and 3 points I'm not sure. Lower values indicated greater agreement with the statements.

Validity:

The validity of the tool was obtained by three experts in the discipline of Pediatric Nursing

Reliability:

The stability or reliability of the tool was investigated by the test-retest reliability method which was indicated by a correlation coefficient. It was done using Cronbach's alpha test, the tool was 0.862, which refers to an acceptable reliability level.

Data collection

Data were collected through a web-based questionnaire distributed to parents via WhatsApp and mail groups the questionnaire form was

interpreted into Arabic by researchers for parents who are native Arabic speakers. The Arabic form of the questionnaire was interpreted again into English by a specialist as an assessment of the preliminary translation. The survey questionnaire on Google forms was pretested with 32 respondents to verify optimal survey functioning and clarity.

Ethical consideration:

The survey was done online through Google Forms and distributed to parents via WhatsApp and mail groups. Participants were informed about the intent of the research, the length of the questionnaire, the identity of the researchers, and how the data would be stored in a section at the starting of the form. Participation is voluntary and has the right to refuse. The researchers pointed out that the information obtained is confidential and will only be utilized in the research, and no harm or conflict will affect the participants. Written informed consent was obtained online before respondents completed the questionnaire.

Pilot study:

A pilot study was performed on 10 % of the sample (32 participants from parents) in a chosen setting to assess the applicability and clarity of the tool. According to this pilot study, the required modifications were made and eliminated from the study.

Statistical analysis:

The data gathered were arranged & analyzed by SPSS (statistical package for the social science software) version 21. Two kinds of statistics were done: Descriptive statistics: were expressed as mean and standard deviation ($\bar{T} \pm SD$) for quantitative data or number and percentage (No & %) for qualitative data. Analytic statistics: as F= ANOVA and t= student's t-test.

Use significance at p-value (≤ 0.05 to explain the outcomes of the significance test and P-value ≤ 0.001 to be highly statistically significant).

Results

Table (1): Socio-demographic characteristics of the study group (n = 268)

Characteristics	n=268	%
Parent sex		
▪ Fathers	47	17.5
▪ Mothers	221	82.5
Father age: Mean \pm SD (47.54\pm8.58)		
▪ 21- < 30 years	8	3
▪ 30- 40 years	39	14.5
▪ More than 40 years	221	82.5
Mother age: Mean \pm SD (41.04\pm6.85)		
▪ Less than 20 years	2	0.7
▪ 20-< 30 years	13	4.9
▪ 30- 40 years	86	32.1
▪ More than 40 years	167	62.3
Father education level		
▪ Primary School	5	1.9
▪ Intermediate	23	8.6
▪ Secondary	58	21.6
▪ University	142	53
▪ Post University	40	14.9
Mother education level		
▪ Primary School	9	3.4
▪ Intermediate	13	4.8
▪ Secondary	51	19
▪ University	172	64.2
▪ Post University	23	8.6
Child sex		
▪ Male	162	60.4
▪ Female	106	39.6

Characteristics	n=268	%
Child Age: Mean ± SD (14.13±1.96)		
▪ 12- <14 years	192	71.6
▪ 14- <16 years	40	14.9
▪ 16- 18 years	36	13.5
Child level of education		
▪ Intermediate	168	62.7
▪ Secondary	100	37.3
No. of doses received by the child		
▪ One-Dose	7	2.6
▪ Two Doses	231	86.2
▪ None	30	11.2
Source of COVID-19 vaccine information		
▪ Social Media	35	13.1
▪ Relatives	3	1.1
▪ Television	15	5.6
▪ Ministry of Health	215	80.2

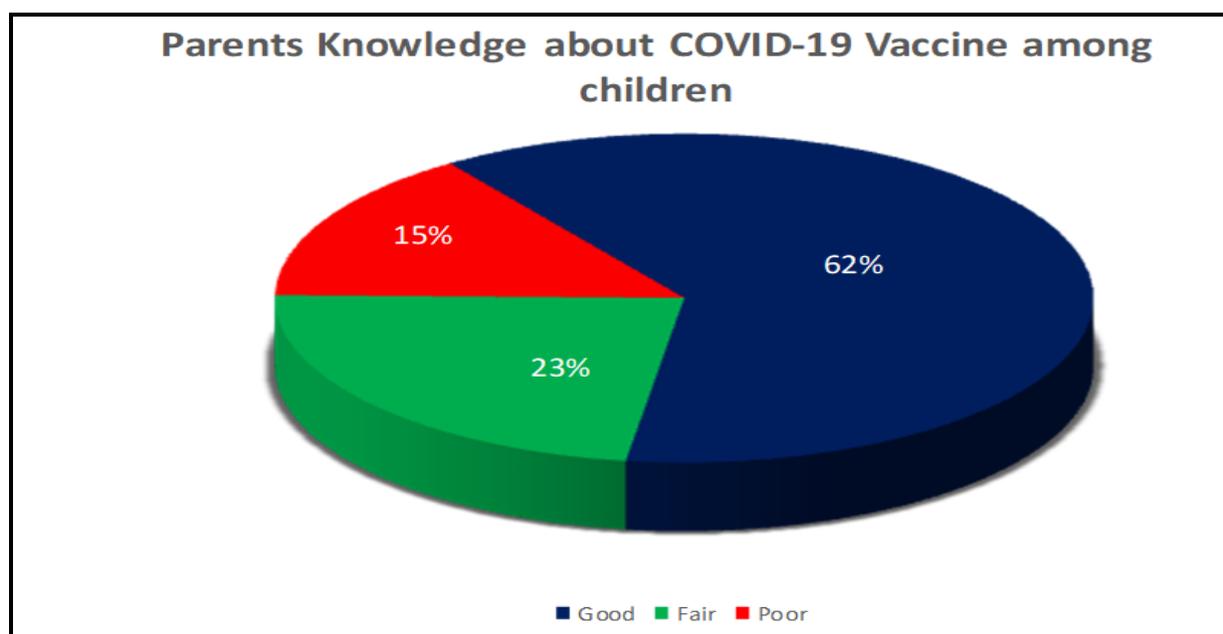


Figure (1): Parents’ level of knowledge about COVID 19 vaccine among children

Table (2): Parents’ beliefs concerning the COVID-19 vaccine. n=268

Items	Agree		Disagree		I'm Not sure		Mean ± SD
	N	%	N	%	N	%	
Perceived susceptibility and severity: 2.02±0.622							
The child is at high risk for COVID-19 infection.	40	15	110	41	118	44	2.27±0.712
The child will get a COVID-19 infection soon.	8	3	211	78.7	49	18.3	2.15±0.436
A child might get seriously ill if got the COVID-19 vaccine.	44	16.4	191	71.3	33	12.3	1.96±0.535
Parent afraid of even thinking about a child getting ill with COVID-19.	164	61.1	24	9	80	29.9	1.69±0.803
Perceived benefits: 1.75±0.721							
The child will not become infected with COVID-19 due to vaccination.	154	57.5	54	20.1	60	22.4	1.65±0.823
A child being immunized will protect others from COVID-19 infection.	29	10.8	182	67.9	57	21.3	2.10±0.558
Because the child has been vaccinated, I am less concerned about the likelihood of serious disease from COVID-19.	186	69.4	34	12.7	48	17.9	1.49±0.781

Items	Agree		Disagree		I'm Not sure		Mean ± SD
	N	%	N	%	N	%	
Perceived barriers: 2.04±0.627							
Parent afraid that the COVID-19 vaccine can cause adverse events following immunization for a child	101	37.7	61	22.8	106	39.5	2.02±0.880
COVID-19 infection can be self-limiting and an unnecessary vaccination	15	5.6	214	79.8	39	14.6	2.09±0.441
I think that the cost of COVID-19 vaccine will be expensive	40	14.9	184	68.7	44	16.4	2.01±0.561
Cues to action: 2.02±0.721							
I think that all children should be vaccinated to promote public health	40	14.9	184	68.7	44	16.4	2.01±0.561
The child will receive a COVID-19 vaccine if healthcare workers recommend a vaccination	101	37.7	61	22.8	106	39.5	2.02±0.880

Table (3): Relation between socio-demographic characters and parents' knowledge and beliefs about COVID-19 vaccine

Socio-demographic characteristics	Items	N	Knowledge Score Mean ± SD	Beliefs Score Mean ± SD
Sex of Parent	Male	47	1.393 + 0.430	1.880 + 0.2996
	Female	221	1.457 + 0.494	1.959 + 0.344
Test of significance			t= -816	t= -1.444
p-value			0.451	0.150
Father Age	21-< 30 years	8	1.225 + 0.328	1.887 + 0.235
	30- 40 years	39	1.346 + 0.393	1.882 + 0.364
	More than 40 years	221	1.472 + 4.992	1.958 + 0.334
Test of significance			F= 1.990	F= 0.972
p-value			0.139	0.380
Mother Age	Less than 20 years	2	1.000 + 0.000	1.800 + 0.000
	20-< 30 years	13	1.400 + 0.380	1.923 + 0.358
	30- 40 years	86	1.357 + 0.388	1.916 + 0.353
	More than 40 years	167	1.500 + 0.527	1.963 + 0.328
Test of significance			2.323	F= 0.515
p-value			0.075	0.672
Father Education Level	Primary School	5	1.440 + 0.537	2.060 + 0.288
	Intermediate	23	1.578 + 0.550	1.913 + 0.237
	Secondary	58	1.436 + 0.486	2.003 + 0.366
	University	142	1.437 + 0.494	1.940 + 0.348
	Post University	40	1.417 + 0.398	1.880 + 0.297
Test of significance			F= 0.481	F= 1.012
p-value			0.750	0.401
Mother Education Level	Primary School	9	1.544 + 0.343	2.100 + 0.342
	Intermediate	13	1.400 + 0.602	2.007 + 0.340
	Secondary	51	1.431 + 0.468	1.933 + 0.244
	University	172	1.438 + 0.488	1.954 + 0.342
	Post University	23	1.521 + 0.475	1.808 + .433
Test of significance			F= 0.283	F=1.592
p-value			0.889	0.177
Child Sex	Male	162	1.495 + 0.533	1.973 + 0.350
	Female	106	1.370 + 0.384	1.901 + 0.310
Test of significance			t= 2.213	t= 1.707
p-value			0.023*	0.089
Child School level	Intermediate	168	1.451 + 0.503	1.944 + 0.350
	Secondary	100	1.436 + 0.449	1.947 + 0.314
Test of significance			t= 0.258	t= -0.069
p-value			0.797	0.945
No. of Doses Received	One-Dose	7	1.442 + 0.607	1.871 + 0.292
	Two Doses	231	1.430 + 0.467	1.942 + 0.325
	None	30	1.563 + 0.576	1.986 + 0.425
Test of significance			F= 0.999	F= 0.404
p-value			0.370	0.668
Source of COVID-19 vaccine	Social Media	35	1.511 + 0.555	1.917 + 0.376
	Relatives	3	1.866 + 0.230	2.100 + 0.100
	Television	15	1.926 + 0.572	2.040 + 0.548
	Ministry of Health	215	1.935 + 0.445	1.940 + 0.313
Test of significance			F= 7.150	F= 0.698
p-value			0.000*	0.554

Statistically significance difference *

Table (4): Simple linear regression about parents’ knowledge and parents’ beliefs about COVID19 vaccine

Summary of Fit				
R Square	0.276			
Adjusted R Square	0.273			
Mean of Response	1.446			
N0. Of Observations	268			
Parameter Estimates				
Term	Estimate	Std. Error	t	prob
Constant	-0.020	0.148	-0.136	0.892
Parents’ beliefs about COVID19	0.754	0.075	10.064	0.000
Knowledge = -0.020 + 0.754 Parents beliefs				

Table (5): Linear regression model

ANOVA						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	17.203	1	17.203	101.277	.000*
	Residual	45.183	266	.170		
	Total	62.385	267			
a. Dependent Variable: knowledge concerning COVID-19 vaccine						
b. Predictors: (Constant), Beliefs concerning COVID-19 vaccine						

Statistically significance difference *

Table (6): Pearson correlation between parents’ knowledge and beliefs about COVID19 vaccine among children

		knowledge concerning the COVID-19 vaccine	Beliefs concerning the COVID-19 vaccine
knowledge concerning the COVID-19 vaccine	Pearson Correlation	1	.525**
	Sig. (2-tailed)		.000*
	N	268	268
Beliefs concerning the COVID-19 vaccine	Pearson Correlation	.525**	1
	Sig. (2-tailed)	.000*	
	N	268	268
**. Correlation is significant at the 0.01 level (2-tailed).			

Table (1): Illustrates the socio-demographic characteristics of the studied parents and children. Regarding parents' sex, it was found that most of the sample were mothers (82.5%), 62.3% of them aged more than 40 years. 14.9% of fathers and 8.6% of mothers completed their post-university education. Regarding children's sex, it was clear that slightly more than half of them (60.4%) were male 62.7% of them were in the Intermediate education. Most of the children (86.2%) in the study sample received the two doses of COVID-19 vaccination and their parents knew about COVID-19 vaccination from the Ministry of Health in Saudi Arabia.

Figure (1): Presented the parents’ level of knowledge about the COVID 19 vaccine among children in terms of good, fair, and poor knowledge.

Table (2): Demonstrates parents’ beliefs about COVID-19 vaccination among children, regarding perceived susceptibility and severity slightly less than half of the parents (44%) were not sure that their child is at high risk to get COVID 19 infection, while more than three quarters (78.7%) of them disagree that child will get COVID-19 infection soon, and 71.3% of respondent disagree that their children might get seriously ill if got COVID 19 vaccine. **Perceived susceptibility and severity** revealed that the total parents’ mean score regarding beliefs concerning the COVID-19 vaccine was 2.02±0.622. About **Perceived benefits**, 57.5% of parents agreed that immunization will prevent their children from contracting COVID-19 infection, 67.9% of them disagreed that their children being

immunized and not getting COVID-19, will protect others from COVID-19, 69.4% of parents' respondents agreed that by their children being immunized, they are less concerned about contracting COVID-19 and developing a serious sickness. **Perceived benefits** revealed that the total parents' mean score regarding beliefs concerning the COVID-19 vaccine was 1.75 ± 0.721 . Regarding **Perceived barriers**, 79.8% of parents disagreed that COVID-19 infection can be self-limiting and an unnecessary vaccination, 68.7% of parents think that the cost of COVID-19 vaccine will be expensive. **Perceived barriers** revealed that the total parents' mean score regarding beliefs concerning the COVID-19 vaccine was 2.04 ± 0.627 . Regarding **Cues to action**, 68.7% of parents disagreed that all children should be vaccinated to enhance the health of the public, Cues to action revealed the total parents' mean score regarding beliefs concerning the COVID-19 vaccine was 2.02 ± 0.721 . Most of the parents had negative beliefs in terms of disagreeing about the COVID-19 vaccination.

Table (3): Presents the relationship between socio-demographic characters and parents' knowledge and beliefs about the COVID-19 vaccine. There was a significant difference between children's sex and parents' knowledge, source of COVID-19 vaccine information, and parents' knowledge (p value = 0.023 and 0.000 respectively).

Table (4): Shows linear regression analysis among Parents' knowledge and Parents' beliefs about COVID19, the estimated equation is expressed as follows:

knowledge = $-0.020 + 0.754$ Parents beliefs

The estimated parents' beliefs about COVID19 value are 0.754 with a probability of 0.000 which confirmed that Parents' beliefs about COVID19 are significant.

Table (5): Explains the analysis of variance results; the F test value is 101.277 with a sig value of 0.000 which confirmed that the linear regression model is statistically significant.

Table (6): Illustrates the correlation coefficient relationship among parents' knowledge and beliefs about COVID19, revealed that the correlation coefficient is 0.525 with a probability of 0.000 which confirmed the persistence of the significant relationship.

Discussion

The current study aimed to assess parents' knowledge and beliefs of COVID-19 vaccinations among children at Al-Baha city. Vaccine hesitation refers to the inability to get or reject immunizations even with the readiness of vaccine-related services, and it is still a critical problem for immunization methods across the world. In 2019, the World Health Organization

(WHO) announced vaccine uncertainty as one of the highest 10 worldwide health risks, which is nourished by misinformation regarding vaccines' efficacy and security (Riad et al., 2021).

Concerning socio-demographic characteristics for parents and children, the current study revealed that the source of information about COVID 19 obtained from social media, relatives, television, and the ministry of health, this finding is similar to the study conducted by (Alfieri et al., 2021) who investigated that the source of information about COVID 19 vaccination obtained from family, friends, internet, social media, newspaper, TV, radio, podcasts, church/place of worship, and health care provider. Also, the current study pointed out that the majority of parents age was above 40 years old and more than half of them had a university education, these results are in line to study performed by (Aldakhil et al., 2020; & Choi et al., 2021) who investigated that more than half of parents had bachelor degree and differ from finding of (He et al., 2021; Yilmaz & Sahin, 2021) who mentioned that the margin of parents age is between 30-39 years old. Concerning child sex, the present study pointed out that the percentage of the male was higher than female, These results are in agreement with (Yilmaz & Sahin, 2021) who revealed that the majority of children sex were male, and differs from a study which was conducted by (Choi et al., 2021) who mentioned that the percentage of female was higher than male children. Young children are more vulnerable to the potential side effects of vaccination. Further research paper concentrating on the excellence of the authorization method for a COVID-19 vaccine for children will be done (Brandstetter et al., 2021).

Knowledge plays a critical part in sympathetic epidemiological pressures; therefore, the public should be modernized with the newest evidence about COVID-19 through popular information channels including TV and social media, which will likely have the potential to provide a faster update of data to the community. Most parents respond correctly in terms of (agree) to the questions about the pathogen of SARS-CoV2 is a virus, mode of transmission, common symptoms, preventive measures, a child with chronic illness at high risk of infection, and COVID-19 can be fatal. A slightly lower level of knowledge was reported related to the isolation period, specific treatment, and child becoming severely ill. Our study is in the line with a study conducted by (Huynh, et al., 2021) who revealed that the total knowledge was reported as being relatively good, participants respond to questions correctly about the pathogen of SARS-CoV2, mode of transmission, common symptoms, isolation, and COVID-19 can be fatal. A slightly lower level of

knowledge was reported related to COVID-19 preventative actions and persons with chronic disease at high probability of infection.

The present study reported that the majority of parents agreed that children who get a COVID-19 immunization can benefit in protecting them from getting COVID-19 infection this result is similar to (Aldakhil et al., 2020) who mentioned that vaccines are an effective technique for parents to safeguard their children against sickness. Also, according to the current study, the majority of parents agreed that COVID-19 vaccines are safe, effective, and free this finding is in the line with (Aldakhil et al., 2020) who stated that in terms of strongly agreed that childhood vaccines are effective. Furthermore, the present study report that the majority of parents mentioned they think that there is the uncertainty of long-term side effects of the vaccine this result is in agreement with those obtained by (Aldakhil et al., 2020) who expressed parents' fear regarding vaccine-related significant side effects.

In the present study two-quarters of parents feel that their children are ready to be vaccinated, the result is similar to a study conducted by (Alfieri et al., 2021) who mentioned that only one-quarter of parents hesitated about COVID-19 vaccine for their child, in terms of "not likely" to receive a coming COVID-19 vaccine. Also, the recent study agreed that the majority of parents hesitated or they are not sure about the vaccine in terms of "I think my child is at high risk to get COVID 19 infection" is differs from (Aldakhil et al., 2020) who pointed out that the majority disagree new vaccines carry more risks.

The current study indicated that fewer numbers of parents agreed that they will wait till to see how it is working on the other children similar to the study conducted by (Aldakhil et al., 2020) whom present that fewer numbers of mothers stated that they were unlikely to obtain a future COVID-19 immunization for their children. In addition, the current study pointed out that most parents think that a vaccinated child will protect themselves from infected peers in school, similar to (Aldakhil et al., 2020) who mentioned that having their child vaccinated is important for the health of others in their community.

This study reported that the majority of parents disagreed with the declaration "I feel that there is no confidence in the medical field" similar to a study done by (Aldakhil et al., 2020) who determined that the bulk of vaccination-related information they get from the immunizations program is accurate and trustworthy. And differs from (Alfieri et al.'s, 2021) study who mentioned that mistrust in the administration and research may be a major influence in COVID-19 vaccine hesitation. The current study mentioned that the majority of parents disagree with

the statement that COVID-19 infection can be self-limiting, thus their offspring do not need to be vaccinated, differs to (Aldakhil et al., 2020) who stated that their children require or do not require immunizations for illnesses that are no longer prevalent.

On the contrary, the current research also investigated the beliefs about vaccines built on the HBM, which is a social perception model that contains items that may be evaluated, as well as assists, in regulating health-related behaviors. Currently, we have developed and validated a scale for beliefs concerning COVID-19 vaccines using Cronbach's alpha of 0.862 and appropriate validity. In general, findings of the present study showed that more than half of parents responded agree related items of afraid of even thinking about a child getting ill with COVID-19, the child will not become infected with COVID-19 due to vaccination, and because the child has been vaccinated, they have less concern about the likelihood of serious disease from COVID-19. As well as the present study indicated that more than two thirds of parents responded disagree about items of the child will get a COVID-19 infection soon, the child might get seriously ill if got the COVID-19 vaccine, the child being immunized will protect others from COVID-19 infection, COVID-19 infection can be self-limiting and an unnecessary vaccination, they think that the cost of COVID-19 vaccine will be expensive and they think that all children should be vaccinated to promote public health. While (Huynh, et al., 2021) stated in their study that the majority of the participants had favorable attitudes on the COVID-19 vaccine.

The current study exposed that there was no statistical difference of the majority of variables, while there was a significant difference between child sex and parents' knowledge (0.023), and the source of COVID-19 vaccine info and parents' knowledge (0.000) differ from a study done by (Alfieri et al., 2021) whom report that all sources of information that parents were self-confident were significantly related with lower odds of vaccine rate, except for religious sources ($p < 0.001$) and those who used family, the internet, and health care providers as sources of information had lower odds of COVID-19 vaccine frequency for their children ($P < 0.001$) compared to those who did not use each source respectively. Also, it differs from (Aldakhil et al., 2020) who stated that there is a significant correlation observed between mothers' education degrees and both vaccine hesitation towards children's immunization and their plans to vaccinate their babies against COVID-19.

Conclusion:

Based on the results of the current study, it can be concluded that most parents have good knowledge about COVID-19 for children, and there is a significant correlation between child sex, source of COVID-19 vaccine information, and parents' knowledge.

Recommendations:

Based on the results of the current study, the following recommendations are suggested

- Additional research should be conducted to explore parents' knowledge and beliefs in different settings regarding COVID-19 Vaccine Among Children.
- Future studies focusing on COVID 19 vaccine adverse effects and associated health consequences in Saudi children.
- Larger sample size, more rigorous randomized control trials, and standardized metrics should all be considered in future study designs.
- Educational training program for parents of children to increase knowledge and modify their beliefs about covid19 and to reduce the incidence of it.

References

- **Aiano, F. Campbell, C. Saliba, V. Ramsay, M. & Ladhani, S. (2021):** 'COVID-19 vaccine given to children with comorbidities in England, December 2020–June 2021', *Archives of Disease in Childhood*, p. arch dis child-2021-323162. DOI: 10.1136/arch dis child-2021-323162.
- **Aldakhil, H. Albedah M N. Alturaiki, N. Alajlan, R. & Abusalih, H. (2020):** 'Vaccine hesitancy towards childhood immunizations as a predictor of mothers' intention to vaccinate their children against COVID-19 in Saudi Arabia. *Journal of Infection and Public Health* 14 (2021) 1497–1504
- **Alfieri, N. Kusma, J. Garris, N. Davis, M. Golbeck, E. Barrera, L. & Macy, M. (2021)** 'Parental COVID-19 vaccine hesitancy for children: vulnerability in an urban hotspot', *BMC Public Health*, 21(1), pp. 1–9. DOI: 10.1186/s12889-021-11725-5.
- **Almhizai, R. Almogren, S. Altwijery. N. Alanazi, B. Al Dera, N. Alzahrani, S., & Alabdulkarim, S. (2021):** 'Impact of COVID-19 on Children's and Adolescent's Mental Health in Saudi Arabia', *Cureus*, 13(March 2020), pp. 1–13. DOI: 10.7759/cureus.19786.
- **Almugti, H. Alotaibi, A. Almohammed, A. Abuhadi, R. Baeshen, R. Alharthi, Z. Alsharari, A. Alotaibi, S. Omar, Y. Alturki, N. Oberi, I. Alrehaili, A. Alzahrani, A. Alghanim, F. & Ayoub, R. (2021):** 'Impact of COVID-19 on Saudi Children: Special Focus on Behavioral, Social, and Emotional Aspects, 2020-2021', 13(11), pp. 2020–2021. DOI: 10.7759/cureus.19856.
- **Alyami, M. Naser, A. Orabi, M. Alwafi, H. & Alyami, H. (2020):** 'Epidemiology of COVID-19 in the Kingdom of Saudi Arabia: An Ecological Study', *Frontiers in Public Health*, 8(September), pp. 1–9. DOI: 10.3389/fpubh.2020.00506.
- **American psychological association (2020):** 'Building Vaccine Confidence Through Community Engagement', American Psychological Association.
- **Brandstetter, S. Böhmer, M. Pawellek, M. Göbel, B. Melter, M. Kabesch, M. & Apfelbacher, C. (2021):** 'Parents' intention to get vaccinated and to have their child vaccinated against COVID-19: cross-sectional analyses using data from the KUNO-Kids health study'. DOI: 10.1007/s00431-021-04094-z.
- **Choi, S. Hee Jo, Y. Jin Jo, K. & Park, S. (2021):** 'Pediatric and Parents' Attitudes Towards COVID-19 Vaccines and Intention to Vaccinate for Children', *Journal of Korean Medical Science*, 36(31), pp. 1–12. DOI: 10.3346/jkms.2021.36.e227.
- **Delahoy, M. Ujamaa, D. Whitaker, M. Halloran, A. Anglin, O. Burns, E. Cummings, C. Holstein, R. Kambhampati, A. Milucky, J. Patel, K. Pham, H. Taylor, C. Chai, S. Reingold, A. Alden, N. Kawasaki, B. Meek, J. Hindes, K. Anderson, E. Open, K. Teno, K. Weigel, A. Kim, S. Leegwater, L. Bye, E. Como-Sabetti, K. Ropp, S. Rudin, D. Muse, A. Spina, N. Bennett, N. Popham, K. Billing, L. Shiltz, E. Sutton, M. Thomas, A. Schaffner, W. Talbot, K. Crossland, M. McCaffrey, K. Hall, A. Fry, A. McMorro, M. Reed, C. Garg, S. & Havers, F. (2021):** Hospitalizations associated with COVID-19 Among Children and Adolescents— COVID-NET, 14 States, March 1, 2020–August 14, 2021. US Department of Health and Human Services/Centers for Disease Control and Prevention *MMWR / September 10, 2021 / Vol. 70 / No. 36*.
- **Didović, D. Nikčević, A. Valenčak-Ignjatić, I. Marić, L. & Roglić, S. (2021):** COVID-19 in Children. *INFEKTOL GLASN* 2021;41(1):15-21 <https://doi.org/10.37797/ig.41.1.3>
- **Ebrahim Elshall, S. & Mohamed Shokry, W. (2021):** 'Disaster Management Educational Intervention: A Key to Reduce Internship Nursing Students' COVID 19 Fear', *Egyptian Journal of Health Care*, 12(3), pp. 179–195. DOI: 10.21608/ejhc.2021.189653.
- **Elharake, J. A. Galal, B. Alqahtani, S. Kattan, R. Barry, M. Tamsah, M. Malik, A. McFadden, S. Yildirim, I. Khoshnood, K. Omer, S. & Memish, Z. (2020):** COVID-19 Vaccine Acceptance among Health Care Workers in the Kingdom of Saudi Arabia. *International Journal of Infectious Diseases* 109 (2021) 286–293

- **Fatmi, Z. Mahmood, S. Hameed, W. Qazi, I. Siddiqui, M. Dhanwani, A. & Siddiqui, S. (2020):** ‘Knowledge, attitudes and practices towards covid-19 among Pakistani residents: Information access and low literacy vulnerabilities’, *Eastern Mediterranean Health Journal*, 26(12), pp. 1446–1455. DOI: 10.26719/emhj.20.133.
- **Fridman, A., Gershon, R., & Gneezy, A. (2021):** ‘COVID-19 and vaccine hesitancy: A longitudinal study’, *PLoS ONE*, 16(4 April), pp. 1–12. DOI: 10.1371/journal.pone.0250123.
- **He, K. Mack, W. Neely, M. Lewis, L. & Anand, V. (2021):** ‘Parental Perspectives on Immunizations: Impact of the COVID-19 Pandemic on Childhood Vaccine Hesitancy’, *Journal of Community Health*, (0123456789). DOI: 10.1007/s10900-021-01017-9.
- **Huynh, G., Nguyen, T. Van, & Nguyen, D. (2021):** ‘Knowledge about covid-19, beliefs and vaccination acceptance against covid-19 among high-risk people in ho chi Minh city, Vietnam’, *Infection and Drug Resistance*, 14, pp. 1773–1780. DOI: 10.2147/IDR.S308446.
- **Ioannidis, J. (2021):** ‘COVID-19 vaccination in children and university students’, *European Journal of Clinical Investigation*, 51(11), pp. 1–8. DOI: 10.1111/eci.13678.
- **Mahmoud, S., Ali, A. & Ali, E. (2021):** ‘COVID -19 Vaccination and Predictors of Vaccine Hesitancy: A Community- Based Research in Zagazig City. *Egyptian Journal of Health Care*, 2021 EJHC vol. 12 no. 4
- **Points, K. (2020):** ‘2020 National Vaccine Plan Development: Recommendations from the National Vaccine Advisory Committee’, *Public Health Reports*, 135(2), pp. 181–188. DOI: 10.1177/0033354920904074.
- **Riad, A. Schünemann, H. Attia, S. Peričić, T. Žuljević, M. Jürisson, M. Kalda, R. Lang, K. Morankar, S. Yesuf, E. Mekhemar, M. Appiah, A. Mahmudi, A. Gaxiola, G. Dziedzic, A. Apóstolo, J. Cardoso, D. Marc, J. Casbas, M. Wysonge, C. Qaseem, A. Gryschek, A. Tadić, I. Hussain, S. Khan, M. Klugarova, J. Pokorna, A. Koščík, M. & Klugar, M. (2021):** ‘COVID-19 Vaccines Safety Tracking (CoVaST): Protocol of a Multi-Center Prospective Cohort Study for Active Surveillance of COVID-19 Vaccines’ Side Effects’, *Int. J. Environ. Res. Public Health*, 18, p. 7859. DOI: 10.3390/ijerph18157859.
- **Yılmaz, M. & Sahin, M. (2021):** ‘Parents’ willingness and attitudes concerning the COVID-19 vaccine: A cross-sectional study’, *International Journal of Clinical Practice*, 75(9), pp. 1–11. DOI: 10.1111/ijcp.14364.
- **Zare-Zardini, H. Soltaninejad, H. Ferdosian, F. Hamidieh, A. & Memarpoor-Yazdi, M. (2020):** ‘Coronavirus disease 2019 (COVID-19) in children: Prevalence, diagnosis, clinical symptoms, and treatment’, *International Journal of General Medicine*, 13, pp. 477–482. DOI: 10.2147/IJGM.S262098.