

Perceptions toward childhood vaccinations (side effects vs. benefits) among the parents living in Hail, Saudi Arabia

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ABSTRACT

Objectives: The objective of the study was to assess the knowledge, attitude, and behavior of parents living in Hail, Saudi Arabia, toward childhood vaccination program. **Materials And Methods:** This descriptive, cross-sectional study was carried out between November and December 2021. Parents who visited Hail's primary health-care clinics were invited to participate in the study. Data was collected using a self-administered questionnaire, and data analysis was performed after data collection was completed. **Results:** Out of 200 parents who took part in the study, the majority were aged between 20 and 30 years (37%, $n = 74$), with females outnumbering males (67%, $n = 134$). It was discovered that younger parents (those under the age of 40) were less hesitant ($P = 0.034$), agreed to have their children vaccinated ($P = 0.021$), and felt it was effective ($P = 0.038$), when compared to parents over the age of 40. Furthermore, parents with a bachelor's degree or higher felt more informed about vaccination ($P = 0.011$) and that vaccination for immunization is safe ($P = 0.013$). **Conclusion:** According to the study findings, residents of Hail, Saudi Arabia, particularly those over the age of 40 and those with only a secondary education, have poor knowledge, beliefs, and behavior regarding the childhood immunization program. As a result, it is necessary to increase knowledge and dispel myths about childhood immunization. Various social media channels and awareness campaigns could be used in this regard.

Keywords: Childhood, perception, Saudi Arabia, side effects, vaccination

Introduction

In health care, it is stated that prevention of disease is better than cure. It is undeniable that in the developed world, vaccines helped to control vaccine-preventable diseases. Therefore, vaccination program was found to be successful in the USA and other parts of the world in significantly reducing the number of cases in childhood communicable diseases, consequently increasing the life expectancy.^[1]

A vaccine is a biological product that helps to boost immunity in humans in order to protect or fight against diseases. A vaccine typically contains microorganism-like-agents that have been weakened or killed, such as the microbe, its toxins, or its surface proteins.^[2] Several lives have been saved since the introduction of the first vaccine, and over 3 million lives are now protected annually.^[3] Vaccines have eliminated or reduced the spread of many diseases, including diphtheria, tetanus, pertussis, influenza, and measles.^[4] Vaccines are now available for more than 20 diseases.^[5]

Vaccine hesitancy is defined by the World Health Organization (WHO) as "delay in accepting or refusing vaccine despite the availability of vaccination services."^[6] This has been observed in several countries.^[7-9] Parents express concerns about the

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safety and efficacy of routine vaccinations, which play an important role in protecting their children from potentially fatal infections.^[10] These fears and misconceptions lead to a decrease in vaccination rates, resulting in the reappearance of these preventable diseases.^[11]

The knowledge and attitude of parents have a significant impact on their children's immunization. Several studies have been carried out to assess parents' knowledge and attitudes toward the childhood vaccination program.^[12,13] Thus, parents' attitudes and behaviors toward the vaccination program were assessed and reported.^[14] Previous research has described the knowledge and attitudes of parents in some Saudi Arabian regions, including Al-Riyadh,^[15] Al-Taif,^[16] and Al-Madina.^[11] However, this subject was not studied in Hail region. Therefore, this study aimed to assess the knowledge, beliefs, and behaviors of parents toward childhood vaccination program, its safety, and efficacy.

Materials and Methods

This descriptive, cross-sectional study was conducted between November and December 2021 in Hail city of Saudi Arabia. The study participants were the parents who were living in Hail city and visited the primary health-care center located in Hail. Therefore, the study was conducted at the primary health-care centers where patients and visitors were invited to participate in the study. Participants could only be parents, but from any nationality, age group, gender, and socioeconomic status.

Ethical approval for the study was granted by the Ministry of Health, Saudi Arabia. An informed consent was taken from each participant before collecting the response. To calculate the sample size, an online software "Raosoft" (Raosoft, Inc., Seattle, WA, USA) was used. A simple random sampling technique was used for sample size calculation. Because every participant had equal chance to participate in the study, probability was set as 0.5, the margin of error was set at 5%, and 95% confidence interval was used. Therefore, the calculated sample size for the study was 200.

A self-administered questionnaire was used in this study, which had three parts. The first part was about the demographics of the parents, the second part contained the questions related to knowledge about childhood vaccination, whereas the third part was about the beliefs and behaviors toward childhood vaccination. The questionnaire was obtained from a previously published study which was conducted in Najran, Saudi Arabia.^[10] Therefore, validation of the questionnaire was not required. Questionnaires were provided to parents during their visit to the primary health-care center after obtaining their consent.

Statistical Package for Social Sciences (SPSS v. 23) was used for data entry and analysis. For descriptive data analysis, frequencies, percentages, bar diagrams, and pie charts were constructed. For inferential statistics, Chi-square test and Fisher's exact test were performed. All *P* values less than 0.05 were considered statistically significant.

Results

Parents were invited to participate in the study, and there were 200 parents who participated and filled the questionnaire completely. Parents who were 20–30 years old were the highest in proportion (37%, *n* = 74), while those who were 60 years or above were the least in proportion (2%, *n* = 4). Table 1 summarizes the demographics of the parents who participated in the study.

Various questions had been asked to the parents to evaluate their knowledge and behavior about childhood vaccination. About 90% of the parents agreed that compliance to the immunization schedule is important, and 91% responded affirmatively that immunization is having more benefits than harm. Figure 1 shows the responses against the questions related to knowledge about childhood immunization. Parents were also asked about the side effects of vaccination; most of the parents (79.5%) reported fever as a side effect of vaccination, followed by pain (42%) and seizure (26%) [Figure 2].

To evaluate the beliefs and behaviors related to vaccination program, different questions were asked. A high proportion of parents replied positively to most of the questions that were asked [Table 2]. However, for some questions, mixed behavior was observed. Immunization could weaken the immune system and vaccination is not required for those diseases which are no longer common: in response to these two, some replied positively while some had negative opinion [Table 2].

The demographic variables collected in the study were then analyzed with the knowledge and behavior related to childhood

Table 1: Demographic characteristics of the parents

	Frequency	Percent
Age, years		
20-30	74	37.0
31-40	66	33.0
41-50	39	19.5
51-60	17	8.5
60+	4	2.0
Gender		
Male	66	33.0
Female	134	67.0
Education level		
Primary	6	3.0
Secondary	32	16.0
Undergraduate	134	67.0
Post-graduate	25	12.5
Illiterate	3	1.5
Occupation		
Student	21	10.5
Private sector	27	13.5
Government sector	71	35.5
Business	6	3.0
Unemployed	62	31.0
Retired	13	6.5

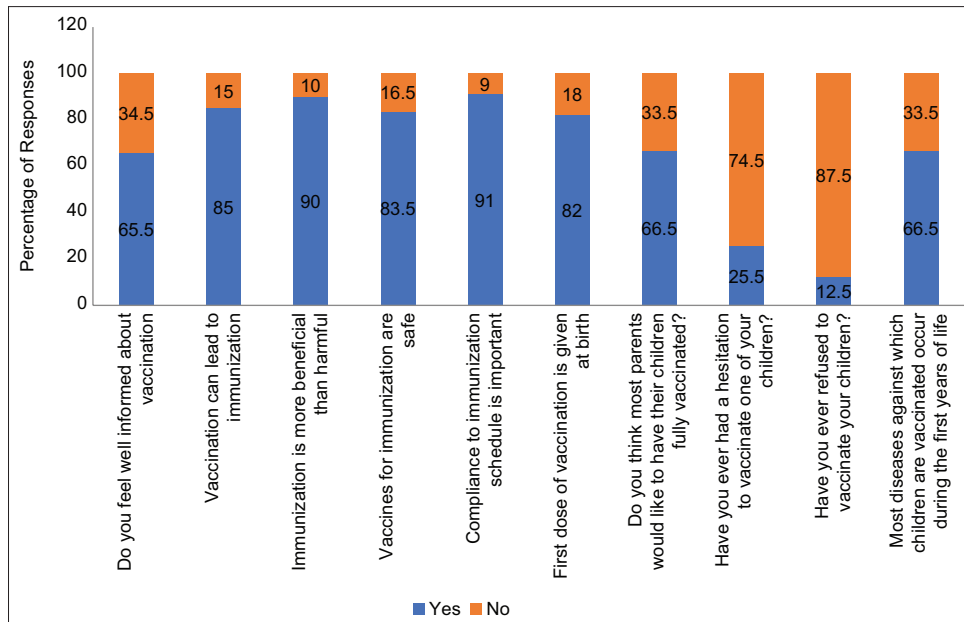


Figure 1: Percentage of responses about parents' knowledge related to immunization

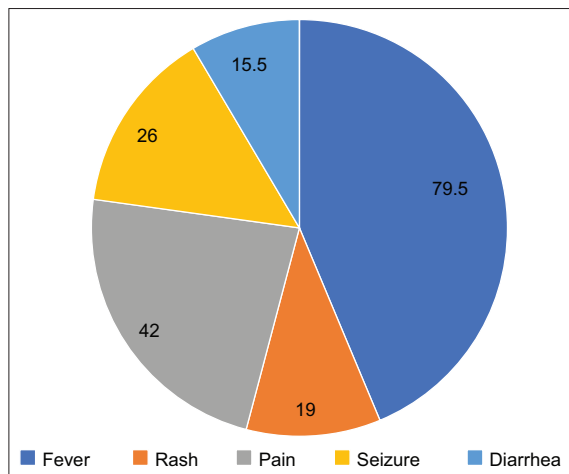


Figure 2: Vaccine side effects

vaccination. Table 3 summarizes all the significant associations found between age, gender, and education level of the parents in relation to the questions related to knowledge. Similarly, when parents were asked about the side effects of vaccination, 51.7% of parents over 40 years of age replied pain as a side effect, while 37.9% of parents of age less than 40 years thought that pain is a vaccination side effect ($P = 0.049$) [Table 3]. Furthermore, parents who were undergraduates or had higher education level had significantly more information about vaccination and thought that it is unharmed for children, with P values being 0.011 and 0.013, respectively [Table 3].

Table 4 summarizes the responses related to hesitation to get the child/children vaccinated in relation to age, gender, and education level of the participants. It was found that 21.4% of the parents with age less than 40 showed hesitation to vaccinate their child, while 35% of the parents with age more than 40 years showed

Table 2: Parental beliefs and behaviors related to vaccination

Questions	Agree	Neutral	Disagree
Children should be vaccinated against diseases in general	171 (85.5)	25 (12.5)	4 (2.0)
Children should only be vaccinated against serious disease	136 (68.0)	31 (15.5)	33 (16.5)
In children, vaccinations are effective	184 (92.0)	14 (7.0)	2 (1.0)
Your child's immune system could be weakened by too many immunizations	51 (25.5)	61 (30.5)	88 (44.0)
I follow the Ministry of Health's recommendations on vaccination	180 (90.0)	16 (8.0)	4 (2.0)
My child/children do not need vaccinations against the diseases that are no longer common	66 (33.0)	54 (27.0)	80 (40.0)
Advertisements on vaccination changed my perspective/idea on vaccination	118 (59.0)	62 (31.0)	20 (10.0)

hesitation ($P = 0.034$). However, regarding gender and education level, no significant difference in responses was observed.

The significant association between age and education level of the parents in relation to their beliefs and behaviors are presented in Figures 3 and 4, respectively. Parents less than 40 years of age showed significantly higher level of agreement ($P = 0.021$) in comparison to those over 40 years of age, when asked about vaccination of children against disease in general. Similarly, regarding the effectiveness of vaccination, parents less than 40 years showed significantly higher agreement compared to those over 40 years ($P = 0.038$) [Figure 3]. Furthermore, Figure 4 shows the variation in responses regarding beliefs and behaviors with regard to the education level. It was found that for the questions on effectiveness of vaccination, following Ministry's recommendation, and no need for vaccination against uncommon

Table 3: Relationship between parents’ age and education level with their knowledge about vaccination

Question	Response	Age		P
		Less than 40	More than 40	
		Education level		
		Secondary or less	Undergraduate or more	
Is pain the side effect of vaccination?	Yes	53 (37.9)	31 (51.7)	0.049*
	No	87 (62.1)	29 (48.3)	
Do you feel well informed about vaccination?	Yes	20 (48.8)	111 (69.8)	0.011*
	No	21 (51.2)	48 (30.2)	
Vaccines for immunization are safe	Yes	29 (70.7)	138 (86.8)	0.013*
	No	12 (29.3)	21 (13.2)	

*Statistically significant at 0.05 level of significance

Table 4: Hesitation to get vaccinated in relation to the demographics of the participants

	Have you ever had a hesitation to vaccinate one of your children?		P
	Yes	No	
Age, years			
Less than 40	30 (21.4)	110 (78.6)	0.034*
More than 40	21 (35.0)	39 (65.0)	
Gender			
Male	12 (18.2)	54 (81.8)	0.072
Female	13 (9.7)	121 (90.3)	
Education level			
Secondary or less	8 (19.5)	33 (80.5)	0.123
Undergraduate or more	17 (10.7)	142 (89.3)	

*Statistically significant at 0.05 level of significance

disease, the agreement level was significantly high among the parents with undergraduate or higher education level, with P values being 0.014, 0.017, and 0.031, respectively [Figure 4].

Discussion

Childhood vaccination plays an important role in protecting us from various diseases.^[17] Therefore, parents have been stressed by health-care providers, health ministries, and governments for timely vaccination. However, different perceptions prevail among parents and guardians about the vaccines. Some negative perceptions about vaccines are about its side effects, reducing immunity, and others. Therefore, this study was conducted to evaluate the knowledge, beliefs, and behaviors related to childhood vaccination among the parents living in Hail region of Saudi Arabia.

From the analysis of the collected data, it was found that 34.5% of the parents who participated in the study were not sure that they were well informed about vaccination. The perception of one-third of the study participants was that not every parent would like to have their child vaccinated. Studies have been conducted and have reported parents’ perceptions about the safety and compliance for childhood vaccination. A study was conducted in France in 2019 in which the perception of the population about mandatory childhood vaccines was evaluated. The study reported that 81.7% of the study

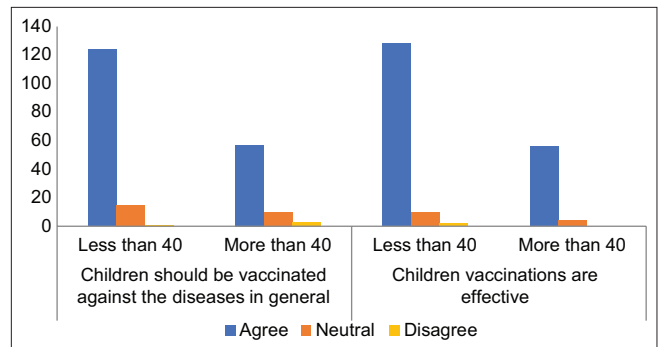


Figure 3: Parents’ beliefs and behaviors in relation to their age

population was in favor of vaccination.^[18] Similarly, a study conducted in Italy in 2016 found that 83.7% of the parents were supporters of vaccination.^[12] Another study published from Saudi Arabia in 2018, which evaluated the knowledge, beliefs, and practices of parents toward childhood vaccination, found 61.8% compliance with the scheduled vaccination for their children.^[10]

One-fourth of the study participants believed that too many doses of vaccination could weaken child’s immune system. Other studies also reported this belief among the parents. Gellin *et al.*^[11] conducted a study to evaluate the parental understanding about vaccination. They reported that 25% of the parents believed that too many doses of vaccines could weaken the immune system of a child. Other studies reported the same perception of the studied population, in which they believed that numerous vaccines could weaken the immune system.^[19,20]

Comparison of demographic characteristics of the study participants with the questions showed that some of the responses varied significantly when compared with age and education level. Parents having up to secondary level of education felt less informed about vaccination and had doubts about its safety. In addition, a significantly high proportion of parents, with at least undergraduate level of education, agreed about the effectiveness of vaccination and compliance with the Ministry of Health recommendations for vaccination. Similar findings had been reported in previous studies, which showed that education level significantly affected the compliance of vaccination.^[21-24]

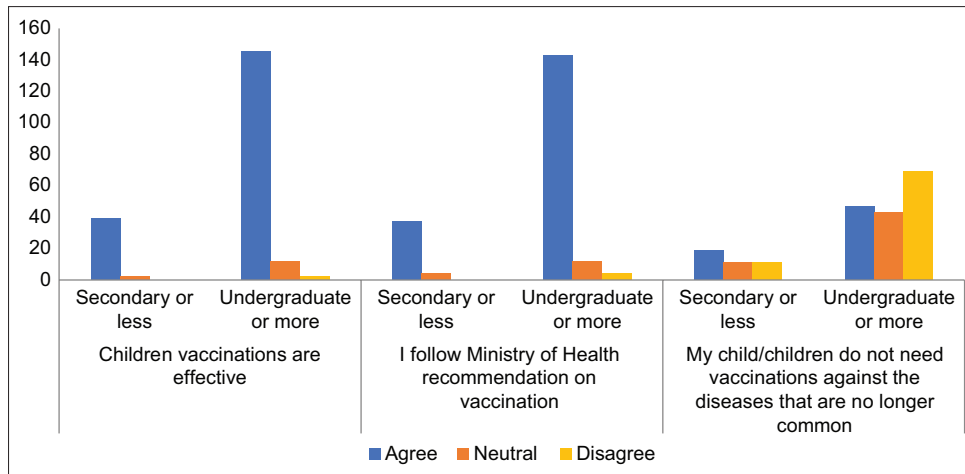


Figure 4: Parents' beliefs and behaviors in relation to their education level

Another factor which caused significant deviation in the participants' responses was age. Parents who were more than 40 years old agreed that they had some sort of hesitation while vaccinating the child/children. Contrarily, parents less than 40 years old showed significantly higher agreement toward vaccination of the children against diseases in general. In addition, they were more confident about the effectiveness of childhood vaccination. Contrary to our findings, previous studies reported that parents in higher age groups had better knowledge, understanding, and compliance to vaccination.^[21,25,26] Higher compliance and informative young parents in Saudi Arabia could be due to their better education level. Illiteracy rate was higher in the past century compared to the present one; therefore, illiteracy could be a cause of this observed knowledge and behavior among parents over 40 years of age.^[27]

Sample size of the study was not big enough to generalize the study findings, and it is one of the study's limitations. Secondly, the study participants were only residents of Hail; therefore, the results of the study were limited to Hail city and could not be generalized.

Conclusion

This study provided an insight into the childhood vaccine-related knowledge, beliefs, and behaviors of parents living in Hail, Saudi Arabia. It was found that findings of the study were not different when compared to other studies. It was found that use of various kinds of advertisements about vaccination played a positive role to improve the knowledge about vaccination. Furthermore, education level also played a vital role to reduce the misconceptions about childhood vaccination. Therefore, it is recommended to use various media and social media resources to increase the awareness about the effectiveness of vaccination and its compliance.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients has/have

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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