

## Parents' Knowledge, Attitude and Practice towards Childhood Vaccination, AlMadinah, Saudi Arabia 2017

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### Abstract

**Background:** During the past few years, physicians in the kingdom were facing a growing number of parents who are questioning the safety and necessity of routine childhood vaccination because of some myths and misconceptions about vaccination.

**Objective:** Our study aimed to assess knowledge, attitude and practice regarding childhood vaccination and their associated factors among Saudi parents in AlMadinah region.

**Methods:** An Observational, Cross sectional study was conducted during the period (January-march 2017) in AlMadinah, Saudi Arabia. Parents of children aged from 1 month to 7 years who lives in AlMadinah were invited to participate in filling electronic questionnaire. The questions were formulated based on questions and answers published by the Ministry of Health Saudi Arabia website. Data was collected by trained medical students of Taibah University from the parents. A representative sample of 614 of participants living in various area of AlMadinah was selected randomly.

**Results:** 614 participants included in the study, Majority of them were mothers (86%). Most of them (58.1%) had their information regarding child vaccination from medical staff, followed by social media (17.4%) and books (14%). The results revealed that almost half of parents (N=310) had adequate knowledge regarding child vaccination. Attitude towards child vaccination was positive in more than half (N=346) of the parents. Most of the parents in the study (85.7%) believed that Compliance with the MOH vaccination schedule is very important but only 43% of them disagreed that vaccine doesn't give child immunity against infectious diseases. Majority of parents had good practice toward vaccination (N=570, 92.8%) reported vaccination of their children according to the MOH vaccination schedule.

**Conclusion:** The study showed that parents had an acceptable knowledge and attitudes on some aspects related to childhood vaccination. However, gaps in both knowledge and attitudes were identified. Most of parents had good practice toward vaccination. Educational interventions are required to improve parents' knowledge on the vaccination.

**Keywords:** Parents; Knowledge; Attitude; Childhood vaccination; AlMadinah

### Introduction

Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease.

Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases and is estimated by WHO to avert between 2 and 3 million deaths each year [1]. World Health Organization (WHO, 2016) reported that 115 million infants worldwide received Diphtheria-Tetanus and Pertussis vaccine, there is about 85% of the world's children received one dose of measles vaccine, and received polio vaccine [2].

In Saudi Arabia, the main vaccinations identified by the Ministry of Health in the Vaccination schedule, from birth to entering the first primary grade, aims to protect children in the Kingdom from diseases targeted by immunization, to keep the Kingdom free of polio, as well as getting rid of measles, rubella, mumps, in addition to reducing the infection with any of these diseases.

During the past few years, physicians in the kingdom were facing a growing number of parents who are questioning the safety and necessity of routine childhood vaccination because of some myths and misconceptions about vaccination.

The belief that vaccines cause autism was the most prevalent parental concern in a survey conducted in USA [3]. According to the global immunization division CDC report, the global parental Attitude and Knowledge regarding immunization services was low and parents have negative beliefs about measles and vaccination programs [4].

Therefore, parents' knowledge and attitude play an important role in achieving complete Immunization of their children. Our study aims to assess knowledge, attitude and practice regarding children immunization and their associated factors among Saudi parents in AlMadinah.

## Methods

An observational, Cross sectional study was conducted during the period of three month (January-march 2017) in AlMadinah, Saudi Arabia. Parents of children aged from 1 month to 7 years who lives in AlMadinah were invited to participate in filling electronic questionnaire. The questions were formulated based on questions and answers published by the Ministry of Health Saudi Arabia.

Data was collected by trained medical students of Taibah University from the parents. A representative sample of 614 of participants living in various area of AlMadinah was selected randomly.

Informed Consent was included in questionnaire. The questionnaire includes 4 sections, the demographic data (age, gender, level of education, occupation and number of children), knowledge, attitude and practice of parents toward childhood immunization questions.

A score was created for the knowledge statement as correct answers were given a score of "1" whereas wrong answers were given a score of "0". Total knowledge score was computed and the median value was identified (it was 6 out of 10). Parents scored below the median value were considered as having "insufficient knowledge" whereas those scored at or above the median value were considered as having "sufficient knowledge".

A score was created for the attitude statements as answers suggesting positive attitude were given a score of "1" whereas those suggesting negative attitude were given a score of "0". Total attitude score was computed and the median value was identified (it was 5 out of 6). Parents scored below the median value were considered as having "negative attitude" whereas those scored at or above the median value were considered as having "positive attitude".

Data were analyzed using statistical Package for Social Sciences (SPSS), version 22 software. Frequency and percentage were used to describe variables whereas chi-square test was applied to investigate the association between knowledge and attitude towards child vaccination and possible related factors and p-value less than 0.05 was considered statistically significant.

## Results

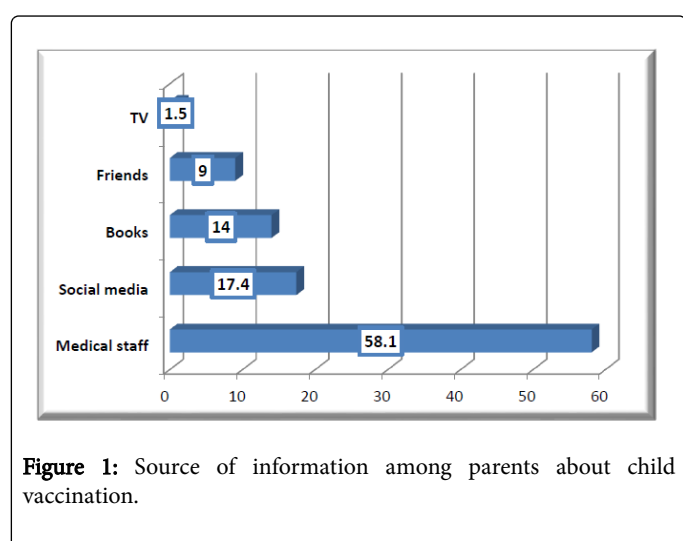
Six hundred and fourteen parents participated in the study. Their baseline characteristics are presented in Table 1. Majority of them were mothers (86%) and aged either between 20 and 30 years (40.4%) or between 31 and 40 years (43.3%). Majority of them 92.7% resided inside Al-Madinah city.

More than half of them (53.8%) were not working whereas only 9.5% were workers in the medical field. Almost one-third of them (33.6%) had more than three children. Most of them (58.1%) had their information regarding child vaccination from medical staff, followed by social media (17.4%) and books (14%) (Figure 1).

	Frequency	Percent
Gender		
Male	86	14
female	528	86
Age (years)		
<20	10	1.6
20-30	248	40.4
31-40	266	43.3
>40	90	14.7
Residence		
Inside Al-Madinah	569	92.7
Outside Al-Madinah	45	7.3
Educational level		
Below secondary school	20	3.3
Secondary school	114	18.6
University	429	69.8
Postgraduate	51	8.3
Job (n=535)		

None	288	53.8
Medical	51	9.5
Non-medical	196	36.7
Number of children		
One	174	28.3
Two-three	234	38.1
>Three	206	33.6

**Table 1:** Baseline characteristics (n=614).



**Figure 1:** Source of information among parents about child vaccination.

As illustrated in Table 2, most of the participants could recognize that children were given frequent doses of the vaccine separated by

definite specific times to constitute their immunity I (83.6%), vaccination is generally not harmful for children (77.9%) and it is necessary to vaccinate children during vaccination campaigns such as polio campaigns (74.8%).

Approximately one third (33.1%) of the participants agreed that it is preferred to give children seasonal influenza vaccine and only 19.9% recognized that common cold, otitis media and diarrhea are not contraindications to vaccination.

From Table 3, it is evident that 60% of older parents (aged over 40 years) were more knowledgeable than other parental categories of age,  $p=0.008$ . Also those having more than three children expressed higher percentage of sufficient knowledge (61.7%) compared to those having less number of children,  $p<0.001$ .

Regarding source of information, the highest percentage of sufficient knowledge was reported among parents who reported TV as the main source of information about child vaccination (66.7%), followed by books (57%) and medical staff (52.7%) whereas the lowest percentage was observed among those whose main source of information was social media (37.4%).

Statements	Correct responses No.	%
The diseases that children vaccinated against them affect children in the first year of life (Agree)	64	10.4
Routine vaccination protect children against infectious diseases and their complications (Agree)	247	40.2
Children were given frequent doses of the vaccine separated by definite specific times to constitute their immunity (Agree)	513	83.6
Giving more than one vaccine to the child at one time doesn't harm his/her immunity (Agree)	427	69.5
It is preferred to give children seasonal influenza vaccine (Agree)	203	33.1
Vaccination may lead to autism (Disagree)	382	62.2
It is necessary to vaccinate children during vaccination campaigns such as polio campaigns (Agree)	459	74.8
Common cold, otitis media and diarrhea are not contraindications to vaccination (Agree)	122	19.9
Vaccination is generally harmful for children (Disagree)	478	77.9
Diseases that children in the Kingdom vaccinated against them are known (Agree)	392	63.8

**Table 2:** Responses of the participants to knowledge statements (n=614).

	Level of knowledge about child vaccination		p-value*
	Insufficient N=304	Sufficient N=310	
<b>Gender</b>			
Male (n=86)	42 (48.8)	44 (51.2)	
Female (n=528)	262 (49.6)	266 (50.4)	0.893
<b>Age (years)</b>			
<20 (n=10)	5 (50.0)	5 (50.0)	
20-30 (n=248)	143 (57.7)	105 (42.3)	
31-40 (n=266)	120 (45.1)	146 (54.9)	
>40 (n=90)	36 (40.0)	54 (60.0)	0.008
<b>Residence</b>			
Inside Al-Madinah (n=569)	277 (48.7)	292 (51.3)	
Outside Al-Madinah (n=45)	27 (60.0)	18 (40.0)	0.144
<b>Educational level</b>			
Below secondary school (n=20)	8 (40.0)	12 (60.0)	
Secondary school (n=114)	56 (49.1)	58 (50.9)	
University (n=429)	219 (51.0)	210 (49.0)	
Postgraduate (n=51)	21 (41.2)	30 (58.8)	0.466
<b>Job (n=535)</b>			
None (n=288)	146 (50.7)	142 (49.3)	
Medical (n=51)	28 (54.9)	23 (45.1)	
Non-medical (n=196)	93 (47.4)	103 (52.6)	0.59
<b>Number of children</b>			
One (n=174)	93 (53.4)	81 (46.6)	
Two-three (n=234)	132 (56.4)	102 (43.6)	
>three (n=206)	79 (38.3)	127 (61.7)	<0.001
<b>Source of information</b>			
Medical staff (n=357)	169 (47.3)	188 (52.7)	
Social media (n=107)	67 (62.6)	40 (37.4)	
Books (n=86)	37 (43.0)	49 (57.0)	
Friends (n=55)	28 (50.9)	27 (49.1)	
TV (n=9)	3 (33.3)	6 (66.7)	0.033
*Chi-square test			

**Table 3:** Factors associated with knowledge of parents regarding child vaccination.

### Perception and Attitude

Majority of the parents (88.4%) agreed that vaccinations are important to keep child's health, compliance with the MOH

vaccination schedule is very important (85.7%) and benefits of vaccinations exceeds their harms (81.4%). Only 43% of them disagreed that vaccine doesn't give child immunity against infectious diseases and he may get infection even after vaccination Table 4.

Statements	Positive responses No.	%
Vaccinations are important to keep child's health (Agree)	543	88.4
Benefits of vaccinations exceeds their harms (Agree)	500	81.4
Child vaccination is safe and not harmful (Agree)	478	77.9
Vaccine has dangerous side effects (Disagree)	340	55.4
Vaccine doesn't give child immunity against infectious diseases and he may got infection even after vaccination (Disagree)	264	43
Compliance with the MOH vaccination schedule is very important (Agree)	526	85.7

**Table 4:** Responses of the participants to attitude statements towards child vaccination (n=614).

Table 5 shows that parents who had more than three children expressed more positive attitude towards child vaccination compared to those who had less children,  $p=0.007$ . Regarding source of information, the highest rate of positive attitude was reported among parents who reported TV as the main source of information about

child vaccination (66.7%), followed by books (65.1%) and medical staff (62.5%) whereas the lowest rate was observed among those whose main source of information was social media (35.5%),  $p<0.001$ . Parents who had sufficient knowledge about child vaccination were more likely to have positive attitude towards it and vice versa,  $p<0.001$ .

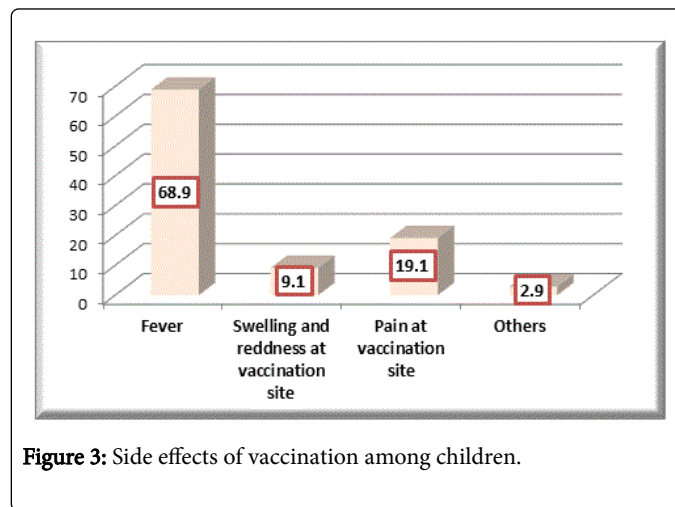
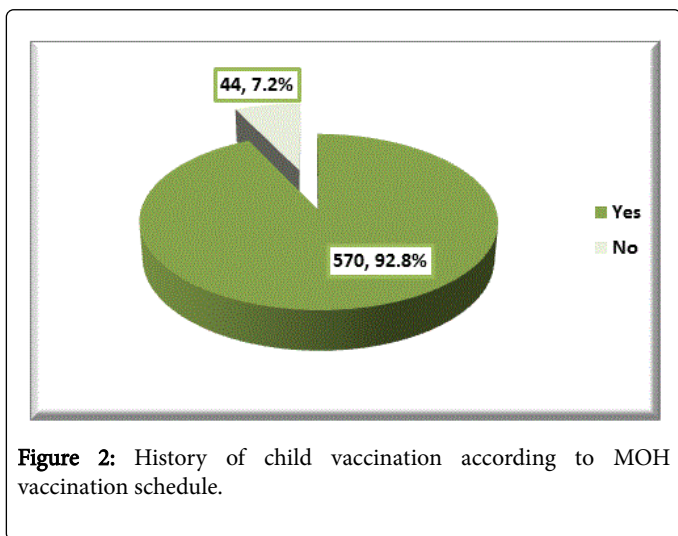
	Attitude towards child vaccination		p-value*
	Negative N=268	Positive N=346	
<b>Gender</b>			
Male (n=86)	42 (48.8)	44 (51.2)	
Female (n=528)	226 (42.8)	302 (57.2)	0.295
<b>Age (years)</b>			
<20 (n=10)	6 (60.0)	4 (40.0)	
20-30 (n=248)	121 (48.8)	127 (51.2)	
31-40 (n=266)	109 (41.0)	157 (59.0)	
>40 (n=90)	32 (35.6)	58 (64.4)	0.074
<b>Residence</b>			
Inside Al-Madinah (n=569)	244 (42.9)	325 (57.1)	
Outside Al-Madinah (n=45)	24 (53.3)	21 (46.7)	0.174
<b>Educational level</b>			
Below secondary school (n=20)	8 (40.0)	12 (60.0)	
Secondary school (n=114)	56 (49.1)	58 (50.9)	
University (n=429)	187(43.6)	242 (56.4)	
Postgraduate (n=51)	17 (33.3)	34 (66.7)	0.295
<b>Job (n=535)</b>			
None (n=288)	125 (43.4)	163 (56.6)	
Medical (n=51)	22 (43.1)	29 (45.1)	
Non-medical (n=196)	85 (43.4)	103 (52.6)	0.59
<b>Number of children</b>			

One (n=174)	80 (46.0)	94 (54.0)	
Two-three (n=234)	116 (49.6)	118 (50.4)	
>three (n=206)	72 (35.0)	134 (65.0)	0.007
Source of information			
Medical staff (n=357)	134 (37.5)	223 (62.5)	
Social media (n=107)	69 (64.5)	38 (35.5)	
Books (n=86)	30 (34.9)	56 (65.1)	
Friends (n=55)	32 (58.2)	23 (41.8)	
TV (n=9)	3 (33.3)	6 (66.7)	<0.001
Knowledge about child vaccination			
Insufficient (n=304)	179 (58.9)	125 (41.1)	
Sufficient (n=310)	89 (28.7)	221 (71.3)	<0.001
*Chi-square test			

**Table 5:** Factors associated with attitude of parents towards child vaccination.

### Practice of Child Vaccination

As illustrated from Figure 2, majority of parents (92.8%) reported vaccination of their children according to the MOH vaccination schedule.



The commonest reported side effects of vaccination were fever (68.9%), pain at the vaccination site (19.1%) and swelling and redness at the vaccination site (9.1%) (Figure 3). Less than half of parents (47%) preferred to vaccinate their children against seasonal influenza (Figure 4).

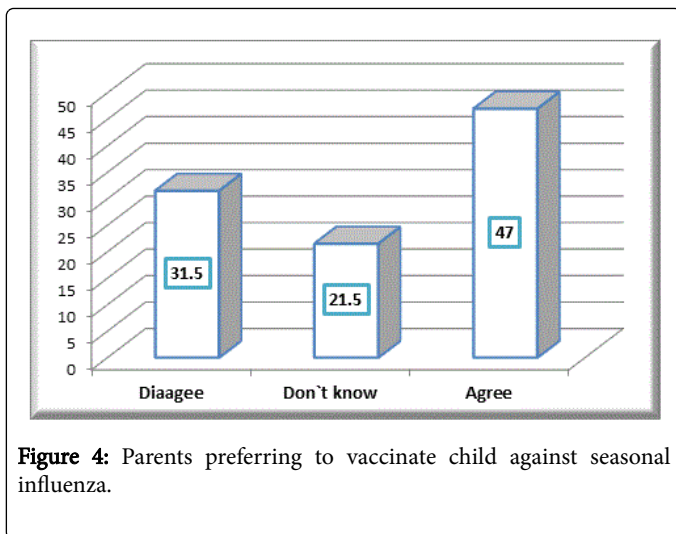


Figure 4: Parents preferring to vaccinate child against seasonal influenza.

## Discussion

Worldwide, childhood vaccination prevents almost two million deaths/year [1,5]. Despite of that, 2.5 million deaths a year continue to be resulted from diseases that can be prevented by vaccination, mainly among children under 5 years old in poor Asian and African countries [1]. In many developing countries, vaccination coverage has reached a plateau and even a good coverage rate has been attained, and reaching children not yet vaccinated has proved difficult [6]. So, there is an urgent need to increase vaccination coverage through encouraging parents to make their children vaccinated. Therefore, this study was carried out to assess knowledge and attitude of the parents toward children's obligatory vaccination in Al-Madinah as well as to identify their determinants.

In accordance with others, the majority of parents participated in this study were mothers. This is because in our culture as well as in others, mothers often have the responsibility of taking children to health care facilities [7,8].

In the current study, 92.8% of the children were vaccinated according to MOH vaccination schedule. This rate is higher than that reported from a study carried out recently in India (86%) [9]. This higher rate could be attributed partially to the parents' knowledge that vaccination is mandatory and required for school registration.

The present study results revealed that almost half of parents had adequate knowledge regarding child vaccination. In another study carried out among mothers, less than one third had good knowledge [10].

The reasons of escaping mandatory vaccination were not investigated in the present study. However, the present study observed that majority of parents considered some illnesses such as common cold, otitis media and diarrhea as contraindications to vaccination. This can be easily overcome by educating the parents that such illnesses are not a reason to miss vaccinations [11]. It has been documented that parental knowledge regarding child vaccination impacts their practice in this regard [12]. Favin, et al. [13] showed in their study that lack of knowledge about the importance of child vaccination vaccines was one of the main barriers to vaccinate their children. In the present study, only 40% of parents agreed that routine vaccination protect children against infectious diseases and their

complications. In another study carried out in India [6], 70% of parents believed that immunization prevents some infectious diseases while the other 30% of parents did not know this fact.

In line with other studies carried out in India [9], and Egypt [14] the main source about child vaccination in the present study was medical staff. This finding suggests a great responsibility of medical staff (physicians and nurses) not only in giving vaccines but also in educating parents toward better health care practices. This study has shown that parents obtained vaccine information from other sources such as social media and books.

Overall, the present study revealed that parents' knowledge about vaccinations was poor, with some serious misconceptions. It has been reported that is no association between parents' knowledge and vaccination coverage rates, [15-17] and the public accept vaccination despite limited knowledge about it [15,18]. This was attributed to the fact that although parents resist vaccination, they want to protect their children from harm [15].

Montasser et al. have shown that provision of information about a disease, its adverse sequelae and the effectiveness of the vaccine have been shown to improve uptake of vaccines [14]. In the present study, parents' knowledge of child vaccination has a significant impact on their attitude toward vaccination. The same has been reported by Gust et al. [19].

Most of the parents in the present study (85.7%) believed that Compliance with the MOH vaccination schedule is very important. A higher percentage (96%) has been reported in another study carried out by Joseph et al. [9] However, it is comparable to finding of a study carried out by Bernsen et al. in the United Arab Emirates [20].

Most of the parents included in this study (83.6%) knew that children were given frequent doses of the vaccine separated by definite specific times to constitute their immunity. In another study carried out in Taif city, Saudi Arabia [7], only 41.6% of the parents correctly knew the importance of administration of multi-doses of the same vaccine given at intervals for child immunity. The consequence of this finding is that parents may think that only the first shot of the vaccine is sufficient to develop immunity and protect their children. The difference between these studies could be attributed to difference in socio-cultural background of the study population.

In the present study, both knowledge and attitude of parents towards child were significantly higher among parents who got their information about child vaccination from TV, which emphasizes the role played by TV in alerting parents regarding child vaccination in our community. Exactly the same result has been reported in other studies carried out in Saudi Arabia and India [21,22].

Some studies revealed an association between higher paternal educational level and higher knowledge and attitude towards child immunization [23,24], In the present study, our findings were not in line with those studies as parental education was not significantly associated with child vaccination knowledge and attitude. The same has been reported in a study carried out in Libya [25].

In the present study older parents and those having more children were more knowledgeable and having higher positive attitude towards child vaccination than younger and those having smaller number of children. The same has been reported in other studies [10,25]. This association between paternal age and knowledge and attitude towards child vaccination could be justified as the young parents may be more interested to have information from social media and books whereas

older parents tended to watch TV more and in this study having information from TV was significantly associated with higher knowledge and better attitudes compared to other sources particularly social media. Also, older parents differ from younger in a variety of physical/biological, psychological/mental and social dimensions.

It has been reported by Nichter that the attitudes of parents are more strongly influenced by the perceived benefits of vaccination or by the perceived risks of not being vaccinated [15]. In the present study, majority of parents agreed that vaccinations are important to keep child's health, benefits of vaccinations exceeds their harms, and child vaccination is safe and not harmful. However, almost 55% of them also agreed that vaccine has dangerous side effects. This would emphasize the fact that other factors such as trust in health-care providers and culture may be more influential factors than knowledge and attitude [26].

About half of parents in the present study preferred to vaccinate their children against seasonal. Therefore, they might be motivated to vaccinate their children if educated about the important role of children in transmitting the infection in households and communities, beside the economic and health burden of contracting influenza [27].

This study has some limitations, it was conducted in only one city in Saudi Arabia; therefore the obtained results cannot be generalized to the parents in all the country. Future researches on the topic need recruitment of parents from different areas in the country. Religious background of parents also can influence the vaccination status of children; we did not investigate this factor in the current study.

## Conclusion

In conclusion, the results of the present study showed that parents had an acceptable knowledge and attitudes on some aspects related childhood immunization. However, gaps in both knowledge and attitudes were identified. Educational interventions are required to improve parents' knowledge.

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