

## Knowledge, Attitude towards vaccination among parents, Saudi Arabia.

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**Abstract** The objective of this study was to assess parental knowledge, and attitudes on childhood immunization among Saudi parents. One of the best and most cost effective medical interventions to prevent infectious diseases is vaccination. Although the effect of Immunization on the illness and disability of children has been noticeable worldwide, but still there are some countries did not reach the desired effect. Each year thousands of children die from diseases that can be prevented by vaccination. We conducted a cross-sectional study from June–August 2017 .We used validated questionnaire. Data was processed (SPSS Version 21). Descriptive statistics were used to describe all variables. Association between dependent variables (knowledge, attitude) and independent ones (parents' demographics) were tested using Chi-square test. Those who answered >60% of the questions correctly were considered to be knowledgeable of vaccination. 1579 subjects participated in this study. Most of them were mothers (74.2%), and Saudis (96.5%), with age mean±standard deviation of 36±10 years. The overall knowledge level was good (75.2%), mostly among mothers (57.6%) and workers in medical field or anyone in same home (39.1%), also it was statistically significant ( $P \leq 0.05$ ) with them. Additionally, the knowledge level was statistically significant with the attitude of parents about vaccination, which was the immunization is important, beneficial, safe, not prohibited in religion, keeping the child healthy and compliance to its schedule is important. In conclusion Intervention with educational programs are required by encouraging medical student to implement an awareness campaigns for the general population to improve their awareness with special attention on rural areas residents. This may lead to reduction in the health care costs and better outcome for the patient's future life.

**Index Terms** – Immunization, Children, Parents, Knowledge, Practice, Compliance, child health, parents education.

### INTRODUCTION

One of the best and most cost effective medical interventions to prevent infectious diseases is vaccination. Hence, it prevents vaccine-preventable diseases including meningitis, diphtheria, hepatitis B, measles, mumps, pertussis (whooping cough), pneumonia, polio, rotavirus diarrhea, rubella and tetanus. (1)

Although the effect of Immunization on the illness and disability of children has been noticeable worldwide, but still there are some countries did not reach the desired effect. Each year thousands of children die from diseases that can be prevented by vaccination. (2)

WHO report that over 1.5 million children die from vaccine preventable diseases. In 2008 , 8.8 million of the deaths was in children under the age of 5 years old and 17% of them where because of preventable diseases by vaccination (3).

There are some influencing factors that affect the vaccination coverage like low socioeconomic level and decrease in the level of education. Also a recent analysis from WHO showed that lack of service due system weakness, low

population awareness, misconceptions or fears of vaccination are also of the affecting factors. As a result parents will not complete the vaccination card in timely manner. (4),(5)

Although that vaccinations in mandatory in Saudi Arabia and the Ministry Of Health have released an application to remind parents about their children appointments for vaccination, but still there are some parents do not follow the schedule and do not attend at the appropriate dates, and they do not understand completely the importance of vaccines to their children except for official documents completion. Thus, our study aimed at assessing parental knowledge toward vaccination of their children. Up to our knowledge this is the first study that covers different regions of Saudi Arabia.

Our aim in this study to assess the knowledge and attitude of parents towards vaccination and compare findings with baseline characters of studied group.

## METHOD

This cross sectional study involved parents from Saudi Arabia from June–August 2017. We included parents from different regions in Saudi Arabia. We excluded any other family member other than the parents. Total enrollment was 1579 parents from different regions in Saudi Arabia.

The 17-item Arabic Questionnaire was adopted after permission from validated questionnaire done in Taif, Saudi Arabia. The questionnaire consisted of two parts: The first part of the questionnaire reflected on the demographics of respondents and family data. This part included parent age, nationality, residence area, city, education level, any family member who works at the medical field, number of children, number of preschool children, number of children whom didn't complete their vaccination schedule and the reason why, and the person who answered the questionnaire (father or mother), these items were self-reported.

Questionnaire is composed of 9 questions to assess knowledge about vaccination, and last question was about the source of the parents information's about vaccination. Single choice questions from a multiple choices provided in each equation. Responses to knowledge questions were recorded as "Yes", "No", and "Don't know". We considered those who answered I don't know to be an incorrect answer. Parents who answered >60% of the questions correctly were considered to have a good knowledge towards vaccination.

The questionnaire was an electronic self-administered questionnaire distributed to parents who agree to participate in the Study. All respondents who did not complete the questionnaire and the demographic data were excluded. Data were collected in an Excel sheet and analyzed with SPSS version 21. Descriptive statistics were used to describe all variables. Association between dependent variables (knowledge) and independent ones (parents' demographics) were tested using Chi-square test. *P* values of < 0.05 were considered statistically significant.

Ethical committee approval was obtained from Taif University Research Committee. All participants agreed to

participate in the questionnaire. All data were maintained in a secure and confidential manner.

## RESULT

### Personal information:

A total of 1579 partners participated in this study. 1172 (74.2%) of them were mothers and 407 (25.8%) were fathers. The mean of ages was 36 years with standard deviation of 10 and they were mainly Saudis (96.5%) and urban residential (80.4%). Spread of participants over the regions of Saudi Arabia was east (56.4%), west (33.3%), central (7.2%), south (2.1%), north (0.9%). 56.4% of fathers were bachelor degree and 63.6% of mothers. Those participants are either working or living with someone who works in the medical field were 44.8%. Mean and standard deviation ( $\bar{x} \pm SD$ ) of number of participants' children, number of children under school age and number of children who didn't complete the specific vaccinations for their age were  $3 \pm 2$ ,  $1 \pm 1$  and  $0 \pm 1$ , respectively.

**Table 1** shows association of personal information with knowledge level of parents about vaccination.

### Knowledge and attitude:

The overall knowledge of parents about vaccination assessment, the mean of scores was 6 with standard deviation of 2. The knowledge level among the participants was good (5 of 9 and above) in (75.2%) and poor (Less than 5 of 9) in (24.8%).

Regarding the attitude of parents about vaccination, most of parents strongly agree with the following: Child immunization is important (79.3%), immunization is more beneficial than harmful (66.4%), vaccines for child immunization are safe (52.4%), compliance to immunization schedule is important (76.4%) and immunization keep the child healthy (74.2%). But they are disagree (35.9%) and strongly disagree (32.6%) with the believe of child immunization is prohibited in religion. Also, they aren't sure about the association of immunization with side effects and infectivity of child after immunization with the diseases against which he/she was vaccinated.

**Table 2** and **Table 3** show association of knowledge level with the knowledge questions and parents' attitudes about vaccination, respectively.

## Discussion

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Childhood vaccination programs are the most cost effective medical interventions to prevent infectious diseases. In our study we aimed to assess the general knowledge and practice of parents about vaccination depending on many variables. Demographic data analysis of the parents who participated in the study showed that the mothers are the majority of the sample. More than half of the parents had bachelor degree education.

In our study, assessment of the parents' knowledge showed variations in their responses to questions regarding childhood immunization. The majority of them knew that Routine vaccination prevent children from some infectious diseases and its complications. In contrast, a recent study in UAE that has been showed that more than 85% of the participants knew that childhood vaccinations prevent life-threatening diseases.62% were aware that immunizations provide lifelong protection (7)

For an adequate and persisting antibody response two or more doses of vaccines in the childhood immunization schedule are required (8). Among our study participants about 83.7% correctly knew the importance of administration of multi-doses of the same vaccine given at intervals for child immunity. While in a previous study only 41% of the participants thinks that multiple dose are important and as consequence of this finding those parents may think that only the first shot of the vaccine is sufficient to protect their children and build their immunity and eventually miss the other doses (9).

In conclusion Intervention with educational programs are required by encouraging medical student to implement an awareness campaigns for the general population to improve their awareness with special attention on rural areas residents. This may lead to reduction in the health care costs and better outcome for the patient's future life.

**Table 1**

Table A1: Personal Information (n= 1579)			
Variables		n	%
Participant	Mother	1172	74.2%
	Father	407	25.8%
Age ( $\bar{x} \pm SD$ )*		36 $\pm$ 10	
Nationality	Saudi	1523	96.5%
	Non-Saudi	56	3.5%
Residency	Urban	1270	80.4%
	Rural	309	19.6%
Region	East Region	891	56.4%
	West Region	526	33.3%
	Central Region	114	7.2%
	South Region	33	2.1%
	North Region	15	0.9%
Father Educational level	Bachelor degree	890	56.4%
	Secondary School	496	31.4%
	Intermediate School	118	7.5%
	Primary School	61	3.9%
	Illiteracy	14	0.9%
Mother Educational level	Bachelor degree	1004	63.6%
	Secondary School	442	28%
	Intermediate School	63	4%
	Primary School	46	2.9%
	Illiteracy	24	1.5%
Working in medical field (anyone in same home)	No	872	55.2%
	Yes	707	44.8%
Number of children ( $\bar{x} \pm SD$ )*		3 $\pm$ 2	
Number of children under school age ( $\bar{x} \pm SD$ )*		1 $\pm$ 1	
Number of children who didn't complete the specific vaccinations for their age ( $\bar{x} \pm SD$ )*		0 $\pm$ 1	

**Table 2**

Table A2: Knowledge of parents about vaccination (n= 1579)			
Variables		n	%
Routine vaccination prevent children from some infectious diseases and its complications	Yes	1469	93%
	Don't know	59	3.7%
	No	51	3.2%
First dose in vaccination given at birth	Yes	1434	90.8%
	Don't know	77	4.9%
	No	68	4.3%
Most diseases against which children are vaccinated occur during the first years of life	Yes	1032	65.4%
	No	313	19.8%
	Don't know	234	14.8%
Multi-doses of the same vaccine given at intervals are important for child immunity	Yes	1321	83.7%
	Don't know	156	9.9%
	No	102	6.5%
More than one vaccine at the same time have no negative impacts on child immunity	Yes	776	49.1%
	No	410	26%
	Don't know	393	24.9%
Is it important to vaccinate children during immunization campaigns	Yes	1166	73.8%
	No	281	17.8%
	Don't know	132	8.4%
It is recommended to vaccinate children against seasonal influenza	Yes	802	50.8%
	No	554	35.1%
	Don't know	223	14.1%
Immunization can cause autism	No	922	58.4%
	Don't know	444	28.1%
	Yes	213	13.5%
Common colds, ear infection, and diarrhea are not contraindications for vaccination	No	711	45%
	Yes	568	36%
	Don't know	300	19%
Knowledge Score ( $\bar{x} \pm SD$ )*		6 ± 2	
Knowledge Level	Good	1188	75.2%
	Poor	391	24.8%

**Table 3**

Table A3: Attitude of parents about vaccination (n=1579)			
Variables		n	%
Child immunization is important	Strongly agree	1252	79.3%
	Agree	213	13.5%
	Not sure	81	5.1%
	Strongly disagree	17	1.1%
	Disagree	16	1%
Immunization is more beneficial than harmful	Strongly agree	1049	66.4%
	Agree	310	19.6%
	Not sure	139	8.8%
	Disagree	63	4%
	Strongly disagree	18	1.1%
Vaccines for child immunization are safe	Strongly agree	828	52.4%
	Agree	441	27.9%
	Not sure	259	16.4%
	Disagree	30	1.9%
	Strongly disagree	21	1.3%
Child immunization is prohibited in religion	Disagree	567	35.9%
	Strongly disagree	514	32.6%
	Not sure	280	17.7%
	Agree	136	8.6%
	Strongly agree	82	5.2%
Immunization associated with side effects	Not sure	564	35.7%
	Agree	472	29.9%
	Disagree	249	15.8%
	Strongly agree	205	13%
Child can become infected after immunization with the disease/s against which he/she was vaccinated	Strongly disagree	89	5.6%
	Not sure	586	37.1%
	Agree	389	24.6%
	Disagree	302	19.1%
Compliance to immunization schedule is important	Strongly agree	163	10.3%
	Strongly disagree	139	8.8%
	Strongly agree	1207	76.4%
	Agree	249	15.8%
	Not sure	80	5.1%
Immunization keep your child health	Disagree	26	1.6%
	Strongly disagree	17	1.1%
	Strongly agree	1171	74.2%
	Agree	283	17.9%
	Not sure	90	5.7%
Disagree	20	1.3%	
	Strongly disagree	15	0.9%

Table B1: Association of personal information with knowledge level of parents about vaccination (n=1579)

Variables		Knowledge Level				P. value	X <sup>2</sup>
		Good		Poor			
		n	%	n	%		
Participant	Mother	909	57.6%	263	16.7%	0.000 <sup>††</sup>	13.161
	Father	279	17.7%	128	8.1%		
Age ( $\bar{x} \pm SD$ )*		37 ± 10		35 ± 10		0.218	61.765
Nationality	Saudi	1142	72.3%	381	24.1%	.223	1.486
	Non-Saudi	46	2.9%	10	0.6%		
Residency	Urban	960	60.8%	310	19.6%	.510	.434
	Rural	228	14.4%	81	5.1%		
Region	East Region	654	41.4%	237	15%	.174	6.352
	West Region	411	26%	115	7.3%		
	Central Region	89	5.6%	25	1.6%		
	South Region	25	1.6%	8	0.5%		
	North Region	9	0.6%	6	0.4%		
Father Educational level	Bachelor degree	672	42.6%	218	13.8%	.187	6.161
	Secondary School	362	22.9%	134	8.5%		
	Intermediate School	96	6.1%	22	1.4%		
	Primary School	45	2.8%	16	1%		
	Illiteracy	13	0.8%	1	0.1%		
Mother Educational level	Bachelor degree	755	47.8%	249	15.8%	.718	2.098
	Secondary School	332	21%	110	7%		
	Primary School	34	2.2%	12	0.8%		
	Intermediate School	51	3.2%	12	0.8%		
	Illiteracy	16	1%	8	0.5%		
Working in medical field (anyone in same home)	No	618	39.1%	254	16.1%	0.000 <sup>††</sup>	19.925
	Yes	570	36.1%	137	8.7%		
Number of children ( $\bar{x} \pm SD$ )*		3 ± 2		3 ± 2		0.605	9.185
Number of children under school age ( $\bar{x} \pm SD$ )*		1 ± 1		1 ± 1		0.778	4.805
Number of children who didn't complete the specific vaccinations for their age ( $\bar{x} \pm SD$ )*		0 ± 1		0 ± 1		0.442	3.746

\*  $\bar{x}$ : Mean SD: Standard deviation ††: Statistical significant X<sup>2</sup>: Chi-square

Table B2: Association of knowledge questions with knowledge level of parents about vaccination (n=1579)

Variables		Knowledge Level				P. value	X <sup>2</sup>
		Good		Poor			
		n	%	n	%		
Routine vaccination prevent children from some infectious diseases and its complications	Yes	1166	73.8%	303	19.2%	0.000 <sup>††</sup>	194.58
	Don't know	14	0.9%	45	2.8%		
	No	8	0.5%	43	2.7%		
First dose in vaccination given at birth	Yes	1133	71.8%	301	19.1%	0.000 <sup>††</sup>	131.87
	Don't know	20	1.3%	57	3.6%		
	No	35	2.2%	33	2.1%		
Most diseases against which children are vaccinated occur during the first years of life	Don't know	88	5.6%	146	9.2%	0.000 <sup>††</sup>	303.18
	Yes	909	57.6%	123	7.8%		
	No	191	12.1%	122	7.7%		
Multi-doses of the same vaccine given at intervals are important for child immunity	Yes	1103	69.9%	218	13.8%	0.000 <sup>††</sup>	297.06
	Don't know	48	3%	108	6.8%		
	No	37	2.3%	65	4.1%		
More than one vaccine at the same time have no negative impacts on child immunity	Yes	194	12.3%	199	12.6%	0.000 <sup>††</sup>	355.98
	Don't know	252	16%	158	10%		
	No	742	47%	34	2.2%		
Is it important to vaccinate children during immunization campaigns	Yes	1011	64%	155	9.8%	0.000 <sup>††</sup>	320.22
	No	130	8.2%	151	9.6%		
	Don't know	47	3%	85	5.4%		
It is recommended to vaccinate children against seasonal influenza	No	353	22.4%	201	12.7%	0.000 <sup>††</sup>	227.70
	Don't know	108	6.8%	115	7.3%		
	Yes	727	46%	75	4.7%		
Immunization can cause autism	Don't know	265	16.8%	179	11.3%	0.000 <sup>††</sup>	81.395
	No	756	47.9%	166	10.5%		
	Yes	167	10.6%	46	2.9%		
Common colds, ear infection, and diarrhea are not contraindications for vaccination	No	521	33%	190	12%	0.000 <sup>††</sup>	193.43
	Don't know	147	9.3%	153	9.7%		
	Yes	520	32.9%	48	3%		
Knowledge Score ( $\bar{x} \pm SD$ )*		6 ± 1		3 ± 1		0.000 <sup>††</sup>	1579.00

\*  $\bar{x}$ : Mean SD: Standard deviation ††: Statistical significant X<sup>2</sup>: Chi-square

Table B3: Association of parent attitude with knowledge level of parents about vaccination (n=1579)

Variables		Knowledge Level				P. value	X <sup>2</sup>
		Good		Poor			
		n	%	n	%		
Child immunization is important	Strongly agree	998	63.2 %	254	16.1 %	0.000	108.52
	Agree	148	9.4%	65	4.1%		
	Not sure	32	2%	49	3.1%		
	Strongly disagree	5	0.3%	12	0.8%		
	Disagree	5	0.3%	11	0.7%		
Immunization is more beneficial than harmful	Strongly agree	856	54.2 %	193	12.2 %	0.000	95.012
	Agree	212	13.4 %	98	6.2%		
	Not sure	72	4.6%	67	4.2%		
	Disagree	43	2.7%	20	1.3%		
	Strongly disagree	5	0.3%	13	0.8%		
Vaccines for child immunization are safe	Strongly agree	701	44.4 %	127	8%	0.000	127.02
	Agree	323	20.5 %	118	7.5%		
	Not sure	142	9%	117	7.4%		
	Disagree	14	0.9%	16	1%		
	Strongly disagree	8	0.5%	13	0.8%		
Child immunization is prohibited in religion	Disagree	439	27.8 %	128	8.1%	0.000	47.360
	Not sure	167	10.6 %	113	7.2%		
	Strongly disagree	408	25.8 %	106	6.7%		
	Agree	104	6.6%	32	2%		
	Strongly agree	70	4.4%	12	0.8%		
Immunization associated with side effects	Not sure	372	23.6 %	192	12.2 %	0.000	51.669
	Agree	372	23.6 %	100	6.3%		
	Strongly agree	153	9.7%	52	3.3%		
	Disagree	211	13.4 %	38	2.4%		
	Strongly disagree	80	5.1%	9	0.6%		
Child can become infected after immunization with the disease/s against which he/she was vaccinated	Not sure	384	24.3 %	202	12.8 %	0.000	50.040
	Agree	311	19.7 %	78	4.9%		
	Disagree	249	15.8 %	53	3.4%		
	Strongly agree	126	8%	37	2.3%		
	Strongly disagree	118	7.5%	21	1.3%		
Compliance to immunization schedule is important	Strongly agree	967	61.2 %	240	15.2 %	0.000	105.81
	Agree	171	10.8 %	78	4.9%		
	Not sure	37	2.3%	43	2.7%		
	Disagree	6	0.4%	20	1.3%		
	Strongly disagree	7	0.4%	10	0.6%		
Immunization keep your child health	Strongly agree	934	59.2 %	237	15%	0.000	115.78
	Agree	207	13.1 %	76	4.8%		
	Not sure	39	2.5%	51	3.2%		
	Disagree	3	0.2%	17	1.1%		
	Strongly disagree	5	0.3%	10	0.6%		

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