

The Educational level and vaccination knowledge among parents in Dawadmi-Saudi Arabia, 2014.

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ABSTRACT

Background: vaccinations are important to our children and their health. Parents' knowledge about the importance of vaccination is affected by many factors, one of them is the level of education. There are some parents does not know about the benefit of vaccination and they vaccinate their children because it's mandatory. **Objectives:** The aim of the study is to assess the knowledge of parents about vaccination in 2014 in Dawadmi city, Kingdom of Saudi Arabia and its relationship to the educational level. **Methodology:** Across-sectional study to assess the relation between parents' educational level and their knowledge about vaccination using a questionnaire in Arabic and English forms. **Results:** A total of 343 parents were included in the final analysis. The study shows an increasing in parents' knowledge with increasing their education level. 91.9% of university educated parents, 72.6% of primary or secondary educated parents and 45.5% of parents who read and write are known that the vaccination prevents disease. **Conclusion and Recommendation:** Although the vaccination knowledge considered higher in this study group, but there should be an increase in doctor recommendation and advices especially for low educated parents.

Keywords: knowledge, vaccination, Saudi Arabia

Introduction

Infections are the most common cause of human disease [1]. Although routine vaccination is a major tool in the primary prevention of some infectious diseases, there is some reluctance in a proportion of the population. Vaccination greatly reduces disease, disability, death and inequity worldwide. Immunization prevents between 2-3 million deaths every year. Parents' knowledge about immunization and their attitudes towards them are likely influence uptake [2]. Previous studies revealed misconceptions on parents' knowledge and negative attitudes towards childhood immunization. Mothers' knowledge about vaccination was found to be quite low and their educational status was significantly associated with child's coverage [3]. Negative attitude, for example mothers fear from vaccination, was found to be significantly affected the immunization status of their children. [4].

Immunizations have had an enormous impact on improving the health of children in the United States. Most parents today have never seen first-hand the devastating consequences that vaccine-preventable diseases have on a family or community. While these diseases are not common, they persist around the world. It is important that we continue to protect our children with vaccines because outbreaks of vaccine-preventable diseases can and do occasionally occur in this country. Vaccination is one of the best ways parents can protect infants, children, and teens from 16 potentially harmful diseases. Vaccine-preventable diseases can be very serious, may require hospitalization, or even be deadly – especially in infants and young children .

Childhood immunization-inducing immunity by applying a vaccine – almost guarantees protection from many major diseases. Childhood vaccination prevents two million deaths per year worldwide and is widely considered to be overwhelmingly good by the scientific community. However , 2.5 million deaths a year continue to be caused by vaccine-preventable diseases, mainly in Africa and Asia among children less than 5 years old. Vaccination coverage has now reached a plateau in many developing countries, and even where good coverage has been attained, reaching children not yet vaccinated has proved difficult.

Thus, there is an urgent need to find ways to increase vaccination coverage and particularly to encourage parents to have their children vaccinated as stated by WHO.

For that we aim to collect an idea about the parental knowledge toward immunizations and goals that makes parents to go and bring their children to health centers. Although, knowing if there is a relationship between the educational or the cultural level of the parents toward the knowledge of vaccines.

Saudi Arabia has achieved, during the last three decades a tremendous achievement in terms of basic vaccination coverage. This has been carried out by structured vaccination programs delivered, mainly, through a wide network of primary health care centers. The development and use of vaccination against infectious agents is important and a successful step towards disease prevention. It is important that vaccines are administered at an age when a child can develop a proper immune response and before significant exposure to natural infections.

The vaccination schedule in Saudi Arabia is as follows: Bacillus of Calmette and Guerin (BCG) at birth; diphtheria, tetanus and peruses (DTP) at 2, 4, 6 and 18 months and 4–6 years; hepatitis B (HepB) at birth, 2 and 6 months; measles at 9 months; measles, mumps and rubella (MMR) at 15 months and 4– 6 years; and the oral polio vaccine (OPV) at birth, 2, 4, 6 and 18 months and 4–6 years. Child immunization in Saudi Arabia is not mandatory, but is given free of charge by the government.

The importance of vaccination should be clear for the parents to encourage them to vaccinate their children regularly. The parents should know that vaccinations can save child's life. Because of advances in medical science, your child can be protected against more diseases than ever before. Some diseases that once injured or killed thousands of children, have been eliminated completely and others are close to extinction– primarily due to safe and effective vaccines. One example of the great impact that vaccines can have is the elimination of polio in the United States. Polio was once America's most-feared disease, causing death and paralysis across the country, but today, thanks to vaccination, there are no reports of polio in the United States.

Vaccination also is very safe and effective. Vaccines are only given to children after a long and careful review by scientists, doctors, and healthcare professionals. Vaccines will involve some discomfort and may cause pain, redness, or tenderness at the site of injection but this is minimal compared to the pain, discomfort, and trauma of the diseases these vaccines prevent. Serious side effects following vaccination, such as severe allergic reaction, are very rare. The disease-prevention benefits of getting vaccines are much greater than the possible side effects for almost all children.

Vaccines can save family time and money. A child with a vaccine-preventable disease can be denied attendance at schools or child care facilities. Some vaccine-preventable diseases can result in prolonged disabilities and can take a financial toll because of lost time at work, medical bills or long-term disability care. In contrast, getting vaccinated against these diseases is a good investment and usually covered by insurance. The Vaccines for Children program is a federally funded program that provides vaccines at no cost to children from low-income families.

Vaccines protect future generations. Vaccines have reduced and eliminated many diseases that killed or severely disabled people just a few generations ago. For example, smallpox vaccination eradicated that disease worldwide. Your children don't have to get smallpox shots any more because the disease no longer exists. By vaccinating children against rubella (German measles), the risk that pregnant women will pass this virus on to their fetus or newborn has been dramatically decreased, and birth defects associated with that virus no longer are seen in the United States. If we continue vaccinating now, and vaccinating completely, parents in the future may be able to trust that some diseases of today will no longer be around to harm their children in the future.

Immunization protects others you care about. Children in the U.S. still get vaccine-preventable diseases. In fact, we have seen resurgences of measles and whooping cough over the past few years. In 2010 the U.S. had over 21,000 cases of whooping cough reported and 26 deaths, most in children younger than 6 months. Unfortunately, some babies are too young to be completely vaccinated and some people may not be able to receive certain vaccinations due to severe allergies, weakened immune systems from conditions like leukemia, or other reasons. To help keep them safe, it is important that you and your children who

are able to get vaccinated are fully immunized. This not only protects your family, but also helps prevent the spread of these diseases to your friends and loved ones. [6].

People in gulf countries have a good knowledge about the role of vaccination and its important effects to the children especially parents those living in developed countries. A few parents take the vaccination of their children as a routine to take the birth certificate or they think that it's just a governmental purpose should they do to take the certificate without knowing the benefit of the vaccination.

Despite nearly 100% childhood vaccination rate in Saudi Arabia, often parents do not follow the schedule in a timely manner, and do not fully understand the value of immunization except that it is mandatory for birth certificate and admission in the school. Thus, this study aimed at assessing parental knowledge, attitude and practice toward vaccination of their children.

Previous studies revealed misconceptions on parents' knowledge and negative attitudes towards childhood immunization. Mothers' knowledge about vaccination was found to be quite low and their educational status was significantly associated with child's coverage as study was done by students in al Taif.

Literature Review

A total of 731 parents were recruited. Parents had a good knowledge about aspects related to the general role of vaccination in prevention of some infectious diseases with the total of 672 parents (91.9 %). The study included parents of 390 children. Factors significantly associated with better knowledge score and positive parental attitude regarding child vaccination were sources of information about child vaccination from TV, internet and journals\newspapers, parents with first child, younger age, and higher level of education. There was a moderate positive correlation between total knowledge score and a total attitude score of child vaccination. [7]. Over 80% of the participants were aware of the importance of adherence to the program. More than 85% of the participants knew that childhood vaccination prevent life-threatening diseases. 62% were aware that immunization provides lifelong protection[8].

An association was observed between greater vaccination coverage of the 4:4:4:3:1 schedule (defined as: 4 DTPa/w doses, 4 Hib doses, 4 OPV doses, 3 MenC doses and 1 MMR dose) and maternal age >30 years (OR: 2.30; 95% CI: 1.20-4.43) and with a knowledge of vaccination score greater than the mean (OR: 0.45; 95% CI: 0.28-0.72). The score increased with maternal educational level and in parents of vaccinated children. A total of 20.47% of parents stated that vaccines could have undesirable consequences for their children. Of these, 23.26% had no specific information and 17.83% stated that vaccines can cause adverse reactions and the same percentage stated that vaccines cause allergies and asthma [8]. Mothers' knowledge about vaccination was found to be quite low and their educational status was significantly associated with child's coverage [9].

All survey's participants reported vaccinating their children. In terms of beliefs, 100% also reported knowing that immunizations are very effective in preventing certain diseases. Only 2.4% (5 out of 205) believed that the risks of immunizations outweigh the benefits; 96.1% (195 out of 205) felt that immunizations are rarely dangerous; 97.1% (199 out of 205) agreed that diseases are prevented by immunizations can be serious and cause death [9].

Two-thirds of respondents (66.7%) agreed that vaccines for children's immunization are safe; 80.7% stated that vaccination is more beneficial than harmful. Only 16.9% of parents indicated that vaccines cause adverse events more frequently than other medical treatment, 62.7% that vaccines are amongst the most effective and least costly forms of medical treatment, and 35.9% that vaccines always warrant protection.

The Majority of parents agreed that children's vaccination is essential (89.0%), and children should be vaccinated regularly according schedule (88.6%). Only 30.1% of respondents agreed with the idea of taking a newly developed vaccine even if it has been carefully tested for safety; 42.3% of respondents could afford to pay for non reimbursed vaccines. On an average,

38.0% of respondents know that they should be revaccinated every 10 years against diphtheria and tetanus, 61.3% have never been vaccinated against influenza. The main sources of information on vaccination are medical institutions (92.2%), print media (38.1%), and broadcast media (38.2%) [10].

Study aim

To design an educational program for parents to enhance their knowledge about vaccination.

Study objective

To assess the knowledge of parents about vaccination in Dawadmi city , Saudi Arabia and its relationship to the educational level of them.

Material

Questionnaire form

Age	
Gender	
Number of children	
Nationality	
Education	Illiterate Read and write Primary /Secondary University
Why do you vaccinate your children?	I do not know Because it prevents diseases Because it is compulsory To get a birth certificate
How do you know about vaccination?	Doctor told me Friends Relatives Media

Methodology

A cross-sectional survey was conducted during the period of two months in 2014, in Dawadmi health centers , Saudi Arabia. Convenient method of sampling was adopted. 343 Parents with children of 0-12 years old were invited to participate in the survey .Participation was optional. We distributed a structured questionnaire to the randomly selected parents in the health center.Data will then be analyzed in SPSS using descriptive statistics to find out the knowledge of parents about vaccination related to their education. The questions were formulated based on questions and answers of multiple choice form which is so simple and does not require a long time to answer . The questionnaire was thoroughly revised by the research team for validity, comprehensiveness, and appropriateness to collect the required information from the targeted group. The questionnaire was composed of three main questions :

1. what is your educational level ?
2. Why do you vaccinate your children ?
3. How do you know about vaccination ?

In order to collect data about the relationship between parents' knowledge about vaccination and their educational level.

Responses to the questions were recorded as:

1. Illiterate, read and write, Primary /Secondary or university for the first question
2. I do not know, because it prevents diseases, because it is compulsory or to get a birth certificate for the second question.
3. Doctor, friends, relatives or media for the third question.

The Sample size was : $N=(Z*Z)*P(1-P)/D*D$

$$(1.96*1.96) *(0.337*(1-0.337))/0.05 = 343.3$$

We contacted with the Research Committee at Arabian Gulf University to get ethical permission to start gathering information for the research. Also we asked the administration of the health center at Dawami to get permission to carry out the study.

Results

In our research, we included 343 parents, in two months duration in Dawadmi city. The results of our study question were as follow: in relation to the parents' education level, there was one parent illiterate, 11 parents read and write, 95 parents have a primary or secondary certificate and 236 have a university certificate (table 1).

Table 1. Characteristics of participant parents according to their educational level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	illiterate	1	.3	.3	.3
	read and write	11	3.2	3.2	3.5
	primary/secondary	95	27.7	27.7	31.2
	university	236	68.8	68.8	100.0
	Total	343	100.0	100.0	

In relation to parents knowledge of vaccination, there were 18 parents did not know why vaccination is given for that corresponds 5.2% , 291 parents agreed that the vaccination is given to prevent diseases that corresponds 84.9% , 27 parents believed that they have to vaccinate their children because it's compulsory which corresponds 7.9% and 7 parents said that they vaccinate their children to get a birth certificate that corresponds 2% (table 2).

Table 2. Percentage of parents knowledge about vaccination

	Frequency	Percent	Valid Percent	Cumulative Percent
I don't know	18	5.2	5.2	5.2
because it prevents diseases	291	84.8	84.8	90.1
Valid because it is compulsory	27	7.9	7.9	98.0
to get a birth certificate	7	2.0	2.0	100.0
Total	343	100.0	100.0	

Now we are going to analyze these variables, the study shows that there is one illiterate parent who did not know why vaccination is given for the children ,that means 100% of illiterate parents did not know why vaccination is given for the children . On the other hand, there are 3 parents who have the ability of reading and writing did not know why vaccination is given for the children which corresponds 27.27% and 5 parents who have the ability of reading and writing know that the vaccination prevents disease which corresponds 45.45% and 2 parents who have the ability of reading and writing said that they vaccinate their children because it is compulsory that corresponds 18.18% , and one parent who has the ability of reading and writing said he vaccinates his children only to get a birth certificate which corresponds 9.09%.

Among the parents who have a primary or secondary certificate there are 5 parents do not know why the vaccination is given for the children that corresponds 5.26% , 69 parents said that vaccination is given to the children to prevent diseases that corresponds 72.63%, 16 parents said that vaccination is compulsory that corresponds 16.84% , 5 parents said that they vaccinate their children to get a birth certificate that corresponds 5.26%. Among parents who have a university certificate there were 9 parents did not know why do they vaccinate their children that corresponds 3.81%, 217 parents believed that the vaccination prevents diseases which corresponds 91.95%, 9 parents said that they vaccinate their children because it's compulsory that corresponds 3.81% and only one parent said that he vaccinates his children to get a birth certificate that corresponds 0.42% (table 3 and 4).

Table 3. Percentage of parents knowledge about vaccination among their educational level

Count						
		Why Do You Vaccinate your children?				Total
		I don't know	because it prevents diseases	Because it is compulsory	to get a birth certificate	
Educational level	Illiterate	1	0	0	0	1
	read and write	3	5	2	1	11
	primary/secondary	5	69	16	5	95
	University	9	217	9	1	236
Total		18	291	27	7	343

We can notice that when the level of education of parents is increasing the knowledge of vaccination is also increasing, so you can see in table 3 and table 4 that the parents who have the ability of reading and writing corresponds (45.55%) of them know that the vaccination prevents diseases, and the percentage increased with those parents who have a primary or secondary certificate since 69 (72%) of them know that the vaccination prevents diseases and parents who are university graduated 217 (91.9%) of them are know that the vaccination is given to the children to prevent diseases. As a result of percentage of the people who know the benefits of vaccination, appear that 232 people were taught about the vaccination by doctors that corresponds 67.6% of the sample, 3 persons knew about the vaccination from their friends that corresponds 0.9% of the sample, 69 people knew about the vaccination by their relatives which corresponds 20.1% of sample and 39 people knew about vaccination from media that corresponds 11.4% (table 4).

Table 4. Percentage of information sources about vaccination among parents according to their educational level

Total	Education						
	university	primary/secondary	read and write	illiterate			
232	168	57	6	1	Count	Doctor	How Do You Know About Vaccination?
67.6%	71.2%	60.0%	54.5%	100.0%	% within education		
3	3	0	0	0	Count	Friends	
0.9%	1.3%	0.0%	0.0%	0.0%	% within education		
69	39	26	4	0	Count	relatives	
20.1%	16.5%	27.4%	36.4%	0.0%	% within education		
39	26	12	1	0	Count	media	
11.4%	11.0%	12.6%	9.1%	0.0%	% within education		
343	236	95	11	1	Count	Total	
100.0%	100.0%	100.0%	100.0%	100.0%	% within education		

Among universities educated parents 168 people knew about vaccination from doctor which corresponds 71.2% , 3 persons knew about vaccination from their friends that corresponds 1.3, 39 people knew about vaccination from their relatives that corresponds 16.5% and 26 person knew about vaccination from media that corresponds 11% . Among primary and secondary educated parents there are 57 educated about vaccination from the doctor that corresponds 60%, 26 persons knew about vaccination from their relatives that corresponds 27.4% and 12 persons knew about vaccination from the media that corresponds 12.6%.

Among parents who have the ability of reading and writing there were 6 persons taught about vaccination from doctors that corresponds 54.5%, 4 persons knew about vaccination from their relatives that corresponds 36.4% and one parent knew about

vaccination from media that corresponds 9.1%. There was one illiterate parent who was taught about vaccination from doctor and that corresponds 100% of illiterate parents.

Discussion

Most of the previous studies found a strong relationship between paediatric vaccination coverage and parental education and vaccination practices. This relationship showed a positive correlation between these factors. In other words, any increase in parental education and practice will lead to increases in vaccination rates of children. This study will provide a clear information regarding vaccination in Dawadmi, Saudi Arabia and the relation between the parents' educational level and vaccination knowledge.

As a result of our research, we found that our study matches the study, which was done by Yousef MA, Ahmed Abdulrahman, Mustafa Awad and Abubaker Ibrahim Elbur in Taif city in the Kingdom of Saudi Arabia in December 2013 which states that "A total of 731 parents were recruited. Parents had a good knowledge on aspects related to the general role of vaccination in prevention of some infectious diseases", since the result of research indicates that 291 out of 343 parents are known that the vaccination is given to the children to prevent diseases and that represents 84.9% of parents included in the study.

On the other hand, our research does not match the study which was done by Jamaan Al-Zahrani in Majmaah which states that "The study included parents of 390 children. Factors significantly associated with better knowledge score and positive parental attitude regarding child vaccination were sources of information about child vaccination from TV, internet and journals / newspapers, parents with first child, younger age, and higher level of education. There was a moderate positive correlation between total knowledge score and total attitude score of child vaccination", since the result of the research indicates that the majority of parents know about vaccination from doctors rather than from other sources, and that account for 232 out of 343 parents included in study and that corresponds 67.6%, while 39 out of 343 parents knew about vaccination from media and that corresponds 11.4% and that means there is variation in the way of how doctor tells his/ her patient about the vaccination and difference in every region of Saudi Arabia in the mechanism of carrying out programs for teaching parents about vaccination and its importance for their children.

When we looked again to parents' knowledge about vaccination, we found that the study is matched with another study done by Roos M. Bernsen, Fatimah R. Al-Zahmi, Noura A. Al-Ali, Rowayah O. Hamoudi, John Schneider, Jamal Al-Motwa and Michal Grivna in Traditional city in the United Arab Emirates which stated that "More than 80% of the participants were aware of the importance of adherence to the program. More than 85% of the participants knew that childhood vaccination prevents life-threatening diseases. 62% were aware that immunization provides lifelong protection" and that correlates with 67.6% of the parents who included in our study who know that the vaccination is given to their children to prevent diseases.

As a result of our study, we found that when the level of education increased the parents' knowledge about vaccination is increased and that matches the study which was done by Eva Borrás, Angela Dominguez, Miriam Fuentes, Joan Batalla, Neus Cardenosa and Antoni Plasencia in Catalonia, which stated that "The score increased with maternal educational level and in parents of vaccinated children. A total of 20.47% of parents stated that vaccines could have undesirable consequences for their children. Of these, 23.26% had no specific information and 17.83% stated that vaccines can cause adverse reactions and the same percentage stated that vaccines can cause allergies and asthma". Here we can see also the role of parents' education in knowledge about vaccination and its importance.

Another study about vaccination and knowledge was done by Siddiqi N, Siddiqi AE, Nisar N and Khan A in peri-urban Karachi which stated that "mothers' knowledge about vaccination was found to be quite low and their educational status was significantly associated with child's coverage"[12], and this study also matches with our study since we saw previously as the level of parent's education increased the level of their knowledge about the important role of vaccinations in preventing diseases is increased.

A Study was done by Nicholas Rademacher, Owen Albin, Vanessa Dalton, Preeti Malani, Julieta Mulonogoti and Levert Wafula in Eastern Uganda stated that "All survey participants reported vaccinating their children. In terms of beliefs, 100% also reported knowing that immunizations are very effective in preventing certain diseases. Only 2.4% (5/205) believed that the risks of immunizations outweigh the benefits; 96.1% (195/203) felt that immunizations are rarely dangerous; 97.1% (199/205) agreed that diseases prevented by immunizations can be serious and cause death", [12] this study matches our study since the result of research indicates that 291 out of 343 parents are known that the vaccination is given to prevent diseases and that represents 84.9% of parents included in the study.

Another study about parental attitudes towards children's vaccination done by Zagminas K, Surkiene G, Urbanovic N and Stukas R. in Kaunas, Lithuania stated that "The main sources of information about vaccination are medical institutions (92.2%), print media (38.1%), and broadcast media", [13] this study matches with our study since 343 parents included in the study and that corresponds 67.6% , while 39 out of 343 parents know about vaccination from the media and that corresponds 11.4% . We can see in these two studies the important role of the doctors and medical institutions in delivering the information for parents and increasing the knowledge of them about vaccination.

Another study which was published in the journal Public Health Nutrition done by Dr. Dave Mihalovic contrasts with our study in which it concluded that the more educated parents less likely to vaccinate their children. The relative decline in uptake by highly educated parents also potentially has wider significance. Generally speaking, individuals with more education have better health. This is possibly because they are better informed about how to achieve better health outcomes. The finding that highly educated parents were the first to react to the information that the MMR had potential side effects is consistent with this hypothesis. More encouraging for anti-vaccine advocates is the finding that highly educated parents also reduced their uptake of other non-controversial childhood vaccines, a good sign that most of the hidden toxins in vaccines are slowly being discovered by parents and the public in general. Another finding published in the journal PLoS Medicine, showed that parents with more education were less likely to let their daughters get HPV shots. It also adds to a growing body of evidence that suggests vaccination efforts are being rightfully eroded not by people who are under-educated, but by upper-middle class folks with degrees. [14]

Conclusion and Recommendation

It is concluded from the study that the percentage of the parents who know the vaccination is given to their children to prevent diseases is highly considered. Everyone can notice that when the educational level increases the knowledge about vaccination will automatically increase and that is a clear evidence of the importance of the education for parents. So we can conclude that the highly educated parents have more awareness about the benefits of vaccination than those with low education level. Also the study shows that most of the subjects were received vaccination knowledge by doctors, which gives us an impression about the role of the doctors in educating the parents about the importance of vaccination. To improve parents' awareness, good knowledge regarding vaccination is required. Therefore, physicians, pharmacists, nurses, and other health care providers should provide parents with correct information about the risks and benefits of vaccines.

There is a need to increase awareness and knowledge about the benefits and importance of vaccination, as well as the harmful consequences of non-vaccination. A planned educational programme is needed; the educational level of the parents needs to be taken into consideration when the programme is planned, especially as regards those with a lower educational level.

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