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## The impact of education on knowledge and perception about childhood vaccination among parents of under five children; interventional community based study

Santhi Muttipoll Dharmarajlu<sup>1</sup>, Eman Hussin Qasem<sup>2</sup>, Shroog Yahya Tarrosh<sup>2</sup>, Weaam MohammedAlamer<sup>2</sup>, Alhanouf Mohammed Faqih<sup>2</sup>, Layla Yahya Goradi<sup>2</sup>

<sup>1</sup> Assistant Professor, College of Nursing, Jazan University, Jazan, Saudi Arabia

<sup>2</sup> Students, College of Nursing, Jazan University, Jazan, Saudi Arabia

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### Abstract

Immunization is unquestionably one of the most indispensable public health interventions to reduce major illnesses that lead to child mortality and morbidity. The extermination, elimination, and considerable minimization of childhood vaccine-preventable diseases (VPDs), as well as the extending of life expectancy in many countries, are an important output of immunization achievement. The aim of this study to determine the impact of education on knowledge, perception and practice about childhood vaccination among the parents of under five children. Through quantitative survey approach and pre-experimental design, the 50 samples were selected by purposive sampling method. Initially, personal information was obtained from mothers and then 20 Questionnaire was used to assess the knowledge, Checklist was used to assess the practice of childhood vaccination and Five-point Rating scale was used to assess the attitude of childhood vaccination among parents. Education about childhood vaccination was given through video assisted teaching. The results of the study was in awareness the total mean score for pre-test was  $4.18 \pm 1.71$ , whereas in post-test it was  $18.56 \pm 0.76$  with the mean difference of 14.38. It shows that parents had very good knowledge on childhood vaccination after Educational programme. In perception the overall mean score during pre-test was  $1.36 \pm 0.69$ , and in post-test the overall mean score obtained by parents was  $5.46 \pm 0.54$ , with the mean difference of 4.1 it reveals that the parents had highly favourable attitude after an educational programme. For practice the mean score was  $9.88 \pm 3.93$ , whereas in post-test it was  $38.56 \pm 1.96$ , with the mean difference of 28.68. The calculated 't' value for awareness, perception and practice scores were 7.05, 8.23 & 8.14 at 0.05 level respectively. There was no association between knowledge, perception and practice scores with selected demographic variables. Most of parents in KSA believed that vaccines can cause autism and disabilities. Moreover, some parents thought that polio immunization will decrease the fertility rate thus the parents attitude plays important role in vaccination process as they are the decision makers for their children.

**Keywords:** knowledge, perception, practice, childhood vaccination, under five children, educational programme

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### Introduction

Protection from diseases is one of the uttermost benefits that any country can offer to its people. It is certain that vaccines are an essential part of a health system, an effective tool for controlling diseases in many countries around the world, and the most cost-effective mechanism for morbidity and mortality prevention that permits people to better protect themselves from particular bacteria and viruses <sup>[1]</sup>. In order to have the greatest protection against diseases, children should receive all their vaccinations within recommended intervals and at the appropriate age. Vaccinating a child with appropriate vaccines would significantly reduce the costs of disease treatment and rates of disease and, therefore, improve the quality of the child's life <sup>[2]</sup>.

Immunization is unquestionably one of the most indispensable public health interventions to reduce major illnesses that lead to child mortality and morbidity. The extermination, elimination, and considerable minimization of childhood vaccine-preventable diseases (VPDs), as well as the extending of life expectancy in many countries, are an important output of immunization achievement <sup>[3]</sup>. Vaccines have thrived as one of the most successful health interventions that have diminished the occurrence of infectious diseases and improved quality of life in the population. During the last few decades, the burden of the infectious diseases has been reduced through immunization. It is a safe and effective method of preventing many severe infectious diseases. The most common vaccine-preventable diseases are rubella, measles, diphtheria, tetanus, pertussis, and polio. The WHO estimated a reduction in the death rate from infectious diseases between 2 and 3 million each year <sup>[4]</sup>.

### Significance of the study

The increasing utilization of vaccines had a great influence during the past two decades on morbidity and mortality. In addition to reducing costs globally that could be spent in case of spreading of infections. Most of

the industrialized countries and few of the developed countries<sup>[3]</sup> have powerful vaccination strategies. This is mainly due to governmental efforts and good management of healthcare resources in addition to implementing a good framework that could organize the storage of vaccines as well as their distribution and utilization. In spite of this, developing countries are still facing a major problem regarding this concern. This is related to the failure of these countries to apply vaccination programs for vaccine-avoidable diseases. The World Health Organization has started an initiative to target these countries to solve the problem. This initiative aims at preventing diseases that could be avoided by the use of vaccines for all the communities<sup>[5]</sup>.

Despite the major efforts of health authorities to keep KSA free of Diphtheria, Pertussis, Tetanus, polio and measles, many physicians face major obstacles from the parents about the safety, efficiency and the necessity of regular childhood vaccines. Most of parents in KSA believed that vaccines can cause autism and disabilities. Moreover, some parents thought that polio immunization will decrease the fertility rate thus the parents attitude plays important role in vaccination process as they are the decision makers for their children<sup>[6]</sup>.

Knowledge and practices among parents regarding immunization are the major factors that contribute to their vaccination decisions. Deficiencies in parents' knowledge about the adverse effects and contraindications of vaccines often lead to many immunization errors. Many parents believe there is a relation between mild illness and vaccine contraindication, therefore they considered mild illness as a reason for not giving their children up-to-date vaccinations. The knowledge, attitude and practice pattern of parents toward vaccination from the first day of birth could provide early prevention from many communicable diseases, disabilities as well as other causes of death<sup>[7]</sup>.

Vaccination has an important preventive role for many types of infections, especially in the early years of life. However, some misconceptions about vaccination lead to the abstinence of some parents from vaccinating their children. This misconception is primarily due to the lack of knowledge and awareness toward childhood vaccination. The aim of the present study is to evaluate the level of knowledge and the behavior of parents toward the immunization of their children in Farasan, Jazan Region, Saudi Arabia.

### **Objectives**

1. Assess the knowledge and perception on childhood vaccination before implementation of educational intervention.
2. Implement the education on childhood vaccination among parents of under five children.
3. Assess the effectiveness of childhood vaccination after implementation of educational intervention.
4. To associate the pre-test knowledge and perception scores with selected demographic variables.
5. To correlate the knowledge and perception scores on childhood vaccination among parents.

### **Hypothesis**

1. There is a significant difference between pre and post-test knowledge and perception scores on childhood vaccination.
2. There is a significant association between pre-test knowledge and perception scores with selected demographic variables.
3. There is a significant correlation between knowledge and perception scores on childhood vaccination.

### **Materials and Methods**

#### **Research approach**

This is a quantitative based cross-sectional study

#### **Research design**

Pre experimental one group pre and post-test design

#### **Research setting**

The study was carried out in Farasan Community, Jazan region, Saudi Arabia.

#### **Population**

The population for the present study were parents of under five children who is living in Farasan Community, Jazan region.

#### **Sample size**

The sample size adopted for this study was Parents who have under five children. The sample size was 50.

#### **Sample techniques**

Non-probability Purposive Sampling technique was used for this study.

- Criteria for sampling technique:

### **Inclusion Criteria**

- Parents have children with under five years.
- Parents can read and write Arabic

### Exclusion Criteria

- Not willing to participate.
  - Tool for data collection:
  - Semi structured interview schedule on demographic variables of parents such as age, education, age of the child, number of children and previous knowledge on vaccination and its effects.
  - Questionnaire was used to assess the knowledge of childhood vaccination among parents of under five children. It has 20 questions, correct response given as 1 score. Total marks were 20.
  - Checklist was used to assess the practice of childhood vaccination among parents of under five children. It has 6 questions, correct response given as 1 score. Total marks were 6.
  - Five-point Rating scale was used to assess the attitude of childhood vaccination among parents of under five children. It has 8 questions, score as divided into 5 to 1. Total marks were 40.
  - Education about childhood vaccination was given through video assisted teaching.
  - Data collection procedure
1. Permission was obtained from Dean of university college of Farasan.
  2. Pre-test was conducted by using questionnaire to assess the parents' knowledge on childhood vaccination. Checklist was used to assess their practice and Rating scale was used to assess the perception of childhood vaccination. Immediately after pre-test the education on childhood vaccination and its Effects was taught to the parents through video assisted teaching for 20 minutes.
  3. Post test was conducted by using same pre-test tool on 7th day after educational administration
- Plan for data analysis
1. Both descriptive and inferential statistics was used.
  2. Mean, standard deviation and mean percentage was used to assess the knowledge practice and perception about childhood vaccination and its effects among parents having under five children.
  3. Inferential statistics like paired "t" test was used to assess the difference between pre and post-test knowledge, practice and perception on childhood vaccination and its effects among parents having under five children.
  4. Chi square used to assess the association between pre-test scores with Demographic variables.
  5. Correlation and Coefficient test was used to identify the significant relationship between Knowledge and Perception scores of childhood vaccination and its effects among parents having under five children.

### Findings and Results

The Percentage wise distribution of demographic variable shows that, Highest percentage (38%) of parents were at the age of 36 and above. The maximum percentage of parents were mothers (54%) was answered for the vaccination. Highest percentage of parents (32%) have 2 children. Maximum percentage of children (42%) were involved for this study at the age group of 3- 5 years. The highest percentage of parents (48%) have the educational status at degree level. Only 26 percentage of parents were had the previous knowledge about vaccination schedule.

**Table 1:** Frequency and Percentage wise distribution pre and post-test knowledge questions on childhood vaccination

Knowledge Questions on Childhood Vaccination	Yes		No	
	Pre-test	Post-test	Pre-test	Post-test
1. Did you give your child all mandatory vaccines?	7 (14%)	43 (86%)	43 (86%)	7 (14%)
2. Are you sure that the vaccinations are important for the child?	2 (4%)	48 (96%)	48 (96%)	2 (4%)
3. Have you given your children the obligatory vaccines?	4 (8%)	46 (92%)	46 (92%)	4 (8%)
4. Do you think vaccination reduces the probability of death or illness of a child?	9 (18%)	41 (82%)	41 (82%)	9 (18%)
5. Do you think that vaccination reduces the number of infectious diseases?	5 (10%)	45 (90%)	45 (90%)	5 (10%)
6. Vaccination prevents infectious disease.	9 (18%)	41 (82%)	41 (82%)	9 (18%)
7. Vaccination decreases the rate of mortality and disabilities.	8 (16%)	42 (84%)	42 (84%)	8 (16%)
8. Do you think that the vaccinations have an important role in the child health?	2 (4%)	48 (96%)	48 (96%)	2 (4%)
9. Diphtheria, Tetanus, and pertussis could be controlled by vaccination.	6 (12%)	44 (88%)	44 (88%)	6 (12%)
10. Do you believe that vaccinations to be given in appropriate age?	3 (6%)	47 (94%)	47 (94%)	3 (6%)
11. Do you aware that there are many types of vaccines?	4 (8%)	46 (92%)	46 (92%)	4 (8%)
12. Do you aware that vaccinations are accompanied with side effects?	5 (10%)	45 (90%)	45 (90%)	5 (10%)
13. Do you aware that low grade fever and diarrhea are	11 (22%)	39 (78%)	39 (78%)	11 (22%)

contraindications of vaccines?				
14. Do you aware that even healthy child also needs vaccination?	5 (10%)	45 (90%)	45 (90%)	5 (10%)
15. Hepatitis B virus could be prevented by vaccination	7 (14%)	43 (86%)	43 (86%)	7 (14%)
16. The childhood vaccines could control Measles	4 (8%)	46 (92%)	46 (92%)	4 (8%)
17. Vaccination could maintain child health by boost up the immunity and prevent infection	5 (10%)	45 (90%)	45 (90%)	5 (10%)
18. The side effects of vaccination are fever, skin rash, vomiting, diarrhea, body pain, lethargy and tiredness.	3 (6%)	47 (94%)	47 (94%)	3 (6%)
19. The route of administration for BCG, DPT and Polio vaccines are through Intra Dermal (ID), Intra Muscular (IM) and Oral.	4 (8%)	46 (92%)	46 (92%)	4 (8%)
20. The route of administration for Hepatitis B, Measles and Rota vaccines are through Intra Muscular (IM), Subcutaneous (SC) and Oral.	6 (12%)	44 (98%)	44 (98%)	6 (12%)

Frequency and Percentage wise distribution pre and post-test knowledge questions on childhood vaccination shows that, In post-test the maximum of the parents that is more than 90 percentage of them were given corrected response for knowledge questions such as vaccinations are important for the child (96%), given your children the obligatory vaccines (92%), vaccination reduces the number of infectious diseases (90%), vaccinations have an important role in the child health (96%), vaccinations to be given in appropriate age (94%), types of vaccines (92%), vaccinations are accompanied with side effects (90%), health child also needs vaccination (90%), childhood vaccines could control Measles (92%), Vaccination could maintain child health by boost up the immunity and prevent infection (90%), side effects of vaccination are fever, skin rash, vomiting, diarrhea, body pain, lethargy and tiredness (94%), route of administration for BCG, DPT and Polio vaccines are through Intra Dermal (ID), Intra Muscular (IM) and Oral (92%) and route of administration for Hepatitis B, Measles and Rota vaccines are through Intra Muscular (IM), Subcutaneous (SC) and Oral (98%). More or less similar percentage of parents were answered in the aspects of give your child all mandatory vaccines (86%), vaccination reduces the probability of death or illness of a child (82%), Vaccination prevents infectious disease (82%), Vaccination decreases the rate of mortality and disabilities (84%), Diphtheria, Tetanus, and pertussis could be controlled by vaccination (88%) and Hepatitis B virus could be prevented by vaccination (86%). Very less percentage of parented were answered in the aspect of aware that low grade fever and diarrhea are contraindications of vaccines (78%). Whereas in pre-test all the parents were answered only less than 20 percentage in all the aspects knowledge questionnaire, in this very less percentage (<5%) of the parents were answered in the aspects of the vaccinations are important for the child (4%), the vaccinations have an important role in the child health (4%) when compared to post-test.

**Table 2:** frequency and percentage wise distribution pre and post-test attitude questions on childhood vaccination

S. No	Rating scale on Perception of Childhood vaccination	Strongly Agree		Agree		Neutral		Disagree		Not sure	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
1	The child needs additional immunizations in the under 5 age children.	5 (10%)	45 (90%)	5 (10%)	3 (6%)	20 (40%)	2 (4%)	10 (20%)	0 (0%)	10 (20%)	0 (0%)
2	Support the vaccination program in your country.	10 (20%)	48 (96%)	5 (10%)	2 (4%)	10 (20%)	0 (0%)	10 (20%)	0 (0%)	15 (30%)	0 (0%)
3.	Understand favor of obligatory vaccination programs designed by the health authorities?	5 (10%)	47 (94%)	5 (10%)	2 (4%)	10 (20%)	1 (2%)	15 (30%)	0 (0%)	15 (30%)	0 (0%)
4	Advice your relatives and friends to vaccinate their children appropriate age group.	5 (10%)	50 (100%)	10 (20%)	0 (0%)	5 (10%)	0 (0%)	20 (40%)	0 (0%)	10 (20%)	0 (0%)
5	Believe that the vaccination program started from the first week of new-born's life.	4 (8%)	50 (100%)	5 (10%)	0 (0%)	10 (20%)	0 (0%)	25 (50%)	0 (0%)	6 (12%)	0 (0%)
6	Believe that to complete all doses of vaccination will improve the immunity of children	5 (10%)	48 (96%)	8 (16%)	2 (4%)	5 (10%)	0 (0%)	22 (44%)	0 (0%)	10 (20%)	0 (0%)
7	Believe that vaccination is very safe to the children.	10 (20%)	45 (90%)	5 (10%)	3 (6%)	5 (10%)	2 (4%)	20 (40%)	0 (0%)	10 (20%)	0 (0%)

8	Believe that assessment of the child vaccinations is very important.	5 (10%)	46 (92%)	6 (12%)	2 (4%)	24 (48%)	1 (2%)	10 (20%)	1 (2%)	5 (10%)	0 (0%)
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Frequency and Percentage wise distribution pre and post-test attitude questions on childhood vaccination shows that, in post all the parents were strongly agreed about the aspects of Advice your relatives and friends to vaccinate their children appropriate age group (100%) and believe that the vaccination program started from the first week of new-born's life (100%) respectively. Nearly 95 percentage of the parents were strongly agreed in the aspects of Support the vaccination program in your country (96%), Understand favour of obligatory vaccination programs designed by the health authorities (94%), Believe that to complete all doses of vaccination will improve the immunity of children (96%) and believe that assessment of the child vaccinations is very important (90%). Only 90 percentage of parents were strongly agreed in the aspects of the child needs additional immunizations in the under 5 age children and believe that vaccination is very safe to the children respectively. Maximum of parents were believed strongly agreed and agreed about all the aspects of attitude questions on childhood vaccinations. Whereas in pre-test less than 20 percentage only the parents were strongly agreed about all the aspects of attitude questions on childhood vaccinations. More or less 45 percentage of the parents were strongly disagreed in all the aspects before implementation of education program.

**Table 3:** Frequency and Percentage wise distribution pre and post-test Practice questions on childhood vaccination

Practice Questions of Childhood Vaccination	Yes		No	
	Pre-test	Post-test	Pre-test	Post-test
1. Do you follow the child's compulsory immunization?	2 (4%)	48 (96%)	48 (96%)	2 (4%)
2. Do you planned for other available vaccines to be given for your children?	10 (20%)	40 (80%)	40 (80%)	10 (20%)
3. Will you manage by cold compress?	6 (12%)	44 (88%)	44 (88%)	6 (12%)
4. Will you use analgesics for fever after vaccinations?	4 (8%)	46 (92%)	46 (92%)	4 (8%)
5. Have you given age related all vaccines to your child?	3 (6%)	47 (94%)	47 (94%)	3 (6%)
6. Will you manage any complication related to vaccination for your child?	3 (6%)	47 (94%)	47 (94%)	3 (6%)

Frequency and Percentage wise distribution pre and post-test Practice questions on childhood vaccination shows that, in post test highest percentage (>90%) of the parents were given adoptive practice about childhood vaccination. Only 80 percentage of parents were answered in the aspect of planned for other available vaccines to be given for children. Whereas in pre-test more or less 15 percentage of parents only had adoptive practice in the aspects like planned for other available vaccines to be given for your children (20%), manage by cold compress (12%) and use analgesics for fever after vaccinations (8%). Similar percentage of parents had their good practice in the aspects of given age related all vaccines to your child (6%) and manage any complication related to vaccination for your child (6%) respectively. Only 4 percentage of parents had adoptive practice in the aspect of follow the child's compulsory immunization.

**Table 4:** Distribution of Mean, SD and Mean percentage of pre and post-test scores on Childhood Vaccination

S. No	Areas of Awareness on Cervical cancer	Max Score	Pre-Intervention		Post intervention		Mean Differenc	't' test Value	P value
			Mean	SD	Mean	SD			
1	Awareness on Childhood vaccination	20	4.18	1.71	18.56	0.76	14.38	7.05	0.05
2	Perception on Childhood vaccination	8	1.36	0.69	5.46	0.54	4.1	8.23	
3	Practice of Childhood vaccination	40	9.88	3.93	38.56	1.96	28.68	8.14	

Overall distribution of Mean, SD and Mean difference of awareness, perception and practice on childhood vaccination shows that, in awareness the total mean score for pre-test was  $4.18 \pm 1.71$ , whereas in post-test it was  $18.56 \pm 0.76$  with the mean difference of 14.38. It shows that parents had very good knowledge on childhood vaccination after implementation of educational programme, it shows that teaching was more effective. In perception the overall mean score during pre-test was  $1.36 \pm 0.69$ , and in post-test the overall mean score obtained by parents was  $5.46 \pm 0.54$ , with the mean difference of 4.1 it reveals that the parents had highly favourable attitude towards childhood vaccination after implementation of educational programme.

The overall mean score for practice on childhood vaccination shows that, in pre-test the mean score was  $9.88 \pm 3.93$ , whereas in post-test it was  $38.56 \pm 1.96$ , with the mean difference of 28.68. It predicts that parents improved their practice after implementation of education programme. on childhood vaccination. The calculated

't' value for awareness, perception and practice scores were 7.05, 8.23 & 8.14 at 0.05 level respectively. Hence it shows that significant improvement of parents' knowledge, attitude and practice on childhood vaccination after implementation of educational programme.

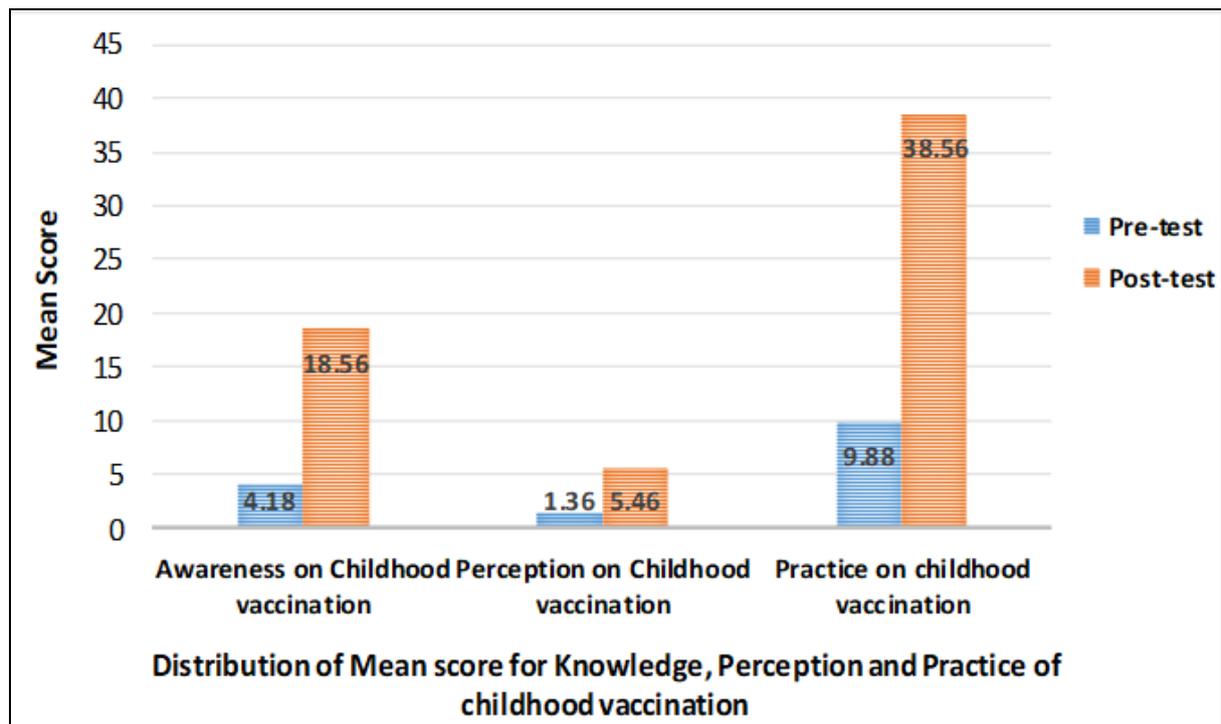


Fig 1

There was no significant association between age of parents, age of the child, levels of parent's education, number of children and Previous knowledge on childhood vaccination and its effects with the pre test scores on vaccination. Hence it shows that the difference observed mean score values were not true difference so the research hypothesis was rejected. There was a significant correlation between knowledge and perception scores (0.68), perception and practice scores (0.71), practice and knowledge scores of childhood vaccination (0.86) respectively,

### Summary

During the last few decades, the burden of the infectious diseases has been reduced though immunization. Also, immunization has shown major aspects of disease, disability and death prevention. This study was conducted to assess the parent's Knowledge, attitude and practice of childhood vaccination in Farasan community, Jazan region, KSA. Through survey research approach and pre-experimental design 50 parents were purposively selected. The mean difference between pre and post-test mean scores of awareness, perception and practice were 14.38, 4.1 & 28.68 respectively. Hence it shows that significant improvement of parents' knowledge, attitude and practice on childhood vaccination after implementation of educational programme. There was no association between knowledge, perception and practice scores with selected demographic variables of students about childhood vaccination. There was a positive correlation between pre and post-test scores of knowledge, practice and perception about childhood vaccination. However, educational programs are still in need to increase the parents' knowledge and practice especially among illiterate and less educated parents living in rural areas.

### Conclusion

The level of knowledge for parents regarding child vaccination and their attitudes towards vaccination may influence their practice. Major obstacles towards the high coverage of children include a lack of knowledge or information on vaccination, low levels of awareness or negative attitudes regarding vaccination, and misperceptions or rumors regarding the safety of vaccination. The common factors associated with higher knowledge and attitude were the mother's age, occupation, level of education, and nature of the family. The most common sources of knowledge about immunization were institutions and internet sources. Therefore, the knowledge, attitude, and practice of mothers concerning child vaccination involve a multidimensional relation that is surrounded by many variables.

### Conflicts of Interests

The research received no specific grant from any funding agency in public, commercial or not-for-profit sectors. The author declared no conflicts of interest.

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