

Original article:

Knowledge and awareness of parents about universal immunization program and optional vaccines: a cross-sectional study in Central India

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ABSTRACT

Background: One of the most cost-effective health interventions for childhood illness prevention is immunization. Parental awareness and practice towards vaccination influences the immunization rate to a great extent. This study evaluates the knowledge and awareness about universal immunization program and optional vaccines among parents, to understand their perception towards immunization, to find out determinant factors for their knowledge in association with selected demographic variables and to identify solutions to address the knowledge gap.

Methods: This cross-sectional study was conducted at a tertiary care hospital in central India from January 2017- December 2017. Immunization knowledge and attitude among 500 parents was evaluated through a questionnaire.

Results: Eighty percent of the parents were aware about Universal immunization program although most of them didn't know the correct name and schedule of all vaccines. Seventy five percent of parents didn't know about the optional vaccines which are not administered as per national program. Most of the parents are unaware of the newer vaccines being available and the disease prevented by them. Parents have misconceptions regarding vaccine efficacy, side effects, safety profile. Doctors were the main source of information (75%) and mass media (television, radio, newspaper) was also underutilized but to a lesser extent. Level of knowledge directly correlated with maternal literacy ($P \leq 0.05$) and to a lesser extent with fathers' literacy and advancing age was associated with better knowledge ($P \leq 0.05$).

Conclusions: There is good knowledge among parents regarding Universal immunization program but limited knowledge towards newer vaccines. Every opportunity of contact with the parents should be utilized by the doctors for imparting health education. It is prudent to target young parents and especially mothers. Vaccine awareness should be enhanced through the use of mass media. Government must include these newer vaccines in the national immunization program in a phase wise manner.

INTRODUCTION

Child's total health includes physical, mental and social wellbeing. It is better to prevent disease than to allow morbidity and mortality. One of the most cost-effective health interventions for disease prevention is immunization. Protection through immunization against vaccine preventable diseases, disabilities and death is the birth right of every child. Awareness regarding vaccines is important for community acceptance of the vaccine and also for maintaining their confidence in the existing vaccines. (1) Effective awareness program should be in place to convey the benefits (and expected adverse events with explanation) as well as disadvantages of not being immunized to the parents. As the social benefits of immunization are extensive and well known; any deficiency in the knowledge,

attitude and practices that leave out large sections of the most deprived populations unimmunized are a cause for serious policy concern. It has been found that factors like birth order, belonging to a very orthodox family, those residing in rural areas, maternal education, parental age specifically maternal age, socioeconomic status and family size could influence immunization coverage. There is need for studies to understand the parent's perception towards immunization. (2) This information should be utilized for taking corrective actions. In the present study we tried to assess the knowledge and awareness about universal immunization program and optional vaccines among parents, to understand their perception towards immunization, to find out determinant factors for their knowledge in association with selected demographic variables and to identify solutions to address the knowledge gap.

METHODS

The study was conducted at a tertiary care hospital in Bhopal, Madhya Pradesh, India. Children from all socioeconomic strata approach the hospital for different illnesses, immunizations and routine check-up. Study population included Parents/caretakers of children (0-5 years old) who visit the hospital out-patient clinic for any of the above purposes and Parents/caretakers of in-patient children. An automated software program was used to calculate the sample size required for this study.

Considering a relative precision of 5% and 95% confidence interval, the estimated sample size was 500. This cross-sectional study was conducted over a period of 1 year from January 2017 - December 2017. The study protocol and consent form were reviewed and approved by Ethical Committee of the hospital. Parents/caretakers were explained regarding the study and only those who consent to participate in the study after proper description and rationale of the questionnaire were included in the study. Participants were asked to fill a questionnaire including 19 statements related to knowledge and attitude of parents visiting the clinic with their children. The questionnaire consisted of two parts Section A Demographic data of the child (name, age, gender, number of siblings and birth order) and demographic data of the parents (religion, age, employment and education of both parents). Section B Questions pertaining to knowledge and perception regarding UIP and optional vaccines. Fully filled proforma were analyzed. Incomplete or partially filled proforma were excluded. The following statistics were applied: Categorical variables were presented as bar diagrams, pie charts, frequency and percentage, to measure associations between nominal variables Chi-square test was used. Test was considered significant where p value is < 0.05. Level of significance was obtained using T test.

RESULTS

Demographic data : A total of 500 parents participated in the study. Out of them, majority of the fathers (59%) were undergraduates and majority of the mothers (52%) were graduates. 56% of the children were of 2nd birth order, 43% of children were of 1st order and the rest (1%) were of 3rd order. Comparing the parental age, majority of the parents including both father and mother were between ages of 25-35 years (Table 1).

Table 1: Demographics of parents

charecteristics	N(%), (n=500)
Parental education	
uneducated	20%(100)
Undergraduates or less	50%(250)
graduates	25%(125)
Postgraduates or more	5%(25)
Maternal education	
uneducated	30%(150)
Undergraduates or less	38%(190)
graduates	22%(110)
Postgraduates or more	10%(50)
Birth order	
First order	45% (225)
Second order	53%(265)
Third order	2%(10)
Paternal age	
< 25 years	48%(240)
25-35 years	35%(175)
25-35 years	17%(85)
Maternal age	
< 25 years	56%(280)
25-35 years	36%(180)
25-35 years	8%(40)

Level of knowledge among parents:

Questions were analyzed that identified parental awareness regarding UIP and optional vaccines. 80% were aware that there are some vaccines which are provided by government free of cost under Universal Immunization program(UIP), 75% didn't know about optional vaccines or few vaccines which are also recommended in immunization schedule, but are not given under UIP, and these vaccines have to be taken in addition to routine vaccines. Parents were provided with the names of UIP vaccines and asked to acknowledge if they have either heard of them or know when we should give them. Most of the parents have heard of BCG(98%), OPV(100%) , DPT (92%), Measles(90%)but less knew about Rotavirus vaccine (55%), Hib (52%)and Hepatitis B vaccine (65%).The knowledge about optional vaccinesis further poor as for Varicella (46%)followed by cervical cancer (HPV) vaccine and Hepatitis A vaccine (40%). The remainder including injectable polio, typhoid, pneumococcaland meningococcal vaccines which were known by only about 30% of the parents.

Although parents had heard about the optional vaccines, very few among them actually knew regarding the diseases prevented by these vaccines. Of the 55% parents who were aware of Rotavirus vaccine and Influenza vaccine, only 27% of them knew that these vaccines prevent diarrhea and common cold respectively. Awareness regarding HPV vaccine was the least, known by only 12% of the parents. Only 30% were aware that an injectable vaccine is also available against polio in addition to oral vaccine.

General awareness about the vaccines are summarized in Table 2. Only 42% of the parents knew that disease prevention from these vaccines is not 100% and each vaccine has its own efficacy. When asked regarding the duration of vaccine efficacy, only 46% of the parents were aware that efficacy depends on the vaccine and the disease which it prevents. When questioned regarding the maximum age the vaccines can be administered, 60% said that they would vaccinate their children till 5 years of age. 35% of them said 10 years. Only 5% of the parents were aware that the vaccination can be done for adolescents and adults also. 35% of parents believed that the child should not be vaccinated if he or she is suffering minor illness like fever or common cold. Respondents were noted to be not well aware about possible side effects of immunization with the exception of fever (86%), redness (52%) and pain (63%). Seizures though uncommon are an important side effect which only a small percent of the parents (3%) are aware of. 23% of the parents had concerns about immunization safety (Table 2).

Table 2: Parental awareness regarding vaccines

General awareness	n (%), (n = 500)
Are the diseases 100% preventable by administering vaccines	
Yes	55%(275)
No	42%(210)
Don't know	3%(15)
Duration of vaccine efficacy	
Lifelong	20%(100)
Few years	14%(70)
Depends on vaccine and the disease which it prevents	46%(230)
Don't know	20%(100)
Maximum age the vaccines can be administered	
5 years	60%(300)
10 years	35%(175)
Adolescents and adults	5%(25)
Can vaccines be administered in presence of minor illness like cough, cold	
Yes	40%(200)
No	35%(175)
Don't know	25%(125)

Side effects of vaccine	
Fever	86%(430)
Redness	52%(260)
Pain	63%(315)
Excess cry	40%(200)
Convulsions	3%(15)

Parental attitude towards vaccines :

Physicians were main source of information about immunization accounting to 75%. Internet (8%), pamphlets at hospital (7%) and friends (10%) were other sources of information. Television (2%) and newspaper (5%) which are an important media of information education and communication (IEC) were under-utilized by the parents for seeking knowledge regarding vaccines. 82% of the parents said that their decision to administer a vaccine or not depends on the doctor’s counseling. 56% of the parents have misconception that paid vaccines administered in private sector are superior compared to free vaccines given in government hospital. 75% of the parents felt that the vaccines are cost effective, as the protection which these vaccines offer against diseases is far greater than the amount they have to pay. Though most of the parents said they would vaccinate their children even if they have to pay, 60% parents felt that optional vaccines should be included in national immunization program and be given free of cost in government hospital (Table 3).

Table 3: Parental attitude towards vaccines.

Expressed attitude	n (%), (n = 500)
Source of information regarding UIP/Optional vaccines	
Doctor	75%(375)
Pamphlets at hospitals	7%(35)
Relatives / friends	10%(50)
Newspaper	5%(25)
Television	2%(10)
Internet	8%
Are vaccines given in private hospitals are superior compared to those given in government hospitals?	
Yes	56%(280)
No	38%(190)
Don’t know	6%(30)
Most important factor for the selection of a vaccine	
Doctor’s counselling	82%(410)
Cost of the vaccine	13%(65)

Advertisement	3%(15)
Knowledge regarding the vaccine	2%(10)
Are the vaccines cost effective	
Yes	75%(375)
No	25%(125)
Should optional vaccines be included in government schedule?	
Yes	60%(300)
No	36%(180)
Not sure	4%(20)

Relationship of education level and knowledge of immunization: In our study, it was found that level of knowledge is directly correlated to mothers' literacy with postgraduate mothers having better awareness than graduate mothers, and undergraduate mothers with the least awareness in uneducated mothers, being statistically significant ($p \leq 0.05$). Fathers' education did influence the awareness regarding vaccination, but less than that of mothers' which was not statistically significant.

Relationship of parental age and knowledge of immunization : our study findings show a significant association between the parent's age (both fathers and mothers) and immunization awareness. Parents more than 35 years of age had a higher level of knowledge regarding vaccines when compared to the 25-35 year age group. Parents younger than 25 years had the least awareness among all the groups. The difference between the three groups is statistically significant ($p < 0.05$).

DISCUSSION

Eighty percent of the parents were aware about UIP and some of them about optional vaccines. Similar results were seen by Inamder et al in Madhya Pradesh, Gandhi et al in Gujarat and Angelillo et al in Italy.(2,3,4) Among those who have heard about the vaccine, more than half were not aware of the diseases against which the vaccine provides protection. These results are similar to the studies by Mapatano MA et al and Mony PK et al where awareness regarding vaccine availability was moderate, but the knowledge regarding dosage schedule and diseases prevented was low.(5,6) In our study, though 40% parents have heard about cervical cancer vaccine, only 10% of them had knowledge regarding the vaccine and knew about the human papilloma virus. Similar results have been shown by Tang CW et al in Taiwan where only 13% had heard of the HPV vaccine.(7)

There were many misunderstandings and misconceptions regarding vaccine efficacy and duration of protection. Respondents were not well aware of the possible side effects of vaccines, with the exception of fever, redness and pain at injection site. Seizures though uncommon is an important side effect which only three percent of the parents are aware of. Similar results were obtained by the EKOS research associates, Inamder et al and Tang CW et al. (2,7,8) Thirty percent of the parents in our study had concerns about immunization safety, the result being similar to new vaccinations of infants in practice online survey where 70% parents were confident in the safety of routinely recommended vaccines. In the study by EKOS research associates, most of the parents are confident in the

safety of childhood vaccines, with 70% of parents considering them as highly safe, 28% as moderately safe and very few saying that they are unsafe.(8,9) In our study, physicians are a main source of information regarding immunization accounting to 75%. Internet, pamphlets at hospital and friends were the next main source of information. Ekos research associate showed that parents believe mostly on Internet physicians (54%) and internet.(8) Coniglio MA et al, Angelillo et al and Inamder et al also showed that most parents sought information about vaccines from the physicians.(3,4,10) In present study, television and newspaper which are an important media of information education and communication (IEC) are not utilized well by the parents. It is good to know that doctors are responsible for informing a majority of respondents about immunization. This opportunity (immunization clinic) of the contact with parents should be utilized for giving health education about all the vaccines. Fifty-six percent of the parents have misconception that paid vaccines administered in private sector are superior when compared to free vaccines given in government hospital. In a study conducted by Center for health services research and development, Armenia, most of the parents indicated that they trusted the vaccines provided at public facilities more than the vaccines in private facilities.(11) In present study, 52% of the parents said that their decision to administer a vaccine or not depends on the doctor's counselling. 65% of the parents felt that the vaccines are cost effective, as the protection which these vaccines offer against diseases is far greater than the amount they have to pay for the treatment of illness. These results are similar to those obtained from new vaccinations of infants in practice online survey, where 67% parents were willing to accept these vaccinations even if they had to pay for the vaccinations. In a study conducted by Madhivanan P et al in Mysore, cost was a significant factor and obstacle to vaccine acceptance among parents and they expressed concerns that they would be able to administer optional vaccines if they were part of the universal immunization program.(12) In this study, it was found that level of knowledge is directly correlated to mothers' literacy ($p < 0.05$). Fathers' education did influence the awareness regarding vaccination, but less than that of mothers'. The results are similar to the study done by Patra et al where there is a strong positive relationship between mother's education and vaccination, the effect of father's education is significantly positive but its impact is less than that of mother's education.(13) Similar results are obtained by EKOS research associates, Angelillo et al, Inamder et al, Zahrani JA and Mohammed A et al where parents (both mothers and fathers) with higher level of education had a better knowledge of vaccines.(3,4,8,14,15,16)

Our study findings show a significant association between the parent's age (both fathers and mothers) and vaccination awareness among them. Parents more than 35 years of age had a better awareness regarding vaccines than 25-35 year age group. Parents younger than 25 years had the least awareness among all the groups ($p < 0.05$). This is in accordance to the Studies done by Angelillo et al and Patra et al which showed that knowledge was significantly greater among mothers who were older at the time of child's birth.(4,13) In contrast to our finding, Mapatano MA et al showed that the age of the mother does not influence the immunization status of the child and Zahrani JA showed that younger mothers (<30 years) showed higher significant total knowledge score about vaccination.(6,14)

CONCLUSION:

There is good knowledge among parents about UIP but limited knowledge about newer and optional vaccines. Also parents have many misconceptions about vaccine efficacy, side effects, vaccines' safety profile, age till which they can be administered. The level of knowledge and attitude towards immunization directly correlated with maternal literacy and to a lesser extent with fathers' literacy and advanced age of the parent. This study highlights the fact that the young parents have lesser knowledge about the benefit of vaccines. Hence it is important to target young parents and especially mothers. As the doctors were the main source of information regarding vaccines, every opportunity of contact with the parents should be utilized for giving health and vaccine education. Vaccine awareness should be enhanced through the use of mass media like television, radio and newspaper, as these were observed to be underutilized in this study. Government can include these newer vaccines in the national immunization program in a phased manner.

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