

Original Research Article

What do parents think? Knowledge and awareness about newer vaccines: a cross-sectional study in South Indian city

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ABSTRACT

Background: One of the most cost-effective health interventions is immunization. Parental awareness regarding vaccines influences the immunization rate to a great extent. This study evaluates the awareness regarding newer vaccines among parents, to understand their perception towards immunization, to determine the association of their knowledge with selected demographic variables and to identify solutions to address the knowledge gap.

Methods: This cross-sectional study was conducted at Lotus Children's Hospital, Hyderabad, India from June 2013-June 2014. Immunization knowledge and attitude among 550 parents was evaluated through a questionnaire.

Results: Eighty percent of the parents were unaware that there are few vaccines which are in the recommended immunization calendar, but 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 (55%) and mass media (television, radio, newspaper) was underutilized. 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 limited knowledge among parents regarding 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.

Keywords: Immunization, Knowledge and perception, Newer vaccines, Parental education

INTRODUCTION

Child's health includes physical, mental and social well-being. It is better to prevent disease than to allow human suffering. One of the most cost effective health interventions 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 new 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) as well as disadvantages of not being immunized to the parents. Given the extensive social benefits of immunization, any inequities in the knowledge, attitude and practices that leave out large sections of the most deprived populations are a cause for serious policy concern.

It has been found that factors like birth order, belonging to an orthodox family, those residing in rural areas,

parental education, parental age, socioeconomic status and family size could influence immunization coverage.

There is need for studies to understand the parent's perception towards immunization. This information should be utilized for taking corrective actions.

In the present study we tried to assess the awareness and knowledge regarding newer vaccines among parents/caretakers and understand their perception towards immunization, to determine the association of knowledge and perception of parents with selected demographic variables, and to identify the solutions to address the knowledge gap.

METHODS

The study was conducted at Lotus children's hospital, Hyderabad, India which is a tertiary care centre. Being an exclusive pediatric hospital, children from all socio-economic strata approach the hospital for various illnesses, vaccinations and routine check-up.

Study population

- Parents/attendees who visit the hospital to immunize their children
- Parents/attendees of in-patient children.

An automated software program was used to calculate the sample size required for this study. A study showed awareness regarding Hib vaccine to be 15%, which is the least among the few vaccines considered. Hence considering a relative precision of 20% and 95% confidence interval, the estimated sample size was 550.

This cross sectional study was conducted over a period of 1 year from June 2012 - June 2013. The study protocol and consent form were reviewed and approved by Ethical Committee of the hospital.

All parents/attendees of inpatient children and of those children who visit for immunization were considered. 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.

Eligible 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 newer vaccines.

Data Analysis

Fully filled proforma were analysed. Incomplete or partially filled proforma were excluded. The following statistics were applied

- Categorical variables were presented as bar diagrams, pie charts, frequency and percentage
- The Chi-square test was used to measure associations between nominal variables
- Test was considered significant where p value is < 0.05
- Level of significance was obtained using T test.

RESULTS

Demographic data

A total of 550 parents participated in the study. Out of them, majority of the fathers (50.9%) were undergraduates and majority of the mothers (54.2%) were graduates. 58% of the children were of 2nd birth order, 41.3% of children were of 1st order and the rest (0.7%) 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 who responded to the questionnaire.

Charecteristics	n (%), (n = 550)
Paternal education	
Undergraduates	50.9 (280)
Graduates	10 (55)
Postgraduates	39.1 (215)
Maternal education	
Undergraduates	17.6 (97)
Graduates	54.2 (298)
Postgraduates	28.2 (155)
Birth order	
First order	41 (227)
Second order	58 (319)
Third order	1 (4)
Paternal age	
< 25 years	0.9 (5)
25-35 years	76.3 (420)
> 35 years	22.7 (125)
Maternal age	
< 25 years	19.4 (107)
25-36 years	74.7 (411)
> 35 years	5.8 (32)

Level of knowledge among parents

Questions were analyzed that identified parental awareness regarding newer vaccines. 80% were unaware that there are few vaccines which are in the recommended immunisation calendar, but are not given under national immunisation program, and these vaccines have to be taken in addition to routine vaccines.

Parents were provided with the names of 9 vaccines and asked to acknowledge if they have either heard them or are aware of them. Most of the parents have heard of Rotavirus vaccine and Swine flu vaccine (48%) followed by cervical cancer (HPV) vaccine and Hepatitis A vaccine (40%). The remainder including injectable polio, typhoid, pneumococcal, meningococcal and varicella vaccines which were known by only about 30% of the parents (Figure 1).

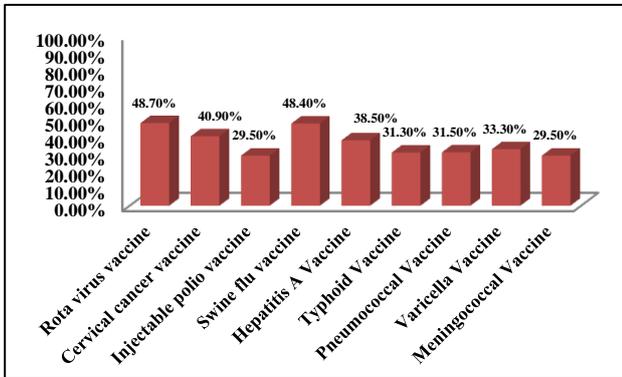


Figure 1: Parental awareness regarding availability of newer vaccines.

Of the 9 vaccines which were shown to the parents, 30% of the participants have heard of/know only 1 vaccine. An average of 15% parents are aware of 2-4 vaccines. All the 9 vaccines were known only by a meagre 3% percent of the parents (Figure 2).

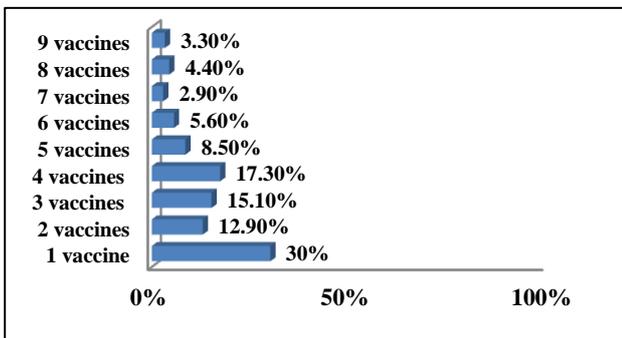


Figure 2: Awareness regarding number of new vaccines which are available.

Although parents had heard about the new vaccines, very few among them actually knew regarding the diseases prevented by these vaccines. Of the 48% parents who

were aware of Rotavirus vaccine and Influenza vaccine, only 27% of them knew that the vaccines prevent diarrhoea and common cold respectively. Awareness regarding HPV vaccine was the least, being known by only 15% of the parents. Only 30% were aware that an injectable vaccine is also available against polio in addition to oral vaccine (Figure 3).

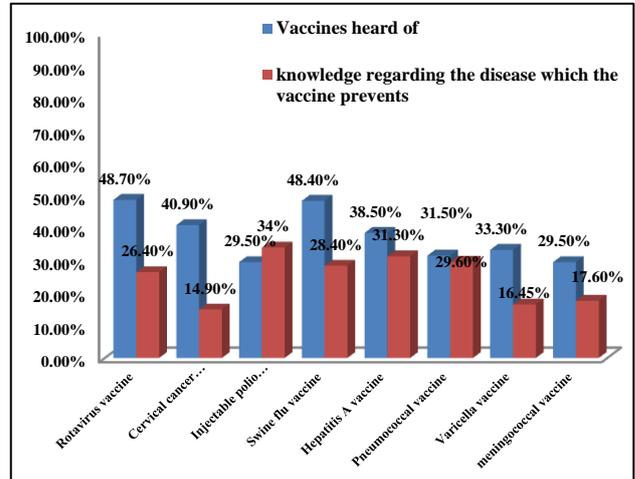


Figure 3: Parental knowledge regarding newer vaccines.

Table 2: Parental awareness regarding vaccines.

General awareness	n (%), (n = 550)
Are the diseases 100% preventable by administering vaccines	
Yes	39 (215)
No	31 (170)
Don't know	30 (165)
Duration of vaccine efficacy	
Lifelong	23 (126)
Few years	14 (77)
Depends on vaccine and the disease which it prevents	49 (270)
Don't know	14 (77)
Maximum age the vaccines can be administered	
5 years	36 (198)
10 years	55 (302)
Adolescents and adults	9 (50)
Can vaccines be administered in presence of minor illness like cough, cold	
Yes	43 (237)
No	41 (225)
Don't know	16 (88)
Side effects of vaccine	
Fever	46 (253)
Redness	22 (121)
Pain	23 (127)
Excess cry	8 (44)
Convulsions	1 (5)

General awareness regarding the vaccines are summarized in Table 2. Only 31% 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 49% of the parents were aware that it depends on the vaccine and the disease which it prevents. When questioned regarding the maximum age the vaccines can be administered, 36% said that they would vaccinate their children till 5 years of age. 55% of them said 10 years. Only 9% of the parents were aware that the vaccination can be done for adolescents and adults also.

45% 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 (46%), redness (22%) and pain (23%). Seizures though uncommon are an important side effect which only a meagre percent of the parents (1%) are aware of. 30% of the parents had concerns about immunization safety (Table 2).

Parental attitude towards vaccines

Physicians were main source of information about immunization accounting to 55%. Internet (14%), pamphlets at hospital (11%) and friends (13%) were other sources of information. Television (2%) and newspaper (5%) which are an important media of information education and communication (IEC) were under utilised by the parents for seeking knowledge regarding vaccines. 52% of the parents said that their decision to administer a vaccine or not depends on the doctor's counseling. 54% of the parents have misconception that paid vaccines administered in private sector are superior compared to free vaccines given in government hospital.

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. Though most of the parents said they would vaccinate their children even if they have to pay, 60% parents felt that these vaccines should be included in national immunisation program and be given free of cost in government hospital (Table 3).

Relationship of education level and knowledge of immunization

In present 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 having the least awareness with the results being statistically significant ($p < 0.05$). Fathers' education did influence the awareness regarding vaccination, but less than that of mothers' as the difference was not statistically significant.

Table 3: Parental attitude towards new vaccines.

Expressed attitude	n (%), (n = 550)
Source of information regarding newer vaccines	
Doctor	55 (302)
Pamphlets at hospitals	11 (60)
Relatives / friends	13 (72)
Newspaper	5 (28)
Television	2 (11)
Internet	14 (77)
Are vaccines given in private hospitals are superior compared to those given in government hospitals?	
Yes	54 (297)
No	16 (88)
Don't know	30 (165)
Most important factor for the selection of a vaccine	
Doctor's counselling	52 (289)
Cost of the vaccine	5 (27)
Advertisement	3 (15)
Knowledge regarding the vaccine	40 (219)
Are the vaccines cost effective	
Yes	65 (358)
No	35 (192)
Should these vaccines be included in government schedule?	
Yes	58 (319)
No	10 (55)
not sure	32 (176)

Relationship of parental age and knowledge of immunization

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 higher level of knowledge regarding vaccines when compared to the 25-35 year age group parents. Parents younger than 25 years had the least awareness among all the groups. The difference between the three groups is statistically significant with a $p < 0.05$.

Relationship of birth order and knowledge of immunization

In this study, it was found that there is no difference in the level of knowledge among parents with 1 and 2 children. Parents with 3 children were found to have better knowledge ($p < 0.05$) than parents with 1 or 2 children, but as the sample is small, this result cannot be considered statistically significant.

DISCUSSION

Eighty percent of the parents were unaware that not all the vaccines are administered under the national program and there are few vaccines which are in the recommended immunization schedule and need to be taken in addition

to the routine vaccines. Similar results were seen by Inamder et al in Madhya Pradesh and Angelillo et al in Italy.^{2,3}

Among those who have heard about the vaccine, more than half were not aware of the diseases against which the vaccine confers protection. These results are similar to the studies by Mony PK et al and Mapatano MA et al where awareness regarding vaccine availability was moderate, but the knowledge regarding dosage schedule and diseases prevented was low.^{4,5} In this study, though 40% parents have heard about cervical cancer vaccine, only 15% 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.⁶

There were many misconceptions regarding vaccine efficacy and duration of protection. Respondents were noted to be not well aware of the possible side effects of vaccines, with the exception of fever (46%), redness (22%) and pain (23%). Seizures though uncommon is an important side effect which only a meagre percent of the parents (1%) are aware of. Similar results were obtained by the EKOS research associates, Inamder et al and Tang CW et al.^{2,6,7}

Thirty percent of the parents in our study have 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 parents are confident in the safety of childhood vaccines, with 65% of parents rating them as highly safe, 30% rating them as moderately safe and very few saying that they are unsafe.^{7,8}

In present study, physicians are a main source of information regarding immunization accounting to 55%. Internet (14%), pamphlets at hospital (11%) and friends (13%) were the next main source of information. Ekos research associate showed that parents rely mostly on Internet (63%) and physicians (54%).⁷ Coniglio MA et al, Angelillo et al and Inamder et al also showed that most parents sought information about vaccines from the physicians.^{2,3,9} In present study, television and newspaper which are an important media of information education and communication (IEC) are underutilised by the parents. It is heartening to note that doctors are responsible for informing a majority of respondents about immunization. This opportunity of the contact with parents should be utilized for giving health education about all the vaccines.

Fifty-four percent of the parents have misconception that paid vaccines administered in private sector are superior 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.¹⁰

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. 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 obstacle to vaccine acceptance among parents and they expressed concerns that they would be able to administer newer vaccines if they were part of the national immunization.¹¹

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' as the difference was not statistically significant. 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 (unadjusted) is significantly positive but its impact is less than that of mother's education.¹² 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.^{2,3,7,13,14} In contrast, studies by Garrido C et al and Mapatano MA et al, showed that parental education does not influence the awareness regarding vaccination.^{15,5}

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 who showed that the knowledge was significantly greater among mothers who were older at the time of child's birth.^{3,12} 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.^{5,13}

In this study, it was found that there is no difference in the level of knowledge among parents with 1 and 2 children. Parents with 3 children were found to have better knowledge ($p < 0.05$), but as the sample is small, this result cannot be considered statistically significant. This is in contrast to the study done by Zahrani JA where parents with first order children showed higher

significant total knowledge score about vaccination than those with second or more child birth order.¹³

CONCLUSION

There is limited knowledge among parents regarding newer vaccines. Also parents have many misconceptions regarding vaccine efficacy, side effects, vaccines' safety profile, age till which they can be administered. The level of knowledge directly correlated with maternal literacy and to a lesser extent with fathers' literacy and advanced age of the parent is associated with better knowledge. This study brings about the fact that the young parents have lesser knowledge about the benefit of vaccines. Hence it is prudent to target young parents and especially mothers. As brought out in the study, the doctors were the main source of information regarding vaccines, thus every opportunity of contact with the parents should be utilized by the doctors for imparting 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 must include these newer vaccines in the national immunization program in a phase wise manner.

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