

Original Research Article

Is mothers' knowledge and practice regarding childhood immunization compliant with immunization completeness?

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ABSTRACT

Background: Immunization is one of the most effective, safest and efficient public health interventions. Despite the concrete efforts of government and other health agencies, a large proportion of vulnerable infants and children in India remain unimmunized. In order to improve immunization coverage, factors such as knowledge, attitude and practices of parents/caretakers are known to contribute to success or failure of immunization program. The aim of present study is to assess the knowledge and practice of mothers with respect to immunization completeness of their child.

Methods: This is a descriptive cross sectional study involving 364 mothers attending immunization OPD in Government Medical College, Aurangabad, Maharashtra, India during month of September till December 2015.

Results: 78.5% children were completely immunized as per date. 57.97% of the study population was found to have adequate knowledge-practice scores. A significant association of immunization completeness with KP scores of mothers ($p < 0.05$) was found.

Conclusions: Future efforts are required to improve immunization rate and parents' knowledge and practice.

Keywords: Complete, Immunization, Knowledge, Partial, Practice

INTRODUCTION

Immunization has greatly reduced the burden of infectious diseases. India has the highest number (approx. 10 million) of such children in the world. National Family Health Survey (2005-2006) reports that only 43.5% of children in India received all of their primary vaccines by 12 months of age.¹ Immunization prevents illness, disability and death from vaccine-preventable diseases including diphtheria, measles, pertussis, pneumonia, polio, rotavirus diarrhoea and tetanus.² Immunization is one of the most effective, safest and efficient public health interventions. While the impact of immunization on childhood morbidity and mortality has been great, its full potential has yet to be reached.

Thousands of children still die from Vaccine-Preventable diseases (VPDs) each year.³

VPDs contribute significantly to Under five mortality. In India under five mortality is 68.8/1000.⁴ Routine immunization is one of the most cost effective public health interventions and was first introduced in India in 1978. Yet despite the concrete efforts of government and other health agencies, a large proportion of vulnerable infants and children in India remain unimmunized. In order to improve immunization coverage, factors such as knowledge, attitude and practices of parents/ caretakers are known to contribute to success or failure of immunization program.⁵

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.⁶

Zagminas et al assessed parents' knowledge on immunization and noted that most of the respondents were having a positive opinion about vaccination, although 20-40% of respondents indicated insufficient knowledge on this issue.⁷ Greater concern about the safety of vaccines was expressed by older parents, residents of towns and highly educated individuals.⁸ Most of the previous studies found a strong relationship between pediatric immunization coverage and parental knowledge and vaccination practices.^{9,10}

Therefore, the study was carried out to assess the level of knowledge and attitude of mothers of children up to 2 years of age, regarding VPDs and routine immunization and at the same time mothers can be motivated by updating their level of knowledge regarding the importance of immunization, as the mothers of under five children are very receptive to advice given by doctors and para-medical staff regarding the health of the child.

METHODS

A cross-sectional study was undertaken in the immunization OPD of Govt. medical college and hospital, Aurangabad district during the period from 1st September till end of December, 2015. Immunization OPD is functional on three days of week viz; monday, wednesday, friday. The average attendance of the centre is 25-30 children per day. The timings of the centre is 9:00 am to 1:00 pm. As children were mostly accompanied by their mothers rather than fathers so respondents were all mothers of children upto 2 years age attending OPD. Verbal informed consent was obtained after explaining the objectives of study to participants. This study did not coerce subjects to be part of the study without their consent. The method used for this study is the convenience sampling technique. This method entails recruiting all the mothers who desired to be part of this study within the study period.

Data collection and analysis

Data was collected using a standard semi structured questionnaire adopted from the World Health Organization with sections on socio-demography, knowledge and practice towards childhood immunization. Face to face exit interview method was used and responses were recorded in a pretested semi structured questionnaire.

Data was processed using the software SPSS (Version 21). Descriptive statistics were used to describe all

variables. Association between independent variables (knowledge and practice) and dependent ones (completeness of immunization) were tested using Chi-square test. Mann Whitney U test was employed for comparing KP scores. P values of <0.05 were considered statistically significant. Ethical approval for the study was obtained from Institutional Ethics Committee.

This study covers the types of vaccines administered before 2 years of age: bacille calmette guérin (BCG), oral polio vaccine (OPV), diphtheria-tetanus pertussis (DTP), hepatitis B virus (HBV), and the measles vaccine. A child was considered up to date if the following immunizations had been received by 2 years of age: one BCG dose, five polio vaccine doses (OPV), four DTP vaccine doses, three HBV vaccine doses, and two measles vaccine doses.

The immunization status of the children was classified into three groups depending on immunization completeness: completely immunized, partially immunized and unimmunized.

When a child received all immunization doses, this child was considered to have had complete immunization. If a child missed at least one immunization dose, then this child was considered to have had partial immunization. the child who haven't received any of the dose according to his age was considered as unimmunized. This was assessed by asking mothers directly and cross verifying it with the immunization cards that mothers carry to OPD. Mothers not carrying card were excluded from this study.

The immunization knowledge and practices questionnaire consisted of 20 single-choice questions from a multiple answer provided in each equation, as shown in Table 2.

Scoring of the questions was determined by giving one point (1) for each correct answer and zero (0) for wrong answers or no response (don't know). The total knowledge scores and practice scores of the parents were calculated by adding up the scores for each question in the test. The total knowledge and practice scores ranged from 0 to 20, with higher scores indicating a higher level of immunization knowledge and practices.

RESULTS

A total of 364 mothers between age group of 21 to 40 years were assessed. Among these assessed, 76 % of mothers belonged to age less than 25 years. Mean age of the respondents was 28.4 years (Table 1).

286 children were immunized with all vaccination doses (78.5%); these children were considered as having had complete immunization, but 78 (21.4%) children had one or more than one missed doses and were considered as partially immunized.

Table 1. Socio demographic profile of study population.

Variable	Frequency (n=364)	Percent (%)
Mother's age		
≤ 25 years	278	76.37
> 25 years	86	23.62
Religion		
Hindu	204	56.04
Muslim	86	23.62
Others	74	20.32
Residence		
Urban	348	95.65
Rural	16	4.39
Socioeconomic status		
I	11	3.02
II	129	35.43
III	120	32.96
IV	104	28.57
Education status		
Illiterate	15	4.12
Upto high school	258	70.87
Above high school	91	25

The result showed an average score of 12.28 (SD=2.95), with a median score of 12. According to the median split method, parents with a total score of less than 12 (median) were considered as having inadequate knowledge and practices regarding child immunization and parents with scores from 12 to 20 were considered as

having adequate knowledge and practices.¹¹ This scoring method was used to form two groups of adequate and inadequate knowledge-practice of parents. Out of the 364 parents who answered the questionnaire, 57.97% of the study population was found to have adequate knowledge-practice scores, whereas 42.03% were found to have inadequate knowledge-practice scores.

Table 2: Knowledge and practice questions (n=364).

Statement	Correct answer (%)	Incorrect answer (%)
Vaccination prevents disease.	353 (96.98)	11 (3.02)
Vaccination is for all ages.	117 (32.14)	247 (67.86)
There are different types of vaccines.	270 (74.18)	94 (25.82)
In some health situations, vaccines should not be given.	284 (78.03)	80 (21.97)
Vaccination is associated with adverse reactions.	247 (67.86)	117 (32.14)
Name routes of vaccination.	225 (61.82)	139 (38.18)
Vaccines need to be stored at particular temperatures and do not freeze.	119 (32.7)	245 (67.30)
The product should be used within 72 hours of the seal being broken.	44 (12.09)	320 (87.91)
There is a uniform immunization guideline for paediatric patients younger than two years.	204 (56.05)	160 (43.95)
Vaccination is harmful.	225 (62)	139 (38)
Are you in favour of vaccination?	360 (98.90)	4 (1.1)
Will recommend vaccination to others.	339 (93.14)	25 (6.86)
Vaccination should be initiated in the first week of age	327 (89.84)	37 (10.16)
Were you informed about vaccination?	315 (86.54)	49 (13.46)
Did you read about vaccination in the media?	70 (19.24)	294 (80.76)
Did you see a television program about vaccination?	232 (63.73)	132 (36.27)
Did you obtain information about vaccination from hospital?	220 (60.43)	144 (39.57)
Have you vaccinated all of your children?	350 (96.15)	14 (3.85)
Apart from NIS, have you given other vaccines to your children?	33 (9.06)	331 (90.94)
Have you motivated others for vaccinating their children?	342 (93.95)	22 (6.05)

Table 3: Association between immunization completeness and knowledge-practice groups.

Groups	Partial immunization (%)	Complete immunization (%)	Total	p value
Inadequate knowledge	85 (57.44)	68 (31.48)	153 (42.03)	0.001*
Adequate knowledge	63 (42.56)	148 (68.52)	211 (57.97)	
Total	148 (100)	216 (100)	364 (100)	

Chi square test, *p<0.05.

Table 2. shows the 20 statements of knowledge and practice which were also tested in a previous study elsewhere.¹²

Table 4: KP scores differences between immunization completeness groups.

Immunization completeness	Frequency (%)	Mean	Median	P value
Complete	286 (78.5)	12.24	13	0.001*
Partial	78 (21.4)	11.2	12	

Mann-Whitney U test, *p<0.05

This study found a significant association of immunization completeness with total knowledge and practice groups (p<0.05). A higher percentage of parents with adequate knowledge and practice were found for children with complete immunization than other group, as shown in Table 3.

The Mann-Whitney test was used to find differences in knowledge and practice scores between immunization completeness groups. Table 4 shows the differences in knowledge and practice scores among variable groups. Significant differences in the knowledge- practice scores were shown among immunization completeness groups.

DISCUSSION

This study evaluates mothers' knowledge and practice and determines the relationship of knowledge and practice of parents with immunization status of children <2 years. The result of this study was similar to other findings in an Italian study in which 57.8% of parents had adequate knowledge-practice (KP), supported by a study in India⁽¹⁰⁾ that found parental knowledge regarding vaccination adequate.^{10,13}

It was found that majority of children were vaccinated on the basis of their mothers' perception about benefits and associated vaccination risks. Another study showed that parents knew that immunization was required for school registration.^{14,15}

About 60% of mothers had gained knowledge about vaccinating their child from a health care provider. An increase in media use also serves to be an important cause of the increase in immunization practice and knowledge.¹⁶ In addition, it should be highlighted that a

difference in knowledge and practice scores does not imply a lack of intelligence in any of the parental groups.

Some of the reasons found for defaulting vaccination was due to lack of information about the day of vaccination in our immunization OPD, inadequate information of present vaccination status of child that led to missed/delayed immunization, leading to decreased protection against infectious diseases, increase morbidity and ultimately increased costs.¹⁷

Other reason found for inappropriate vaccination timings was improper maintenance of immunization card which shows child's vaccination status and further helps parent determine the upcoming vaccination day.^{15,17}

Majority of parents were in favour of immunization of their children and knew that vaccination would prevent infectious diseases in the future, as shown in question 1 when 96% of parents answered positively. The finding is similar to results in other studies in which more than 90% of parents favoured child vaccination.¹⁸⁻²⁰ Although most parents knew that vaccines prevent diseases, 67% did not know that vaccination was for all ages but only applied to children below school age (six years). This negative finding is inconsistent with the positive finding in another study in which more than 70% of parents knew that vaccination was for all ages without exception.¹⁸ Questions 3 showed that most parents (74%) knew that there are different vaccine types. Severe allergic reaction, prolonged seizures, prolonged systemic steroid therapy or immunodeficiency disease are the most important contraindications of immunization.²¹ The present study asked the parents about vaccine contraindications (question 4): although most parents (78%) thought that fever was the most important vaccination barrier but did not specify the degree (mild, moderate, high), fever $\geq 40.5^{\circ}\text{C}$ is a factor to be taken into account but is not a contraindication according to immunization recommendations.²¹ This finding was similar to other studies^(19,22,23) in which the majority of parents had low knowledge regarding immunization contraindication and the parents stated that fever, allergy, pregnant women and breastfeeding women are immunization contraindications.^{19,22,23} About 67% of mothers had knowledge about some adverse reactions following vaccination, they named a few as fever, swelling and redness at site of injection. 62% were able to name various route by which vaccine is administered as oral route and through injection. The majority of

parents gave incorrect answers (67% and 89%) to questions or statements related to vaccine storage and handling (Q.7 and Q.8), possibly because of the level of parent's education. Approximately 56% of parents were able to answer correctly the question related to vaccination schedules (Question 9) and identify the timing of vaccine doses routinely given to children younger than two. This is consistent with results reported in a previous study in which an immunization knowledge questionnaire administered at the children's hospital in Boston produced a mean score of 76% on questions relating to the schedule and administration of childhood vaccines.^{12,24} In question 10, 62% of parents answered correctly that vaccination is potentially harmful. It shows that most of the parents acknowledged vaccine side effects. Parents in this study seem to be more aware of vaccine risk/benefit than parents in another study in which 36.1% of parents believed that vaccines could be potentially harmful after vaccination.¹⁸ Positive finding was found in the part of practice questionnaire (Q.11, Q.12), approximately 98% of parents favoured vaccination for their children and 93% of parents recommended immunization to other parents.²⁵ That means the parents have good immunization practice and adequate information about the benefits of vaccination in the future and they have great trust in the immunization programme. This finding is similar to other findings in a study in Pakistan in which 96% of parents were in favour of vaccination for their children, but the percentage of parents (57.7%) that recommended the vaccination to others was lower than what was found in present study, and this difference could be related to the different environment and socioeconomic status prevailing in each country.¹⁸ In addition, most parents correctly answered question 13, which related to the first immunization dose in the first week of life; the highest frequency of respondents (327 mothers) had to have a good experience in immunization field and this was drawn from older children's experience or that of friends or relatives. The majority received information about vaccines from health care providers (60%). Other studies in India and Bangladesh showed that health care providers were the main sources of immunization information for mothers and other study in India found that mothers received weak information from medical staff owing to the poor communication between them.²⁶⁻²⁸ In this study, mothers are noted to have adequate immunization information but their immunization knowledge needs to be strengthened. According to question 14, 86% of respondents were informed about vaccination from one of immunization's information sources, a finding similar to another study in which most parents were informed about immunization.^{18,19} According to the parents' answers to questions 15, 16, 17, then only 19% of parents collected the information from literature by reading, while approximately 64% of respondents claimed to have acquired information from the television and 60% had obtained information from hospitals/clinics alone. The above results suggest television is the best source for immunization information

because television is freely available at home and it is more convenient for parents to watch medical programs than use the internet/ hard copies as not all parents know how to obtain information by reading. However, this result was inconsistent with other studies which consider internet as the main source of information on vaccination.^{18,29}

The question 18 in the practice questionnaire assessed and evaluated the respondents' previous practices in immunizing their elder children. The result showed that 96% of mothers had vaccinated their elder children in the same pattern as of their present child. Question 19 shows that approximately 10% of mothers had even immunized their child from vaccines other than routine vaccination schedule such as MMR, Pneumococcal vaccine. Finally, the last question i.e. 20 shows that 94% of mothers had motivated other parents to vaccinate their children.

The levels of KP among parents were positively associated with their children's immunization rate in this study. The finding of this study is consistent with other studies' findings in which knowledge regarding vaccination is correlated with immunization rates.^{30,31} In addition, the results are supported by an Italian study of mothers which showed that mothers' lack of knowledge regarding vaccination is an important reason for failure to complete the immunization schedule.¹³ Another study revealed that parents' good knowledge could not explain the low immunization rate of their children.³²

CONCLUSION

Immunization completeness is significantly associated with knowledge and practice of mothers/parents. Yet there is a need to increase awareness and knowledge about the benefits of vaccination, as well as the potential harmful consequences of incomplete immunization.

Recommendations

IEC activities should be increased in immunization clinics to improve the prevailing scenario of immunization in the country.

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