



## Review article

# Importance of immunization in children: A sweeping knowledgeable review

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## Abstract

Immunization is considered as the most cost effective and safest public health intervention to reduce childhood morbidity and mortality although its full potential is not reached yet. Many under five children die from vaccine preventable diseases (VPD's) each year. The burden of infectious diseases has been reduced primarily due to immunization. Life expectancy is also increased due to vaccination. Immunization prevents diseases like diphtheria, measles, pertussis, pneumonia, polio, rotavirus diarrhoea, rubella, tetanus and many more. The immunization can be achieved by two forms they are active immunization and passive immunization. Vaccination is the active form of immunization. Active immunization entails the introduction of a foreign pathogenic micro organism enters into the body which causes the body itself to generate immunity against the target. This immunity comes from the T-cells and B –cells with their anti-bodies. Passive immunization is where pre-synthesized elements of immune system are transferred to a person so that the does not need to produce these elements itself. Passive immunization occurs physiologically, when antibodies are transferred from mother of fetus during pregnancy to protect the fetus before and shortly after birth. Artificial passive immunization is normally administered by injection and is used if there has been a recent outbreak of a particular disease or as an emergency treatment for toxicity, as in for tetanus.

Knowledge is necessary to take any decision. Mothers' knowledge can help them to take proper decision regarding immunization of her child. Keeping these facts, we did a systematic review with the objective to assess the knowledge about immunization of under five children among mothers and to impart health education to mothers regarding childhood immunization.

**Key Words:** Effectiveness, structured teaching, immunization, mothers under five children

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## 1. Introduction

Learning is the addition of new knowledge and experience Interpreted in the light of past knowledge and experience. Teaching and learning is an integral part of nursing. Nurses have the responsibility to educate patients related to various aspects and keep themselves updated. Various teaching strategies are used to increase knowledge, such as lecturing, demonstration, discussion and self-education. These methods of self-education has an advantage over the others as the learner can educate himself at his own pace and it also stresses on rereading [1]. Immunization is the process whereby a person is made immune or resistant

to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease. Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases and is estimated to avert between 2 and 3 million deaths each year.

The American Academy of Pediatrics (AAP) and the Advisory Committee on Immunization Practices (ACIP) have made recommendations for immunization schedules. Immunizations are a very important part of the childhood [2]. Immunization is considered as the most cost effective

and safest public health intervention to reduce childhood morbidity and mortality although its full potential is not reached yet. The burden of infectious diseases has been reduced primarily due to immunization [3]

Immunization prevents diseases like diphtheria, measles, pertussis, pneumonia, polio, rotavirus diarrhoea, rubella, tetanus and many more. The under five children can be saved from deaths by immunizing them at the right age and right time and by completing the full course of immunization. Childhood immunization is an act of inducing immunity to a child by applying a vaccine that almost guarantees protection from many major diseases [3].

### Need for the Study

According to the World Health Organisation (WHO), vaccination annually averts 2 to 3 million infant deaths globally from diseases such as diphtheria, hepatitis B, measles, mumps, pertussis, polio and tetanus. And yet, one in five children, or an estimated 21.8 million infants worldwide miss out on basic vaccines [4]. An effective, evenly targeted immunization programme and its ability to reduce the burden of vaccine-preventable diseases (VPDs) will greatly contribute to achieving the Millennium Development Goal 4 (MDG4) that aims for a two-third reduction in child mortality by 2015. India has the largest number of births in the world – more than 26 million a year – and also accounts for more than 20 per cent of child mortality worldwide. Nine million immunization sessions are organized each year to target these infants. Some improvement has taken place in the past few years, the country still accounts for the largest number of children who are not immunized: 7.4 million [5].

The knowledge of mothers is an important factor for better immunization coverage. Less knowledge affects decision making regarding immunization. There is a need to strengthen Information Education and Communication (IEC) activities to improve knowledge regarding immunization among population. The role of media in the form of advertisements in radio and television and involving famous film personalities and politicians to encourage people for immunization activities is the need of the hour. Motivation of health workers is necessary to disseminate information regarding immunization [5]. All vaccines under the routine immunization programme are provided free-of-charge. However, the figures for the coverage of routine immunization (RI) are lagging. The current level of coverage of „a fully-immunized“ child under the national immunization programme is quite low, as pointed out by several studies [5].

The mother plays a major role in promoting the health of children. Several misconception, ignorance and inadequacy of knowledge in relation to optional vaccine is prevalent among mothers especially under five children. Mothers' awareness and knowledge of under five years children regarding immunization. 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 & para-medical staff regarding the health of the child.

### Literature related to the immunization

A cross sectional study was conducted on National Immunization survey (NIS) which was designed to measure vaccination coverage estimates for the 10 states of United State. The NIS includes a random-digit-dialed telephone survey and a provider record check study. Data are weighted to account for the sample design and to reduce non response and non coverage biases in order to improve vaccination coverage estimates. The survey reports communicated that 92% of the children in 10 state of United State has been covered by vaccination and prevented from all vaccine preventable diseases [6].

An exploratory study was conducted to assess immunization coverage among 500 mothers of children under the age of 5 years belonging to a low income group. All were attending the paediatrics outpatient department of a large teaching hospital in New Delhi, India. Only 25% were found to have received complete primary immunization as per the National Immunization schedule (bacilli calmette – Guerin at birth, 3 doses of diphtheria, pertussis and tetanus and oral poliovirus vaccine at 6, 10 and 14 weeks and measles at 9 months). The major reasons for non-immunization of the children were migration to a native village (26.4%), domestic problems (9.6%). The immunization centre was located too far from their home (9.6%) and for child was unwell when the vaccination was due (9%). The lack of awareness and fear of side effects constituted a small minority of reasons for non-immunization [7].

A comparative study was conducted to estimate the vaccination coverage level of children's living in rural and urban areas to identify statistically significant differences. Children's aged between 19-35 months residing in Kolar District of Bangalore participating on the 2008 National Immunization Survey were included in the study. Statistically significant differences in vaccination coverage levels between the rural population and their urban counterparts were determined for individual vaccines and vaccine series as evidenced by 28% of the children were covered by immunization residing in rural areas whereas 46% were covered in Urban area. The study recommended that health care personnel need to execute the awareness among the needy population of the Koral District (8). A cross-sectional study was conducted to determine the coverage of the expanded programme of Immunization (EPI) of the ministry of Health and the coverage of private vaccines in Yelahanka Health District in order to establish approaches for improving vaccination services. Thirty streets were selected at random from each health care region, utilization of vaccination services and vaccination status of children under the age of 5 years were determined by face to face interviews. The findings of the study was as follows: Hepatitis B third dose, 84.6%; BCG, 94.8%; DPT third dose, 90.1%; Oral polio virus (OPV) third dose, 90.0%; Measles, mumps, rubella (MMR), 13.3%;, The full

vaccination rates for children under 5 years were 68.3% [9].

A comparative study was conducted between two slums in Tamil Nadu to evaluate the reason being not immunized in the two slums. The study revealed that group A was 69.7% immunized and group B was 79.8% immunized. The conclusion of the study was that there is no adequate information to the crowd about immunization [10].

A cross-sectional study was conducted to assess the knowledge about immunization among six hundred and eighty-two caretakers accompanying children under 5 years in Pulse polio immunization centres in East Delhi. The data was collected by using Pre-tested semi-open-ended questionnaire. The collected data was analyzed by using Proportions, Chi-square test. The study results shows that the proportions of respondents who had awareness about different aspects of immunization, such as weekday of immunization (37.0%), age group for immunization (49.1%), number of visits required in the first year of life (27.0%) were all low. When asked to name the four diseases covered under the immunization programme in Delhi, only 268 (39.3%) could name at least three. The study concluded that the need of the hour is to make Immunization a 'felt need' of the community. Making caretakers more aware about immunization is a vital step in achieving the health goal of the country [11]

### **Literature related to knowledge regarding immunization among mother**

A logistic study was conducted to find out: (a) the immunization status of children admitted to a paediatric ward of tertiary-care hospital in Delhi, India and (b) reasons for partial immunization and non-immunization. Parents of 325 consecutively-admitted children aged 12-60 months were interviewed using a semi-structured questionnaire. A child who had missed any of the vaccines given under the national immunization programme till one year of age was classified as partially-immunized while those who had not received any vaccine up to 12 months of age or received only pulse polio vaccine were classified as non-immunized. Reasons for partial/non-immunization were recorded using open-ended questions. Of the 325 children (148 males, 177 females), 58 (17.84%) were completely immunized, 156 (48%) were partially immunized, and 111 (34.15%) were non-immunized. Mothers were the primary respondents in 84% of the cases the most common reasons for partial or non-immunization were inadequate knowledge about immunization or belief that vaccine has side-effects, lack of faith in immunization. The immunization status needs to be improved by educating mothers and caregivers regarding immunizations [7].

A health survey regarding immunization status among one hundred and thirty mothers in the age group (15-44) years and 142 children aged (12-59) months were selected in Wardha district. Out of this 100 mothers and 122 children could be contacted for evaluation of immunization coverage and assessing maternal knowledge and practices

regarding immunization 52.5% children were fully immunized and 45.1% were partially immunized. Vaccine coverage for B.C.G. and primary doses of DPT/OPV was 95.9% and above 85% respectively. It was 57.4% for measles and 63.04% for booster dose was 36.96%. Mothers had a knowledge regarding need for immunization but a poor knowledge regarding the diseases prevented and doses of the vaccines. The study recommended that mothers need to improve their knowledge regarding immunization thereby preventing disease which can be prevented by vaccine [12]

A case control study was conducted to assess the level of knowledge among 800 parents in Tumkur, regarding support for immunization registries laws, authorizing registries and mandating provider reporting and financial worth and responsibility of registry development and implementation methods. Surveys administered to the parents, asked about views on registries and perceived utility and safety of vaccines. The findings shows that surveys were completed by 56.1% of respondents, fewer than 10% of parents were aware of immunization registries on their communities. The study recommended that health care personnel need to create awareness regarding importance of immunization registries laws to improve the health indices of the state thereby can take the intervention to improve child mortality and morbidity rate [13]

A study was conducted in 2009 in northern California with the objective of mother's poor knowledge about immunization. 50 women were taken as samples. Teaching and counselling were taken up as a part of evaluation of their knowledge. The study revealed many barriers which inhibits the knowledge of the mother so to improve it the mothers were given the checklist of immunization for children [14]

A community based study was conducted to evaluate the factors affecting the immunization coverage of children in Assam, India, in the first year of life of the children. About 62.2% of the children were fully immunized. Lack of information among the parents was one of the major causes of drop out of vaccinations. The children from urban areas and mother's education level showed significant role in immunization coverage. Improvement in female literacy coupled with the reduction in the dropout rate would add to achieve a higher target of immunization among children in the study area [15].

A cross sectional study on immunization in the town of Pilani was conducted and a total of 166 mothers were interviewed using a pre-tested interview schedule/questionnaire on Knowledge. The results showed that among the 12-24 month old children 50% fully, 31.3% partially and 18.7% not at all immunized. Many mothers (87%) were aware of the importance of vaccination in general; specific information about importance of completing the schedule and knowledge about vaccine preventable diseases other than poliomyelitis was very limited. Obstacles, misconceptions/beliefs among the mothers of partially

immunized children and lack of information among not at all immunized group were the main reasons of non-immunization. The implications of the study are to enhance the maternal knowledge about the vaccine preventable diseases and importance of completing the immunization schedule through interpersonal mode and to overcome obstacles to immunization such as accessibility and lack of family support [16].

A case control study was conducted to assess Immunization coverage and the knowledge and practice among one hundred and thirty mothers in the age group (15-44) years and 142 children aged (12-59) months which were selected by cluster sampling method from nine villages in Wardha district. Out of this 100 mothers and 122 children could be contacted for evaluation of immunization coverage and assessing maternal knowledge and practice regarding immunization. 52.5% children were fully immunized and 45.1% were partially immunized. Vaccine coverage for B.C.G. and primary doses of DPT/OPV was 95.9% and above 85% respectively. It was 57.4% for measles and 63.04% for booster dose of DPT/OPV. Drop-out rate from second to third dose of DPT/OPV was 5.3% and from third to booster dose was 36.96%. Mothers had a fair knowledge regarding need for immunization but a poor knowledge regarding the diseases prevented and doses of the vaccines. Commonest side reactions reported were fever (36%) and pain at injection site (33%). Contraindications listed by mothers were mild cold (41%), mild fever (24%) or loose stools (14%). Health workers were the major source of information and 76% knew the use and maintenance of immunization cards [17].

Immunization is one of the most effective, safest and efficient Public Health Interventions for the prevention from several diseases among under five children. While the impact of Immunization on childhood morbidity and mortality has been great, its full potential has yet to be reached. India has the highest number of morbidity and mortality rate among under five. This article presents the systematic collection of data and analysis presents the actual picture of status of knowledge of immunization among mothers of under five. Objectives of study are as followed, to assess knowledge regarding immunization among mothers of under-five and prepare health education programme regarding immunization. Methodology: For this study Research approach is quantitative, Research Design non experimental survey method, target population is mothers of under-five, settings is town Kunderki, district Moradabad, Data Source sample size fits for the study was 30 mothers, sampling technique was convenient sampling methods. Results: Knowledge Score categorized in 3 categories (good, average and poor). Good knowledge score is 10%. Average knowledge score is 23.34%. Poor knowledge score is 66.66%. Most of the mothers of under-five having poor knowledge score, that's why researcher felt to take the problem for survey [18] (Table 1).

Table 1 Allotment of score and frequency for assessment of knowledge mothers of under five children

S N	Description	Max. Score	Good	Average	Poor
1	Knowledge score	20	15-20	10-14	Below 10
2	Frequency	20	3	7	20

Immunization has saved the lives of more children than any other medical intervention in the last 50 years. Vaccines are safe, simple and one of the most cost-effective ways to save and improve the lives of children. The present study was taken up to evaluate the knowledge and attitude among mothers of under five, pertaining to immunization coverage. Results of the study revealed that, majority, 289 (96.33%) mothers knew that BCG vaccine prevents Tuberculosis. Only 26(8.66%) mothers were knowledgeable about the measures that can be done if the child has not given DPT. 11 (3.66%) mothers knew that chicken pox can be prevented by varicella vaccine. The study concluded that even though the mothers had good attitude regarding vaccines, but they were unaware of Hib vaccine and rotavirus vaccine [19].

The knowledge of mother's is an important factor for better immunization coverage. Less knowledge affects decision making regarding immunization. A Cross sectional study was done among mothers of under five children attending the OPD of pediatrics in a tertiary care hospital in Kollam, Kerala from 1st to 30th May, 2014. The sample size was 210 and simple random sampling was used. Statistical analysis was done and chi-square test & percentages were calculated. Result: 93.8% of mothers knew that vaccines are beneficial for their child. 58% were aware about the side effects of few vaccines. 50% of mothers believed that as polio is eradicated from India, there is no need to give polio vaccine. 35% of mothers acquired knowledge regarding immunization through health workers. All of them had knowledge about polio vaccine but only half of them knew about rotavirus vaccine. 60% mothers believed that multiple vaccines are beneficial although 26% hold their view that it has no benefit at all. 39.5% of mother's had adequate knowledge about immunization. It was positively associated with education, working class and high socio-economic status of mothers. Conclusion: There are several loopholes in the mother's knowledge regarding immunization. Many of them had no knowledge about optional vaccines. There is a need to improve knowledge regarding immunization among general population. Adequate information about completing the schedule and correct knowledge about optional vaccines should be given to mothers [20].

### Literature related to effectiveness of structure teaching programme

A pre-experimental study was conducted in The Children's Hospital at Saint Peter's University Hospital, New Brunswick, NJ, USA, 2008, for the implementation of

pertussis immunization program among the employees of the hospital with a 3 phase publicity and educational model and 3 phase vaccination delivery approach. As the infection transmission rate was high from patients to employee implementation of pertussis vaccine came into action. After the teaching program every employee in the hospital was immunized which reduced one third of the cases has reported annually in hospital [21]. An evaluative study was conducted in Udupi District, Karnataka to determine the knowledge of mothers on immunization of children and to the effectiveness of structured teaching programme (STP) in selected pediatric wards. One group pre test post test design and non probability convenience sampling was used. Data were collected from 50 samples by structured knowledge questionnaire and STP was administered. Data were analyzed by descriptive and inferential statistics. The  $t$  – test showed that post test knowledge means score (29.74%) were significantly higher than that of pre – test mean score. (16.16%)  $t_{(49)} = 27.77$   $p < 0.01$ . This indicated that the STP was effective in improving the knowledge level of mothers regarding immunization. Majority of the mothers (87.7%) strongly agreed that STP was highly effective to a great extent [22]. A study was conducted to assess effectiveness of planned teaching programme on immunization among mothers of underfive children staff in selected hospital of Udupi. The sample consisted of 35 mothers. Study has conducted in two phases. In the first phase learning needs were identified and in the second phase, planned teaching programme was developed based on identified learning needs. To evaluate the planned teaching programme one group pre-test and post-test design was used. The findings revealed that the post-test knowledge score (26.53%) was higher than the pre-test knowledge score (13.5%). Therefore, planned teaching programme was found to be an effective media for educating mothers regarding importance of immunization [23] (Table 2).

Table 2: Socio-demographic characters of the study population (N=210)

Particulars	Frequency (%)
Age group (years)	
≤ 25	94(44.8)
26-30	73(34.8)
31-35	31(14.8)
≥ 36	12(5.7)
Total	210
Religion	
Hindu	81(38.6)
Muslim	111(52.9)
Christian	18(8.6)
Type of family	
Nuclear	112(53.3)
Joint	98(46.7)
Education	
≥ 12 <sup>th</sup> Std	101(48.1)
< 12 <sup>th</sup> Std	109(51.9)

Particulars	Frequency (%)
Employment status of mothers	
Housewife	132(62.9)
Working	78(37.1)
Socioeconomic status	
class I	115(54.8)
class II	31(14.8)
class III	20(9.5)
class IV	27(12.9)
class V	17(8.1)
Decision maker regarding immunization	
Mother	86(40.1)
Father	7(3.3)
Both	117(55.8)

An evaluative study was conducted among 50 mothers of underfive children in selected pediatric hospital, Pondicherry. The aim of the study was to evaluate the effectiveness of structured teaching programme (STP) regarding immunization. A closed ended questionnaire with 30 items related to immunization was used to collect the data followed by intervention of STP. The study finding shows that the post-test knowledge score (22.73) was higher than the pre-test knowledge score (12.78). The study claimed that STP is effective to enhance mother's mother knowledge regarding the importance of immunization. The study recommended that nursing personnel should continue in health teaching approach especially to the health problems which can be prevented [24].

Kadam,A.(2014) found that Structured education programme was highly effective to improve the knowledge score and to improve the attitude score of subjects/ caregiver towards colostomy care of patient [25]. Anjum,S.(2014)conducted study to assess knowledge of contraceptives methods and appraisal of health education among married women and concluded After the health education married women knowledge was improved to 100% about female sterilization followed by condom 99%, skin implants 86%, oral pills 85% and emergency contraceptives 85%.Sociodemographic variable were significantly associated with existing knowledge and level of married women specially age at marriage, age at first child, occupation,, income ,education [26] [27]. Babu, R. L. (2014) the findings of the study concluded that care takers had inadequate knowledge regarding non-curative care of terminally ill cancer patients. The planned education programme on non-curative care of terminally ill cancer patients was highly effective in improving the knowledge of care takers regarding non-curative care of terminally ill cancer patients [28]. Shinde,M.(2014) concluded that demonstration regarding feeding of hemiplegic patient among caregivers was effective in increasing the skill of the caregivers regarding feeding of hemiplegic patient [29].

Deshmukh, M., & Shinde, M. (2014). Concluded that the structured education was effective on knowledge and

practice of staff nurses regarding venous access device care (30). Bhudhagaonkar, J., & Shinde, M. (2014). Concluded that Structured Education Regarding Menstrual Hygiene Practices was effective among Adolescent Girls [31].

## Discussion

40% of the mothers in our study told us that they are themselves the decision maker in family regarding immunization of their child. A study done in Kashmir showed that 66% of decisions regarding immunization of children were taken by mother's themselves [32].

**Knowledge of mothers regarding immunization:** 93.8% of mothers knew that vaccines are beneficial for their child. Similar results were reported in studies done in different parts of the world [33].

Usually administration of vaccines may be associated with some side effects like pain, swelling as well as redness at the injection site [34]. 58% of our study population was aware about the side effects of few vaccines. Nearly half of mothers had incorrect information that there is no need to give polio vaccine.

**Source of Knowledge:** Majority of mothers acquired knowledge regarding immunization through health workers. Singh et al also find out in their study that major source of information were health workers [35].

**Knowledge of mothers regarding individual Vaccines/VPD's:** 87.6% knew about BCG and they also knew that it protects from Tuberculosis. The knowledge regarding diphtheria, pertussis, and tetanus was 71.9%, 72.9% and 91.9% respectively. 84.8% knew about measles vaccine. A study done in rural West Bengal showed that 62% named polio, 61% measles, 53% TB but very few named diphtheria, whooping cough and tetanus [36].

Regarding polio vaccine 100% mothers had knowledge about it. Nearly 94% had knowledge about Hepatitis B. A study done by Kapoor and Vyas found that 85% of mothers had knowledge about polio although only 15% knew about Hepatitis B. [37]. Only three fourth of mothers knew about varicella and two thirds were aware of typhoid vaccine.

**Knowledge of mothers regarding combined/multiple Vaccines:** 60% mothers believed that multiple vaccines are beneficial although 26% hold their view that it has no benefit at all.

There is a need for policy makers to make people understand that combined vaccines are safe and equally effective than individual ones [38]. 8% of mothers labeled combined vaccines to be harmful for their child. A study showed a quarter of parents believed that their child's immunity becomes weak as a result of too many vaccines given simultaneously [39].

**Knowledge level of mothers:** 39.5% mothers had adequate level of knowledge regarding immunization. A study done in Mangalore showed that 30% of mothers had poor knowledge while 44% had average knowledge regarding immunization [40].

Knowledge level was positively associated with education, working class of mother and high socio-economic status. Higher educational level helps the parents to understand the important educational messages well and they have better chances to understand about immunization [41].

## Conclusion

The present study focuses on knowledge of immunization among mothers of under five children. A better understanding of various issues associated with immunization among mothers is a big challenge for doctors and health workers. There are several gaps in the mother's knowledge regarding availability of vaccines for specific diseases especially optional vaccines. Some of them had no knowledge about the diseases for which their child is immunized. Majority of mothers have no knowledge about rotavirus vaccination. Half of the mothers are not ready to give polio vaccination since it eradicated. There was a significant association between adequate knowledge level of mothers regarding immunization level and the high educational status, working status of mothers and high socioeconomic status of mothers.

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