Original Article

Factors affecting parent's awareness regarding paediatric immunization: A cross sectional study

Ms. Sakshi Satish Rane[1], *Dr. Abhijeet Asaram Shinde*[2], *Prof. Dr. Sunil Natha Mhaske*[3]

[1]*Final Year MBBS Student,* [2]*Assistant Professor, Department of Paediatrics,* [3]*Dean & Professor Paediatrics, DVVPFs Medical College & Hospital, Ahmednagar-414111, Maharashtra, India*

Abstract:

Introduction: The Indian government launched the Mission Indradhanush (MI) campaign in 2015 to raise full immunisation coverage to 90% by 2020 in the districts with the lowest performance levels. The available research supports vaccination as a financially advantageous strategy for diseases that can be prevented by vaccines. Compliance with childhood immunisation laws is affected by a number of factors, including parental immunisation knowledge and practises. With this study, we aim to assess the factors influencing childhood vaccination uptake among in Maharashtra. **Methodology:** This is a cross-sectional study design. Immunization knowledge and practices among 386 parents who visited the pediatrics OPD of a tertiary care medical college hospital were evaluated through validated, pre-structured questionnaire. The parents having children born between 1st January 2019 and 31st June 2022 were included in this study. **Results:** The knowledge-practice scores of the study participants and respondents are adequate in 72.1 percent of cases. Knowledge-practice groups showed significant relationships ($p< 0.05$) with birthplace, parents' gender, family income, mother's education level, father's education level, mother's age at delivery, and the number of pre-schoolers. **Conclusion:** It is necessary to increase parents' knowledge of and adherence to immunisation practises through vaccination campaigns and awareness. The study's findings support suggestions for using educational activities to advance immunisation understanding and practise.

Key words: Paediatric immunization, Mission Indradhanush, Knowledge and practice

Introduction:

With a goal of immunising approximately 27 million kids annually, the Indian Universal Immunisation Programme (UIP) is the largest public health project of its kind. The UIP currently offers free vaccinations against tuberculosis (BCG), poliomyelitis (OPV and IPV), diphtheria, pertussis, tetanus, Hepatitis B (pentavalent), measles-rubella (MR), rotavirus diarrhoea, Japanese encephalitis (in endemic districts), and pneumococcal diseases (in some Indian states).[1] Following a decade-long strengthening of polio immunisation efforts, India received its certification as polio-free in 2014.[2]

The Indian government launched the Mission Indradhanush (MI) campaign in 2015 to raise full immunisation coverage (children aged 12-23 months receiving one dose each of the BCG and measles vaccines and three doses of pentavalent and OPV) to 90% by 2020 in the districts with the lowest performance levels.[3] However, the recently completed National Family Health Survey (NFHS-4, 2015-16) reports increased immunisation coverage for all Indian states with the exception of Haryana, Himachal Pradesh, Uttarakhand, Maharashtra, and Tamil Nadu, which calls for further investigation.[4] Administrative reports suggested improved full immunisation coverage after the first two phases of MI.

India has made significant strides in lowering under-five mortality rates, which have decreased by 38% over the last 20 years.[5] The available research supports vaccination as a financially advantageous strategy for diseases that can be prevented by vaccines. Disparities still remain amongst various populations in India notwithstanding the achievement of the universal immunisation programme.

Corresponding Author: *Ms. Sakshi Satish Rane*

Email ID: *sakshi9rane@gmail.com*

Address: *2/B, 501, Dahisar Shivdutta CHS, C.S. Complex Road no 2, Dahisar (East), Mumbai-400068, Maharashtra, India.*

ISSN No. *: (p) 2348-523X, (o) 2454-1982*

DOI: 10.46858/vimshsj.9402

Date of Published : *30th January 2023*

In comparison to the general population, vaccination uptake is poor among the migrant and slum populations. The effectiveness of immunisation coverage is the primary factor influencing the efficiency of the urban health system, according to numerous research on immigration.[6]

Only 60% of urban Indian children who live in slums are immunised against six VPDs. Over one-third of the urban population does not receive immunisation services. Because of the high population density and ongoing influx of migrant population, outbreaks of VPDs are more frequent in urban slums.[7]

Compliance with childhood immunisation laws is affected by a number of factors, including parental immunisation knowledge and practises. These variables include the parents' level of education, the mother's race, her age of delivery, the number of preschoolers, the child's order, and the family's income. Additionally, vaccination providers have an impact on parents' knowledge, habits, and choices towards immunising their kids.[8-10]

The most significant element affecting parents' understanding of and practises surrounding immunisation is their degree of education. The majority of information on the risks and advantages of vaccinations is based on the parents' educational background. Parents' concerns and misgivings about vaccination will be reduced if they receive accurate information regarding immunisation. Previous research revealed that mothers' knowledge was substantially correlated with their educational attainment, but other studies found no association between parents' educational attainment and their immunisation knowledge, attitudes, or practises (KAP).[11,12]

Even though Maharashtra lacks comparable data, a recent analysis of studies from other parts of India reveals that full immunisation coverage among kids in underprivileged families ranges significantly from 31 to 89%.[13]

Aiming to address the hurdles to vaccination uptake in such situations, timely and region-specific estimations of regular immunisation coverage among children from disadvantaged areas might help uncover potential disparities in service delivery or uptake.[14]

With this study, we aim to assess the factors influencing childhood vaccination uptake among in Maharashtra.

Methodology:

This was a cross-sectional study conducted after the ethical clearance was obtained from the institutional ethics committee to determine parents' knowledge about pediatric immunization. It included the parents that attended the pediatric OPD of a tertiary care hospital and medical college in western Maharashtra and they were interviewed by researchers for one time only.

The parents having children born between 1st January 2019 and 31st June 2022 were included in this study to ensure completeness of immunization histories. Informed consent was obtained from parents of all children enrolled in the study. The study excluded parents who refused to give consent for participation.

Simple convenience non-probability sampling technique was used and data was collected by means of a self-designed, pre-structured online questionnaire. Sample size was calculated using the formula N=z2 pq/d2 where, p=prevalence, q=p-1, N=sample size, z=1.96 at 95% confidence interval (CI), d=maximum tolerable error. Estimated sample size was 386.

The questionnaire consist of 20 questions which are divided in three parts: The first part of the questionnaire included demographic details of parents. It included father's education, mother's education, mother's age at delivery, number of preschool children, medical family history, family income, and the person who answered the questionnaire (father or mother).

The second part of the questionnaire included the number of immunization providers, provider types, and birth place. Many children completed their immunization within the same health institution, i.e. one provider, but some children received immunizations from many health institutions, considered as more than one provider.

The third and last part related to immunization knowledge and practice parents and the questionnaire was adapted from a previous study. Both the domains of knowledge and practices had 10 items each in their domains, single-choice questions from a multiple answers provided in each equation.

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. 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. This scoring method and categorization were used to identify the degree of parental immunization knowledge and practices in the current study.

The data were analyzed using SPSS version 17.0 and a P-value of <0.05 was considered statistically significant. The Chi-square test was used to measure associations between nominal variables, and medians were calculated for continuous variables.

Results:

A total of 386 parents were recruited in this study, the knowledge-practice scores ranged from 0 to 20 and the result showed an average of 14.02 (SD=2.45), with a median score of 14.

Using the categorization of the knowledge-practice scores explained in the median split method, we formed two groups of adequate and inadequate knowledge-practice of parents respectively.

Table 1: Frequency in percentage terms of the two groups.

Scale	Median	Frequency (%)	
		Inadequate	Adequate
KP	14	107.7 (27.9)	278.3 (72.1)

Out of the 386 parents who answered the questionnaire, 72.1% of the study population was found to have adequate knowledge-practice scores.

Table 2: Frequency of correct and incorrect answers.

Statements	Frequency			
	Correct answer	%	Incorrect answer	%
1. Vaccination prevents disease.	302	78.2	84	21.76
2. Vaccination is for all ages.	164	42.5	222	57.51
3. There are different types of vaccines	281	72.8	105	27.20
4. Active immunization is a killed or weakened form of a disease-causing agent.	159	41.2	227	58.81
5. Passive immunization is an antibody from someone who was infected with the disease.	87	22.5	299	77.46
6. In some health situations, vaccines should not be given.	311	80.6	75	19.43
7. Vaccines need to be stored at more than 8 degrees Celsius and do not freeze.	197	51.0	189	48.96
8. The product should be used within 72 hours of the seal being broken.	236	61.1	150	38.86
9. There is a uniform immunization guideline for paediatric patients younger than two years.	287	74.4	99	25.65
10. Vaccination is harmful.	254	65.8	132	34.20
11. Are you in favour of vaccination?	298	77.2	88	22.80
12. Will recommend vaccination to others.	246	63.7	140	36.27
13. Vaccination should be initiated in the first week of age.	199	51.6	187	48.45
14. Were you informed about vaccination?	349	90.4	37	9.59
15. Did you read about vaccination in the media?	378	97.9	8	2.07
16. Did you see a television programme about vaccination?	334	86.5	52	13.47
17. Did you hear about vaccination on the radio?	341	88.3	45	11.66
18. Did you read about vaccination on the internet?	359	93.0	27	6.99
19. Did you obtain information about vaccination from an antenatal clinic?	268	69.4	118	30.57
20. Did you obtain information about vaccination from a maternity hospital or home?	299	77.5	87	22.54

The lowest correct answer was apparent in the question no 5 related to passive immunization (22.5%). The highest correct answer was apparent in the statement related to hearing about vaccines in media. (97.9%), question no 15.

Table 3: Relation of KP scores with familial data

Familial data	Knowledge-practice (%)				Total (%)
	Inadequate KP	%	Adequate KP	%	
Father's education					
<13 yr	21	5.4	5	1.3	26 (6.7)
13-18 yr	41	10.6	31	8.0	72 (18.7)
>18 yr	90	23.3	198	51.3	288 (74.6)
Mother's education					
<13 yr	12	3.1	32	8.3	44 (11.4)
13-18 yr	46	11.9	40	10.4	86 (22.3)
>18 yr	72	18.7	184	47.7	256 (66.3)
Mother's age at delivery					
=19	121	31.3	53	13.7	174 (45.1)
20-29	66	17.1	83	21.5	149 (38.6)
>29	8	2.1	55	14.2	63 (16.3)

Significant associations of knowledge-practice groups with father's education level, mother's education level, mother's age at delivery, number of preschool children, questionnaire answered by parents, and family income were found ($p < 0.05$). Father's and mother's education level (>18 years) were found in a higher proportion within the parents with adequate knowledge-practice than other groups. Mother's age at delivery of 20 to 29 years had a higher percentage(21.5%) of adequate KP than other groups. Families who had two or three preschool children were found in a higher proportion within the parents with adequate and inadequate knowledge-practice than other groups.

Fathers were represented more often within adequate knowledge-practice, whereas mothers were represented more often within inadequate knowledge-practice.

Significant associations of knowledge-practice groups with provider types were found ($p < 0.05$). Children immunized in the public health system were the highest proportion among the parents with both adequate and inadequate KP. No significant associations of KP groups with numbers of immunization providers were found. Significant Associations of knowledge-practice groups with birth place groups were found ($p < 0.05$). Parents of child delivered in maternity hospital have higher proportion with adequate KP (52.5%) and inadequate KP (47.5%) than other groups.

Discussion:

By adding the knowledge score and practise score for each parent, the parental knowledge-practice (KP) scores were calculated. Roughly 72.1% of parents had appropriate KP since they received more than 12 out of a possible 20 on the KP test. This can be due to an increase in the number of television, internet, and other media providing vaccination and health information. The findings of this study corroborated those of an Italian study [15] in which more than half of participants had appropriate KAP, and they were also confirmed by an Indian investigation that found that parents' knowledge about vaccination was adequate.[16]

On the other hand, the majority of parents in various nations had poor immunisation practises or insufficient or restricted immunisation knowledge. Indian women had little knowledge of diseases that may be prevented by vaccination. 60% of Chinese mothers reported having little to no understanding of infant immunisation. ding to studies conducted in Canada and Germany, the majority of parents lamented the lack of information regarding child immunisation.[18] The lack of parental information and understanding may be a result of a number of variables, but the most crucial ones are those that are connected to the type of immunisation provider, information sources, family income, the cost of immunisations, and other barriers.

In the current study, a significant correlation between parent's gender and immunisation KP was discovered. The findings of this study were at odds with those of Wang et al. (2007), who discovered that gender had no discernible relationship to immunisation KAP levels but that males had higher KAP scores than females. The study's conclusions imply that the association and impact of gender may be related to paternal education. Fathers filled out more than 60% of the questionnaires, compared to mothers who filled out fewer than 40%.

The degree of education of moms and fathers and immunisation KP were shown to be significantly correlated. The relationship between knowledge and education levels was in line with earlier research on the assessment of vaccine knowledge. This might be the case because parents who are more educated tend to come from higher socioeconomic classes and find it simple to learn things via the media, books, and internet.

Many parents struggle with issues including low family incomes and insufficient parental education, which can negatively affect their understanding of and practises with immunisations as well as their capacity to finish their children's vaccinations. Effective communication between immunisation providers and parents may be hampered by lower family poverty. These findings demonstrate that mothers' knowledge, attitude, and behaviour are positively connected with families' monthly income, just like those of other research conducted in poor nations.[19]

Birthplace is one of the key variables influencing vaccination rates, knowledge, and practise since most kids receive their first dose of the BCG vaccine (vaccination) where they are born. Additionally, as the mother and her infant stay in the hospital for two- or three-days following delivery, the parents will get information and advice about immunisations during their first few days in the hospital. This gives them a chance to interact well with the medical personnel.

The place of birth of the child and immunisation KP were found to be significantly correlated. These findings imply that maternity hospitals provide parents with better and more adequate information and instruction regarding immunisation than do other settings. This conclusion is primarily attributable to the fact that medical staff (physicians, chemists, nurses, and others) in maternity hospitals are more knowledgeable about women's and children's health care than staff in other hospitals. Parents therefore receive focused information from the professionals of the maternity hospital.

Mother's age was correlated with parents' KP ratings. The older parents may have had better education, attended talks and used the internet as a source of information, reflected in their higher knowledge rate, and the immunisation provider may be more likely to teach older parents, considering that older parents have good cognitive capacity. This finding is supported by other studies in which younger mothers had higher KP scores.[10]

Each child's medical care will take less time as the number of children in a family grows, and health facilities will take less time to provide information on immunisations. Additionally, when the size of the family lowers, the socioeconomic standing of the family will rise. The findings are at odds with earlier research in which the KP scores rose as family size grew because larger families had better experiences with child immunisation.[20,21] The number of children or siblings in each household, as well as the size of the family, were found to significantly and negatively correlate with the immunisation rate of children, according to studies conducted in various nations. In this study, there was a strong correlation between parent's KP and the number of children.

By giving thorough information on vaccines, notably their dangers and benefits, vaccination providers can influence parents' decisions to vaccinate their children. Because of this, the immunisation providers play a significant part in raising awareness of the value of vaccination.

The correlation between immunisation KP and parents whose children had immunisations from one or more providers of immunisations was shown to be insignificant. The immunisation knowledge and practise that parents acquire from immunisation providers are unaffected by the outcomes relating to the provider number because immunisation information will be the same from one provider, two providers, or more in the same type of health institution.

In India, there are three different types of vaccination providers: general or government hospitals, private health clinics, and public health clinics. Due to their accessibility and availability, public health clinics are where the majority of youngsters receive their vaccinations. The correlation between parents' KP and vaccine providers was shown to be statistically significant. When children are immunised in private clinics as opposed to by other types of immunisation providers, the parents can receive immunisation recommendations and develop their immunisation experience more so because the private immunisation provider can spend more time communicating with the parents, the number of children visiting this type of clinic is very low due to the high cost, and the parents receive adequate, high-quality information regarding risks and benefits. [8]

Conclusion:

Public health authorities must devote a lot of attention to promoting vaccination through educational initiatives and campaigns, especially those that target those with lower levels of education. Enhancing communication between parents and the immunisation provider will involve parents in decision-making, clarify the value of immunisation compliance, and involve parents in decision-making. It is necessary to spread awareness of the advantages and significance of vaccination as well as the negative effects of incomplete immunisation. It is necessary to have a planned educational programme; when planning the programme, it is important to consider the educational background of the parents, especially for those who have less education.

Limitations: This study only targets children less than 2 years of age in one tertiary care hospital in western Maharashtra, who may not represent all Indian children. The nature of convenience sampling further limits the generalization of these findings to the entire paediatric population of India.

Conflict of interest: None.

Funding: No special funding was received for this project.

References:

1. Ministry of Health and Family Welfare, Government of India. National Immunization Schedule for Infants, Children and Pregnant Women [Internet]. 2018 [cited 2020 Feb 17]. Available from: https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/report/National_%20Immunization_Schedule.pdf.
2. Thacker N, Vashishtha VM, Thacker D. Polio Eradication in India: The Lessons Learned. Pediatrics [Internet]. 2016 [cited 2020 Aug 27]; Available from: https://pediatrics.aappublications.org/content/early/2016/08/31/peds.2016-0461.
3. Travasso C. "Mission Indradhanush" targets India's unvaccinated children.
4. Ministry of Health and Family Welfare, Government of India. Mission Indradhanush | National Health Portal Of India [Internet]. [cited 2019 Nov 19]. Available from: https://www.nhp.gov.in/mission-indradhanush1_pg.
5. Hill K, You D, Inoue M, Oestergaard MZ. Child mortality estimation: accelerated progress in reducing global child mortality, 1990–2010.
6. Geddam JB, Kommu PR, Ponna SN, Mamidi RS, Kokku SB, Dudala SR, Veerraju BB. Immunization uptake and its determinants among the internal migrant population living in nonnotified slums of Hyderabad city, India. Journal of family medicine and primary care. 2018 Jul;7(4):796.
7. Agarwal S, Bhanot A, Goindi G. Understanding and addressing childhood immunization coverage in urban slums. Indian pediatrics. 2005 Jul 17;42.
8. Al-lela OQ, Bahari MB, Al-abbassi MG, Salih MR, Basher AY. Estimation of immunization providers' activities cost, medication cost, and immunization dose errors cost in Iraq. Vaccine. 2012 Jun 6;30(26):3862-6.
9. Angelillo IF, Ricciardi G, Rossi P, Pantisano P, Langiano E, Pavia M. Mothers and vaccination: knowledge, attitudes, and behaviour in Italy. Bulletin of the World Health Organization. 1999;77(3):224.
10. Zhang X, Wang L, Zhu X, Wang K. Knowledge, attitude and practice survey on immunization service delivery in Guangxi and Gansu, China. Social science & medicine. 1999 Oct 1;49(8):1125-7.
11. Al-lela OQ, Bahari MB, Alabbassi MG, Salih M, Basher AY. PIH4 immunization status and families' factors in Iraq. Value in Health. 2012 Nov 1;15(7):A638.
12. Borràs E, Domínguez À, Fuentes M, Batalla J, Cardeñosa N, Plasencia A. Parental knowledge of paediatric vaccination. BMC Public Health. 2009 Dec;9:1-7.
13. Priya P K, Pathak VK, Giri AK. Vaccination coverage and vaccine hesitancy among vulnerable population of India. Human vaccines &immunotherapeutics. 2020 Jul 2;16(7):1502-7.
14. Francis MR. Vaccination Coverage and Factors Associated with Routine Childhood Vaccination Uptake in India: Findings from a National Survey and Household Surveys in Vellore, Southern India.
15. Angelillo IF, Ricciardi G, Rossi P, Pantisano P, Langiano E, Pavia M. Mothers and vaccination: knowledge, attitudes, and behaviour in Italy. Bulletin of the World Health Organization. 1999;77(3):224.
16. Shah B, Sharma M, Vani SN. Knowledge, attitude and practice of immunization in an urban educated population. The Indian Journal of Pediatrics. 1991 Sep;58:691-5.
17. Hariweni T, Ali M, Sofyani S, Lubis IZ. Knowledge, attitude, and practice of underfive children stimulation of working and nonworking mothers. PaediatricaIndonesiana.2004;44(2):51-4.
18. Schmitt HJ. Factors influencing vaccine uptake in Germany. Vaccine. 2001 Oct 15;20:S2-4.
19. Yawn BP, Xia Z, Edmonson L, Jacobson RM, Jacobsen SJ. Barriers to immunization in a relatively affluent community. The Journal of the American Board of Family Practice. 2000 Sep 1;13(5):325-32.
20. Roodpeyma S, Kamali Z, Babai R, Tajik Z. Mothers and vaccination: Knowledge, attitudes, and practice in Iran. Journal of Pediatric Infectious Diseases. 2007 Mar;2(01):029-34.
21. Torun SD, Bakırcı N. Vaccination coverage and reasons for non-vaccination in a district of Istanbul. BMC public health. 2006 Dec;6(1):1-8.