



# **Knowledge and Attitude about Immunization Recommended by Government of India and Indian Academy of Paediatrics among Medical Students**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

**Background:** Immunization being the most cost-effective treatment for preventing disease and extending life, is essential to know about its schedule and be aware of vaccines that are available up to date. Immunization is one of the most important strategies for protecting children from disease.

**Aim:** The aim of the study is to assess the knowledge and attitude of immunization among medical students recommended by Government of India (NIS) and Indian Academy of Paediatrics (IAP).

**Methodology:** A descriptive cross-sectional study was conducted in Saveetha Medical College and Hospital, Chennai among final year MBBS students, Medical Interns using a structured questionnaire. The study was conducted between February 2021 & April 2021.

**Results:** In a total of 259 study participants, around 78(65%) of Medical Interns and 74(52%) of final year MBBS students are aware that as per NIS, BCG vaccine in catch up can be given until 1 year of age.

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**Conclusion:** The degree of knowledge among medical students should be emphasised and various initiatives regarding the knowledge and awareness about immunization among the interns and the medical students should be introduced.

*Keywords: Immunization; knowledge; attitude; vaccination; preventive medicine.*

## 1. INTRODUCTION

Immunisation, a global success story in health and development, is responsible for saving millions of lives each year. Vaccines help develop your body's natural defences against disease by reducing your chance of getting it. Our immune system reacts to vaccination when given. Primary health care includes immunization as a critical component. Vaccines are crucial in the prevention and control of infectious disease epidemics. As a result, they are crucial to the fight against antimicrobial resistance and help ensure global health security [1].

In India, where the National Immunization Schedule (NIS) exists, child immunization is an essential component of child survival initiatives. Bacillus Calmette Guerin (BCG), Oral polio vaccine (OPV), pertussis, diphtheria, as well as tetanus toxoid (DPT), measles, Hib, and indeed the newly introduced pneumococcal conjugate vaccines (PCV 13), Pneumococcal Polysaccharide Vaccine (PPSV 23) and rotavirus vaccinations are included within the Indian NIS, which is modelled upon Universal Immunization Program (UIP) [2].

Vaccines have helped humanity overcome horrible illnesses like smallpox, polio, and have proven to be an extremely effective weapon in the battle against a variety of infectious diseases. Childhood immunization has long been a key goal for UNICEF, WHO, and the Indian government. Adult immunization has received little attention despite the access to a greater range of vaccinations for efficient disease management and speaking about child immunization, child protection is a responsibility of all health providers and a high emphasis must be given [3]. In a healthy childhood, immunization is extremely important. It is the key to ensuring a child's health and ensuring the child's future health. Parents have a primary obligation to immunize their children [4].

Globally, 155.8 million episodic bouts of pneumonia result in roughly 1.9 million fatalities, with 70% of these deaths occurring in Southern and Eastern Africa. 3,000 instances of

meningitis, 50,000 bouts of bacteraemia, 500,000 episodes of pneumonia, and eight million episodes of otitis media are believed to be caused by pneumococcal bacteria each year. So, Vaccinations against pathogens, as well as their development and administration, have been essential and effective as it plays a role in Prophylactic Measures [5].

In India, in addition to the National Immunization Schedule (NIS) recommended by the Government of India under the Universal Immunization Program (UIP), additional vaccines are recommended by the Indian Academy of Paediatrics (IAP). NIS is followed in all government institutions under Health for all and the IAP immunization schedule is being practiced in private hospitals and clinics after providing counselling regarding additional vaccines to parents. Many new vaccines are available on the market in countries like India, including expensive combination vaccines with fewer adverse effects recorded from such marketed new vaccines.

In the field of preventive medicine, vaccination is a crucial element. Although immunization has fully established itself, lost chances for vaccination remain an issue of public health. Earlier research has shown that clinician attitudes towards vaccination can affect patient decisions to accept or deny immunization directly [6,7,8].

Only a little amount of study has been done to determine medical students' knowledge and attitudes regarding immunization. This study aims to assess the knowledge and attitude of immunization among final year MBBS students and Interns about immunization schedules practiced in India.

## 2. MATERIALS AND METHODS

This research was carried out at Saveetha Medical College Hospital (SMCH), Chennai, a tertiary care teaching and research institution. This was descriptive cross-sectional research that was done utilizing a structured questionnaire among medical students (final year MBBS and

Medical Interns). The medical students and interns who participated were from different parts of India as well as non-resident Indians (NRIs) enrolled. A convenient sample size of 100 in each group was decided. At the end of the survey, 140 medical students and 119 interns participated. The data was gathered between February and April 2021.

A self-structured questionnaire, which covered knowledge and attitude regarding NIS and IAP immunization schedule was provided to medical students. The questionnaire collected the demographic details of the medical students such as age, gender, qualification, and marital status, and the knowledge and attitude questions of NIS and IAP immunization schedule. The students filled out the questionnaire voluntarily. Informed consent was obtained and the details of participants were kept confidential. Using the statistical program SPSS v23, analysis of the statistics was done with the help of chi-square and the percentages and frequencies were obtained. The study was approved by the Institutional Research Board.

### 3. RESULTS

A total of 259 medical students filled out the questionnaire: 119 were Medical Interns and 140 were medical students. The demographic details of participants are listed out in Table 1.

In the NIS knowledge questions, when questioned about the catch-up of BCG vaccine which can be given up to 1 year, around 78(65%) of Interns and 74(52%) of final year MBBS students answered correctly. When asked about the Vitamin A dosage, Only 48(34.2%) of final year MBBS students and 29(24.3%) of Medical Interns realised that the dose given was 2 Lakhs IU at 2 years of age. Similarly, when queried about the number of strains that are available in OPV currently only 27(22.2%) of interns and 43(30.7%) of final year MBBS students were familiar with the fact that 2 strains of poliovirus are currently in use. Coming to the IAP knowledge questions, around 59(49.7%) of Interns and 88(62.8%) of final year MBBS students were aware of the fact that from 9 years of age the HPV vaccine is recommended.

When questioned about the recommended doses of varicella vaccine in children and IPV in infancy and around 25(21%) of Medical Interns and 51(36.4%) of final year MBBS students responded correctly as 2 doses and 30(25.2%) and 32(28.57%) of interns and final year MBBS students answered 3 doses respectively. Students were also tested on their knowledge about tetanus vaccines and around 30(25%) of Medical Interns and 48(34%) of final year MBBS students knew that TdaP is the vaccine that is recommended in 9- 14 years as per IAP. The percentage responses of students on attitude questions have been shown in Table 2.

**Table 1. Demographic details of medical students**

Parameter	Interns (n=119)	Final year MBBS students (n=140)
Mean age in years (SD)	23.3(0.81)	21.9(0.82)
Gender		
Male n (%)	54(45)	67(48)
Female n(%)	65(55)	73(52)

**Table 2. Responses recorded in (%) on selected NIS and IAP attitude questions**

Selected NIS Attitude Questions	Interns (%)	Final year MBBS students (%)
1. Children are not given vaccines later if they miss the dose on scheduled time.		
Strongly Agree OR Agree	42	60
Neutral	5	17.1
Strongly Disagree OR Disagree	52	22.85
2. BCG lymphadenitis needs treatment with Antitubercular drugs	63.02	65.7
Strongly Agree OR Agree	13	9
Neutral	23.52	25

<b>Selected NIS Attitude Questions</b>	<b>Interns (%)</b>	<b>Final year MBBS students (%)</b>
<b>Strongly Disagree OR Disagree</b>		
<i>3. Vaccines under NIS are available free of cost only in government hospitals and immunization centers</i>		
Strongly Agree OR Agree	35	32
Neutral	34	38
<b>Strongly Disagree OR Disagree</b>	31	30
<b>Strongly Disagree OR Disagree</b>		
<i>4. I have got adequate education regarding national immunization schedule during my MBBS</i>		
Strongly Agree OR Agree	64.2	44.5
Neutral	21.4	47.05
<b>Strongly Disagree OR Disagree</b>	16.4	18.48
<b>Strongly Disagree OR Disagree</b>		
<i>5. Government of India follows the same immunization schedule for many years without adding new vaccines</i>		
Strongly Agree OR Agree	68.9	64.2
Neutral	36.1	37.1
<b>Strongly Disagree OR Disagree</b>	13.4	17.85
<b>IAP Attitude Questions</b>	<b>Interns (%)</b>	<b>Final year MBBS students (%)</b>
<b>Strongly Disagree OR Disagree</b>		
<i>1. IAP updates immunization schedule frequently and adds new vaccines</i>		
Strongly Agree OR Agree		
Neutral	35	42
<b>Strongly Disagree OR Disagree</b>	34	28.1
<b>Strongly Disagree OR Disagree</b>	31	29.9
<b>Strongly Disagree OR Disagree</b>		
<i>2. Children should not be given additional vaccines as per IAP as they are unnecessary</i>		
Strongly Agree OR Agree	21	36.3
Neutral	20.5	32.7
<b>Strongly Disagree OR Disagree</b>	58.5	31
<b>Strongly Disagree OR Disagree</b>		
<i>3. Affordability and lack of awareness are important reasons for children not getting additional vaccines recommended by IAP</i>		
Strongly Agree OR Agree	72.1	68.7
Neutral	16.3	10.3
<b>Strongly Disagree OR Disagree</b>	11.6	21
<b>Strongly Disagree OR Disagree</b>		
<i>4. I'm comfortable in answering questions related to IAP immunization schedule to parents</i>		
Strongly Agree OR Agree	55.1	57.3
Neutral	23.5	23
<b>Strongly Disagree OR Disagree</b>	21.4	19.7

With the help of chi square test, the p values that are less than 0.005 were considered significant level and p values less than 0.0001 were considered highly significant. they have been listed in Chart No: 1

#### 4. DISCUSSION

In this descriptive study among medical students and interns, we found that knowledge of final year MBBS students was better than interns. Although there are several reports on the knowledge and attitude of medical students on immunization, ours is one of the few studies

where we have analyzed the awareness of immunization schedules of NIS and IAP among medical students.

In the knowledge domain, the possible reasons for a better performance could be the inclusion of immunization in their core curriculum and recent memory from classes and reflect the influence of their clinical rotations in paediatric and internal medical rotations in their third year in Pediatrics. Similar to our study they have also had similar results and had concluded that as evidenced by the rise in knowledge levels of the medical students, vaccine guidelines and experience are

**Chart 1. Association of knowledge between final year medical students and interns**

Title	S.No		Final Years MBBS (n = 140) n (%)	Interns (n = 119) n (%)	All Responses (n = 259) n (%)	P-Value	
Selected NIS Knowledge Questions	1	According to National immunization schedule, catch up of BCG vaccine can be given up to					0.21
		1 year	74 (52.85)	78 (65.54)	152 (58.68)		
		2 years	35 (25.00)	17 (14.28)	052 (20.07)		
		4 years	10 (07.14)	04 (03.36)	014 (05.45)		
		5 years	21 (15.00)	20 (16.80)	041 (15.83)		
	2	As per the NIS, MR vaccine is given at _____ site					0.08
		Left Thigh	09 (6.42)	13 (10.92)	22 (8.49)		
		Left Upper Arm	26 (18.57)	11 (09.24)	037 (14.20)		
		Right Upper Arm	89 (63.57)	63 (52.94)	152(58.68)		
		Right Thigh	16 (11.42)	32 (26.89)	048 (18.53)		
Selected IAP Knowledge Questions	3	How many doses of live Hepatitis A vaccine is recommended in children as per IAP?					0.13
		1 dose	90 (64.28)	55 (46.20)	145 (55.98)		
		2 doses	28 (20.00)	36 (30.25)	064 (24.70)		
		4 doses	08 (05.71)	16 (13.44)	024 (9.26)		
		5 doses	14 (10.00)	12 (10.08)	026 (10.00)		
	4	As per IAP, how many doses IPV are given in infancy?					0.0001
		1 dose	58 (52.85)	30 (25.21)	88 (33.97)		
		2 doses	17 (25.00)	40 (33.61)	57 (22.00)		
		3 doses	48 (07.14)	30 (25.21)	78 (30.11)		
		4 doses	17 (15.00)	19 (15.96)	36 (13.8)		

now available in their four core education years [9]. On the contrary, Medical Interns' inability to answer several questions could be due to their short-term memory and lack of emphasis on immunization topics for Interns.

Both the interns and final year MBBS students showed a positive attitude towards vaccination which would lead to increased take-up and utilization of immunization. This conclusion is also confirmed by Shrestha et al, Laing et al [10,11]. Students who strongly agreed on their expertise to answer patient/parent vaccine concerns had a substantially superior knowledge evaluation. This study shows that it is important to provide chances for all students to practice vaccination while they are in medical college, potentially via vaccination clinics. Efforts to standardize immunization training in their curriculum for medical students are most likely to benefit from the strengthening of vaccine core competencies. The inclusion of certain learning modes and fundamental skills in vaccination can handle this issue successfully and increase students' confidence in the quality of their training and their capacity to educate patients.

Most students indicated good attitudes and supportive vaccination practices from an evaluation of immunization attitudes. In forthcoming public health initiatives, vaccination and the expertise of students, especially physicians, may play an essential role. A significant link between the knowledge and attitudes of vaccines implied that a specialization curriculum would be introduced at both the postgraduate and an undergraduate level this was implied by [12].

Finally, regarding the limitations of this study, we have collected the responses of medical students from our college only and we suggest expanding this survey to other medical colleges which would be significant as they may show different results.

## 5. CONCLUSION

This study provides an essential basis for supporting the establishment of comprehensive medical student vaccination education. Medical students see vaccine education favourably and are likely to be open to more vaccine-related education and training. Further research should extend the survey to additional people of medical schools and look at how an educational intervention may be developed to address the knowledge gaps found and to increase student trust in immunization.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Available:[https://www.who.int/health-topics/vaccines-and-immunization#tab=tab\\_1](https://www.who.int/health-topics/vaccines-and-immunization#tab=tab_1)
2. Available:<https://www.unicef.org/immunization>
3. Chaitra KM, Yashoda HT. Knowledge of vaccination among the nursing students. *Journal of Evolution of Medical and Dental Sciences*. 2014 May 19;3(20):5637-42.
4. Kaur G. An Exploratory Study to assess the Knowledge and Practices regarding Immunization among mothers of Infants attending Pediatric OPD of Bebe Nanaki Mother and Child Care Centre, Guru Nanak Dev Hospital, Amritsar. *Asian Journal of Nursing Education and Research*. 2018;8(3):379-84.
5. Conly JM, Johnston BL. Macrolide resistance in *Streptococcus pneumoniae*: Fallacy or fact?. *Canadian Journal of Infectious Diseases*. 2002 Jan 1;13(1):13-6.
6. Link-Gelles R, Chamberlain AT, Schulkin J, Ault K, Whitney E, Seib K, Omer SB. Missed opportunities: a national survey of obstetricians about attitudes on maternal and infant immunization. *Maternal and child health journal*. 2012 Dec;16(9):1743-7.
7. Wong CA, Taylor JA, Wright JA, Opel DJ, Katzenellenbogen RA. Missed opportunities for adolescent vaccination, 2006–2011. *Journal of Adolescent Health*. 2013 Oct 1;53(4):492-7.
8. Freed GL, Clark SJ, Cowan AE, Coleman MS. Primary care physician perspectives on providing adult vaccines. *Vaccine*. 2011 Feb 17;29(9):1850-4.
9. Berera D, Thompson KM. Medical Student knowledge, attitudes, and practices regarding immunization. *J Vaccines Vaccin*. 2015;6(268):2.
10. Shrestha R, Chhetri P, Bhusal CK, Ruchal R, Shrestha S, Shrestha B. Knowledge, Attitude and Practice Regarding Immunization among Medical Students. *Journal of Universal College of Medical Sciences*. 2019 Jul 2;7(1):46-50.
11. Smailbegovic MS, Laing GJ, Bedford H. Why do parents decide against immunization? The effect of health beliefs and health professionals. *Child: care, health and development*. 2003 Jul;29(4):303-11.
12. Cvjetkovic SJ, Jeremic VL, Tiosavljevic DV. Knowledge and attitudes toward vaccination: A survey of Serbian students. *Journal of infection and public health*. 2017 Sep 1;10(5):649-56.

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