

## Knowledge, attitude and perception of Phase One MBBS students about immunization in children

Shipra Agrwal<sup>1\*</sup>, Bindu T Nair<sup>2</sup>, Mugdha Anand<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Pediatrics, Army College of Medical Sciences, New Delhi, India

<sup>2</sup>Professor, Department of Pediatrics, Army College of Medical Sciences, New Delhi, India

<sup>3</sup>Assistant Professor, Department of Pediatrics, Army College of Medical Sciences, New Delhi, India

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### Abstract

**Background:** Immunization is a very important strategy for improving the health in the community. During the pre-clinical years, MBBS students receive knowledge about immunization. Besides increasing awareness, inculcating positive attitudes in medical students toward immunization would lead to their increased participation in immunization promotion programs and their implementation. We planned this study with the aim of understanding the knowledge, attitude and perception of these new medical students about immunization in children and incorporation of immunization class in foundation course. **Materials and methods:** The study was conducted in a Medical college in North India. Phase One MBBS students who were undergoing the Foundation course were included in the study after taking informed consent. They were asked to fill a pre validated questionnaire containing questions about their knowledge, attitude and perception about immunization in children. The data was analyzed by Excel 2013. The study was approved by the institutional ethical committee. **Results:** Ninety eight out of 100 students filled the questionnaire, 54% of them were females. Sixty two (63.2%) students knew about the immunizations prior to the class. The knowledge scores ranged from 0-4 with 7 (7.3%) having full score of four while only 2 (2.1%) achieved score of zero. All of them (100%) agreed that doctors have very important role in educating the parents about importance of immunization and most of them (98%) believed that educating parents will improve the vaccine coverage. Most of them also believed that it is necessary to vaccinate the children. Regarding the perception about the immunization and the inclusion of immunization class in the foundation course, all of them (100%) believed that it is important for the first year MBBS students to know the basics of immunization. Most of them believed that the immunization class in foundation course will help them understand immunization better in future classes and also felt motivated to promote immunization in the community. **Conclusion:** Newly joined Phase one MBBS students showed positive attitude and perceptions about immunization in children and inclusion of immunization class in foundation course. They had gaps in knowledge about immunization which needs to be filled during the medical curriculum.

**Keywords:** Immunization, Phase one MBBS, Universal immunization program, Perception, Foundation course

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### Introduction

Health for all remains one of the most important component of sustainable development goal and immunization is a very important preventive strategy to improve health in the community. Even after more than thirty years of universal immunization program, immunization coverage is not yet universal in our country. As per NFHS-IV, although there has been improvement in various key indicators of immunization ranging from 8% -23%, only 63.9% of children aged 12-24 months had received BCG, measles and three doses of DPT vaccines[1]. Missed opportunities for vaccination (MOV) and vaccine hesitancy has contributed to this lag[2]. WHO defines missed opportunity for vaccination as any contact with health services by a child (or adult) who is eligible for vaccination (unvaccinated, partially vaccinated or not up-to-date, and free of contraindications to vaccination), but which does not result in the individual receiving all the vaccine doses for which he or she is eligible[3].

In a recent study by Albaugh et al, 65.4% of the hospitalized children at a tertiary care hospital in India were under immunized and 98.1% of them remained under immunized at discharge as well, suggesting significance of missed opportunities. The common reasons for MOV were considering fever, pneumonia, diarrhea and acute illness related hospitalizations an absolute contraindication for vaccination; concerns

about vaccinating a child recovering from an illness which was found in 80% of the interviewed health care workers.

Other reasons were unavailability of vaccine or vaccinating staff in inpatient setting[4].

Right from the first day of entry into medical college as First professional medical students, people in the community and their own homes look up at the medical students for medical advice which includes immunization for their family members. Being healthcare workers of first contact at community level, the medical students would be able to influence the parents' decisions to vaccinate their children. Besides increasing awareness, inculcating positive attitudes in medical students toward immunization would lead to their increased participation in immunization promotion programs and their implementation.

During the pre-clinical years, MBBS students receive knowledge about immunization and they may also prescribe vaccines during their clinical postings in final professionals. A recent study from Europe identified few gaps in knowledge and behavior of medical students and junior doctors in regard to immunization[5]. Barera et al also showed that the final year students scored significantly better as compared to the first year students. Assessing the knowledge of healthcare students about immunization is important to plan educational strategies[2].

As the present MBBS students are going to be the future health care professionals, it is important to instill knowledge and motivation about immunization in them. Competency based medical education (CBME) curriculum has been incorporated since 2019 and it incorporates a 'Foundation Course' of one month duration at the beginning of phase one MBBS[6]. The Foundation Course constitutes

\*Correspondence

**Dr. Shipra Agrwal**

Assistant Professor, Department of Pediatrics, Army College of Medical Sciences, New Delhi, India

E-mail: [shiprapaeds@gmail.com](mailto:shiprapaeds@gmail.com)

modules which will sensitize the students about the medical curriculum and to assist them to acclimatize with the new professional environment[7]. ‘Immunization’ has also been included as a part of the ‘Skills Module’ of the Foundation Course. Understanding the knowledge and perception of the newly joined MBBS students about immunization in children will help us plan the teaching strategy for these students and also to understand their perception about immunization and help us setting the goals for change in behavior. We planned this study with the aim of understanding the knowledge, attitude and perception of these new medical students about immunization in children and incorporation of immunization class in foundation course. The study results can be used to make targeted interventions to increase knowledge, awareness and inculcate positive attitudes in the medical students who would become future doctors of tomorrow with responsible roles in the country’s immunization programs.

**Materials and methods**

The study was conducted after taking consent from the Dean of the college and ethical clearance from the Institutional Ethics Committee. Thirty-five hours were devoted to teaching ‘Skills Module’ which

included teaching ‘Immunization’ to the freshly admitted medical undergraduates during the one-month Foundation Course[6]. The first year MBBS students who had joined the college after a delayed admission during the COVID pandemic and were undergoing their Foundation Course were asked to fill a structured, pre-validated anonymous questionnaire. This was provided as print copies to them. The questionnaire contained 4 questions from knowledge and 5 each from attitude and perception. There were three open ended questions also. Knowledge score was calculated as number of correct answers out of four; not sure answer was given a score of zero. Data was presented as proportions, mean (SD) or median (IQR) and was analyzed using Excel 2013. Thematic analysis was done for the open ended questions.

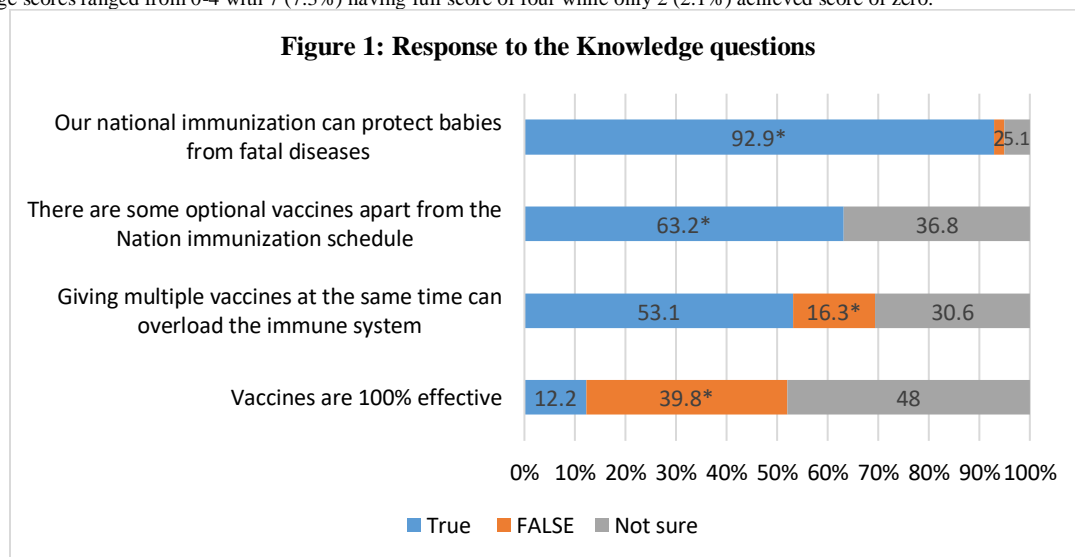
**Results**

Ninety-eight students out of which 56% were females consented to fill the questionnaire. Sixty two (63.2%) students agreed that they knew about the immunizations prior to the class. Students reported various sources of knowledge about immunization including family (36.7%), coaching classes (32.7%), digital and print media (54.1%). (Table 1)

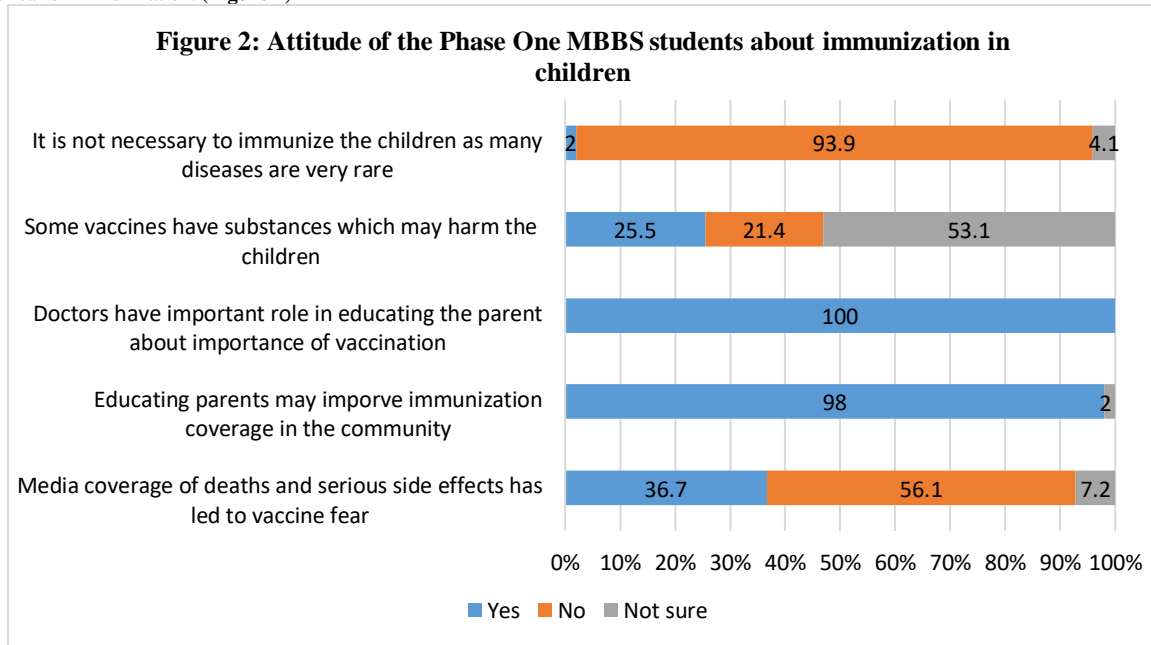
**Table 1: Demography and baseline information of the study population (N=98)**

Parameter	Value, N (%)
<b>Gender</b>	
Male	37 (36.7)
Female	61 (62.2)
<b>Age</b>	
<18 years	11 (11.2)
18-20 years	40 (40.8)
20-21 years	45 (45.9)
>21 years	2 (2.04)
<b>Did you know about vaccination prior to this class</b>	
Yes	62 (63.2)
No	18 (18.4)
Not sure	18 (18.4)
<b>Source of knowledge about vaccination (includes more than one response)</b>	
Family	36 (36.7)
Coaching classes	32 (32.7)
Digital or print media	53 (54.1)
Others	4 (4.1)

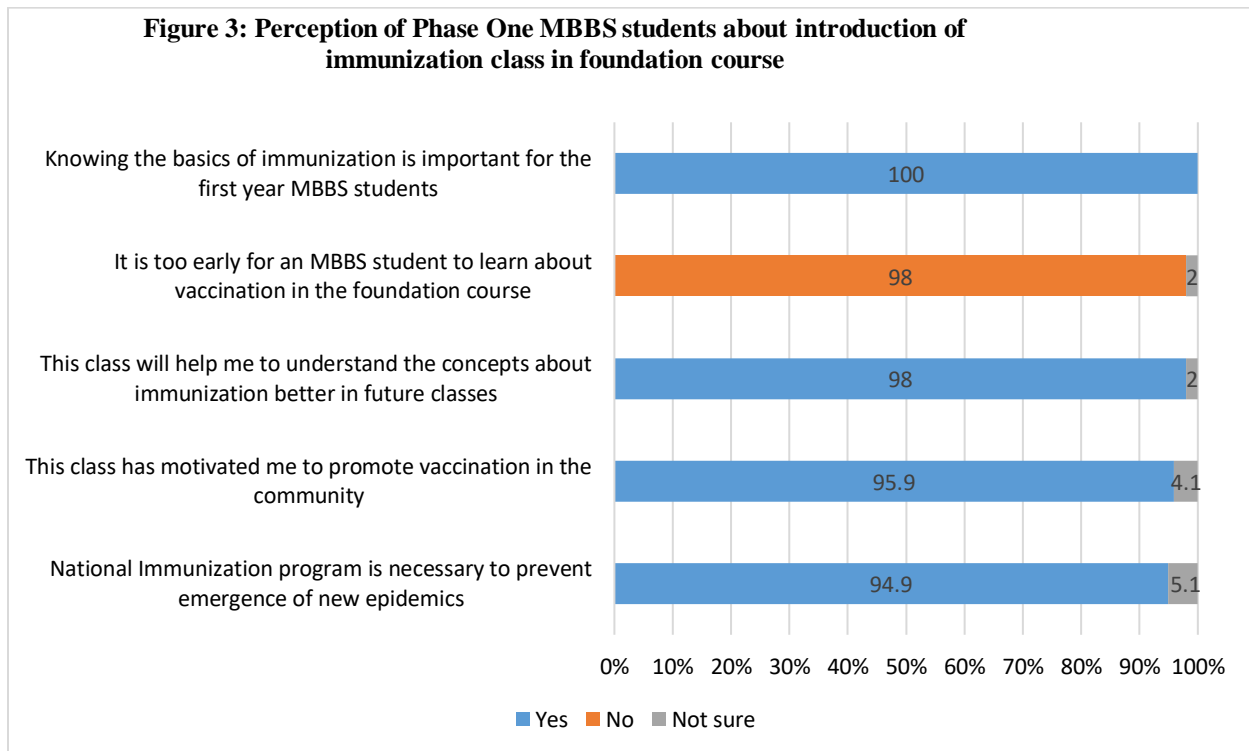
In response to the knowledge questions, 91 (92.9%) agreed that our national immunization program can protect babies from fatal infectious diseases and 62 (63.2%) knew about the optional vaccines. Fifty two (53.1%) believed that giving multiple vaccines at the same time can overload the immune system. About the efficacy of vaccines, only 12 (12.2%) believed that the vaccines are 100% effective. (Figure 1) The knowledge scores ranged from 0-4 with 7 (7.3%) having full score of four while only 2 (2.1%) achieved score of zero.



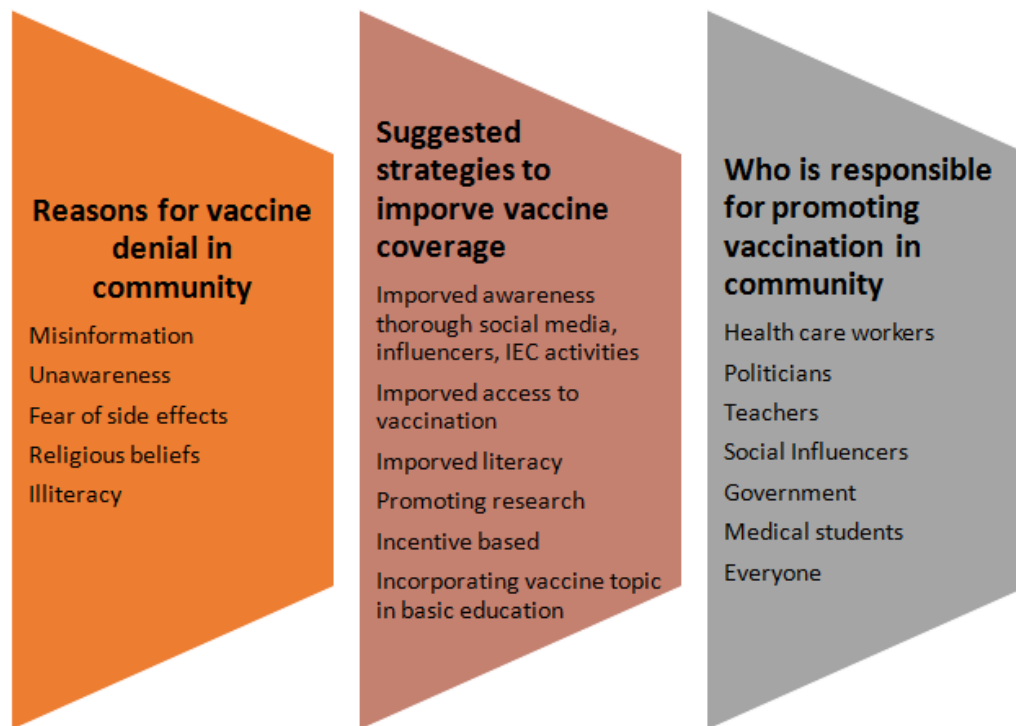
Ninety-two students (94.5%) believed that it is necessary to vaccinate the children, while only 2 (2.04%) believed that it is not necessary because most diseases doesn't occur at all. Twenty five (25.5%) of them believed that vaccines contain substances which may harm the child. All of them (100%) agreed that doctors have very important role in educating the parents about importance of immunization and most of them (98%) believed that educating parents will improve the vaccine coverage. One third (36.7%) believed that media reporting of harmful effects of immunization has led to fear of immunization. (Figure 2)



Regarding the perception about the immunization and the inclusion of immunization class in the foundation course, although all of them (100%) believed that it is important for the first year MBBS students to know the basics of immunization, two of them felt that it is too early to learn about the immunization. Ninety six (98%) believed that the immunization class in foundation course will help them understand immunization better in future classes. Ninety four (95.9%) of them agreed that this class had motivated them to promote immunization in the community. Most of them (94.9%) agreed that national immunization programs are important to prevent the emergence of new epidemics. (Figure 3)



Student comments in response to the open ended questions are given in **Figure 4**.



#### Discussion

Overall the students showed positive attitude and perception towards immunization, while there was a gap in knowledge. Response to the knowledge questions was variable with knowledge score ranging from 0-4 with only 7.3% students having all four correct answers. Knowledge about immunization affects the recommendations and advice of the health care professionals and students to the patients. Pally et al showed that those with higher knowledge score about immunization were more comfortable addressing to their patients' concerns and had positive attitude[8]. Barera et al studied MBBS students and reported similar results where students with higher mean knowledge score were more likely to believe that immunization is important and felt comfortable addressing the parental concerns[2]. They also showed that the knowledge scores improved with the years of MBBS with final year students having significantly better knowledge scores compared to the first year students. As the present study group involved students who had just entered the medical college, they are not expected to have very good knowledge scores and would acquire more knowledge over the course of their medical curriculum.

Most of the students showed positive attitude towards immunization and all of them believed in the important role of doctors in promoting immunization in society. Public considers their health care provider's recommendations as a foremost motivation for opting for immunization[8]. The beliefs and attitudes of health care workers affects their recommendations in regard to immunization. Study by Nickol et al showed that there was significant association of physicians' recommendation for influenza and pneumococcal vaccine and receipt of these vaccines by themselves[9]. Similar data was reported by Pally et al that health care professionals who had not received their influenza immunization were more likely to agree that influenza vaccines are not required and less likely to agree that an unimmunized health care worker can spread influenza[8]. Such a positive attitude is a welcoming sign as the students who believe in immunization is more likely to promote immunization in community. Students showed a positive perception towards inclusion of immunization classes early in the course. They also felt motivated

about promoting immunization in the community after attending the class. This serves the purpose of change in the curriculum which aims to act as an induction for the fresh medical students to promote immunization. Studies have evaluated the responses of the students about the foundation classes as a whole and have shown that qualities like professional development, ethics, and communication were well received by the students[7]. Dixit et al reported that there was significant improvement in knowledge and importance score after the foundation course in all the modules including immunization with mean knowledge score improving from 1.00 to 3.45[10]. We did not find any study which has specifically evaluated the perception about immunization classes.

Analysis of responses to open-ended questions showed that the students considered misinformation, unawareness, fear of side effects, religious beliefs and illiteracy as important reasons for immunization denial in community. WHO/UNICEF joint report (2015-2017) reported the most common reasons for vaccine hesitancy as fear of side effects, lack of knowledge and religious issues[11]. Similar reasons were reported by Kumar et al who found lack of knowledge, belief that vaccines have side effects, belief that OPV is the only required vaccines and that vaccine should not be given in children having minor illnesses as the common reasons for vaccine denial[12]. Misinformation has been reported on the part of health care workers as well. Study from western India reported MOV in 45.6% children who had visited health facility and found that the reason was considering mild acute illnesses as contraindication in 21% of them. Other reasons for MOV were considering being on antimicrobial therapy as a contraindication, recent exposure to infection and prematurity as contraindication to immunization[13]. Understanding of these limitations by the fresh medical students is important for their amendments.

When asked about strategies to improve immunization, students reported improving awareness, accessibility and literacy as potentially useful measures to improve vaccine acceptability. Other measures advised were provision of incentives for immunization, inclusion of immunization in basic education and promoting research. Engaging social influencers as a measure to promote immunization has also

been pointed out by our students. They also pointed out that promoting immunization is a responsibility of all the sections of society including health care workers, politicians, social influencers and teachers. Systematic review by Jarrette et al reported the most successful interventions to address the vaccine hesitancy were those aiming to improve knowledge and awareness, improve convenience and access; and those directly targeting the under vaccinated population. Other strategies were targeting high risk groups, mandating immunization and engaging influencers to promote immunization. Posters, extended clinic hours and incentive based interventions were least effective[14].

To conclude, newly joined Phase One MBBS students had positive attitude and perception towards immunization and consider inclusion of immunization class in the foundation course a welcome step. They felt motivated towards promoting immunization in the community. There were gaps in knowledge about immunization in the students which needs to be filled during the course of medical curriculum.

#### Conflict of interest

None

#### Source of support

None

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None

#### References

1. International Institute for Population Sciences (IIPS) and ICF. 2017. National Family Health Survey (NFHS-4), 2015-16: India. Mumbai: IIPS.
2. Berera D, Thompson KM. Medical Student Knowledge, Attitudes, and Practices Regarding Immunization, *J Vaccines Vaccin*. 2015;6:1.
3. World Health Organization. Planning guide to reduce missed opportunities for vaccination (MOV).2016:1–60.
4. Albaugh N, Mathew J, Choudhary R, Sitaraman S, Tomar A, Bajwa IK, et al. Determining the burden of missed opportunities for vaccination among children admitted in healthcare facilities in India: a cross-sectional study. *BMJ Open*. 2021;11:e046464.
5. Rostkowska OM, Peters A, Montvidas J, Magdas TM, Rensen L, Zgliczyński WS, et al. Attitudes and knowledge of European medical students and early graduates about vaccination and self-reported vaccination coverage—multinational cross-sectional survey. *Int J Environ Res Public Health*. 2021;18(7):1–17.
6. Competency based undergraduate curriculum for the Indian Medical Graduate. Medical Council of India, 2018. Available at [www.mciindia.org/CMS/information-desk/for-colleges/ug-curriculum](http://www.mciindia.org/CMS/information-desk/for-colleges/ug-curriculum), (accessed on 22 March 2021).
7. Velusami D, Dongre AR, Kagne RN. Evaluation of one-month foundation course for the first year undergraduate students at a Medical College in Puducherry, India. *J Adv Med Educ Prof*. 2020;8(4):165–71.
8. Pelly LP, Macdougall DMP, Halperin BA, Strang RA, Bowles SK, Baxendale DM, et al. THE VAXED PROJECT: an assessment of immunization education in Canadian health professional programs. *BMC Med Educ*. 2010 Nov 26;10:86.
9. Nichol KL, Zimmerman R. Generalist and subspecialist physicians' knowledge, attitudes, and practices regarding influenza and pneumococcal vaccinations for elderly and other high-risk patients: a nationwide survey. *Arch Intern Med*. 2001;161(22):2702-8.
10. Dixit R, Joshi K, Suhasini P, Jamadar D. Students' perception of foundation course—a new experience in MBBS curriculum in India. *Int J Med Sci Educ*. 2019;6(3):1–7.
11. Lane S, MacDonald NE, Marti M, Dumolard L. Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEF Joint Reporting Form data-2015–2017. *Vaccine*. 2018;36(26):3861–7.
12. Kumar D, Aggarwal A, Gomber S. Immunization status of children admitted to a tertiary-care hospital of North India: reasons for partial immunization or non-immunization. *J Health Popul Nutr*. 2010;28:300–4.
13. Verma SK, Mourya HK, Yadav A, Mourya S, Dabi DR. Assessment of missed opportunities of immunization in children visiting health facility. *Int J Contemp Pediatr*. 2017;4(5):1748.
14. Jarrett C, Wilson R, O'Leary M, Eckersberger E, Larson HJ, Eskola J, et al. Strategies for addressing vaccine hesitancy - A systematic review. *Vaccine*. 2015;33(34):4180–90.