General practitioners’ knowledge, attitude, and practices regarding optional immunization in urban area of Sangli District: A cross sectional study

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ABSTRACT

Introduction: Immunization is one of the most effective, safest, and efficient public health interventions. Thousands of children are still dying from vaccine-preventable diseases every year. Administration of optional vaccines such as Hib, Inactivated polio vaccine (IPV), typhoid, hepatitis A, chickenpox, and rotavirus at appropriate age helps them in protecting from various diseases in under 18 population. Also, the attitude and practices of general practitioners have an important role in preventing modern diseases in children. Objective: This study was undertaken to assess the level of knowledge, attitude, and practices regarding optional vaccines among the general practitioners. Material and Methods: Study type: Cross-sectional. Study setting: Sangli–Miraj–Kupwad corporation area. Study subject: Practicing General Practitioners willing to participate. Study period: July 2018-Sep 2019. Study tools: predesigned, pretested questionnaire. Statistical analysis: by using Microsoft Excel and SPSS 22.0 version software. Results: Out of 162 general practitioners, 105 were males and 57 were females. A total of 83 (51.23%) general practitioners had good knowledge about optional vaccines in their practice. Good knowledge was found to be highest among MBBS practitioners 38 (55.9%). A total of 118 (72.84%) general practitioners were counseling the parents regarding optional vaccines. Conclusion: There is a need to create training programs and continuing medical education (CMEs) for general practitioners (GPs) on optional vaccination practices to improve knowledge.

Keywords: Attitude, general practitioners, immunization, knowledge, practices, urban area

Introduction

Plotkin et al.10 state that except for the availability of clean drinking water, no other preventive or curative modality has a greater impact on death prevention and population growth than vaccines. World Health Organization (WHO) estimates that immunization prevents 4–5 million death per year and has the potential of further saving 1.5 million lives.10 Hence the importance of vaccines especially among children cannot be understated.

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rubella (MR), and tetanus diphtheria (Td) had been added to the program.\[6\]

The term optional vaccination is ambiguous and is generally used for describing the vaccines that are not available for free through Government's immunization program but are recommended by Indian Academy of Pediatrics (IAP). A list of these is generally published and conveyed regularly by IAP. It is recommended for pediatricians to counsel the parents regarding them and their administration to children depends on the discretion of parents.\[8\]

The “optional vaccine” provide protection against many important diseases. These have helped in the expansion of the vaccination program in a way that many optional vaccines at a certain point of time were later included in the Government’s immunization program.\[3,4\] At present, the optional vaccines recommended by IAP include vaccines against meningococcal infection, cholera, typhoid, Human papilloma virus (HPV), and Varicella.\[1\] It has been observed that the rate of optional immunization uptake is very low.\[9\]

General practitioners and family physicians play a vital role in providing health services to the family including infants and children.\[10\] Rural India faces a scarcity of trained doctors, especially specialists. The estimated short fall of pediatricians in Community Health Centers is nearly 82%.\[10\] Hence it is safe to assume that primarily the health services regarding pediatric care is handled by general practitioners. Studies conducted even in developed nations have shed a light on the discrepancy of knowledge regarding vaccines like HPV vaccines between general practitioners and pediatricians.\[8\]

After an extensive literature search, we were unable to find the locally applicable literature observing awareness of general practitioners regarding the optional vaccines. We believe that lack of awareness among general practitioners may be one of the important roadblocks for coverage of optional immunization in India. Hence, the objective of this study was to assess the knowledge, attitude, and practices regarding optional vaccines among the general practitioners from the Sangli district of Maharashtra state (India).

**Material and Methods**

A cross sectional study was carried out among the general practitioners practicing in Sangli– Miraj–Kupwad corporation area which represents the urban area from Sangli district in Western Maharashtra. Study was carried out in a stepwise manner from July 2018–Sep 2019. Before starting the study, approval from the Institutional Ethical Committee was obtained. We conducted a pilot study to plan and refine the main study, and we checked the feasibility and validity of the study as a result. Sample size was calculated as 155 by using formula: \( n = Z^2_{\alpha/2} \times \frac{\sigma}{d}^2 \), where, \( \alpha = 1\% \) and \( d = 0.10 \) (\( P = 37\% \) from pilot study). So, in the study, 162 cases were considered by using purposive sampling. A predesigned, pretested questionnaire was developed and then used to collect the data from the general practitioners, which includes sociodemographic information such as age, gender, professional degree, years of practice, practicing area, and undergone any training or attended any conference related to immunization update. This questionnaire also consists of questions about knowledge, attitude, and practices regarding optional immunization. This questionnaire was written in English so that the content could be easily understood. Participants completed the questionnaire in about 10–15 min after delivering brief information related to the research topic. These questionnaires were distributed exclusively in their association in monthly meetings and conferences. The investigator thoroughly explained the questionnaire and the purpose of data collection, and thus data was collected. The questionnaire includes three questions about knowledge of optional vaccines. The first question was designed regarding the age of vaccine administration and booster dose, and the response was analyzed in the form of a marking system. The correct answer was worth one point, while the incorrect answer was worth none. The vaccine dose and route of administration were the subjects of the second question. Several options were presented, and the correct answer was chosen. The question about vaccine side effects, like the question about the age of administration, was designed in the form of a scoring system. Six questions were designed to assess attitudes toward optional vaccination, and responses were graded on a Likert scale as strongly agree, agree, undecided, disagree, and strongly disagree. Scores were assigned on a scale of 6 to 0: strongly agree to strongly disagree. Some questions were asked negatively, and the scores were reversed in those cases. Based on these results, we divided the participants into two groups: those with a positive attitude (score ≥50%) and those with a negative attitude (<50%).

Finally, among immunization practices, questions were designed on counseling and prescribing optional vaccines in their practice, with options given as yes or no.

Initially, permission was obtained from the Head/President of the Association of General Practitioners from the urban area of the corporation. Their meeting date was set, and they were given brief information about the study project. Each participant gave informed consent on their own. Data was gathered from MBBS, BAMS, or BHMS practitioners who live in the study area, and are willing to take part in the study. Participants’ anonymity regarding participation was kept confidential.

Later questionnaires were distributed for the collection of information and collected data was entered in SPSS for analysis. Statistical analysis was done by using SPSS 22 and Microsoft Excel. Frequency and percentages are used to explain qualitative characters. The Chi-square test was applied to study the association between different factors with optional vaccines.

**Results**

Table 1 shows various sociodemographic factors associated with study participants. The variables considered in this study are age, gender, years of practice, possessing a degree, practice area, and attending any CME or training in this area.
Out of the total of 162 general practitioners, 105 were males and 57 were females. A total of 59 (36.42%) general practitioners were in the age group of 40–50 years followed by 48 (29.63%) who were between 50–60 years, 21 (12.96%) between 30–40 years, 18 (11.11%) were practicing at age of 60 years and above, and 16 (09.88%) were in the age group of less than 30 years.

In their field of practice, 148 (91.36%) general practitioners had been practicing for less than 10 years, while 14 (8.64%) had been practicing for more than ten years. Out of 162 general practitioners, 68 (41.98%) held an MBBS degree, 38 (23.46%) held a BAMS degree, and 56 practitioners held a BHMS degree (34.57%). In terms of practice location, 77 general practitioners (47.53%) practiced in urban areas, while 85 general practitioners (52.47%) practiced in rural areas.

Only 26 (16.05%) of general practitioners had received any updates on optional vaccination, such as training, workshop, CME, or attending a conference, while the majority of general practitioners 136 (83.95%), had not.

Table 2 shows the study participants’ knowledge and attitudes. We ranked knowledge and practices on a good-to-poor scale. In their practice, 83 (51.23%) general practitioners had good knowledge about optional vaccines, while 79 (48.77%) had poor knowledge. Only 03 (01.85%) of general practitioners had a negative attitude toward optional vaccines, while 159 (98.15%) had a positive attitude.

Table 3 shows various frequencies regarding counseling and prescribing optional vaccines in the practice by general practitioners. A total of 118 (72.84%) general practitioners were counseling the parents regarding optional vaccines. On the other hand, 36 (22.22%) general practitioners were prescribing the optional vaccines in their practice. Both the practices of counseling and prescribing the optional vaccines were observed in 36 (22.20%) general practitioners.

Association of knowledge about optional vaccines with various socio-demographic characters was shown in Table 4. Knowledge about optional vaccines was found to be good among general practitioners having age >50 years as compared to other groups. However, the association between them was not statistically significant (P > 0.05). Knowledge about optional vaccines was found to be good among the female general practitioners, that is, 32 (56.1%) as compared to males. Those general practitioners who practiced for more than 10 years showed good knowledge about optional vaccines, that is, 9 (64.29%).

The knowledge of general practitioners about optional vaccines varies depending on their qualification/degree. We found poor knowledge among BHMS practitioners 32 (57.1%) as compared to MBBS and BAMS professionals. General Practitioners practicing in the urban area show good knowledge 43 (55.8%) about optional vaccines as compared to those practicing in rural area 40 (47.1%). Knowledge was very poor among practitioners from rural areas, that is, 45 (52.9%). The reason could be as easy accessibility towards CMEs, weekly meetings, and their knowledge becomes updated.

Out of the total of 162 general practitioners, only 26 had undergone training programs or conferences on immunization. In regard to the vaccination update, knowledge was found to be good 20 (76.9%) among practitioners who had attended conferences or undergone training programs. The statistical association between vaccination update and knowledge on optional immunization is not so significant (P < 0.05).

Table 1: Sociodemographic factors associated with study participants

| Variable          | Frequency | Percent |
|-------------------|-----------|---------|
| Age (in yrs)      |           |         |
| <30 yrs           | 16        | 9.88    |
| 30 yrs - 40 yrs   | 21        | 12.96   |
| 40 yrs - 50 yrs   | 59        | 36.42   |
| 50 yrs - 60 yrs   | 48        | 29.63   |
| >= 60 yrs         | 18        | 11.11   |
| Gender            |           |         |
| Female            | 57        | 35.19   |
| Male              | 105       | 64.81   |
| Years of Practices|           |         |
| < 10 yrs          | 148       | 91.36   |
| >= 10 yrs         | 14        | 8.64    |
| Degree            |           |         |
| MBBS              | 68        | 41.98   |
| BAMS              | 38        | 23.46   |
| BHMS              | 56        | 34.57   |
| Practice area     |           |         |
| Urban             | 77        | 47.53   |
| Rural             | 85        | 52.47   |
| Undergone Vaccination Update training/CME | | |
| No                | 136       | 83.95   |
| Yes               | 26        | 16.05   |
| Total             | 162       | 100.00  |

Table 2: Knowledge and attitude of study participants

| Knowledge | Frequency | Percent |
|-----------|-----------|---------|
| Poor      | 79        | 48.77   |
| Good      | 83        | 51.23   |
| Attitude  |           |         |
| Poor      | 3         | 1.85    |
| Good      | 159       | 98.15   |
| Total     | 162       | 100.00  |

Table 3: Frequency table for practices

| Variable                      | Frequency | Percent |
|-------------------------------|-----------|---------|
| Practices Counselling regarding optional vaccine | 118 | 72.84 |
| Practices Prescription | 36        | 22.22   |
| Practices both               | 36        | 22.20   |
| Total                        | 162       | 100.00  |
Dhobale, et al.: KAP study regarding optional immunization

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Vaccination has been the most cost-effective public health intervention, from eradicating smallpox to nearly eradicating polio and, to a lesser extent, measles. Advocacy and social mobilizations are the key steps in the implementation of newer vaccines in the community. The National Immunization Schedule is expected to be revised due to the recent introduction of so many newer vaccines and the urgency of new infections.

In our study, the knowledge of general practitioners on optional vaccines in urban area. We found that 51.23% of general practitioners had good knowledge about optional vaccines in their practice. Different studies were done to check the knowledge of mothers on optional vaccination. According to a similar study conducted in Italy by Schaffer et al.,[12] 42.3% of pediatricians were aware of all recommended vaccinations for infants. In a study conducted in a rural area of Pune by Ambike et al.,[13] overall awareness and knowledge about newer vaccines were very low (32.5%). Some studies have been conducted to assess mothers’ knowledge, and the results show that they have very poor knowledge, ranging from 3% to 17%.[11,14,15] The reasons for this could be a lack of awareness, illiteracy, a low socioeconomic status, or poor access to health care facilities. Such studies are required to investigate these factors.

The authors mentioned the reasons for not administering the vaccines were the high cost of the vaccines and travel restrictions to the hospital. This could be due to a lack of interest or focus on optional vaccines, or to a lack of vaccine updates. We found general practitioners, who have vaccination updates, have significantly higher knowledge.

In our study, younger aged physicians with the MBBS degree, practicing in the urban area, and practicing more than 10 yrs, have good knowledge. Schaffer et al.[12] found appropriate behavior was significantly higher among the younger, those with more years of experience, and those who gave the recommended vaccinations to infants.

Maher et al.[16] mentioned in his study conducted among general practitioners in South-Western Sydney while investigating the knowledge, attitudes, beliefs, and practices that majority of the general practitioners were aware of the government recommendations for influenza vaccination during pregnancy, but few general practitioners were confident of their knowledge about the vaccine and most felt they needed more information.

Jäger et al.[17] assessed the awareness, attitudes, and clinical practices of Swiss GPs and pediatricians in the context of HPVs, where they found that the reported number of HPVv doses administered was low and reported awareness on HPV and associated diseases was high.

Killian et al.[18] conducted a survey to learn more about vaccine hesitancy among general practitioners. GP has a divergence of 45.7%. GPs’ immunization attitudes toward their relatives and patients differ.

The good attitude of general practitioners toward optional immunization was found to be 98.15% in our study. The results

| Table 4: Relation of Knowledge about optional vaccines with various variables |
|-----------------------------|---------------------|---------------------|---------------------|
| Knowledge about optional vaccines | Total | Significance |
| Poor | Good | Total | |
| Age (in yrs) |  |  |  |
| <30 | 11 | 5 | 16 | Chi 68.8% | 53.7% | 100.0% square=2.909, P=0.0573 |
| 30-40 | 10 | 11 | 21 | Chi 47.6% | 52.4% | 100.0% |
| 40-50 | 28 | 31 | 59 | Chi 47.5% | 52.5% | 100.0% |
| 50-60 | 22 | 26 | 48 | Chi 45.8% | 54.2% | 100.0% |
| >=60 | 8 | 10 | 18 | Chi 44.4% | 55.6% | 100.0% |
| Gender |  |  |  |
| Female | 25 | 32 | 57 | Chi 43.9% | 56.1% | 100.0% square=0.847, P=0.357 |
| Male | 54 | 51 | 105 | Chi 51.4% | 48.6% | 100.0% |
| Years of Practices |  |  |  |
| <10 yrs | 74 | 74 | 148 | Chi 50.0% 50.0% 100.0% square=1.595, P=0.264 |
| 10 yrs - 20 yrs | 5 | 9 | 14 | Chi 35.71% 64.29% 100.0% |
| Degree |  |  |  |
| MBBS | 30 | 38 | 68 | Chi 44.1% | 55.9% | 100.0% square=2.408, P=0.050 |
| BAMS | 17 | 21 | 38 | Chi 44.7% | 55.3% | 100.0% |
| BHMS | 32 | 24 | 56 | Chi 57.1% | 42.9% | 100.0% |
| Practice area |  |  |  |
| Urban | 34 | 43 | 77 | Chi 44.2% 55.8% 100.0% square=1.248, P=0.026 |
| Rural | 45 | 40 | 85 | Chi 52.9% 47.1% 100.0% |
| Vaccination Update |  |  |  |
| No | 73 | 63 | 136 | Chi 53.7% 46.3% 100.0% square=8.18, P=0.004 |
| Yes | 6 | 20 | 26 | Chi 23.1% 76.9% 100.0% |
| Total | 79 | 83 | 162 | Chi 48.8% | 51.2% | 100.0% |

Discussion

Knowledge, attitude, and practices regarding the vaccines administered under the National Immunization Programme have been studied in different settings; however, studies regarding optional vaccines in India are scarce. As a result, this study was conducted in an urban setting.

Vaccines are estimated to prevent deaths in millions annually. Vaccination has been the most cost-effective public health intervention, from eradicating smallpox to nearly eradicating polio and, to a lesser extent, measles.[14] Advocacy and social
are in accordance with a study done by Moiseeva and Turushева\cite{18} in which the attitude of the surveyed doctors, residents, and a student toward vaccination are mostly optimistic (95.5% of students, 85.7% of residents and 76.2% of doctors).

A study done by Hagan et al\cite{19} mentioned this attitude less. They assessed private immunization service providers’ knowledge, attitudes, and practices regarding immunization service delivery in the urban settings of Surat and Baroda in Gujarat, India. It could be due to financial constraints on the part of the parents, or it could be due to their willingness. Mui et al\cite{20} conducted a similar study in Hong Kong on general practitioners’ attitudes toward pneumococcal vaccination for middle-aged (50-64) and elderly population optional immunization. The authors mentioned the reasons for negative attitudes among general practitioners were a lack of vaccine recommendations from their doctors and a belief that vaccines can cause illness or symptoms. Fredy\cite{21} found 53.3% good attitude while Shinde and Dev\cite{22} found 77.3% positive attitude among mothers.

Another study was conducted in Tamil Nadu, India, on vaccination coverage for routine and optional vaccines, as well as parental attitudes and knowledge about immunizations, by Manthiram et al\cite{23}. It demonstrates that, despite positive attitudes toward immunizations, the coverage of optional vaccines was low. Efforts to reduce the cost and raise awareness of these vaccines, particularly among low-income families, or to incorporate them into the routine schedule may increase uptake and reduce morbidity and mortality from vaccine-preventable diseases.

In our study, we found 72% GPs practices counseling regarding the optional vaccine. According to the study, conducted by Kumar RK, there is a greater awareness among the general public in India about the importance of opting for optional immunization measures to ensure the overall health and safety of their infants.\cite{24}

**Conclusion**

Training and educational interventions are required to improve general practitioners’ vaccination knowledge, attitudes, and behaviors. This study has some limitations. Our study was designed to provide a description of general practitioners’ knowledge, attitudes, and practices regarding optional immunization. These findings, however, may not be representative of all urban settings in India, which differ greatly in terms of economic development and other factors such as religious and cultural norms that influence demand, access, and use of the health care system.

Although non-physicians provide immunization services in some settings in India, it was not possible to get the complete list of non-physician immunization providers affiliated with Ayurvedic Yoga and Naturopathy, Unani, Siddha, and Homeopathy organizations. Data were collected only from private practitioners.

**Take home message**

In the study, we found that only 16.05 percent of general practitioners had received any updates on optional vaccination; however, practitioners who had attended conferences or undergone training programs had good knowledge. As a result, such training or updates are essential for general practitioners to serve better for the community.

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**Consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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