

Study of Knowledge, Attitude, and Practice of Immunization among Parents of 1 to 12 Years Old Children Visiting Tertiary Care Centre: A Questionnaire Based Cross Sectional Study

Dr. Hemang Mendpara¹, Dr. Monica Choudhary^{2*}, Dr. Riddhi Patel³, Dr Rashmi Shad⁴

¹Fellow in Pediatric Intensive Care, Regency Hospital, Sarvodaya Nagar, Kanpur, Uttar Pradesh 208005

²Senior Resident, Department of Paediatrics, Index Medical College & Research Centre, Index City, Nemawar Road, NH-59A, Indore, Madhya Pradesh 452016

³Fellow in Pediatric Endocrinology, CDER, Regency Hospital, Sarvodaya Nagar, Kanpur, Uttar Pradesh 208005

⁴Consultant, Department of Paediatrics, Choithram Hospital and Research Centre, 14, Manik Bagh Road, Choithram compound, Indore, Madhya Pradesh 452014

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*Corresponding author
Dr. Monica Choudhary

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Abstract: Background: For better utilization of vaccination service with newly available antigens, it became essential to eradicate these gaps in Knowledge Attitude Practices (KAP) by health promotion & health education. In this study, an endeavour is being done to assess knowledge, attitude of parents towards immunization. An effort has been made to assess immunization service utilization by parents. **Materials & Methods:** The first section of the questionnaire reflected on the demographics of respondents. This includes independent variables such as responder's name, age, relation with child, father's education, occupation, family income per month, mother's education, mother's age at delivery, total number of family members (household size), religion and contact details along with bio-social characteristic of child namely age, sex, place of delivery, birth order. The second section of questionnaire is consisting of immunization status of the child. Third section is consisting of questions about reason for partial or complete immunization and source of immunization information. Fourth section of general questionnaire is subdivided in two parts. First part is consisting of total 7 questions of which first 4 questions were of general knowledge about vaccine. Next 3 questions are to assess attitude of the parent. The second part is consisting of questions about specific vaccine. **Results:** Majority of parents belonged to age group 31-40 years (71%) followed by age group 21-30 years (26.5%). Very few (2.5%) of parents belonged to age group 41-50. As per our study, 49.75% and 46.25% mother had delivered the child at age group of 21-25 and 26-30 years. Only 4% mother delivered the child at age of 31-35 years. Mean maternal age at delivery of the child was 25.7 years, and range was of 21-35 years (SD=2.65 years). Study does not reveal statistically significant difference between knowledge score of mother & or father. Study found very strong positive, statistically highly significant correlation between knowledge – attitude score of parents. **Conclusion:** We concluded that better maternal education and socio-economic status would lead to possession of better knowledge and positive attitude towards immunization. This was ultimately reflected in better immunization coverage. Thus improving female literacy and socio economic status at national level is need of time.

Keywords: Immunization, KAP, children, parents, optional vaccine, vaccination coverage.

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INTRODUCTION

India demographically is the second most populous country in the world, with over 1.21 billion people [1]. Already containing 17.5% of the world's population, India is projected to be the world's most populous country by 2050; surpassing China [2].

Developing countries of the world have maximum infant mortality rates as compared to those of developed countries. There are wide variations between countries or regions in the levels of infant mortality. During the past decades, there has been a steady decline in infant mortality. The drop was greatest for the developed countries and lowest for least developed countries.

Commonest killer of children in developing countries are malnutrition, diarrhea, respiratory infections, and infectious diseases like measles, tuberculosis [3]. Even though the standard of Health services have improved considerably in last few years with launch of National Rural Health Mission (NRHM)[4] & wide variety of health care schemes like Janani Surakhsha Yojna (JSSY)[5], Navjaat Shishu Surakhsha Karyakram (NSSK)[6], its output in form of Under-5 childhood mortality reduction is still to be seen all over India[7]. One of the primary reasons for this is lack of adequate awareness about availability of health services, especially in rural & backward areas. Illiteracy, poverty, poor status & care of women, as well as dysfunctional health systems adversely affect children's health in a developing country like India [8-10].

In developing countries like India, where communicable diseases are the major cause of morbidity as well as mortality, one effective way of controlling spread of infection is strengthen the host defenses. Under certain circumstances, this may be accomplished by active immunization, which is one of the most powerful and cost effective weapons of the modern medicine [11].

Immunization is considered a proven tool for controlling and even eradicating disease. World Health Organization (WHO) carried out a global vaccination from 1967 to 1977 leads to eradication of smallpox. Eradication of poliomyelitis is also within reach. Global Polio Eradication Initiative has been started in 1988. Since then, infection rate of polio have fallen by 99%, and approximately five million people have escaped paralysis. Although international agencies such as the WHO and the United Nations Children's Fund (UNICEF) and Global Alliance for Vaccines and Immunization (GAVI) provide extensive support for immunization activities, the success of any immunization program depends more upon local realities and national policies[12].

The vaccination coverage at present with EPI vaccines is far from complete despite the long-standing commitment to universal coverage. Estimates from the Coverage Evaluation Survey 2009 (CES 2009)[13] indicate that only 61% of children aged 12–23 months were fully vaccinated (received BCG, measles, and 3 doses of DPT and polio vaccines), and 7.6% had received no vaccinations at all. Given an annual birth cohort of 26.6 million, and an under 5 year child mortality rate of 59/1000, this results in over 9.5 million under-immunized children each year.¹² There is also a tremendous, heterogeneity in state and district level immunization coverage in India. Since the launch of Universal Immunization Program (UIP) in 1985, full immunization coverage in India has not surpassed 65%, so government of India (GOI) launched Mission Indradhanush which focuses on interventions to expand this coverage to more than 90% children [14].

Coverage Evaluation Survey of UNICEF stated that lack of awareness is one great barrier to achieve good immunization coverage [13]. Factors affecting vaccination service utilization have been evaluated in many studies. Currently, in era of better availability of optional vaccine and WHO's resolution to introduce more and more newer vaccine in national immunization schedule, it is essential to evaluate knowledge and attitude of parents towards immunization. Currently, in era of better availability of optional vaccine and WHO's resolution to introduce more and more newer vaccine in national immunization schedule, It is essential to evaluate knowledge and attitude of parents towards immunization. For better utilization of vaccination service with newly available antigens, it became essential to eradicate these gaps in Knowledge Attitude Practices (KAP) by health promotion & health education.

In this study, an endeavour is being done to assess knowledge, attitude of parents towards immunization. An effort has been made to assess immunization service utilization by parents.

MATERIALS AND METHODS

Place of study: OPD area of Well Baby Clinic of Choithram Hospital and Research Centre, Indore, M.P.

Study design: A prospective, descriptive, questionnaire based cross sectional study.

Study duration: One year (01-April-2014 to 1-April-2015).

Inclusion criteria

- Parents having their children in Age group: 1 to 12 year.
- Parents visiting tertiary care center well baby clinic from 1 April 2014 to 1 April 2015.
- Parents of the child willing to provide their voluntary written informed consent for participation in the study.

Exclusion Criteria

- No documentation of vaccination available
- Not understanding Hindi/English language
- Parents of the child not willing to provide their voluntary written informed consent for participation in the study

Sample size: 400

Methodology

The study was conducted after obtaining clearance from the Institutional Ethics Committee. The families approaching to well-baby clinic of Choithram Hospital and Research Centre were interviewed with the help of carefully prepared customized and pretested questionnaires, to know their knowledge, attitude and

practice towards the currently available and routinely administered immunization measures. Written informed consent was obtained from beneficiaries before interviewing as per the consent form. After establishing the initial rapport and explaining the purpose of study, the interview was carried out in friendly manner. Parents were interviewed by researcher in a single setting. The participants were briefed about proforma. Any query regarding understanding of question was solved during interview only. The data was collected via formal and informal discussions, direct observations, & crosschecked with health records. The relevant information was recorded in proforma immediately thereafter.

Analysis

Data was tabulated on Microsoft Excel sheet and was analyzed using the SPSS software for Windows. Frequency and percentage for categorical variables were calculated. Data was represented in form of tables, bar diagrams, pie charts where ever necessary.

Mean and Range were calculated for quantitative data. Discrete data was analyzed using Pearson's Chi-square test for normal distribution. P value < 0.05 was considered as significant. Correlation between two variables was assessed by Pearson's Coefficient for correlation. Unpaired "t" test applied to assess significance of correlation between knowledge and attitude score. Median split method was used for categorizing the parents as having positive or negative attitude towards immunization.

RESULTS

Majority of parents belonged to age group 31-40 years (71%). Mean age of respondents were 32.7 years with range =25 to 48 years (SD=3.4 year). Among respondents, 56.75% were father of child. Nuclear family slightly (53.5%) was dominated our study. Mean numbers of family member per family (household size) was 5.2 with range = 3-12 (SD=2) [Table 1].

Table-1: Demographic characteristics of parents (N=400)

Age of Parents (Years)	Number	Percentage
21-30 years	106	26.5
31-40 years	284	71.0
41-50 years	10	2.5
Distribution of Parents	Number	Percentage
Mother	173	43.25
Father	227	56.75
Type of family	Number	Percentage
Extended	186	46.5
Nuclear	214	53.5
Socioeconomic Status	Number	Percentage
Class I (upper)	8	2.0
Class II (upper middle)	220	55.0
Class III (lower middle)	122	30.5
Class IV (upper lower)	50	12.5
Class V (Lower)	0	0

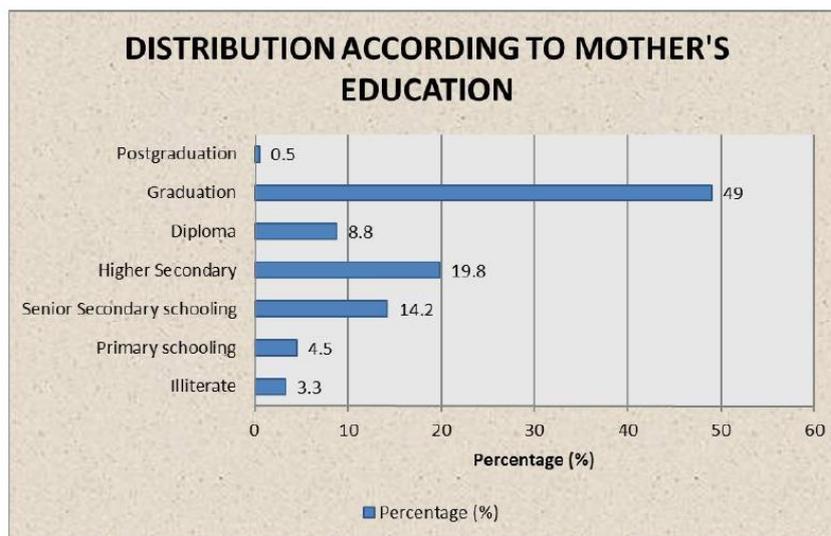
According to study, very few parents (2%) belonged to class I SES. Majority belonged to Class II (upper middle) 55% [Table 1]. Remaining respondents belonged to class occupying 30.5% and 12.5% of total respectively. None of family belonged to class V. As per study only 3.3% mothers were illiterate. Almost half had completed graduation or post-graduation (49% and 0.5% respectively). Percentage of mothers who had completed their primary, senior secondary and higher secondary schooling and diploma were 4.5%, 14.2% and 19.8% and 8.8% respectively. About 81.25% of mothers were housewife (Table 2/ Fig. 1). Mean maternal age at delivery of the child was 25.7 years with range of 21-35 years (SD=2.65 years) with,

49.75% and 46.25% mother had delivered the child in study at age group of 21-25 and 26-30 years. Only 4% mother delivered the child at age of 31-35 years.

In study, among female respondents (mother of child) 53.18% were graduated. Whereas, mothers who had completed primary, senior secondary, higher secondary schooling and diploma were 5.2%, 13.87%, 16.18%, and 7.51% respectively. Only 4 % female respondents were found to be illiterate. 50.87% and 46.66% had delivered the child (study subject) at 21 to 25 and 26 to 30 years respectively. Rest 3.47% had delivered the child at age 31 to 35 years (Table-2).

Table-2: Distribution of child according to maternal characteristics (n=400)

Mother's Education	Number	Percentage
Illiterate	13	3.3
Primary schooling	18	4.5
Senior Secondary schooling	57	14.2
Higher Secondary	79	19.8
Diploma	35	8.8
Graduation	196	49.0
Post-Graduation	2	0.5
Total	400	100.0
Mother's Occupation	Number	Percentage
Job	75	18.75
House wife	325	81.25
Total	400	100
Mother's Age at Delivery (years)	Number	Percentage
21-25	199	49.75
26-30	185	46.25
31-35	16	4
Total	400	100

**Fig-1: Bar diagram showing distribution according to educational status of female respondents**

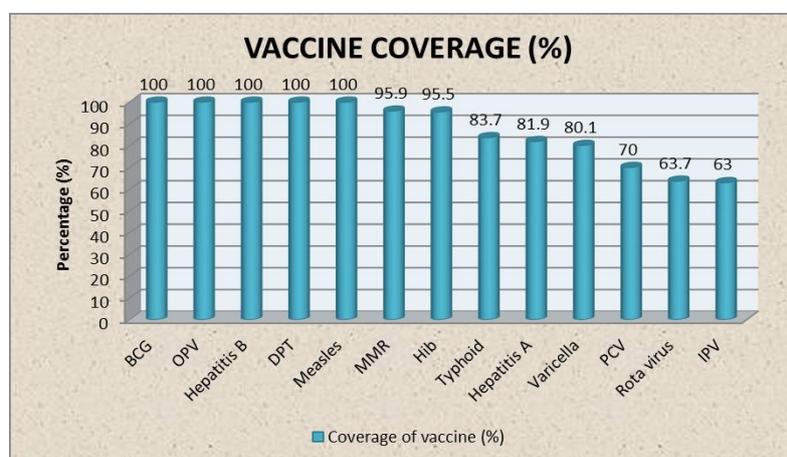
Among parents, majority belonged to Hindu (73.5%) followed by Muslim (14.25%) religion. Very few belonged to Jain, Sikh, and Christian religion (6%, 5.5% and 0.75% respectively). Among the study group, 75.25% of the children were 12-24 months of age. Mean age of children in study is 30.2 month with range from 12-144 month (SD= 26.9 months). 56.75% were male child in study. Percentage of children with birth order 1st, 2nd and 3rd were 39.75%, 56% and 4.25% respectively. All the children in study were institutionally delivered. Majority of children were delivered in private institution (67.42%). 49.8% children

had missed one or more dose of vaccine from recommended in IAP schedule.

Coverage of BCG, OPV, DPT, Hepatitis B, and measles vaccination was 100%. Among the optional vaccine, uptake of MMR vaccine is highest (95.9%) followed by Hib (95.5%). As per our study, Uptake of Inactivated Polio vaccine (IPV) was lowest (63%). Among other optional vaccines uptake of Typhoid, Hepatitis A, Varicella, PCV, and Rotavirus were 83%, 81.9%, 80.1%, 70%, and 63.7% respectively [Table 3/ Fig. 2].

Table-3: Distribution according to individual vaccination [n=400]

Vaccination	Total Number (Eligible children)	Vaccinated children	
		No.	%
BCG	400	400	100
OPV	400	400	100
IPV	400	252	63
Hepatitis B	400	400	100
DPT	400	400	100
PCV	400	280	70
Hib	400	382	95.5
Rota Virus	400	255	63.7
Measles	400	400	100
MMR	348	334	95.9
Varicella	347	278	80.1
Hepatitis A	398	326	81.9
Typhoid	166	139	83.7

**Fig-2: Bar diagram showing coverage of individual vaccine (%)**

As per our study, among the children who were not vaccinated with one or more age appropriate vaccine (n=199), question regarding cause of incomplete vaccination status was asked. 94% of respondents do not perceive the need for vaccine. Fear of side effects (78.4%), and unawareness of availability

of vaccine (56.3%) were also mentioned as another important reasons. 30.2% stated reason to be wrong advice by others. In 28.1% case, unaffordability was the reason. Only 1.5% respondents stated unavailability of vaccine as reason [Table 4]. This reflect large knowledge practice gap among general population.

Table-4: Reason for partial / incomplete immunization (n=199)

Reason for Partial / Incomplete Immunization	No. of parents	%
Do not feel need	187	94
Not knowing about vaccine	112	56.3
Not knowing where to go for vaccination	17	8.5
Time not convenient	2	1
Fear of side effects	156	78.4
Wrong advice by someone	60	30.2
Cannot afford the cost	56	28.1
Vaccine not available	3	1.5
Long waiting time	0	0
Service not available	0	0

Doctor and paramedical worker remained as major source of vaccination information provider as per study in 70.3% and 60.8% of parents respectively. The

study also shows that family members or relatives (51.7%), Media (Television/ Radio/ Internet) (23.5%) and in approximately one third cases (37.8%) printed

material (Poster) highlighted as significant contributor

as source of information.

Table-5: Distribution of parents according to knowledge grading (n=400)

Knowledge Grading	No.	%
Poor (0-15)	35	8.75
Average (16-30)	286	71.5
Good (31-40)	79	19.75
Total	400	100.0

As per our study, out of total 400 parents, majority of parents (71.5%) were among average knowledge score (16-30). Almost 1/5th of total parents (19.75%) were having good knowledge score (31-40).

About 8.75% of the parents have knowledge score <15 considered to have poor knowledge score [Table 5/Fig. 3]. Mean knowledge score of respondents was 26.48 with range 9-35 (SD=5.47).

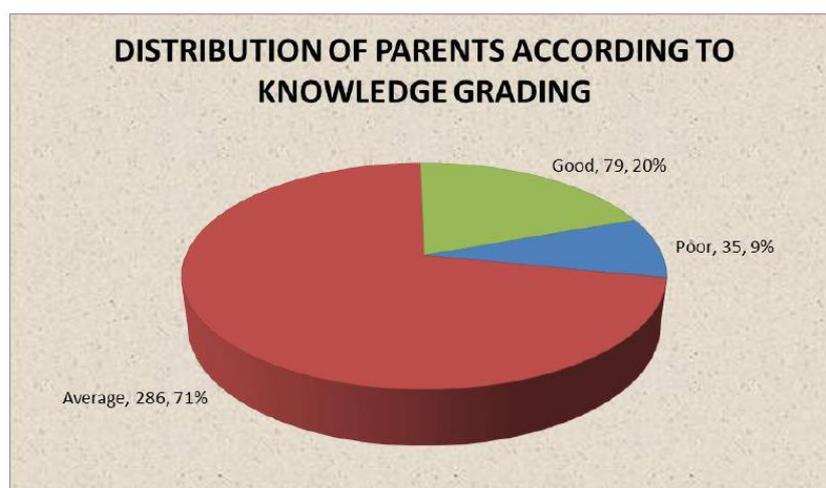


Fig-3: Pie diagram showing distribution according to knowledge grading

As per our study, higher percentage of respondents found to have positive attitude towards immunization (54%) (Table 6). Mean attitude score of respondents was 23.11 ranging from 6 to 29 (SD=5.3). As per response data, 65.75% parents preferred painful

whole cell pertussis vaccine. High proportion of parents (45.5%) preferred to vaccinate their child with both OPV and inactivated polio vaccine. Preference towards either OPV or IPV alone was seen in 36.3% and 18.3% of parents respectively.

Table-6: Attitude of respondents towards immunization (n=400)

Attitude	No.	%
Negative Attitude (< 25)	184	46.0
Positive Attitude (>25)	216	54.0
Total	400	100.0

Table-7: Association of age of parents with their knowledge grading (n=400)

Parental Age Group	Knowledge Grading (No. of parents)						Total
	0-15 (Poor)		16-30 (Average)		31-40 (Good)		
	n=35	%	n=286	%	n=79	%	
21-30 years	9	8.49	73	68.87	24	22.64	106
31-40 years	25	8.80	205	72.18	54	19.01	284
41-50 years	1	10.00	8	80.00	1	10.00	10
Total	35	8.75	286	71.50	79	19.75	400

Chi-square value = 1.257, df=4, P value = 0.869, Not Significant

As per study, knowledge of parents was found to have statistically significant (p < 0.05) association with socio economic status and maternal education. Association of knowledge of respondents with their age, type of relation, religion of family, and maternal age at

delivery was not statistically significant (P> 0.05) [Table 7]. Attitude of respondents was statistically significantly influenced by their age, socio economic status of family and maternal educational status (p < 0.05). Type of relation, religion and maternal age at

delivery did not have significantly association with attitude of parents ($P > 0.05$). The completeness of vaccination of children was significantly influenced by

SES, maternal education status, religion of family, and birth order of the child ($P < 0.05$).

Table-8: Comparison of mean knowledge score between the parents (N=400)

Relation	Mean \pm SD	't' Value	P value
Father (n=227)	26.67 \pm 5.27	-0.832, df=398	0.406, NS
Mother (n=173)	26.21 \pm 5.74		

P value = 0.406, Not Significant

Type of family, maternal occupational status, maternal age at delivery and sex of child, did not have significant influence on completeness of immunization

($P > 0.05$). Study does not reveal statistically significant difference between knowledge score of mother & or father with p value > 0.05 [Table 8].

Table-9: Correlation Between knowledge – Attitude Score Parameters (n=400)

Pairs	'r' Value	P Value	Significance
Knowledge Score – Attitude Score	0.866	0.000*	Very strong positive, statistically highly significant correlation

*P value < 0.05 , Significant

Study found statistically significant correlation between knowledge – attitude score of parents (P value < 0.001) [Table 9].

DISCUSSION

The present study was carried out to identify gaps in parents' Knowledge, Attitude & Practices with regard to immunization of their children, and to assess the vaccination service utilization by the parents of children between 1-12 year of age groups in a tertiary care hospital. The study was conducted at Well Baby Clinic of Choithram Hospital and Research Centre, Indore a district of Madhya Pradesh from April 2014 to April 2015. A total of 400 parents attending well baby clinic of the hospital for vaccination of their child were selected by convenience sampling method. A carefully prepared customized and pretested questionnaire was used to collect required data. Although these types of surveys are subject to sampling, response, and recall biases, they are the most convenient for situations in which time and resources are limited. Such bias has also been described in study done by Bernsen *et al.* [15], Padda *et al.* [16], Manthiram *et al.* [17], Bbaale *et al.* [18], Lakew *et al.* [19], Trivedi *et al.* [109]

The present study was done on 400 parents who visited the well-baby clinic voluntarily to get their child vaccinated. Bernsen *et al.* [15], Al-Lela *et al.* [20, 21], Angadi *et al.* [22], Oyefara *et al.* [19], Devkota *et al.* [23], ul Haq *et al.* [24] and Mereena *et al.* [25] did similar study with sample size of 217, 528, 155, 237, 120, 780 and 300 respectively. However, Jose *et al.* [26] did a similar study with sample size of 30 only.

Mean age of respondents in our study was 32.7 years with range from 25 to 48 years (SD=3.4 year). Majority of parents belonged to age group 31-40 years (71%) in our study. This type of distribution was also seen in study done by ul Haq *et al.* [24] at Pakistan (age

group 18-57 years, mean age 32.61 \pm 9.48 years with 36.3%, 34.4%, 21.9% and 7% respondents belonged to age group of 18-27, 28-37, 38-47, 48-57 years respectively), Awodele *et al.* [27] (mean age 30.7 \pm 4.0 years with 10.9%, 35.8%, 46.0% and 7.3 % respondents belonged to age group 21-25, 26-30, 31-35 and > 35 years), and Angadi *et al.* [22] (10%, 4%, 30%, 14%, 3%, 1% of the respondents belonged to < 20 , 21-25, 26-30, 31-35, 36-40 and > 40 years respectively). However, in study done by Ibnouf *et al.* [28] (53.5% and 46.5% belonged to 15-29 and 30-45 years age group respectively), and Mareena *et al.* [25] (1.7%, 35.7%, 50.3%, 9.7% and 2.7% of the respondents belonged to age group 16-20, 21-25, 26-30, 31-35, 36-40 years respectively), predominant respondents were younger than our study. Majority of respondents in our study were male (father) (56.75%). Similar pattern has been observed in study done by ul Haq *et al.* [24] (53.5%) and Al-Lela *et al.* [20] (62.1%).

In our study, nuclear family system (53.5%) was observed predominantly. Similar results were obtained in study done by Mareena *et al.* [25] (72.3%), and Padda *et al.* [16] (59%). However, study done by Malakar *et al.* [29] observed predominant joint family pattern (70.48% case). The place of study may have influence on predominant family type. Mean household size in our study was 5.2 with range from 3-12 (SD=2). Mean household size of India, Madhya Pradesh and Indore are 4.8, 4.8, and 5 respectively. There is difference in rural and urban area. The mean household size in rural Indore is 5.3 whereas, in Urban Indore, it is 4.9 [30].

As stated, Majority of respondents (55%) in our study belonged to class II. However, study done by Nath *et al.* [31] had majority of respondents belonging to class IV (modified Kuppusswami classification). Similarly, study done by Angadi *et al.* [22] also had a

sample predominantly belonging to SES IV (55%) (According to modified Prasad classification).

In our study, it can be promulgated that literacy rate reflected hand-in-hand with KAP of mothers and was found to be higher than other studies, with only 3.3% mothers being illiterate. Almost half (49.5%) of mothers had completed graduation or post-graduation. The study done by Al-Lela *et al.* [20] (mother with educational years <13, 13-18, >18 years were 15.2%, 23.7% and 61.1% respectively) and Awodele *et al.* [27] (mother with educational years ≤5, 8, 13, and college were 8.7%, 25.7%, 54.2% and 11.4% respectively) also had higher percentage of mothers with high literacy. However, Study done by Oyefara *et al.* [19] (illiterate, primary, secondary and higher secondary level education in 6.8% 26%, 46%, 21.1% of mothers respectively) and Bernsen *et al.* [15] (less than primary, up to high school, and university education in 8.8%, 46.1%, 44.2% of mothers respectively) predominantly had mothers with medium literacy rate up to schooling. Similarly, study done by Bbaale *et al.* [18] (illiterate, primary, secondary, post secondary education in 32%, 58% 9% and 2% of mothers respectively), Trivedi *et al.* [32] (Illiterate, primary, high school and graduation completed mothers in 50%, 21.48%, 27.35%, 1.17%) had higher percentage of mothers who had only primary education. Angadi *et al.* [22] (illiterate, primary, secondary school, pre collage, graduation in 50.32%, 7.10%, 40.65%, 1.29%, 0.65% of mothers respectively) did a similar study and found predominance of illiterate mothers.

As per our study, Mean knowledge score of respondents was 26.48 with range 9-35 (SD=5.47). Thus, majority (71.5%) of our respondents had average knowledge. Similar studies done by Jose *et al.* [26] (43.3% had average knowledge score) and Al-Lela *et al.* [21] (66.1% found to have adequate Knowledge Practice score) however had differing knowledge scores. Burnsen *et al.* [15] had 40.6%, 24.4% and 35% of respondents in good, average and poor knowledge groups respectively. However, respondents in ul Haq *et al.* 24 had predominant (75.4%) poor knowledge score while Mareena *et al.* [25] had predominant (61.33%) good knowledge.

Mean attitude score of respondents in our study was 23.11 ranging from 6 to 29. (SD=5.3) along with more than half of respondents having positive attitude towards immunization (54%). Mareena *et al.* [25] had 68.7% and 20.7% of mother having good and very good attitude score respectively. Bernsen *et al.* [15] found 93.1% of mother had positive attitude towards immunization. However, ul Haq *et al.* [24] reports that overall, there was negative attitude towards vaccination with mean attitude score 3.72 ± 1.2 with range of 0-7.

CONCLUSION

To conclude, our study of knowledge, attitude and practice in immunization at tertiary care center– a questionnaire based cross sectional study revealed. Almost all parents had average to good knowledge about vaccination. More than half of parents had positive attitude towards immunization. As per institutional policy, all children were vaccinated with all compulsory vaccines. However, uptake of optional vaccines remained low as only half of children were found to be completely immunized.

Among optional vaccines, coverage of Hib and MMR was good, that of Hepatitis A, Varicella and Typhoid vaccine was satisfactory, while that of IPV, PCV and Rotavirus was poor. Not knowing importance of vaccine, fear of side effects, not having knowledge about vaccine or place of vaccination, and unaffordability were major reasons for incomplete immunization.

In our study, we concluded that better maternal education and socio-economic status lead to possession of better knowledge and positive attitude towards immunization, which was ultimately reflected in better immunization coverage. Thus improving female literacy and socio economic status at national level is need of time.

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