



A Study to Assess and Correlate the Knowledge, Attitude and Practices of Vaccination among Mothers with Educational Status in a Teaching Hospital in South India

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Abstract

Introduction: Childhood immunization almost guarantees protection from several diseases. Since mothers are the important health decision makers of their child, their knowledge, attitude and practice regarding immunization and their educational status in general have a great impact in the immunization status of their children.

Objectives: The objectives of this study were to assess mothers, knowledge, attitude and practice of immunization and to make a correlation between these factors and vaccination status of their child. This study also aims to establish a relation between educational level of mothers and immunization status of their child.

Methodology: The study was conducted in a teaching hospital in a socioeconomically backward part of Bangalore, Karnataka. Mothers who came to the outpatient department of hospital to vaccinate their children were interviewed by a self-designed Knowledge, Attitude and Practice (KAP) questionnaire. A total of 143 mothers were enrolled in the study. Each mother was assessed their Knowledge, Attitude and Practice by giving specific scoring to selected questions in the questionnaire.

Results: Even though most of the mothers had satisfactory knowledge, attitude and practice, almost 25% children were identified as un-immunized or partially immunized. Educational status of mothers were identified as an independent factor in the determination of their children's vaccination status. There is an urgent need to increase the coverage of UIP (Universal Immunization Programme) vaccines and there is a dire need to arrange for health education program sessions for all the parents regarding the importance of complete adherence of vaccination among children. TV, newspaper and other Medias can be also promoted as most important sources which can be used for spreading educational messages regarding vaccination.

Keywords: Vaccination; Children; Health education; Hospital

Introduction

Prevention of disease is always better than cure. Vaccine is a substance that is introduced into the body to prevent infection or to control disease due to a certain pathogen - a disease-causing organism, such as a virus, bacteria or parasite. The vaccine "teaches" the body how to defend itself against the pathogen by creating an immune response [1]. It is undeniable that vaccines are integral part of health system, which has been proved on the basis of their success in controlling vaccine preventable diseases in several countries in the world. Protection from infectious diseases is one of the greatest benefits that any country can offer to its population [2].

Childhood immunization almost guarantees protection from many major diseases. It prevents 2 million deaths per year worldwide and is widely considered to be 'overwhelmingly good' by the scientific community [3]. Immunization of infants and young children against serious infectious diseases is among the most successful and cost-effective interventions in preventative health care. The success of these programs relies on sufficiently high coverage to maintain herd immunity [4]. India's Universal Immunisation Programme (U.I.P.), launched by the Government of India in 1985, is one of the largest in the world in terms of quantities of vaccine used, the number of beneficiaries, the number of Immunization session organized, the geographical spread and diversity of areas covered. With the UIP, significant achievements have been made in preventing and controlling 7 vaccine-preventable diseases (VPDs) such as Diphtheria, Pertussis, Tetanus, Polio, Measles, and Hepatitis B and Tuberculosis [5].

Since mothers are the important health decision makers of their children, their Knowledge, Attitude and Practices regarding immunization in general have a great impact on immunization status

of their child [6,7]. Several studies on immunization status of children conducted in various countries have revealed that increasing parents' knowledge regarding vaccination improves immunization status and affects success of immunization programme. Education status and other socioeconomic status of parents have a great impact on their decision regarding vaccination. Therefore, our aim of this study was to assess parent's knowledge, attitude and practice towards vaccination and to correlate these factors with vaccination status of their child in order to improve and increase vaccination coverage and completeness [8].

Materials and Methods

This study was carried out in a teaching hospital in a sub-urban part of Bangalore, Karnataka. This is a socio-economically backward area and this factor can have a great influence in Parents' decision regarding vaccination. Our study population included mothers who brought their children to the Outpatient department of hospital for vaccination administration. Caretakers other than mothers who came in the department for the same reason were excluded from the study.

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Received January 29, 2018; **Accepted** February 28, 2018; **Published** March 07, 2018

Citation: Sankar BK, Rameh S, Sunny A (2018) A Study to Assess and Correlate the Knowledge, Attitude and Practices of Vaccination among Mothers with Educational Status in a Teaching Hospital in South India. Prim Health Care 8: 290. doi: [10.4172/2167-1079.1000290](https://doi.org/10.4172/2167-1079.1000290)

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Consent form was obtained from the mothers who were interested to be included in the study after explaining the need and importance of the study. Then they were interviewed by using a self-designed questionnaire. The questionnaire had two parts, in which first part consisted of the demographic data for child (age and gender) and demographic data for parents (age, education and employment) and the second part was with a knowledge (seven), attitude (five) and practice (Three) (KAP) questions related to vaccination. A total of 143 mothers were enrolled in the study.

Knowledge, Attitude and Practice regarding vaccination of each mother was assessed by giving scores to their response to selected question and was compared with their education status and adherence of child to vaccination. From Knowledge domain, first 3 questions were selected as basic knowledge questions. Knowledge of each mother was assessed by categorizing them into 3 groups, based on the total score obtained by them. Categories in the knowledge domain are- Poor (0,2), Average (4) and Excellent (6). In Attitude domain, first and third questions were selected and specific scoring was given in the range of -1 to 4. Categories in attitude domain were Excellent, Acceptable and Un-acceptable. In practice domain, last 3 questions were selected for assessing practice and score range was given between -1 and 6. Good, Average and Poor were the categories in practice domain.

Results

A total of 143 mothers were included in the study. More than half of the children enrolled in study sample were males 75 (52.44%) and 68 (47.55%) were females. A total of 106 (74.16%) children were identified with complete adherent with vaccination, whereas 57 (75%) male and 49 (73.013%) female were completely adherent. Child's gender was not identified as a significant factor in immunization status (Table 1). Out of 143 mothers interviewed, majority of the mothers had high school certificate (50, 34.96%), followed by 28 (19.58%) with higher secondary school education, 26 (18.18%) with upper primary education, 4 (2.97%) Diploma and 3 (2.09%) with Lower primary education. There were only 10 (6.99%) and 7 (4.89%) mothers with Graduation and Post-Graduation, respectively. Four (2.97%) mothers refused to divulge their education status, while, 11 (7.69%) mothers were illiterate (Table 2).

Mothers were interviewed using a self-designed questionnaire

Adherence Status	Male		Female
	Number	%	Number
Adherent	57	75	49
Non-adherent	19	25	18
Grand total	76	100	67

Table 1: Distribution of adherence status with gender of the child.

Mothers' Education	Number	Percentage
	N	%
Not Went To School	11	7.69
LP	3	2.09
UP	26	18.18
HS	50	34.96
HSS	28	19.58
Diploma	4	2.97
Graduate	10	6.99
Post Graduate	7	4.89
Did not divulge	4	2.97
Grand Total	143	100%

Table 2: Distribution of mother's education status.

about their knowledge, attitude and practices related to vaccination. The first K1 question was to assess mothers' basic knowledge regarding the use of vaccination. To this question, only 86 (60.13%) mothers said that they were aware of the use of vaccination, in which majority of them (79, 91.86%) opted the correct answer that vaccination can prevent illness (Table 3). Question K2 was to assess the knowledge of mothers regarding when the first vaccination should be administered. Among 122 (85.31%) mothers who all said that they were aware about vaccination schedule, most of them, 115 (94.22%) provided the correct answer that vaccination should be started from birth (Table 4). Next K3 question enquired if the mothers knew that their children should be vaccinated, and further analysed the source of information regarding vaccination. Among 143 mothers, most of the mothers (131, 91.60%) knew that their children should be vaccinated. Among the respondents who were aware of vaccination, 79 (60.39%) said that they were informed about vaccination by their healthcare providers (Doctors and Nurses) (Table 5). Question K4 pertained to the mothers' knowledge about polio vaccination. They were asked as to what disease could be prevented using OPV. Only 102 (73.6%) of the 143 mothers were aware of OPV. Out of the 102 respondents who were aware about OPV, majority of them 101 (99.01%) said that OPV is used for prevent Polio (Table 6). Next Question K5 was to assess mothers' knowledge regarding pentavalent vaccine. Unfortunately none of the mother was aware regarding pentavalent vaccination. Question K6 was to identify

Answers	Respondents	Percentage
	N	%
A- Prevent Illness	79	91.86
C- Its only an Injection	2	2.32
D- Used For Treatment	5	5.81%
Grand Total	86	100

Table 3: Distribution of responses received for question, K1.

Answer	Number	Percentage
	(n)	%
A) From 6 Months	5	4.09
B) From 1 Year	1	0.81
C) From Birth	115	94.22
D) From 2 Years	1	0.81
Grand Total	122	100%

Table 4: Distribution of responses received for question, K2.

Response Chosen	Number	Percentage
	(n)	%
Mass Media (TV/Newspaper)	7	5.34
Friends And Relatives	13	9.92
Yourself	32	24.42
Doctors and Nurses	79	60.30
Grand Total	131	100

Table 5: Distribution of responses received for question, K3.

Response	Number	Percentage
	(n)	(%)
Polio	101	99.01
Pneumonia	0	0.00
Jaundice	0	0.00
Pertussis	1	0.09
Grand Total	102	100

Table 6: Distribution of responses received for question K4.

whether mothers' were aware of typhoid vaccination. Vaccination for typhoid is being recommended increasingly by physicians. It's an important finding that, out of 143 mothers majority of them (113, 79.02%) were not aware of Typhoid vaccination (Table 7). The last knowledge question K7 analysed mothers' knowledge regarding booster dose. Only 57 mothers (39.86%) were aware of booster dose. Out of 53 respondents, majority (53, 92.98%) said that booster dose gives more protection against immunity falling down (Table 8).

The first question in the attitude domain was to assess the attitude of mothers regarding vaccination as to whether they recommend vaccine to other children or not. To this question most of mothers 90 (62.93%) said that they strongly recommend vaccination to other children and 8 respondents (13.28%) said that they discourage vaccination (Table 9). Question A2 assessed whether mothers would recommend vaccination if the child was already sick. To this question, majority (125, 87.41%) of them said they would not vaccinate the child even if the child was already sick (Table 10). Then question A3 was to assess whether the mothers have fear of vaccination. Among 143 mothers most of them (114, 79.72%) said that they have no fear regarding vaccination (Table 11). The last question A4 of this domain assessed the attitude of mothers with respect to what encourages them to give vaccination for their children. Among 143 mothers almost half of them (72, 50.35%)

Answer	Number	Percentage
	(n)	(%)
No	113	79.02
Yes	30	20.97
Grand Total	143	100

Table 7: Distribution of responses received for question K6.

Response received	Number	Percentage
	(n)	(%)
Gives More Protection	53	92.98
Given To Cover Up The Missed Vaccine.	4	7.01
Grand Total	57	100

Table 8: Distribution of responses received for question K7.

Answer	Number	Percentage
	(n)	%
Strongly Recommend	90	62.93
Only If They Ask	26	18.18
Discourage Taking Vaccination	8	5.59
No Comments	19	13.28
Grand Total	143	100

Table 9: Distribution of responses received for question A1.

Answer	Number	Percentage
	(n)	(%)
No	125	87.41
Yes	18	12.58
Total	143	100%

Table 10: Distribution of responses received for question A2.

Answer	Number	Percentage
	(n)	(%)
No	114	79.72
Yes	29	20.27
Grand Total	143	100%

Table 11: Distribution of responses received for question A3.

said that they give vaccination to their child since government provides vaccination, whereas for 61 (42.66%), it was because of Expert advice (Table 12).

In Practice domain, first Question P1 assessed the source of information about vaccination. This question was to identify from whom mothers got the information regarding vaccination soon after their first child's birth. Majority of mothers said they were informed by the doctor (124, 86.71%) that their child should receive vaccination. Only one mother (0.94%) knew about vaccination earlier (Table 13). Next Question P2 assessed whom the mothers would contact if their child missed a dose of vaccination. To this question majority (129, 89.58%) of them were provided the answer Doctor (Table 14). Question P3 was to assess what mothers would do if there is fever following vaccination. For this question, Out of 143 mothers, majority of them (124, 86.71%) said that fever medicine is necessary; whereas 15 (10.48%) respondents said that no medicine is necessary if there is fever following vaccination (Table 15). The last question P4 was to identify to whom respondents will contact for next vaccination. To this question out of 143 mothers, majority (101, 70.62%) said that they will contact doctor for the next vaccination (Table 16).

The scores of each domain were calculated by totalling the scores obtained for selected questions under the domain. After providing scoring it was identified that, among 143 mothers, most of them (72,

Answer	Number	Percentage
	n	%
Government Provides Vaccination	76	53.14
Expert Advice	61	42.66
Advertisements	2	1.39
Self Experience	4	2.79
Grand Total	143	100

Table 12: Distribution of responses received for question A4.

Answer	Number	Percentage
	(n)	(%)
Doctor	124	86.71
Nurse	4	2.71
Knew Earlier	1	0.69
Family/Friends	14	9.79
Grand Total	143	100

Table 13: Distribution of responses received to question P1.

Answer	Number	Percentage
	(n)	(%)
Doctor	129	89.58
Grand Mother	4	2.77
Friends	2	1.39
Nurse	8	5.59
Grand Total	143	100

Table 14: Distribution of responses received to question P2.

Answer	Number	Percentage
	(n)	(%)
No Medicine Necessary	15	10.48
Fever Medicine Necessary	124	86.71
Stop Giving The Vaccination	0	0.00
Vaccination Has Worked For My Child	4	2.79
Grand Total	143	100

Table 15: Distribution of responses received to question P3.

50.43%) had excellent knowledge, whereas 49 (34.26%) had Average knowledge and 22 (15.38%) had poor knowledge (Table 17). In Attitude domain, majority (92, 64.33%) had acceptable attitude, 92 (64.33%) had acceptable attitude and 22 (15.38%) had unacceptable attitude (Table 18). Among the mothers, more than 90% (129, 90.20%) of them had excellent practice scores and 14 (9.79%) had average practice. None of them had Bad practice regarding vaccination administration (Table 19).

In this study, no relation was identified between mother's education status and vaccination adherence status (Table 20). Hundred percentage complete vaccination adherence was seen in children of mothers with lower primary education and diploma. Fewer adherences (60%) were identified with mothers who are graduates.

Discussion

Several studies on the immunization status of children have been published in various countries at different times. The relevance of this study is in its attempts to reveal the knowledge, attitude and practice of mothers regarding vaccination and to establish the relationship between mothers' educational status and vaccination adherence.

Answer	Number	Percentage
	(n)	(%)
Grand Mother	2	1.39
Friend	0	0.00
Doctor	101	70.62
Nurse	40	27.97
Grand Total	143	100

Table 16: Distribution of responses received to Question P4.

Grading of domain	Mother (N)
Excellent	72
Average	49
Poor	22

Table 17: Distribution of scores received for knowledge domain.

Grading of domain	Mother (N)
Excellent	29
Acceptable	92
Unacceptable	22

Table 18: Distribution of scores received for attitude domain.

Grading of domain	Mother (N)
Excellent	129
Average	14
Bad	0

Table 19: Distribution of scores received for practice domain.

Mothers' Education	Adherence Status		
	Adherent (n)	Adherence (%)	Adherent (n)
Not Went To School	7	63.63	4
LP	3	100	0
UP	20	76.92	6
HS	35	70.00	15
HSS	21	77.77	6
Diploma	5	100.00	0
Graduate	6	60.00	4
Post Graduate	6	85.71	1

Table 20: Distribution of mothers education status with adherence.

Out of 143 children included, 52.44% were males and remaining (47.55%) females. Gender distribution was not identified as an important factor in vaccination status. This result distribution is almost similar with the study conducted by Angadi MM et al., to determine knowledge, attitude and practice with respect to immunization among respondents in Bijapur, which found that there is no significant association between vaccination status and genders [7].

More than half of the mothers (60.13%) were in favour of immunization for children and thought that vaccination would prevent illness, as shown in question K1 when more than 91% of respondents gave the correct answer. The finding is similar to results in the study conducted by Al-lelaomer QB et al., in which more than 82% of parents favoured child vaccination and most parents knew that vaccines prevent diseases [8]. Question K2 was to assess the knowledge of informants regarding when the first vaccination should be administered. Among 143 mothers, 94.22% provided the correct answer that it should be started from birth. This result is similar with finding of the study conducted by Paudyal S to find out Mother's knowledge of immunization and to analyse the attitude and practice of immunization in Jhapa district, Nepal, were more than 86% of respondents were seen as familiar with administration of first vaccine - BCG. Question K3 was to identify from where respondents came to know regarding vaccination [9]. To this question, more than half (60.30%) of them said that they got information from doctors and nurses. Our findings are consistent with the findings of study conducted by Nath B et al., to determine the knowledge, attitude and practice about immunization among respondents of children aged 12-23 in Lucknow which found those health workers and the health personnel were the major sources (78%) of information regarding immunization. It is heartening to note that doctors are responsible for informing a majority of respondents about immunization but a need exists to work further in this area. In the current study, mass Medias (TV/Newspaper) were seen as a weak source of information (5.34%) regarding vaccination to the study population. This result is contrast to the study conducted by Al-Zahrani J et al., to assess parental knowledge and attitude regarding vaccination and their effects on vaccination practice, in which the media is noted to be a strong source (43.7%) for providing awareness among the respondents about immunization [10,11]. Here also exists a strong need for improvement in this area. Television and other Medias can be a good source to promote immunization and results of our study point out a need to further utilization of these sources. The next question K4 was to analyses respondent's knowledge regarding OPV. Out of 102 mothers, who were aware of OPV almost all of them (99.01%) said the correct answer that OPV prevents Polio. It is similar with the study conducted by Selvaraj K et al., in Puducherry, which found that vaccine knowledge was higher for polio (94.4%). Question K5 assessed mothers' knowledge regarding the use of pentavalent vaccination. Result shows that none of them was not aware about pentavalent vaccines. This result is contrast with the study conducted by Selvaraj K et al., in puducheri, to study mother's knowledge on routine vaccination with special focus on pentavalent vaccine, which shows that among 215 mothers, 36.7% had knowledge about pentavalent vaccine [12]. This finding of our study point out that doctor and other health workers should increase awareness in the mothers regarding the importance of pentavalent vaccination and they should remind them regarding next schedule the vaccination administration. According to care takers answer to question K6, which was regarding typhoid vaccination, it was found that majority of respondents (79.02%) were not aware of the availability of typhoid vaccination. Similar result can be found in a study conducted by Sharma R et al., in east Delhi, to assess the knowledge about routine

immunization among caretakers of young children, which shows that less than one in two respondents, knew about the availability of typhoid vaccine [13]. To the Question K7, which was to analyse the knowledge of respondents regarding booster dose, among 143 mothers only 57 (39.87%) were aware about Booster dose. Out of 57 responses received, more than 92.98% respondents provided the correct answer.

Positive finding was found to the question A1, which was to assess the attitude of mothers regarding vaccination as to whether they recommend vaccine to other children or not. Out of 143 respondents 62.93% said that they would strongly recommend vaccination to other child. This result can be compared with the study conducted by Al-lelaomer QB et al., which found that 96% of parents recommended immunization to other children [8]. Question A2 was to assess whether the mothers would recommend vaccination if the child was already sick. Among 143 respondents, more than 87% said that they would not their child, if the child was already sick. To the question A3, which was to assess whether the mothers have fear of vaccination, majority of them (79.72%) said that they have no fear about vaccination. However, the remaining 22.71% respondents expressed their fear about vaccination. This finding is similar with the result of the study conducted by Gupta P et al., in Lucknow to assess specific factors regarding immunization coverage, which shows that 16% of reason for vaccination non-adherence is fear of vaccination [14]. Question A4 assessed the attitude of respondents with respect to what encourages them to give vaccination for their children. Out of 143 responses, most of them said that they provide give vaccination to their child because of government provides vaccination (53.14%). This finding of our study is contrast with result obtained by the study, conducted by Nath B et al., to determine the knowledge, attitude and practice about immunization among respondents of children aged 12-23 in Lucknow, in which results shows that a greater proportion of those who availed government and outreach facilities remained partially immunized as compared to the private facilities [10]. So this finding of our study highlight that, government should take systemic measures to monitor immunization status of child and reminding regarding next schedule, to the care takers who depend on government facilities for administering vaccination to child. Here advertisement and TV were seen as weak sources of encouragement in parents to give vaccination to their child. Hence this study suggests for proper utilization of mass Medias in this area.

Question P1 was administered to identify from whom mothers got information regarding vaccination soon after birth. From this question it was identified as, for most of the care takers (86.71%), information regarding BCG was provided by doctors. Question P2 was to assess whom the respondent would contact if their child misses a dose of vaccination. To this question, most (89.58%) of the responded said that they will contact their doctor. Next question P3 assessed what the respondent would do if there is fever following vaccination. For this question, majority (86.71%), of respondent provided the answer that, fever medicine is necessary. Question P4 was to identify to whom respondents will contact for next vaccination. To this question, most of them (70.62%) said that they will contact their doctor while 27.97% said they would contact nurses.

In the present study, specific scoring was done to selected question in each domain. The study revealed that, among 143 mothers, half (50.43%) were found with excellent knowledge regarding immunization. In a study, conducted by Mereena et al., to assess knowledge and attitude regarding vaccines among mothers in a Hospital at Mangalore, in which more than 61% mothers had good knowledge in vaccination [15]. Here among 72 mothers with excellent knowledge, more than 70% mothers showed good vaccination adherence in their children. Chi square test

($p=0.002$) proves that there is a positive correlation between mother's knowledge in vaccination and vaccination adherence of the child.

In Attitude domain, first and third questions were selected and specific scoring was given in the range of -1 to 4. Majority (64.33%) of mothers included in this study had acceptable attitude towards vaccination, which is similar to the study conducted by Mapatano MA et al., in Democratic Republic of the Congo in which the mothers generally had a positive attitude [16]. In our study, mothers with acceptable attitude (70%) showed complete adherence to vaccination. It is an interesting fact that, more adherences (81.81%) was seen in the children of mothers with unacceptable attitude. In our study there is no relation between mothers attitude and vaccination status of their child, which is statistically proved by Chi square test ($p=0.4217$).

In practice domain, last 3 questions were selected for assessing practice and score range was given between -1 and 6. In our study, majority (90.20%) of mothers were identified with good practice, where more than 72% seen as completely adherent with vaccination. More adherence was assessed mothers with good practice, which couldn't be proved statistically by Chi square test ($p=0.3214$).

In our study, Educational level of mothers was identified as an independent factor in the determination of child's vaccination status. Mothers with lower primary and diploma educational status were found with complete vaccination adherence. Fewer adherences were identified with mothers who are graduate. This result is contrast with study conducted by Abdulraheeman IA et al., to identify the reasons for incomplete vaccination and factors for missed opportunities among rural Nigerian children, which found that there is an association between mothers' education status and missed opportunities of vaccination [16].

Conclusion

Different factors determine a child's complete vaccination status. In the present study, even though considerable mothers had satisfactory knowledge, attitude and practice regarding vaccination, around 25% children were identified as un-immunized or partially immunized.

Doctors and nurses were identified as main source information regarding vaccination to parents. Most of the mothers were having basic knowledge regarding vaccination and also had positive attitude. Gender did not show any significance in the study. In this population mothers with low as well as higher educational level showed a considerable knowledge and practice regarding vaccination of their child.

Despite all the efforts taken by the Government of India and international agencies, the proportion of unimmunized and partially immunized children remain quite high (24.89%) and we lag far behind the National socio - demographic goal of 85% coverage of all the vaccines. There is an urgent need to increase the coverage of UIP (Universal Immunization Programme) vaccines and there is a dire need to arrange for health education program sessions for all the parents regarding the importance of complete adherence of vaccination among children. TV, newspaper and other Medias can be also promoted as most important sources which can be used for spreading educational messages regarding vaccination.

References

1. Roush WS, Murphy VT (2007) Historical comparisons of morbidity and mortality for vaccine- preventable diseases in the United States. *J Am Med Assoc* 298: 2155-2163.
2. National Vaccine Policy (2011) India: Ministry of health and family welfare government of India.

3. Mabrouka AMB (2011) Knowledge, attitude and practices of mothers regarding immunization of infants and preschool children at Al-Beida City, Libya 2008. *Egyptian J Aller & Immunol* 9: 29-34.
4. Nath B, Singh JV, Awasthi S, Bhushan V, Kumar V, et al. (2008) KAP Study on immunization of children in a city of North India – A 30 cluster survey. *J Heal All Sci* 7: 2.
5. <https://mohfw.gov.in/sites/default/files/3962469192REPORT.pdf>
6. Qidwai W, Ali SS, Ayub SS, Ayub S (2007) Knowledge attitude and practice regarding immunization among family practice patients. *J Dow University of Health Sci* 1: 15-19.
7. Angadi MM, Jose AP, Udgiri R, Masali KA, Sorgarvi V, et al. (2013) A study of knowledge, attitude and practices on immunization of children in urban slums of Bijapur City, Karnataka, India. *J Clin Diagn Res* 7: 2803-2806.
8. Al-lelaomer QB, Bahari MB, Al-Qazaz HK, Salih MRM, Jamsheed SQ, et al. (2014) Are parent's knowledge and practice regarding immunization related to pediatrics immunization compliance? A mixed method study. *Bio Med Central* 14: 20.
9. Paudyal S (2013) Knowledge, attitude and practice of immunization behaviour among mothers visiting Amda Hospital, Jhapa. *Bhairahawa multiple campus, Tribhuvan University, Nepal*.
10. Al-Zahrani J (2013) Knowledge, attitude and practices of parents towards childhood vaccination. *Majmaah J Health Sci* 1: 29-38.
11. Selvaraj K, Sarkar S, Dayapraveena A (2015) Knowledge on routine pentavalent vaccines and socioeconomics correlates among mothers of children aged younger than 5 years in urban Puducherry. *Intern J Med Sci Pub Heal* 4: 199-204.
12. Sharma R, Bhasin KS (2008) To assess the knowledge about routine immunization among caretakers of young children. *Indian J Commun Med* 33: 31-34.
13. Guptha P, Prakash D, Srivastava PJ (2015) Determinants of immunization coverage in Lucknow district. *North Am J Med Sci* 7: 36-40.
14. Mereena, Sujatha R (2014) A study on knowledge and attitude regarding vaccines among mothers of under five children attending pediatric OPD in a selected hospital at Mangalore. *IOSR J Nur Heal Sci* 5: 39-46.
15. Mapatano MA, Kayembe K, Piriipi L, Nyandwe K (2014) Immunisation-related knowledge, attitudes and practices of mothers in Kinshasa, Democratic Republic of the Congo. *South African Family Practice* 60: 60-61.
16. Abdulraheem IS, Onajole AT, Jimoh AG, Oladipo AR (2011) Reasons for incomplete vaccination and factors for missed opportunities among rural Nigerian children. *J Public Health Epidemiol* 3: 194-203.