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Knowledge, attitude and perceptions of mothers with children under five years of age about vaccination in Mangalore, India

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ABSTRACT

Objective: Vaccination is a cost-effective intervention to prevent major illnesses that contribute to child mortality in the country. Increase in parental knowledge about vaccination will lead to increase in vaccination rates of children The main aim of our study was to assess the Knowledge (K), attitudes (A) and perceptions (KAP) of mothers with children under five years of age about vaccination.We also compared the KAP data between urban and rural setup. **Methodology:** This cross sectional descriptive study was conducted on mothers attending the Urban Health Centre (in Mangalore city) and on mothers attending a Peripheral Health Centre (Bengre, outskirts of Mangalore) havingchildren under five years of ageA semi structured pre validated questionnaire designed to assess the Knowledge, Attitudes and Perceptions about vaccination was administered to mothers attending the Urban Health Centre and on mothers attending a Peripheral Health Centre havingchildren under five years of age. **Results:** Among the study participants, 74 were from urban setup and 126 from rural set up. Around 8 (10.8%) from urban area and 78(61.9%) from rural area were illiterate. Mothers were the main decision makers regarding vaccination of the child in both urban and rural setup. The main source of information regarding vaccination differed among urban and rural setup, being the hospital and the anganwadi worker respectively. There was a statistically significant difference between urban and rural mothers when it was asked whether they knew why vaccination was important. A majority of the mothers both in the urban and rural areas believed that vaccines were safe. Among the urban mothers 90.5% and 62.7% of mother from rural were able to identify polio as a vaccine preventable disease.On a net analysis, 64(86.5%) mothers in the urban area and only 64 (50.8%) mothers in the rural areamothers found to have favourable knowledge, attitudes, perceptions and practices towards vaccination. **Conclusion:** A significant number of mothers in rural areas were unaware about the vaccination and its implications. Even in the urban areas we found significant lacunae in the KAP of mothers towards childhood vaccination.

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Key words: Knowledge, Attitude, Perception, Vaccine

INTRODUCTION

Vaccination is one of the most cost-effective interventions to prevent major illnesses that contribute to child mortality in the country, particularly in environments where malnourished children, overcrowding, poverty and illiteracy reign. Knowledge (K), positive attitudes (A) and appropriate perceptions (P) about vaccination hence become one of the main tools to reduce the incidence of vaccine preventable diseases (VPDs) thus reducing childhood mortality and morbidity. In our society, a large chunk of the population lives in rural areas, where mothers are illiterate and have numerous myths about vaccination; this results in children being unimmunized and susceptible and hence causes a serious policy concern. Evidence about the inequalities in vaccination practices exist even though

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childhood immunization has been an important part of maternal and child health services since the 1940s.[1]

In 2010 it was estimated that 1.7 million children died from vaccine preventable diseases.[2] It was also noted that 19.3 million children had been incompletely vaccinated, leaving them susceptible to vaccine preventable disease mortality and morbidity. Approximately 50% of all under vaccinated children live in three countries, India being one of them.[3]

The situation of under immunization is not only in the rural areas of the country, but also in urban areas as the migration of workersand the mushrooming of slums in urban areas are occurring at a rapid rate, and these are areas with unprecedented poverty, illiteracy, overcrowding and disease.[4] National Family Health Survey-3 reports that only 43.5% of children in India receive all of their primary vaccines by 12 months of age.[5] Main reasons identified for poor coverage includes inadequacy of community participation in routine immunization and Information Education and Communication activities.[6] Negative parental perceptions of vaccination are also an important barrier to childhood vaccination.[7] Therefore it is important to understand the variables that influence parental decisions to vaccinate their children and plan measures to overcome these barriers. A way to measure these variables, beliefs and behaviour of parents is to conduct a Knowledge, Attitudes and Perceptions (KAP) study. With this outlook, this study was planned to assess the KAP of mothers with children under five years of age about vaccination and to compare the KAP data between urban and rural setup.

METHODOLOGY

This cross sectional descriptive study was conducted on mothers attending the Urban Health Centre (in Mangalore city) and on mothers attending a Peripheral Health Centre (Bengre, outskirts of Mangalore) havingchildren under five years of age. The sample population is representative of the mothers of both these areas. The study was conducted after obtaining the ethics committee approval from Institutional Ethics committee. Informed consent was obtained from all eligible participants after explaining the objectives and nature of this study in their own language.

A semi structured pre validated questionnaire designed to assess the Knowledge, Attitudes and Perceptions about vaccination was administered to all the mothers fulfilling the above criteria. The data collected through this questionnaire includes: mother's age, educational status, occupation and socioeconomic status, number of children in the family, place of delivery and place of vaccination, immunization status of their child/children, knowledge of vaccines and the diseases they prevent, age of vaccine administration, distance of the health facility from home andtravel time, the source of the information regarding vaccination and the parental attitude towards vaccination. Confidentiality was maintained in the study.

Statistical analysis

Data was analyzed using SPSS version 11.0. Categorical variable were analyzed using chi-square test. A pvalue less than 0.05 was considered as statistically significant.

RESULTS

Among the study participants, 74 were from urban setup and 126 from rural set up. Table 1 shows the demographic characteristics of the participants. Around 8 (10.8%) from urban area and 78(61.9%) from rural area are illiterate, the difference being statistically very significant ($p<0.0001$). Seventeen (24.4%) of the participants from urban set up and 47 (37.3%) from rural set up were employed, the difference being statistically significant ($p=0.04$).

Mothers were the main decision makers regarding vaccination of the child in both urban and rural setup. The main source of information regarding vaccination differedamong urban and rural setup, being the hospital and the anganwadi worker respectively (Table 1).

When the awareness regarding vaccination was assessed, it was found that all mothers from the urban area were aware about childhood vaccination while 6.4% of the rural mothers were unaware about childhood vaccination and this difference was found to be statistically significant ($p=0.027$).

Table 2 shows the comparison of knowledge about vaccination among mothers from urban and rural area. There was a statistically significant difference between urban and rural mothers when it was asked whether they knew why vaccination was important. Urban mothers showed a significantly higher knowledge in this regard(75.6%) as against 62.69% in rural mothers. Around 91.89% of the mothers in the urban setup knew when vaccination was to be initiated as against 44.44% in the rural setup, implying that a statistically significant number of the mothers in the rural areas did not know when to initiate vaccination (55.56%).

When other knowledge regarding vaccine safety and situations of vaccine administration were analysed; a majority of the mothers both in the urban and rural areas believed that vaccines were safe. A large percentage 35%

in the rural population of mothers did not know whether vaccinations were safe for their children which underlies the problem of illiteracy in the mothers. Most of the mothers (54% urban and 33.3% rural) would not vaccinate their child if child was having mild upper respiratory tract infection and (63.5% urban and 43.7% rural) would not vaccinate their child if child had fever.

Table 1: Socio-demographic details of the mothers

Characteristics	Urban		Rural	
	Number (74)	Percentage	Number (126)	Percentage
Education				
Illiterate	8	10.8%	78	61.9%
School	32	43.2%	36	30.2%
Pre degree	24	32.4%	9	7.1%
Graduate	10	13.5%	3	2.4%
Occupation				
Housewife	56	75.7%	79	62.7%
Govt employed	2	2.7%	2	1.6%
Self Employed	4	5.4%	9	7.1%
Housemaid	1	1.4%	18	14.3%
Others	10	13.5%	18	14.3%
Decision maker (in matters of immunization)				
Mother	51	68.9%	89	70.6%
Father	2	2.7%	1	0.8%
Both	21	28.4%	35	27.8%
Sources of information regarding immunization				
ANM (auxiliary nurse midwife)	8	10.8%	18	14.3%
TV/Radio	15	20.3%	11	8.7%
Anganwadi worker	16	21.6%	54	42.9%
Hospital	73	98%	35	27.8%
Doctor	40	54%	16	12.7%

X^2 test

Figure 1 shows the vaccine preventable diseases identified by the urban and rural mothers. Among the urban mothers 90.5% and 62.7% of mother from rural were able to identify polio as a vaccine preventable disease. Similarly 39.2% of mothers in urban and 15.9% of mother in rural knew that tuberculosis is prevented by BCG vaccine. No mother could name all the diseases prevented by DPT vaccine. Around 47.3% of mothers from urban area and 69% of mothers from rural area had no knowledge about pertussis; 91.9% of mother from urban areas and 54% of mothers from rural area knew the disease prevented by OPV. Among urban mothers 86.5% and 54% of mothers from rural area knew the importance of attending pulse polio campaigns. Around 91.9% of urban mothers and 66.7% of rural mother knew that polio causes paralysis.

Around 25.7% of mothers from urban area had and 60.3% of mothers from rural set up had no knowledge about measles disease;21.6% of urban mothers and 24.6% of rural mother felt thatthe most common side effect of

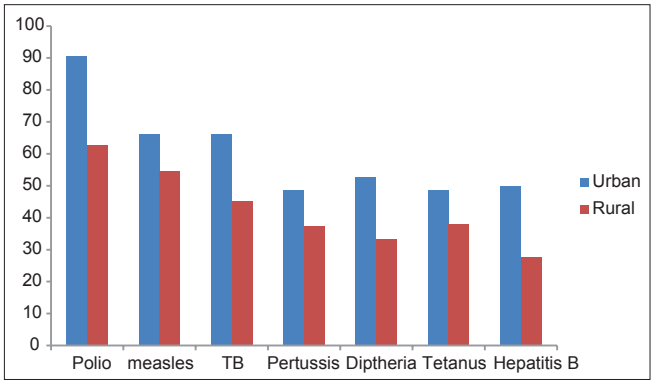

Figure 1: Vaccine Preventable Diseases identified by the urban and rural mothers

Table 2: Knowledge of mothers about vaccination

Survey questions	Urban		Rural		p value
	Number (74)	Percentage	Number (126)	Percentage	
Mothers who knew the reason to vaccinate a child	56	75.6%	79	62.69%	p<0.041
Mothers who did not know the reason for vaccination	17	24.4%	47	37.31%	
Mothers who knew the correct age to start immunization	68	91.89%	56	44.44%	p<0.0001
Mothers who did not know the appropriate age to start vaccination	6	8.1%	70	55.56%	
Are vaccines harmful?					
No	65	87.8%	81	64.3%	
Yes	0	-	1	0.8%	
Don't Know	9	12.2%	44	34.9%	
Can child with cold be vaccinated?					
Yes	21	28.4%	40	31.8%	
No	40	54%	42	33.3%	
Don't Know	13	17.6%	44	34.9%	
Can child with fever be vaccinated?					
Yes	15	20.3%	22	17.5%	
No	47	63.5%	55	43.7%	
Don't Know	12	16.2%	49	38.8%	

X^2 test

measles vaccine is allergic reaction. Around 32% of mother from urban and 17.4% of mother from rural area could name all diseases prevented by MMR vaccine. Only 4 of the 74 urban mothers and 12 of the 126 rural mothers have heard about complications after vaccination; the complications they listed were paralysis (8), deafness (3) and death (1).

Table 3 shows the comparison of attitude towards vaccination among urban and rural mothers. On analysing the attitude of the mothers towards vaccination, 89.2% of the mothers in the urban area and 55.6% of rural mothers felt vaccination were important and 45.4% of them in the rural area felt that vaccination was not required which was found to be statistically significant. Similarly when asked whether it was important to follow and complete the schedule 14.9% of urban mothers and 61.1% of rural mothers felt it was not needed to stick to a schedule or did not know. This also showed a high statistical significance and further underlines the cause of under immunization and poor vaccination coverage in our country. Most mothers in the urban area preferred to go a private health facility for vaccination (65%) while 91% of rural mothers preferred the government health facilities. Around 96% of urban mothers and 90.5% of rural mothers were satisfied about how the vaccination and its information was provided.

Table 4 shows the comparison of practice of mothers regarding vaccination between urban and rural setup. On analyzing the perceptions and practices of the mothers regarding vaccination, 95.9% of urban mothers and 73% of rural mothers had completely immunized their children whereas 27% in the rural mothers and only 4% of urban mothers had not completed vaccinating their child for age. This was found to be statistically significant. This again highlights the importance of educating the mother about the importance of completing their child's vaccination.

On further analysis of the practices, 77% of the urban mothers and 72% of rural mothers gave history of side effects in their children following vaccination. The most common side effects were fever (76% urban and 72%

Table 3: Attitude of mothers towards vaccination

Survey questions	Urban		Rural		p value
	Number (74)	Percentage	Number (126)	Percentage	
Do you think vaccination is important?					
Yes	66	89.2%	70	55.6%	p<0.0001
No/don't know	8	10.8%	57	45.4%	
Is it important to follow vaccination schedule?					
Yes	63	85.1%	49	38.9%	p<0.0001
No/don't know	11	14.9%	77	61.1%	
Where do you prefer to receive vaccination?					
Govt institute	26	35.1%	115	91.27%	p<0.0001
Private facility	48	64.9%	11	0.08%	
Are you satisfied with the way in which vaccination is provided?					
Yes	71	95.9%	114	90.47%	p<0.156
No	3	4.1%	12	9.53%	

X^2 test

Table 4: Practices of mothers regarding vaccination

Survey questions	Urban		Rural		p value
	Number (74)	Percentage	Number (126)	Percentage	
Was immunization completed according to schedule?					
Yes	71	95.9%	92	73%	p<0.0001
No	3	4.1%	34	27%	
Did side effects appear?					
Yes	57	77%	91	72.2%	
No	17	23%	35	27.8%	
If yes, which were seen?					
Fever	56	75.7%	92	73%	
Pain and swelling	10	13.5%	6	4.8%	
Rash	5	6.8%	7	5.6%	
Did you inform the doctor/health care worker about the side effect seen in your child?					
Yes	67	90.5%	90	71.4%	
No	7	9.5%	36	28.57%	

X^2 test

rural), pain and swelling in 13.5% urban and 4.8% rural children and rash in approximately 6% in both urban and rural children. However, where 90.5% of the urban mothers had informed the doctor about the side effects, 28.5% of rural mothers did not inform the health care workers about these side effects.

On a net analysis, favourable knowledge, attitudes, perceptions and practices towards vaccination were found in 64(86.5%) mothers in the urban area and only 64 (50.8%) mothers in the rural area. This difference was found to be statistically significant ($p<0.001$) and again shows that the vaccination coverage is incomplete in our rural areas and this is the reason for increase in incidence of VPDs and difficulty in eradication of VPDs.

DISCUSSION

Assessment of knowledge of mothers about immunization showed wide gap in the knowledge of urban and rural mothers. When the sociodemography was assessed, a low literacy level was found in the rural mothers. This was significant and needs to be addressed in order improve knowledge about vaccination strategies and its advantages, as most mothers are the primary caretakers and decision makers regarding vaccination in their families. Singh *et al* had reported in their study that mothers had fair knowledge regarding the need for immunization but had poor knowledge regarding VPDs.[6] In a study by Kapoor *et al* it was found that awareness and knowledge about VPDs increases with education status of mothers.[8] In a cross sectional study conducted by Siddiqui *et al*[9] inperi-urban Karachi significantly better vaccination status was found among children with both parents literate as compared to children with bothparents illiterate.[9] Our study revealed that anganwadi workers were the main source of information in the rural areas and it is this population that needs to be adequately trained so that they can spread the awareness upto the doorstep of the population. This was in concordance with the study by Bholanath *et al*.[4]

Knowledge about vaccination was assessed and it was found that a significant difference was seen between urban and rural mothers regarding the importance of vaccination as well as the age of initiation and completion of vaccination schedule. These lacunae need to be filled in order to attain 100% vaccination coverage in the country especially in the rural areas. Further into the knowledge about vaccination most mothers from both urban and rural areas believed vaccines were safe, however a large proportion of mothers both from urban and rural setting would delay vaccinating their child in the circumstances of simple childhood illnesses. These myths must be abolished and mothers must be assured regarding the safety of vaccines. Mothers' inability to name or identify diseases other than poliomyelitis indicates that health education should be emphasized to enhance knowledge about the complete programme. This was emphasized in many studies.[8,10,11]

Most mothers in the urban area preferred private setup vaccination services as against preference of government health facilities by rural mothers. Hamid *et al*[10] too in their study have reported that rural mothers preferred and trusted Government health facilities. This was probably because of the expense that would be incurred in a private health facility which an urban mother can afford. This was also found to be statistically significant and can draw attention to a hypothesis that if private clinics were not storing the vaccines properly, the children thus vaccinated would be still susceptible; especially in vaccines where maintenance of the cold chain is vital (eg. polio vaccine).

The mothers' practices regarding vaccination is found to be better in the urban than in the rural area as 95.9% of children in urban areas and only 73% of children in rural areas are completelyvaccinated according to schedule. One of the reason for not being able to complete vaccination on schedule cited by the mother was lack of awareness;the others being sick child and forgetfulness. In the study done by Hamid *et al*, lack of awareness and sick child were some of the reasons for not completing vaccination on schedule.[10] This indicates that the mothers do not completely understand the importance of vaccinating the child as was seen in our study.

Our study has found a significant difference in mothers from urban and rural areas in terms of their knowledge, attitude and practices regarding vaccination. The mothers from the urban (86.5%) set up were more aware and showed favourable attitude and practices regarding vaccination than their rural counterparts (50.8%). This could be attributed to the betterliteracy status of the urban mothers. It must also be kept in mind that since the majority of the mothers are the main caregivers and informantsregarding immunization, Information Education and Communication activities and media must be harnessed in creating awareness and knowledge about vaccines and vaccine preventable diseases. Hence if steps were taken to ensure good education to the girl child and knowledge about vaccination integrated into the antenatal care of mothers, the vaccination coverage will be near complete and the goals of eradication of diseases like polio may be achieved.

CONCLUSION

A significant number of mothers in rural areas were unaware about the vaccination and its implications. Even in the urban areas we found significant lacunae in the KAP of mothers towards childhood vaccination. These are the problems which need to be addressed so as to achieve vaccination coverage of 100%. Health care workers at the grass root level must be trained and through them the importance of childhood vaccination disseminated to all rural areas. In the urban areas also, centralization of vaccination facilities in certain major hospitals, will ensure vaccine safety and good vaccination coverage.

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SM – Concept and design, analysis and interpretation, manuscript preparation, revision of the manuscript and literature search; AS and PR – data collection, preparation of manuscript; DM – revision of the manuscript and literature search; BA – manuscript preparation, revision of the manuscript and literature search; MK – revision of the manuscript and literature search.

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