

Knowledge towards childhood immunization among mothers & reasons for incomplete immunization

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ABSTRACT

The purpose of the present study was to determine the mother's knowledge towards childhood immunization and examining the reasons for incomplete immunization. Information regarding socio demographic variables, gender disparity ratio, urban and rural inequality ratio and causes for incomplete immunization, knowledge of immunization was collected from 377 mothers bearing children of age 3 years. Around 115 (30.50%) children were partially immunized. Unavailability of vaccine was considered to be the major reason for incomplete immunization. The association between gender and immunization status ($p=0.027$), mother's education and knowledge score ($p=0.005$) and area of residence and knowledge score towards immunization ($p=0.001$) was found to be statistically significant. Mother's education and area of residence were found to get associated with knowledge of immunization. However, knowledge towards immunization and immunization status was not significantly associated. Gender disparity in immunization was observed in the present study. No association was found between the children's immunization status and area of residence, birth order or mother's education. Area of residence and mother's education and was found to get associated with knowledge of immunization.

INTRODUCTION

There is no exaggeration to assert that vaccination is one of the greatest scientific discoveries ever made. It protects many children from getting sick and dead from dreadful diseases, thereby reducing the agony of many parents. So, there is necessity for the parents to develop unequivocal knowledge and perceptions about vaccinations. Because unequivocal knowledge and practices helps to develop positive attitude towards vaccination and thus their contribution to vaccination. It helps to reduce the burden of dreadful infectious diseases, which are best controlled by vaccination (Bruce *et al.*, 2000, Omer *et al.*, 2014). A positive correlation between parental knowledge, practice and vaccination rates of children was reported by many studies (Shah *et al.*, 1991; Qidwai *et al.*, 2007; Nath *et al.*, 2008; Borrás *et al.*,

2009). Similarly many studies reported positive correlation between mother's knowledge, attitudes and practice and children's immunization (Nisar *et al.*, 2010).

As shown in previous studies in resource limited settings, good immunization coverage has been achieved by the efforts of a robust primary health care approach (Bradley, IGALS, 2005) mothers' knowledge (Streatfield *et al.*, 1990; Bhuiya *et al.*, 1995; Bradley, IGALS, 2005) and the provision of immunization information (Bhuiya *et al.*, 1995; Jamil *et al.*, 1999; Cui and Gofin, 2007). Social Cognition Models have provided useful insight, particularly the fear of vaccine harm as a barrier to immunization (Peter *et al.*, 2000).

Parental practices like unawareness of adverse effects and contraindications of vaccination, negative perceptions about vaccination in mild illness, negative attitude, for example, mother's fear of vaccination was considered as one of the major barrier to childhood vaccination (Gherardi, 2013). The belief that vaccines cause autism was the most prevalent parental concern in a survey conducted in the USA (Smith *et al.*, 2009).

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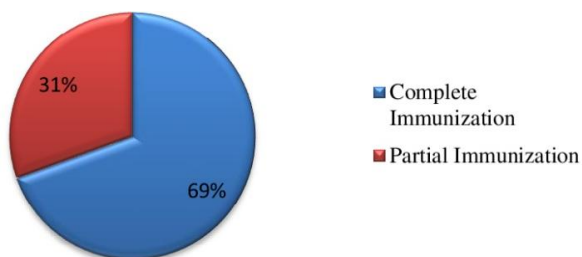


Fig. 1: Immunization status.

MATERIALS AND METHODS

This was a descriptive observational study and was conducted on 377 mothers for a duration of six months in the outpatient department of Pediatrics, Government General Hospital, Kakinada. The project was subject to approval by the Institutional Ethical Committee (RC.No.Clinicals/Pharma.D/N2/2016, Dt 22.04.2016). The study was conducted for a duration of 6 months starting from 22.04.2016 to 22.10.2016. After stating the aim and objective of research work clearly, an informed consent was taken from mothers who had shown their willingness to participate. Mothers with children of age below or equal to 3 years, mothers who visited the outpatient department of pediatrics were enrolled in the study. Mothers who did not cooperate for the interview, caretakers who brought children other than his/her mother was excluded from the study. A data collection form which suits our present study was framed. It contains demographic data like child's age, mother's age, location, and educational status, mother's occupation, etc. A qualitative interview was done using 20 mothers and based on their response questions was framed. Then a pilot study was carried out on 15 mothers. Cronbach's alpha coefficient test was applied to measure internal reliability (0.81) and thus a questionnaire was prepared to assess the knowledge of mothers on immunization. Immunization status of children was assessed from mothers or observed from the immunization card and reasons for incomplete vaccination was noted down. Knowledge assessment of mothers was carried out using a specially designed questionnaire. It consists of seven questions. Each question carries three options. Answering 'yes' to questions 1, 2, 3, 5, and 7 and 'no' to questions 4, 6 reveals good knowledge about immunization. The knowledge was categorized as poor (≤ 0), fair (1-5), good (> 5). Gender Disparity Ratio (GDR) was used to measure gender inequality in immunization. A GDR value of 100 indicates that there is no gender differential. GDR values exceeding 100 indicate that the girl child is at a disadvantage. Association between child gender, mother's occupation, mother's educational status, area of residence and birth order with immunization status was found using chi-square test. The association between mother's education, birth order with knowledge score was also found using chi-square test. $p < 0.05$ was considered as statistically significant.

RESULT AND DISCUSSION

The mean age of the mothers in the sample was 24.37 ± 3.85 years. Most of the mothers were unemployed

(90.18%). Most of them completed graduation (38.9%) followed by secondary education (27.5%). Around 220 (58.3%) are from urban set up (Table 1).

Table 1: Socio demographic characteristics of the sample (n=377).

S. No.	Socio-demographics characteristics	Total sample	Percentage (%)
1	Age of Mother (in years)		
	16-20	59	15.65
	21-25	190	50.39
	26-30	100	26.52
	31-35	28	7.42
2	Child gender		
	Male	203	53.84
	Female	174	46.15
3	Occupation of Mother's		
	Unemployed	340	90.18
	Working	37	9.81
4	Educational status of Mother's		
	Nil	16	4.24
	Primary	47	12.46
	Secondary	98	25.99
	Inter	74	19.62
	Degree	142	37.66
5	Area of Residence		
	Rural	160	42.44
	Urban	217	57.56
6	Birth order of children		
	1 st	213	56.49
	2 nd	155	41.11
	3 rd	9	2.38

Table 2: Knowledge assessment criteria of total sample (n=377).

S. No.	Knowledge assessment questions	Yes (%)	No (%)	Don't know (%)
1	Knowledge regarding age related vaccination	87.26	3.97	8.75
2	Vaccine prevents diseases	97.61	0.79	1.59
3	Vaccination should be given from birth	97.08	1.59	1.32
4	Vaccines are harmful	2.65	93.10	4.24
5	Child with common cold be vaccinated	15.64	59.41	24.93
6	Child with fever be vaccinated	8.48	62.33	29.17
7	Child with diarrhea be vaccinated	9.01	60.21	30.76

Around 115 (30.50%) children were partially immunized. Unavailability of vaccine was considered to be the major reason for incomplete immunization. Other reasons for incomplete immunization were unawareness of mother regarding age related vaccines, the child was ill-was brought and was not immunized, unawareness of need for immunization (Table 3).

Table 3: Reasons for incomplete immunization (n=377).

S. No.	Reasons for incomplete vaccination	Total	Percentage (%)
1	Mother was too busy	4	1.06
2	There was a family problem	5	1.32
3	The vaccine was not available	52	13.79

4	The time for immunization was not convenient	2	0.53
5	There was a postponement in going until another time	4	1.06
6	The child was ill-was brought but not immunized	12	3.18
7	The child was ill-was not brought	6	1.59
8	Unaware of the need for a second or third dose	0	---
9	No belief in the vaccination	0	---
10	Was not aware of the need for immunization	9	2.38
11	Mother was afraid of side effects	0	---
12	Mother was unaware of age related vaccination	13	3.44
13	Did not know the place and time for immunization	2	0.53
14	There was long queue and waiting time	0	---
15	Unaware of optional vaccines	0	---
16	Mother was asked to buy any vaccines	6	1.59

Table 4: Gender disparity ratio values.

S.No.	Gender	Complete Immunization (in percentage)	Partial Immunization (in percentage)	Gender Disparity Ratio
1	Male	76.84	23.15	115.27
2	Female	66.66	33.33	

Table 5: Association between socio demographics and immunization status.

Socio demographic Characteristic	Immunization Status		Statistic	p-value
	Complete	Partial		
Gender				
Male	156 (76.84%)	47 (23.15%)	$\chi^2= 4.832$	0.027*
Female	116 (66.66%)	58(33.33%)		
Occupation				
Unemployed	247 (72.64%)	93(27.35%)	$\chi^2=0.155$	0.693
Employed	28 (75.67%)	9(24.32%)		
Education				
Nil	11 (68.75%)	5(31.25%)	$\chi^2=4.645$	0.325
Primary	37 (78.72%)	10(21.27%)		
Secondary	69 (70.40%)	29(29.59%)		
Inter	60 (81.08%)	14(18.91%)		
Degree	98 (69.01%)	44(30.98%)		
Area of Residence				
Rural	120 (75%)	40(25%)	$\chi^2=1.067$	0.301
Urban	153 (70.50%)	64(29.49%)		
Birth Order				
1	160 (75.11%)	53(24.88%)	$\chi^2= 4.009$	0.134
2	110 (70.96%)	45(29.03%)		
3	3 (33.33%)	6(66.66%)		

The association between gender and immunization status was found to be statistically significant ($p=0.027$), while associations between other demographic variables, like mother's occupation, mother's education, area of residence and birth order with immunization status was found to be statistically not significant (Table 5).

Some studies reported that girls are less likely to access immunization than boys (Filmer *et al.*, 1998; Fikree, Pasha, 2004). Gender discrimination in immunization coverage has been shown to exist in all states of India (Pande, Yazbeck, 2003; Borooah, 2004). These studies depicted that female children are subjected to gender discrimination and are not getting proper attention regarding immunization. Few other studies also depicted same difference, but were insignificant (Moulton *et al.*, 2005; Elliott, Farmer, 2006). The evidence from recent national level data shows that the gender gap in full immunization coverage has either stagnated or narrowed (Gaudin, Yazbeck, 2006; Bhagyaxmi *et*

al., 2007). Trend analysis shows that, at the national level, the average gender disparity in full immunization has remained constant (Prusty, Kumar, 2014).

Gender differentials are calculated as a simple ratio of immunization rates for boys and girls, multiplied by 100, as follows:

Gender disparity ratio (GDR) for full immunization:

$$= \frac{\% \text{ of boys fully immunized}}{\% \text{ of girls fully immunized}} \times 100 = \frac{76.84\%}{66.66\%} \times$$

$$100 = 115.27(\text{Table 4})$$

A GDR for complete immunization (115.27) clearly indicates gender inequality in the present study (Pande, Yazbeck, 2003).

Mother's education influences health seeking behavior. It is also believed that higher the level of education, higher the proportion of children who were fully immunized. In the present study, the association between the mother's education and immunization status was found to be statistically not significant. Similar findings were reported in some other studies (Mabrouka, 2011; Félicitée *et al.*, 2016). In contrast many studies have reported a statistically significant association between mother's education and immunization status (Bruce *et al.*, 2000; Nath *et al.*, 2008; Borrás *et al.*, 2009; and Soundarya *et al.*, 2014). Perhaps, nationwide social welfare programmes like Integrated Child Development Services (ICDS) succeeded in bringing awareness in everyone by setting up anganwadi centers, a community based service- delivery division of ICDS. Electronic media also play a crucial role in bringing awareness about vaccination.

Area of residence and immunization status is not associated in present study (Table 5). But the Urban-rural inequality ratio of the present sample (94) also indicates no inequality in the coverage of full immunization. Urban-rural inequality ratio was calculated as a ratio of full immunization rates. Urban-Rural differentials are calculated as a simple ratio of immunization rates for urban and rural, multiplied by 100, as follows:

Urban-Rural inequality ratio (URIR) for full immunization:

$$\frac{\% \text{ of urban children fully immunized}}{\% \text{ of rural children fully immunized}} \times 100 = \frac{70.50\%}{75\%} \times 100 = 94$$

A value of 100 in an inequality ratio would imply that there was no urban-rural difference in full immunization coverage, while a value above 100 would indicate inequality in the coverage of full immunization. Specifically, geographical access has a greater impact on the utilization of health care services, particularly in rural areas with the limited service provision of health care services (Singh, 2013). Usually unemployed mothers have more feasibility towards child immunization than employed mothers.

Mother's occupation was not associated with immunization status in our study (Table 5). Similar findings were presented in other studies (Malini *et al.*, 2001; Mabrouka, 2011). Some studies reported statistically significant association between mother's occupation and immunization status (Vilas *et al.*, 2013; John, 2014).

There are fewer chances of complete immunization for the first child than second and third one. Better awareness and improved knowledge about the benefits of immunization, availability of polyvalent vaccines which cures two or more diseases might be the reason. Birth order is not associated with immunization status in the present study (Table 5). Inverse relationship between birth order and immunization status was disclosed in some studies (Elizabeth *et al.*, 2003; Bhola *et al.*, 2007; Vilas *et al.*, 2013). The association between mother's education and knowledge score was statistically significant in our study ($p=0.005$).

Many studies reported similar findings and significant association (Mabrouka, 2011; Fatima, Chizoma, 2013; Omer *et al.*, 2014; Soundarya *et al.*, 2014; and Chris *et al.*, 2015). Uneducated mothers were less conscious about the immunization of their children as compared to the mothers who were highly educated. A statistically significant association was found between area of residence and knowledge score towards immunization in our study ($p=0.001$) (Table 6). However, recently nationwide service programs have been successful in bringing awareness about immunization in rural areas.

Anganwadi workers to ensure immunization for children below 6 years of age. Electronic media and mass media are also bringing awareness about immunization through advertisements and special programmes.

Table 6: Association of socio demographics with knowledge score.

Socio Demographic Characteristic	Knowledge Score			Statistic	P-value
	Poor	Fair	Good		
Education					
Nil	2	13	25	$\chi^2 = 21.605$	0.005*
Primary	4	39	4		
Secondary	12	77	11		
Inter	4	58	5		
Degree	3	113	30		
Birth order					
1 st child	15	164	33	$\chi^2 = 3.291$	0.510
2 nd child	9	130	18		
3 rd child	1	7	0		
Area of residence					
Rural	20	110	23	$\chi^2 = 28.019$	0.001*
Urban	85	116	23		
Immunization Status					
Complete	17	216	33	$\chi^2 = 1.048$	0.591
Partial	7	85	18		

CONCLUSION

Gender disparity in immunization was observed in our study. In contrary to many studies, no association was found between immunization status of children and area of residence, Birth order, or mother's education. Mother's education and area of residence were found to get associated with knowledge of immunization. However, knowledge towards immunization and immunization status was not significantly associated. It shows a very good progression regarding awareness of immunization. Issues regarding gender disparity should be addressed. In recent days electronic media and anganwadi worker's efforts in raising

consciousness about the importance of immunization might increase the immunization rate irrespective of knowledge and area of residence of people.

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