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Study of immunization status of children less than 5 years of age in a tertiary health care institution of Amritsar: A hospital based study

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Abstract
Background: Immunization is an important public health intervention and a cost effective strategy to reduce morbidity and mortality associated with the vaccine preventable diseases.
Aim and objectives
1. To estimate the immunization status as per the National Immunization Schedule and
2. To identify the socio-demographic profile influencing the immunization status of children under five years of age.
Material and Methods: The study was carried out in the immunization unit of Urban Health Training Center, Department of Community Medicine, Sri Guru Ram Das Institute of Medical Sciences & Research Vallah, Amritsar. It was a cross sectional descriptive study. In the present study, 994 children aged 0-5 years were included. The study involved interviewing the mother/caregiver having a child in the age group of 0- 5 years, using a Performa to obtain characteristics of mothers and immunization history of children. It was carried out from November 2016 to January 2017. Statistical analysis was done and valid conclusions were drawn.
Results: Majority of mothers (95.77%) were literate. Majority of the children (93.96%) were completely immunized. Sex of a child had no significant association with immunization coverage.
Discussion: Present study showed that most of the children under study were completely immunized as per the National Immunization Schedule. The study had shown that there was a direct positive correlation of the higher socio-economic and literacy status of mothers/caregivers with the immunization coverage of children. Immunization coverage is found more in children delivered in hospitals/Govt. Institutes as compared to children delivered in homes.

Keywords: immunization, prevalence, chi square, immunization, socio-demographic factors

Introduction

In developing countries like India where the vaccine preventable diseases prevalence among Infants, Children and women of child bearing age is common due to Poor nutritional and environmental sanitation, immunization is an important means of protecting these children against the vaccine preventable diseases. Immunization is one of the most important Public Health Interventions and cost effective strategy to reduce both the morbidity and mortality associated with these vaccine preventable diseases. Immunization forms the major focus of child survival programmes throughout the world. Over Two million deaths have been delayed through immunization and approximately three million children die each year worldwide due to the vaccine preventable diseases. Recent estimates suggest that approximately 34 million children are not completely immunized, with almost 98% of them residing in the developing countries. Though there is increased accessibility of health care services in both urban and rural areas, still the utilization of health care services is low by the different segments of the society [1]. The current scenario depicts that immunization coverage has been steadily increasing but the average level remains far less than the desired. Still only 44 per cent of the infants in India are fully immunized (NFHS-III) which is much less than the desired goal of achieving 85 per cent coverage [2]. Therefore immunization is one of the most cost effective and highest-impact public health intervention, reducing hospitalization and treatment costs through prevention, which directly or indirectly prevents the bulk of mortality associated with Vaccine preventable Diseases in children under five years of age in India. Even though the immunization services in India are being offered free of cost in public health facilities, about 45% of Indian children are

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deprived of the recommended vaccinations [3]. Hence the present study was undertaken with aim

1. To estimate the immunization status of children and
2. To identify the socio-demographic factors influencing the immunization status of children from 0-5 years of age. As coverage data are traditionally considered as the best indicators of an immunization program's performance because these data reflect the management of, access to, and utilization of services.

Materials and Method

The study was a cross sectional descriptive study that involved interviewing the mothers/primary care takers having children below five years of age to note their maternal characteristics and immunization history. It was carried out from November 2016 to January 2017 in the Urban Health Training Centre (UHTC) of Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar using a pre-designed and pre-tested questionnaire. After taking permission from college ethics committee, all the children in the age group of 0-5 years attending the UHTC for vaccination during the period of study were included and the required information was collected on the performa. The information provided by the mother/caregiver was verified from the immunization card of the child and if the card was not available, validation of immunization history was done by seeking information about the time and source of immunization and inspection for the BCG scar on the left upper arm (usual site). Educational status of mother was noted. Children were classified as fully immunized who had received all vaccines including BCG, (Pentavalent vaccine, IPV, Measles vaccine) in proper doses and at proper time as per universal immunization program, Partially immunized: Child who had not been completely immunized but received only one or two doses of vaccine for his/her age as per schedule and unimmunized children who had not received any vaccine till the date of study though they may have received polio drops in the pulse polio drive). Statistical analysis of data in the form of comparison of immunized and un-immunized status of the child to age, sex and education of mother was done with percentages and chi square test. P value <0.05 was considered as significant. Analysis of association between immunization coverage and various socio-demographic variables was done using chi square.

Inclusion criteria

Children under five years of age attending Urban Training Health Centre of S G R D Institute of Medical Sciences and Research, Amritsar.

Exclusion criteria children, who were seriously ill, too agitated & unwilling for immunization, were excluded from the study.

Results/ Observation

Table 1: Distribution of children according to the age group& sex (n =.994)

Age in months	Number	Frequency
-12 months	169	17%
13-24 months	178	17.91%
25-36 months	234	23.54%
37- 48 months	226	22.73%
49 -60 months	187	18.81%
Total	994	100%
Male	573	57.65%
Female	421	42.35%
Total	994	100%

In the present study, a total of 994 children under five year of age were included. Out of these, 573 (57.65%) were male and 421 (42.35 %) were female children. There were 169 (17%) children in the age group of 0-12 months, 178 (17.91%) in the age group of 13-24 months, 234 (23.54%) in the age group of 25-36 months, 226 (22.73%) in the age group of 37-48 months and 187 (18.81%) were in the age group of 49 -60 months.

Table 2: showing various socio-demographic factors of the study population (n=994)

Variable		Number	Frequency (%age)
Religion	Hindu	380	38.23
	Sikh	544	54.73
	Muslims	28	2.82
	Christians	22	2.21
	Others	20	2.01
Resident status	1. Resident	795	79.98
	2. Migrant	199	20.0
Literacy status of Mother	1. Illiterate	42 ⎫	4.23% ⎫
	2. Primary	58 ⎬ 952	5.83 ⎬ 95.77%
	3. Secondary literate	368	37.02
	3. Above Secondary	526 ⎭	52.90 ⎭
Occupation of the mother/father	i. Skilled	394	39.64
	ii. Skilled	248	24.95
	iii. Unskilled	48	4.83
	iv. Professional	106	10.70
	v. Lab our /Daily Wages	198	19.91
	vi. Private /Govt job		
Type of the family	1. Nuclear Family	132	13.28%
	2. Joint Family	862	86.72%
*S-E status of the Family * On the basis Of Modified B.G Prasad Classification July 2014.	* 1. Class-I	328	33%
	2. Class-11	373	37.52%
	3. Class-Iii	158	15.90%
	4. Class-Iv	79	07.95%
	5. Class-V	56	05.63%
Immunization card	1. Present	880	(88.53%)
	2. Not present	114	(11.47%)
888.53On the basis Of Modified B.G Prasad Classification July 2014.			

Out of the total 994 study subjects 380(38.23%) were Hindus, 544 (54.73%) were Sikhs, 28 (2.82%) were Muslims, 22 (2.21%) were Christians and Others were 20 (2.01%). Out of 994 study subjects 795 (79.98%) were resident and 199 (20.02%) children were belonging to migratory families. As far as literacy status of the study population (mothers) was concerned, maximum number 952 (95.77%) of mothers were literate. [526 (52.92%) had educated above the secondary level of education, followed by 368 (37.02%) were educated up to secondary level,40 were educated up to middle level,18 were had received up to primary level education] and 42 (4.23%) were illiterate. Out of total 994 study subjects, 394 (39.64%) were skilled workers, 248 (24.95) were unskilled/semiskilled workers, 48 (4.83%) were professionals,106 (10.70) subjects were Laborers /and daily wagers, followed by 198 (19.91%) were in Private/Govt. Jobs. 862(86.72%) children were belonging to joint, and rest 132(13.28%) belonged to nuclear families. As far as Socio-economic status of the study population was concerned, out of the 994 subjects, 328 (33%) belonged to socio-economic status class-I, followed by 373 (37.52%) to class-ii, 158 (15.90) to class-iii, 79 (07.95 %) to class-iv, and rest 56 (05.63%) were belonging to class –V.

Majority of mothers had immunization cards of the child with them (88.53%).

Table 3: Gender-wise vaccination status among study subjects (n=994)

Variable	Male (573)	Female (421)	Total
Fully vaccinated (n=934)	535 (93.36%)	399 (96%)	934 (93.96%)
Partially vaccinated(n =44)	26 (59.1%)	18 (40.9%)	44 (4.43%)
Un-vaccinated (n=16)	5 (31.25%)	11 (68.75%)	16 (1.61%)

Chi-square=0.796 df =4 p=0.939 (not significant)

The above table reveals that 934 (93.96%) infants were completely immunized as per their age. Immunization coverage was found more among the females (96 %) as compared to males (93.36%) though the difference was found to be statistically insignificant (cye=0.796, *p*>0.05).44 (4.43 %) children were partially immunized and16 (1.61 %) were unimmunized. Out of 16 unimmunized, 5 (31.25%) and 11 (68.75 %) were male and female children respectively had not received any vaccination. Though the percentage of the partially vaccinated and unimmunized children was more among the females.

Table 4: Distribution of children according to their vaccination status in relation to various socio-demographic factors

Age in months	Fully vaccinated children N=934 (93.96%)	%age	Partially vaccinated children N=44 (4.43%))	%age	Unvaccinated children N=16 (1.60%)	%age
0-12	159	94.08	8	4.73	2	1.18
13-24	167	93.8	7	3.94	4	2.25
25-> 49	608	93.97	29	4.49	10	1.55

Chi-square =0.796 df=4 p=0.939 (not significant).

This table shows that the maximum percentage (94.08%) of fully immunized children were in the age group of 0-12 months followed by the rest (93.8%, & 93.97%) in the age groups of 13- 24 months and 25-49 months respectively of the children. The difference was statistically insignificant.

Table 5: Distribution of children according to their socio-economic factors

Socio-economic status	Fully vaccinated (n=934)	%age	Partially vaccinated (n=44)	%age	Unvaccinated children (n=16)	%age
Class 1 328	319	97.26	4	1.22	0	-
Class11 373	366	98.12	6	1.61	0	-
Class 111 158	138	87.34	8	5.06	1	-0.63
Class iv 79	68	86	14	17.72	7	8.86
Class v 56	43	76.78	12	21.49	3	5.36
Chi–square =134.299; df=8; p=0.000 (highly significant)						
Literacy status	Fully vaccinated (n=934)	%age	Partially vaccinated (n=10)	%age	Unvaccinated N(=16)	%age
Literate 952 (95.77%)	890	93.49	4	0.42	5	0.52
Illiterate 42 (4.23%)	31	73.80	6	14.29	1	2.38
Chi–square =84.014; df=2; p=0.000 (highly significant)						
Family Type Joint	862	86.72	6	0.7	2	0.23
Nuclear	132	13.28	7	5.30	5	3.37
Chi–square =36.28; df=2; p=0.000 (highly significant)						
Immunization cards (n=994)	Fully vaccinated	%age	Partially vaccinated	%age	Un-vaccinated	%age
Present 816	809	99.14	05	0.61	02	0.24
Absent 178	163	91.57	12	6.74	03	1.69
Total 994	972		17		5	

Chi–square =38.96; df=2; p=0.000 (highly significant)

This table shows that higher socio-economic class-I &ll (97.26% & 98.12%) status and literacy subjects(93.49%) were more likely to be fully immunized as compared to those with low socio-economic status class and literacy.(P=000 highly significant). Children of mothers/caregivers belonging to joint families were more likely to be fully immunized (86.72%) Statistically this finding was highly significant (p=0.000) it as

compared to nuclear families which might have provided support to the family.
Children of the mothers who had an immunization card had higher (99.14%) immunization coverage for routine vaccines as compared to those who did not had the immunization cards. Which was a significant finding (p=0.000)

Table 6: Distribution of newborns according to their place of birth place of Birth and at birth vaccination relationship.

Place of delivery	No	B CG/OPV/Hepatitis B given	BCG not given
Institutional	428 (43.06%)	417(97.42%)	11 (2.58%)
Domiciliary	566 (56.94%)	21(03.71%)	545(96.29%)
Total	994	438(44.1)	556(55.93%)

Chi-square =868.479; df=1,;p=0.000 (highly significant)

This table shows that most of the deliveries (56.94 %) took place in the homes as compared to institutional (43.06%) deliveries. Out of the 428 institutional newborns 417 (97.43%) were given BCG at birth and, zero doses of OPV and Hepatitis B vaccines before they were discharged from the hospital as compared to those born at homes (03.71%).This observation has found to be statistically highly significant (p=000).

Discussion
The current study showed that majority of the children were completely immunized (93.96%).This finding was similar to the study conducted by Padda P, Kaur H, Kaur A, Kaur H, Jhajj K in Amritsar [4] but in contrast o the cross sectional study conducted by Saxsena P *et al*. Who found that only 30% of the children were completely immunized [5]. This might be due to better knowledge, socio-economic status, literacy rate of the study population. The impact of various socio-demographic factors on age appropriate vaccination was studied (Table 2). It was observed that percentage of infants fully immunized as per their age was marginally higher among children of 0-12 months of age in comparison to other age groups. The difference was statistically insignificant. Contrary to the general perception, percentage of the female children was better (96%) than males (93.36%). Similar findings were observed by Malkar *et al*. In Maharashtra [6]. Higher socio-economic status and literacy subjects were more likely to be fully immunized as compared to those with low socio-economic status class and literacy. (P=000 highly significant). Similar finding showing a positive correlation between maternal education status and complete immunization status of child was reported by Mathwes in a review study [10]. Children born in the joint families were more likely to be vaccinated as compared to nuclear families. Which might provided support to the family. Children of mothers who had an immunization card had higher (99.14%) immunization coverage for routine vaccines as compared to those who did not. These findings are in tune with the findings of another study conducted by Gill KP, Devgun P. In Amritsar [9]. Other factors that were associated with vaccination status of the children were the place of birth. Children born at home were less likely to receive BCG and zero doses of OPV and Hepatitis B (03.71%) as compared o those born in hospital (97.42%). These findings were in consistent with the studies of Coetzee N, Berry DJ, Jacobs ME in Mozambique and South Africa have also observed the same [7-8]. Mothers who deliver at home may be non-users of health services in general and have to be targeted for utilization of health services.

Conclusion
Mother's education significantly influences the immunization coverage among the under-fives. Sex of a child had no significant association with immunization coverage

Recommendations
Institutional deliveries should be promoted so that each and every child should be vaccinated at birth place before they are discharged.
Education programmes that can target poor and uneducated parents/mother should be put in place so that they are able to make informed decisions regarding Immunization of their children.

Contributory Statement
All the authors were involved in data collection and patient management. All the authors have read and approved the final manuscript.

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