ORIGINAL RESEARCH

A cross-sectional study to assess awareness regarding immunization among caregiver of infantsvisiting Immunization Clinic at tertiary care center in Gwalior in Madhya Pradesh

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ABSTRACT

Background: Most parents have a poor understanding of vaccine-preventablediseases and believe in false propagations about the contents, side effects, and effectiveness of vaccines. This study was conducted to assess the profile of infant with their caregiver and awareness regarding immunization among the caregivers who were attending Immunization Clinic.**Material and Methods :**The present cross-sectional study done on the 450 Caregivers of infants up to 1 year of age who gave consent to participate in the study. The descriptive representation of data was done in the form of numbers and percentages, calculated in MS Excel. **Results:**The majority of infants i.e., 183(40.6%) were 2-4 months of age, came at 5th visit for vaccination (32%), 61.8% were males and belonged to the general category (53.3%). Hindus caregivers were observed in preponderance (90.4%). Mostly infants were from urban areas i.e., 436(96.9%).This table shows that more than 3/5th of infants were born with ≥2.5 kg birth weight i.e., 292(64.9%).About half (55.6%) of the infants were at the first birth order. The majority of caregivers i.e., 449(99.8%) had already heard about immunization and 77.8% had the knowledge that immunization prevents morbidity from a certain specific disease. Maximum proportion of caregivers got information about immunization through Anganwadi Workers i.e., 287(63.7%). **Conclusion:**Immunization can prevent many morbidities, mortalities and disabilities. In this study, majority of infants were males, were in age group of 02-04 months, belonged to general category and Hindu families living in the urban area. Most of the parents were graduates,living in joint families, and belonging to upper middle class. In this study, almost all caregivers were already heard about immunization and knew that immunization was necessary and 77.8% knew that immunization prevent morbidity due to certain specific disease.

Key Words: Knowledge; Prevention;Vaccination.

INTRODUCTION

Vaccination is one of the most cost-effective interventions to prevent major illnesses that contribute to infant mortality and morbidity, as well as the most successful method for eradication of diseases. [1]This is illustrated by the eradication of smallpox all over the world in 1980, and the elimination of poliomyelitis from four of the World Health Organization regions. In the country, particularly in environments where malnourished infants, overcrowding, poverty, and illiteracy reign, immunization saves millions from illness, suffering, and lifelong disability (WHO estimate, 2009).[2,3] In India, vaccine coverage was progressing slowly till 2010, after which there has been a stagnant state till 2013. Mission Indra-dhanush (MI), was launched by GOI in 2014, to target the underserved (remote rural-urban slum dwellers), vulnerable (migrants), resistant, and inaccessible populations (hilly areas), which resulted in a 6.7% increase in full vaccination coverage. In October 2017, came the Intensified Mission Indra-dhanush (IMI) to accelerate progress to

reach 90% full vaccination coverage in districts and urban areas with persistently low levels of vaccination status 5 but studies conducted in 190 IMI districts found the proportion of fully vaccinated children to be 69% which is an 18.5% increase from pre-IMI estimate [4] with the best possible efforts and political will, vaccination coverage is still lagging behind.

Literature review reveals that decision-making for vaccination is highly influenced by various social factors such as past experiences with health services, family histories, feelings of control, conversations with friends, etc. [5]" Shared beliefs about disease etiology, potency, efficacy, and safety of modern medicine as well as vaccines and views related to preventive measures " decide the vaccine culture in the community along with "local health services experiences and vaccination settings" influence the individual decision about vaccination. Children age 12-23 months fully vaccinated based on information from either vaccination card or mother's recall was 76.4 % as per NFHS-5 (2019-21) and 62.0% as per NFHS-4 (2015-16). [6]Full immunization coverage as per NFHS-4/IMI survey for the Gwalior district is 52.5% so the possibility of vaccine hesitancy among caregivers could be there at this level of FIC. [7]A study conducted in Gwalior city in 2019 reports vaccine hesitancy present among 20% of families. [8]It is influenced by factors such as complacency, convenience, and confidence. Ignorance in communities leads to a low perceived risk of VPDs and thus vaccination is not considered essential. It has been observed that vaccine hesitancy is heavily impacted by a lack of confidence in the vaccine's safety and efficacy as well as fears regarding the reliability and competence of the health system. [9] Most parents have a poor understanding of vaccine-prevent able diseases and believe in false propagations about the contents, side effects, and effectiveness of vaccines. [10]To ascertain the various reasons the present study was designed. Present study was conducted to assess the profile of infant with their caregiver and awareness regarding immunization among the caregivers who were attending Immunization Clinic.

MATERIAL AND METHODS

The present study was a hospital-based cross-sectional study. A predesigned, pretested, structured interview-based questionnaire was used for data collection from all the caregivers of infants up to one year of age, who attended the immunization clinic of Madhav dispensary of J.A group of hospitals of G.R medical college, Gwalior (M.P) from November 2019 to June 2021 . By considering a 5% absolute error and 95% confidence interval the sample to be taken by using formula N =4PQ/L2, where P proportion of knowledge regarding immunization among caregivers = 50 %, L = Absolute error =5% and non- response rate 10%.By using the above formula, the minimum sample size was calculated for the study as 440 which were increased to 450. Caregivers who gave consent to participate in the study were included.While seriously ill and debilitated infants and Children above 12 months of age were excluded from the study. Ethical permission was taken from the Institutional Ethical Committee of G.R medical college, Gwalior (M.P.) before starting the study.(D.No:284/IEC-GRMC/2019). Data were collected and entered in MS Word & MS Excel sheets. The graphical representation of data was done using figures and tables. The descriptive representation of data was done in the form ofnumbers and percentages, calculated in MS Excel. The analysis was performed with IBM Statistical Package for the SocialSciences (SPSS, Armonk, NY: IBM Corp) version 26. $P<0.05$ wasconsidered statistically significant.

OBSERVATION AND RESULTS

Table 1: Descriptive profile of Infants who visited Immunization OPD at tertiary care center

VariablesRelated With Infants Profile		Frequency	Percentage
Age Group (in months)	0-2	115	25.5
	2-4	183	40.6
	4-6	5	1.1
	6-8	2	0.4
	8-10	144	32
	10-12	1	0.2
Visit number	1(at birth)	4	0.9
	2(6th week)	120	26.7
	3(10th week)	90	20
	4(14th week)	92	20.4
	5(at 9 months)	144	32
Gender	Male	278	61.8
	Female	172	38.2
Category	Others	240	53.3
	OBC	130	28.9
	SC&ST	80	17.8

Religion	Hindu	407	90.4
	Muslim	36	8.0
	Others (Sikh, Christian)	7	2.0
Place of Residence	Urban	436	96.9
	Rural	14	3.1
Birth weight(kg)	<2.5	158	35.1
	>2.5	292	64.9
Birth Order	1	250	55.6
	2	157	34.8
	>3	43	9.6

The majority of infants i.e., 183(40.6%) were 2-4months of age, followed by 144(32%) infants were 8-10 months of age and115(25.5%) were up to 2 months of age. The table shows that the majority of infants 144(32%) came at 5th visit for vaccination, 120(26.7%) came at the 2nd visit, 92(20.4%) came at the 4th visit, 90(20%) came at 3rd visit, 4(0.9%) came at 1st visit (birth dose). The majority of infants were males i.e., 278 (61.8%) while 172(38.2%) were females.The majority of infants belonged to the general categoryi.e., 240 (53.3%) followed by the OBC category i.e., 130(28.9%), rest80(17.8%) belonged to the SC & ST category. Majority of infants were Hindus i.e., 407(90.4%), 35(8%) were Muslim, rest 7 (2%) were others which include Sikh, Christian.Mostly infants were from urban areas i.e., 436(96.9%).This table shows that more than 3/5thof infants were born with ≥2.5 kg birthweight i.e., 292(64.9%).About half (55.6%) of the infants were at the first birth order.

Table 2: Distribution of Socio-Demographic Variables of the Caregivers.

Variables		**Frequency**	**Percentage**
Education of mother	Illiterate	15	3.3
	Primary school	18	4
	Middle school	51	11.3
	High school	72	16
	Intermediate	54	12
	Graduate	166	36.9
	Post-graduate	74	16.4
Education of father	Illiterate	20	4.44
	Primary school	9	2
	Middle school	34	7.6
	High school	52	11.6
	Intermediate	64	14.2
	Graduate	194	43.1
	Post-graduate	77	17.1
Occupation of father	Business	92	20.4
	Private job	199	44.2
	Government job	81	18
	Others	78	17.3
Occupation of mother	Household work	410	91.1
	Private job	21	4.7
	Government job	15	3.3
	Others	4	0.9
Age of caregiver	<26	151	33.5
	27-34	267	59.3
	>35	32	7.1
Relation of caregivers with infants	Mother	393	87.3
	Father	36	8
	Others	21	4.7
Decision-maker regarding immunization	Mother	273	60.7
	Father	34	7.6
	Both	143	31.8
Type Of Family	Nuclear	210	46.7
	Joint	240	53.3
Socioeconomic Status	Upper Class	103	22.9

	Upper Middle Class	176	39.1
	Middle Class	106	23.6
	Lower Middle Class	59	13.1
	Lower	6	1.3

This table shows that the majority of mothers were graduates i.e.,166(36.9%),followed by post-graduates i.e., 74(16.4%), 72(16%) were educated till high school, 54(12%) were educated till intermediate, 51(11.3%) were educated till middle, 18(4%) were educated till primary, and 15(3.3%) were illiterate. The majority of father were graduates i.e.,194(43.1%), 77(17.1%) post-graduates, 64(14.2%) intermediate, 52(11.6%) high school, 34(7.6%) middle school, 20(4.44%) illiterate, and 9(2%) primary school. This table shown that the majority of fathers i.e., 199(44.2%) did a private job, 92(20.4%) did business, 81(18%) did a government job, 78(17.3%) were others which includes farmers, laborers, students, and unemployed people. This table shows that the majority of mothers i.e., 410 (91.1%) did household works. The majority of caregivers i.e., 267(59.3%) were from 27-34 years of age, followed by 151(33.5%) were ≤26 years, rest 32(7.1%) were ≥35years. This table shows that the majority of families were joint families i.e.,240 (53.3%), followed by nuclear families i.e., 210(46.7%).In this table, majority of infants i.e., 176(39.1%) were from upper-middle class, 106(23.6%) middle class, 103(22.9%) upper class, 59 (13.1%) lower middle class, 6(1.3%) lower class respectively. This table shows that the majority of caregivers i.e., 393(87.3%) were mothers. This table shows that the majority of mothers i.e., 273(60.7%) were decision makers inthe matter of immunization, followed by both (mother & father)at 143(31.8%).

Table 3

Variables		**Frequency**	**Percentage**
Heard About Immunization	Yes	449	99.8
	No	1	0.2
The Objective Of ImmunizationProgram	Don‘t Know	50	11.1
	To Prevent Death Due To Certain Specific Disease	50	11.1
	To Prevent Morbidity Due To CertainSpecific Disease	350	77.8
Knowledge And Source Of Information About Immunization	Neighbors	18	4
	TV	49	10.88
	Radio	3	0.66
	Newspaper	27	6
	Relative	42	9.33
	ANM	86	19.11
	Anganwadi Workers	287	63.7
	Hospital Staff	129	28.6
	Doctor	134	29.77
	Others	11	2.44
Caregivers About Immunization During Mild Flu	Should Not Be Given	310	68.9
	Should Be Given	25	5.6
	Don‘t Know	115	25.6
Importance Of Immunization Cards forThe Caregiver	Yes	440	
	No	10	
Knowledge Of Side Effects Occurs After Vaccination	Yes	391	86.9
	No	59	13.1
Vaccination Is Important After A Few Side Effects	Yes	449	99.8
	No	1	0.2

The majority of caregivers i.e., 449(99.8%) had already heard about immunization, only 1(0.2%) had not heard about immunization. The majority of caregivers i.e., 350(77.8%) had the knowledge that immunization prevents morbidity from a certain specific disease, followed by50(11.1%) having

knowledge that immunization prevents death due to certain specific diseases, while the rest, i.e. 50(11.1%) didn'thave knowledge about the objectiveof the immunization program. Majority of caregivers got information about immunization through Anganwadi Workers i.e.,287(63.7%), followed by doctors 134(29.77%), hospital staff 129 (28.6%),ANM 86 (19.11%), TV 49 (10.88%), relatives 42 (9.33%), newspapers 27(6%), neighbors 18 (4%), others 11 (2.44%), radio 3 (0.66%).Most of the caregivers 449(99.8%) had opinions about immunization being necessary while only 1(0.2%) caregiver had the opinion that immunization was notnecessary. The majority of caregivers i.e., 310(68.9%) opined that immunization should not be given during mild flu, 25(5.6%) opined that immunization should begiven during mild flu, 115 (25.6%) didn't know about this.The maximum proportion of caregivers 391(86.9%) knew side effects thatoccur after vaccination, while 59(13.1%) did not know about side effects thatoccur after vaccination.

Table4: Distribution of knowledge of caregiver regarding immunization Schedule, Dose, Route &Site:

Vaccine	Schedule		Dose		Route		Site	
	Yes	No	Yes	No	Yes	No	Yes	No
BCG	59 (13.1)	391 (86.9)	16 (3.6)	434 (96.4)	20 (4.4)	430 (95.6)	31 (6.9)	419 (93.1)
Hepatitis B	34 (7.6)	416 (92.4)	17 (3.8)	433 (96.2)	16 (3.6)	434 (96.4)	19 (4.2)	431 (95.8)
OPV (0)	116 (25.8)	334 (74.2)	153 (34)	297 (66)	210 (46.7)	240 (53.3)	210 (46.7)	240 (53.3)
OPV (1,2,3)	35 (7.8)	415 (92.2)	151 (33.6)	299 (66.4)	207 (46.0)	243 (54.0)	208 (46.2)	242 (53.8)
Pentavalent (1,2,3)	19 (4.2)	431 (95.8)	13 (2.9)	437 (97.1)	13 (2.9)	437 (97.1)	15 (3.3)	435 (96.7)
FIPV	12 (2.7)	438 (97.3)	11 (2.4)	439 (97.6)	11 (2.4)	439 (97.6)	11 (2.4)	439 (97.6)
Rotavirus	18 (4)	432 (96)	20 (4.4)	430 (95.6)	31 (6.9)	419 (93.1)	31 (6.9)	419 (93.1)
PCV	11 (2.4)	439 (97.6)	11 (2.4)	439 (97.6)	11 (2.4)	439 (97.6)	11 (2.4)	439 (97.6)
MR 1st Dose	16 (3.6)	434 (96.4)	13 (2.9)	437 (97.1)	12 (2.7)	438 (97.3)	12 (2.7)	438 (97.3)
Vitamin A	16 (3.6)	434 (96.4)	13 (2.9)	437 (97.1)	22 (4.9)	428 (95.1)	22 (4.9)	428 (95.1)

In this table it was shown that, 59(13.1%), 16(3.6%) , 20(4.4%), 31(6.9%), caregivers knew the schedule, dose, route & site of BCG vaccine respectively, 34(7.6%), 17(3.8%), 16(3.6%), 19(4.2%), caregivers knew the schedule, dose, route & site of hepatitis B vaccine respectively, 116(25.8%), 153(34%), 210(46.7%), 210(46.7%)caregivers knew the schedule, dose, route & site of OPV (0) vaccine respectively. 35(7.8%), 151(33.6%), 207(46%), 208(46.2%), caregivers knew the schedule, dose, route & site of OPV (1,2,3) vaccine respectively.19(4.2%),13(2.9%), 13(2.9%),15(3.3%) caregivers knew the schedule, dose, route & site of pentavalent (1,2,3) vaccine respectively.12(2.7%),11(2.4%),11(2.4%),11(2.4%), caregivers knewthe schedule, dose, route & site of FIPV vaccine respectively; 18(4%), 20(4.4%), 31(6.9%), 31(6.9%),caregivers knew the schedule, dose, route &site of rotavirus vaccine respectively. 11(2.4%) caregivers knew the schedule,dose, route, site of PCV vaccine respectively; 16(3.6%), 13(2.9%), 12(2.7%), 12(2.7%) caregivers knew the schedule, dose, route, site of MR 1stdose vaccine respectively. 16(3.6%), 13(2.9%), 22(4.9%), 22(4.9%) caregivers knew the schedule, dose, route & site of vitamin-A supplement respectively.

DISCUSSION

In the present study, there were 450 infants, out of which61.8% were malewhile the rest38.2% were female. Similar findings were reported by other studies. [8,11-13] Ourfindings were not in concordance with some studies. [2,14,15] In the present study,40.6% infants were in the age group of 2-4 months,32%were 8-10 months of age. Similar findings were reported by GebreEyesus et al, N. B. MASTERS etal, Makgomo R Mphakaet al**.** [16-18]In the current study, 53.3% infants were from the general category, 17.7%from SC& ST category,28.9% from the OBC category. Similar findings werereported by Singh S, et al. [19] Our findings are not in accordance with the studyconducted by Anjan Datta et al. [20] In present study, 90.4% infants were Hindu, 8% were Muslim, rest wereothers i.e., 2% which include Sikh and Christian. Similar findings were reported in some studies. [2,10, 21] while dissimilar with Ms. Mereena etal. [22]In the present study, 96.9% infants' residences were urban areas while3.1%'s residences were in rural

areaswhich were similar with the study of Mereena et al., Bofarraj M. et al.[15,22]Our findings regarding the education of caregiversweresupported by Lamiya KK et al., VasanthaKalyani C et al., Binai K Sankaretal. [2,10,11]Similar findings regarding the father's education were reported byLamiyakk et al.Our findings are not in accordance with a study conductedby Anjan Datta et al.[10,20]For the mother's occupation, similar observations were made in a study conductedby Lamiya KK et al., VasanthaKalyani C et al., Ms. Mereena et al., RachnaKapoor et al.[2,10,21,22]In the current study, 53.3% families were joint families, while 46.7% were nuclearfamilies. A similar observation was made in a study conducted by VasanthaKalyani C et al. [2], Our findings are not in accordance with some studies. [8,14,22,23]In the present study, 39.1% infants belonged to an upper-middle class, 23.6%from a middle class, 22.9% from the upper class, and 13.1% from the lower-middleclass. The least number of infants (1.3%) belonged to the lower classaccording to B.G. prasad scale which were similarto the studyconducted previously. [2, 8,19]In the present study,1st birth order infants were 55.6%, 2nd birth order infantswere 34.9%. ≥3rd birth order was 9.6%. A similar observation was made in other studies.[2,8,14,24]In the present study, the majority of caregivers had already heard aboutimmunizationwhile in studies conducted by Yenit et al and GebreEyesus et al, 97% and 80.4% had heard about immunizationrespectively.[16,25]The difference in the findings might be due to the reason thatlatter studies were conducted in the community while the former study wasconducted at an immunization clinic where caregivers came at their own will.In this study, the main source of information and knowledge aboutimmunization was Anganwadi workers 287 (63.7%), followed by doctors 134(29.77%). Similar findings were reported by Rachana Kapoor et al[21]where the Anganwadi Workers were the main source of information for the respondents. This might be due to the fact that nowadays most parents got deliveryservices at a health facility with skilled birth attendants where health care workersplay an indispensable role during ANC and PNC period by convincing parents to link the new-born baby to immunization unit to acquire immunization service as well as the intimate relationship between a service provider and the parents at primary health care levels and these health facilities seem to be most readily available and accessible to the people. In this study, 99.8% opined that immunization is necessary. It is higher than the observations made by NighatNisar et alandGebreEyesus et al[3,16]where 86.65 and 87.1% of participants said that vaccination is necessary. The probable reason for the difference in findings might be the difference in education status of the parents in both studies. A significant number of caregivers i.e., 310(68.9%) reported that immunization should not be given during mild illness while 25(5.6%) caregivers said that immunization should be given even if the child is having mild illness, and 115(25.6%) caregivers did not know anything about it. Near similar observations was made in this study conducted by Binai K Sankar et al[11]stated that the majority 87.41% of them said they would not vaccinate the child even if the child was already sick. The similar results obtained might be due to similar study settings. In this study, the majority of caregivers (77.8%) knew that immunization prevents morbidity due to certain specific disease while 11.1% knew thatimmunization prevents death due to certain specific disease, rest (11.1%) didn't know about the objective of the immunization program. Similar findings were reported previously. [1,5,10,16]This might be because people were more interested in obtaining information about the vaccine and VPDs from health care professionals, social media, friends, and neighbors' to improve their awareness which in turn change parents' perception of the importance of immunization in the care of their infant. In the present study regarding the schedule, dose, route, site of different vaccinesrespectively, results were similar to study conducted by Lamiya KK et al[10], who stated that knowledge regarding individual vaccines,their dosages, and schedule were found to be low. The dissimilar observation was made in this study conducted by Binai K Sankar et al[11]stated that among85.31% mothers said that they were aware of the vaccination schedule. Yenitetal[25], stated the knowledge on the schedule of vaccination is poor 30.7%, medium 26%, good 43.3%. The vaccinator generally tells caregivers about the next dose of vaccination but not about the route, dose, and site of the vaccine. This is the probable reason that most caregivers know about the schedule of the vaccination but not about the route, dose, and site of the vaccine. The difference in the findings might be due to the reason that the former study was conducted at an immunization clinic and later studies wereconducted in the community. This could be attributed to the better literacystatus of the urban caregivers.

CONCLUSION

Immunization is a very cost-effective preventive health intervention. It can prevent many morbidities, mortalities and disabilities. In this study, majority of infants were males, were in age group of 02-04 months, and belonged to general category and Hindu families living in the urban area. Most of the parents were graduates,living in joint families, and belonging to upper middle class. In this study, almost all caregivers were already heard about immunization and knew that immunization was necessary and 77.8% knew that immunization prevent morbidity due to certain specific disease. There is a need to increase awareness and knowledge about the benefits and importance of vaccination, as well as the harmful consequences of partialimmunization. A planned educational programme is needed; the educational

level of the parents needs to be taken into consideration when the program is planned.

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