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Knowledge about 'immunization of health care worker' among paramedical staff of field practice area of Jamdoli, Jaipur: A cross sectional study

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Abstract

Objectives: To estimate the knowledge of "Immunization of Health Care Workers" in field practice area of Jamdoli, Jaipur among paramedical staff regarding Hepatitis B, Polio, Meningitis, Influenza, Measles, Diphtheria, Rubella, Varicella and to assess the factor associated with the knowledge about immunization among the paramedical staff.

Materials and Methods: It was a Cross sectional study conducted in field practice area of Jamdoli, Jaipur among paramedical staff from October 2018 to December 2018. The sample Size was calculated from Prevalence of adequate knowledge of Polio Vaccination is 91% which was 131 so total sample size is 135. Convenience sampling method was adopted and Pretested predesigned structured interview schedule was conducted as study tool.

Results: The majority (40%) paramedical staff enrolled in this study were in the age group of 20-30 yrs. The male and female respondents were 14.1% and 85.9% respectively, 63% respondent belongs to general category. The majority (91.1%) of the respondent qualified up to GNM with serve duration (45.9%) more than 10 years. Regarding Route of transmission, for Hep B (78.5%) answered parenteral, Polio (49.5%) answered faecooral, Diphtheria (81.5%) droplet etc. The highest knowledge was about Hepatitis B 91.9% and the poorest was regarding rubella 33.3%. Satisfactory knowledge among the respondents were 55.6% depending upon mean score (26.7). The satisfactory knowledge significantly associated with the caste of the respondents (P= 0.02).

Conclusion: Education and Communication strategies for improving the level of knowledge and for the immunization uptake regarding Hepatitis B, Polio, Meningitis, Influenza, Measles, Diphtheria, Rubella, Varicella among health care workers are strongly needed.

Keywords: Immunization, nursing staff, hospital

Introduction

Vaccination is a minor medical procedure that reduces or eliminates the risk of contracting a target disease. WHO has recommended eight diseases vaccination schedule with aim of controlling vaccine preventable diseases such as Hepatitis B, Poliomyelitis, Meningococcal Meningitis, Influenza, Measles, Diphtheria, Rubella and Varicella to assist countries to develop national policies for the vaccination of the health care workers^[1].

The establishment of strong national immunization services in many countries over recent years has ensured that today over 70% of the world's targeted population is reached with immunization. As a result, it is estimated that immunization carried out in 2003 alone will prevent more than 2 million deaths from vaccine-preventable diseases^[2].

The disease burden is most appropriately represented by a range of values reflecting uncertainty. The estimated 1,000 deaths a year caused by polio reflect past infections and current deaths^[3].

From 1963 to 1998, 1223 people had a record of admission to hospital for meningococcal meningitis and 25 for other diagnoses mainly meningitis or septicemia. The median age of these 1248 was 6 years; 255 (20%) were < 1 year old, 116 died within 30 days and five more within 365 days of admission^[4].

A survey describing the perception of health workers about the supplemental immunization activities was carried out among 265 health workers who participated in the 3rd round of the 2003 sub-national immunization days in Gombe local government area of Gombe state, Nigeria^[5].

Hepatitis B vaccination is the most effective measure to prevent HBV infection and its consequences. Recent estimates indicate that approximately 95% of pregnant women are tested for HBsAg [6].

In transitional and developing countries where unnecessary injections are common, the average number of health care injections per person was estimated to be 3.7 per year. Each year, the reuse of injection equipment may cause 20 million infections with hepatitis B virus [7].

However, there is paucity of information regarding Immunisation of Health Care Workers among among the paramedical staff. Hence the present study has been conducted to study the knowledge of "Immunisation of Health Care Workers" among among the paramedical staff regarding HepatitisB, Polio, Meningitis, Influenza, Measles, Diphtheria, Rubella, Varicella and to assess the factor associated with the knowledge about immunisation among among the paramedical staff.

Materials and methods

It was a Community Based Cross sectional study conducted in field practice area of Jamdoli, Jaipur among paramedical staff. The duration of study was From October 2018 to December 2018. The study tool used was a pre designed, pre tested, semi- structured interview schedule.

Sample size calculation: Considering the Prevalence of adequate knowledge of Polio Vaccination is 91% at 5% level of significance and absolute precision was 5% (d). Sample size was calculated by using the formula $n = 4pq/d^2$. After calculation the sample size was 131. Thus sample size of 135 were taken for study.

Sampling Method: Convenience sampling method was adopted

Inclusion criteria: All paramedical staff working in field practice area of Jamdoli, Jaipur.

Exclusion criteria: Those who are not willing to participate in the study, who were on other shift of duty and those who could not be contacted in spite of two visits due to their engagement in other official works.

Data analysis: Data analysis was done by SPSS 22.0 version. Descriptive statistics was expressed in frequency and percentages. Chi square statistics was applied to assess the association between different variables. P value < 0.05 was taken as significant.

Ethical Consideration: Ethical clearance was obtained from Institutional ethics committee

Scoring for assessment of knowledge regarding immunization

The scoring in the Knowledge component was done by giving numerical marks. Responses to question were coded such that correct answers scored one and incorrect answers scored zero. These scores were added to arrive at a single

value out of a possible total score of 40 for knowledge.

Knowledge divided in two divisions: Respondents were assessed by questionnaire and scoring was done according to their response. Questionnaire contains eight vaccines preventable diseases, each had five questions. For every correct answer one marks was awarded for each question in every vaccine so total score was 40, then mean score was calculated the by SPSS 22.0 version. The mean score was 26.7, median score 27.0 with standard deviation of 4.1 is the knowledge scores of the paramedical staff. paramedical staff who got Score of ≥ 26.7 was considered to be satisfactory knowledge and those who had less than 26.7 was considered to be unsatisfactory knowledge.

Results

Table 1: Demographic Characteristics of Respondents in which Study showed that 40% nursing staff who took part in study belong to the age group 20-30 yrs, 17.8% belongs to 31-40 yrs, 20.7% belongs to 41-50 yrs and 21.5% were in the age group of above 50 yrs. Females were 85.9% and 14.1% were male. General category respondents were 63%, 8.9% belongs to OBC category, 14.1% belongs to ST category and 14.1% belongs to SC category. Majority (91.1%) of the paramedical staff had education qualification as graduate and 8.9% had postgraduate. Study showed that 19.3% of the respondents had <1 yr of service experience, 21.5% had service experience ranging from 1 to 5 yrs, 13.3% had had service experience from 5 to 10 yrs and 45.9% had service experience of more than 10 yrs.

Table 1: Demographic Characteristics of Respondents

Characteristics	Respondents	Frequency (N)	Percentage (%)
Age group	20-30 Yrs	54	40
	31-40 Yrs	24	17.8
	41-50 Yrs	28	20.7
	> 50 Yrs	29	21.5
Sex	Male	19	14.1
	Female	116	85.9
Category	General	85	63
	OBC	12	8.9
	SC	19	14.1
	ST	19	14.1
Education	Graduate	123	91.1
	Post graduate	12	8.9
Duration of Services	<1 Yrs	26	19.3
	1-5 Yrs	29	21.5
	6-10 Yrs	18	13.3
	>10 Yrs	62	45.9

Table 2: Knowledge of respondents regarding Hepatitis B vaccine showed that majority (78.5%) of the respondents had answered parenteral as route of transmission. 91.1% of the responders answered hepatobillary as the system involved. 91.9% of them have answered IM route as the route of administration of vaccine. 66.7% have answered that immunization can be taken at any age. And 60.0% have answered that the vaccine is available in both private and govt. sectors.

Table 2: Knowledge of respondents regarding Hepatitis B vaccine

Characteristics	Respondents	Frequency (N)	Percentage (%)
Route of transmission	Parenteral	106	78.5
	Perinatal	9	6.7
	Sexual	13	9.6
	Percutaneous	4	3.0
	Others	2	1.5
	Don't know	1	0.7
System involved	Hepatobiliary	123	91.1
	GIT	4	3.0
	Others	1	0.7
	Dont know	7	5.2
Route of administration	IM	124	91.9
	SC	7	5.2
	Oral	1	0.7
	Don't know	3	2.2
Age of immunization	Children	24	17.8
	Infants	11	8.1
	Adolescent	3	2.2
	Adults	7	5.2
	Any age	90	66.7
Vaccine availability	Private	12	8.9
	Govt.	40	29.6
	Both	81	60.0
	Others	2	1.5

Table 3: Knowledge of respondents regarding Oral Polio vaccine showed that majority (49.5%) of the respondents have answered faecooral as route of transmission. 48.1% of the responders answered musculoskeletal as the system involved. 96.3% of them had answered oral route as the route of administration of vaccine. 80.7% had answered that immunization is done in infants and 63.0% had answered that the vaccine is available in govt. sectors.

Table 3: Knowledge of respondents regarding Oral Polio vaccine

Characteristics	Respondents	Frequency (N)	Percentage (%)
Route of transmission	Parenteral	25	18.5
	Faecooral	67	49.5
	Inhalation	4	3.0
	Others	17	12.6
	Dont know	22	16.3
System involved	Musculoskeletal	65	48.1
	GIT	5	3.7
	Respiratory	2	1.5
	Nervous	55	40.7
	Dont know	8	5.9
Route of administration	Parenteral	4	3.0
	Oral	130	96.3
	Others	1	0.7
Age of immunization	Infants	109	80.7
	Children	22	16.3
	Adults	2	1.5
	Any age	2	1.5
Vaccine availability	Govt.	85	63.0
	Both	48	35.6
	Others	2	1.5

Table 4: Knowledge of respondents regarding DPT vaccine study showed that majority (81.5%) of the respondents had answered droplet as the route of transmission. 56.3% had answered respiratory as the system involved. 79.3% had answered IM as the route of administration of diphtheria

vaccine. 66.7% had answered that immunization has to be taken in infant age and 34.8% had answered that the vaccine is available in both private and govt. sector.

Table 4: Knowledge of respondents regarding DPT vaccine

Characteristics	Respondents	Frequency (N)	Percentage (%)
Route of transmission	Parenteral	11	8.1
	Droplet	110	81.5
	others	6	4.4
	Do not know	8	5.9
System involved	Lymphoglandular	36	26.7
	GIT	10	7.4
	Others	1	0.7
	Don't know	9	6.7
	Respiratory	76	56.3
	nervous	3	2.2
Route of administration	IM	107	79.3
	SC	16	11.9
	ID	10	7.4
	Oral	2	1.5
Age of immunization	Children	39	28.9
	Infants	90	66.7
	Adolescent	2	1.5
	Adults	1	.7
Vaccine availability	Any age	3	2.2
	Private	1	.7
	Govt.	85	63
	Both	47	34.8
	Others	2	1.5

Table 5: Knowledge of respondents regarding Meningococcal vaccine showed that majority (62.2%) of the respondent have answered droplet as the route of transmission. 85.2% of the respondent have answered nervous system as the system involved. 71.1% of the respondent have answered IM as route of administration. 37.8% have answered at any age of immunization and 35.6% of them have answered govt. as the availability of the vaccine.

Table 5: Knowledge of respondents regarding Meningococcal vaccine

Characteristics	Respondents	Frequency (N)	Percentage (%)
Route of transmission	Parenteral	32	23.7
	Sexual	2	1.5
	Others	6	4.4
	Droplet	84	62.2
	Don't know	11	8.1
System involved	Hepatobiliary	2	1.5
	GIT	2	1.5
	Respiratory	12	8.9
	Nervous	115	85.2
Route of administration	Don't know	4	3
	IM	96	71.1
	SC	12	8.9
	ID	4	3.0
	Oral	1	0.7
Age of immunization	Don't know	22	16.3
	Infant	24	17.8
	Children	37	27.4
	Adolescent	6	4.4
	Adult	7	5.2
Vaccine Availability	Any age	51	37.8
	Don't know	10	7.4
	Private	41	30.4
	Govt.	48	35.6
Vaccine Availability	Both	38	28.1
	Others	8	5.9

Table 6: Knowledge of respondents regarding Influenza vaccine showed that the majority (94.8%) of the respondent had answered droplet as the route of transmission. 90.4% of the respondent had answered respiratory system as the organ involved. 53.3% of the respondent have answered intra muscular as route of administration. 37% have answered at any age of immunization and 37% of them have answered govt. as the availability of the vaccine.

Table 6: Knowledge of respondents regarding Influenza vaccine

Characteristics	Respondents	Frequency (N)	Percentage (%)
Route of transmission	Parenteral	3	2.2
	Droplets	128	94.8
	Sexual	1	0.7
	Others	2	1.5
	Don't know	1	0.7
System involved	Musculoskeletal	4	3
	GIT	1	0.7
	Respiratory	122	90.4
	Nervous	3	2.2
	Others	2	1.5
Route of administration	Don't know	3	2.2
	IM	72	53.3
	SC	20	14.8
	Intranasal	18	13.3
	Both	6	4.4
Age of immunization	Don't know	19	14.1
	Infant	21	15.6
	Children	47	34.8
	Adolescent	3	2.2
	Adult	4	3.0
Vaccine Availability	Any age	50	37.0
	Don't know	10	7.4
	Private	32	23.5
	Govt.	50	37.0
Vaccine Availability	Both	40	29.6
	Others	13	9.6

Table 7: Knowledge of respondents regarding Measles vaccine showed that majority (57.4%) of the respondent

had answered droplet as the route of transmission. 32.6% of the respondent had answered mucocutaneous as the organ involved. 59.3% of the respondent have answered subcutaneous as route of administration. 65.2% have answered infant as age of immunization and 62.2% of them had answered govt. as the availability of the vaccine.

Table 7: Knowledge of respondents regarding Measles vaccine

characteristics	Respondents	Frequency (N)	Percentage (%)
Route of transmission	Droplet	77	57
	Sexual	2	1.5
	Contact	54	40
	Don't know	2	1.5
System involved	Respiratory	38	28.1
	Mucocutaneous	44	32.6
	GIT	11	8.1
	Nervous	5	3.7
Route of administration	Don't know	37	27.4
	I.D	32	23.7
	Intra nasal	5	3.7
	S.C	80	59.3
Age of immunization	Don't know	18	13.3
	Infant	88	65.2
	Children	33	24.4
	Adolescent	2	1.5
	Adult	2	1.5
	Any age	10	7.4
Availability	Don't know	10	7.4
	Private	5	3.7
	Govt.	84	62.2
	Both	45	33.3
Availability	Others	1	0.7

Table 8: Knowledge of respondents regarding Varicella vaccine showed that majority (58.5%) of the respondents had answered direct contact as route of transmission. 74.8% of the responders had answered mucocutaneous as the system involved. 57.8% of them had answered IM route as the route of administration of vaccine. 35.6% had answered immunization is done in children and 31.9% had answered that the vaccine is available in both private and govt. sectors.

Table 8: Knowledge of respondents regarding Varicella vaccine

Characteristics	Respondents	Frequency (N)	Percentage (%)
Route of transmission	Contact	79	58.5
	Droplet	52	38.5
	Don't know	4	3
System involved	Mucocutaneous	101	74.8
	GIT	6	4.4
	Respiratory	19	14.1
	nervous	3	2.2
Route of administration	Don't know	6	4.4
	IM	78	57.8
	SC	33	24.4
	ID	14	10.4
	Oral	9	6.7
Age of immunization	Don't know	1	0.7
	Infants	27	20.0
	Children	48	35.6
	Adolescent	5	3.7
	Adult	8	5.9
Vaccine availability	Any age	47	34.8
	Private	42	31.1
	Govt.	43	31.9
	Both	43	31.9
Vaccine availability	Others	7	5.2

Table 9: Knowledge of respondents regarding Rubella vaccine showed that majority (57%) of the respondents have answered droplet as route of transmission. 33.3% of the responders answered mucocutaneous as the system involved. 47.4% of them have answered IM route as the route of administration of vaccine. 41.5% have answered immunization is done in infancy. And 50.4% have answered that the vaccine is available in only govt. sector.

Table 9: Knowledge of respondents regarding Rubella vaccine

Characteristics	Respondents	Frequency (N)	Percentage (%)
Route of transmission	Droplet	77	57.0
	Perinatal	20	14.8
	Others	13	9.6
	Don't know	25	18.5
System involved	Lymphoglandular	39	28.9
	Mucocutaneous	45	33.3
	Respiratory	29	21.5
	Nervous	5	3.7
	Don't know	17	12.6
Route of administration	IM	64	47.4
	SC	34	25.2
	ID	18	13.3
	Oral	1	0.7
	Don't know	18	13.3
Age of immunization	Infants	56	41.5
	Children	55	40.7
	Adolescent	2	1.5
	Adult	5	3.7
	Any age	17	12.6
Vaccine availability	private	18	13.3
	Govt.	68	50.4
	Both	40	29.6
	others	9	6.7

Table 10: Factors affecting knowledge of Immunization of health care workers among paramedical staff in which category (P=0.023) was found to be statistically significantly associated with the knowledge of Immunization of health care workers among paramedical staff whereas age group (P = 0.194), sex (P = 0.472), education (P = 0.417) and duration of service (P = 0.062) were not significant.

Table 10: Factors affecting knowledge of Immunization of health care worker among nursing staff

Characteristics	Respondents	Satisfactory Knowledge	Unsatisfactory Knowledge	P Value
Age group	20-30 Yrs	32	22	0.194
	31-40 Yrs	15	9	
	41-50 Yrs	17	11	
	>50 Yrs	11	18	
Sex	Male	12	7	0.472
	Female	63	53	
Category	General	46	39	0.023
	OBC	10	2	
	SC	13	6	
	ST	6	13	
Education	Graduate	67	56	0.417
	Post graduate	8	4	
Service duration	<1 Year	13	13	0.062
	1-5 Years	17	12	
	5-10 Years	15	3	
	>10 Years	30	32	

Discussion

In case of Polio, study revealed that majority of the respondents 49.5% identified faeco-oral as route of

transmission. Similar study conducted by Khan MU on healthcare Workers on the Knowledge and Attitudes towards Polio Vaccination in Pakistan in which it was found that 61.9% of the respondents answered the same.⁸

According to present study, 78.5% health worker marked parenteral route of transmission for Hepatitis B, whereas study conducted by Othman *et al* on knowledge about hepatitis b infection among medical students in Erbil city, Iraq showed that 80% of the respondents answered the same. 64.5% answered involvement of hepatobiliary system where as in present study 91.1% answered the same.⁹

In present study, it was found that the respondents answered correct route of administration for Hepatitis B, MMR, Measles, DPT which are 91.1%, 23.3%, 39.3%, 79.3% respectively whereas study conducted by Widsanugorn O *et al* on Healthcare workers' knowledge and practices regarding expanded program on immunization in kalasin, Thailand in which the route of administration were 78.4%, 41.4%, 64%, 63.2% respectively.¹⁰

In present study, it was found that satisfactory knowledge were more prevalent among the age group of 31-40 years and 21-30 years and among the respondents having experience of 5-10 years. Similarly Widsanugorn O *et al* on Healthcare workers' knowledge and practices regarding expanded program on immunization in kalasin, Thailand in which it was reported that knowledge of immunization were more satisfactory in the age group of respondents who had experience of more than 2 years.¹⁰

In present study, 35.6% of the respondents had answered children as age of immunization whereas study conducted by Hesham R *et al* on Knowledge, Attitude and Vaccination Status of Varicella Among Students of University Kebangsaan Malaysia in which 31.3% of the respondents answered the same.¹¹

Conclusion

This study showed the overall satisfactory knowledge was 55.6% among the paramedical staff. The best knowledge was about Hepatitis B which was 91.9% and the poorest regarding rubella being only 33.3%. Out of 5 questions regarding all 8 disease vaccination, staff were having the best knowledge about the route of transmission of Influenza and Diphtheria. Among the factors affecting, category were found to be significant determinants of satisfactory knowledge. Intensive IEC activities, motivated intervention, skilled peripheral health workers are required to enhance the knowledge immunization of health care worker among paramedical staff.

Declarations

Funding: No funding sources

Conflicts of interest: None declared

Ethical Approval: The study was approved by the Institutional Ethics Committee

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