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### RESEARCH ARTICLE

#### AWARENESS AMONG MOTHERS REGARDING CARE OF CHILD DURING PRIMARY IMMUNIZATION - AN INTERVENTIONAL STUDY IN SELECTED HEALTH FACILITY OF HIMACHAL PRADESH

Neeti Sharma<sup>1</sup>, Sanchita Pugazhendi<sup>2</sup> and Jayanti Semwal<sup>3</sup>

1. PhD Scholar, Child Health Nursing, Swami Rama Himalayan University, Uttarakhand.
2. Professor, Community Health Nursing, Department of Nursing, Swami Rama Himalayan University, Uttarakhand.
3. Professor, Department of Community Medicine, Swami Rama Himalayan University, Uttarakhand.

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#### Abstract

**Background:** Immunization is an important event in a child's life. Awareness of mothers regarding immunization is an important factor affecting adherence to immunization.

**Materials and Methods:** The study was conducted in Zonal hospital, Solan (HP) to determine effectiveness of an interventional package in terms of awareness of mothers regarding care of children during primary immunizations. Pre-test post-test control group design was used to achieve the objective. Seventy five mothers were enrolled in interventional and control group using systematic random sampling and followed on every immunization event until nine months. Awareness among mothers was assessed at immunization events namely birth, six weeks and nine months using a self-structured tool to assess vaccine related problems among children.

**Results:** Significant increase in the awareness level was seen among mothers in the interventional group and was found associated with their number of children.

**Conclusion:** The interventional package significantly increased awareness among mothers in the intervention group in the initial weeks.

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#### Introduction:-

Immunization is an important milestone in the field of children's health and has the largest reach to children in the community areas. India, has a total population of 139.4 Cr, has 13.59% of its population belonging to age group of 0-6 years and 25.78% in the aged 0-14 years. Knowledge about demographic profile of paediatric population of a country is essential. It helps us to understand the population dynamics that ultimately shapes the future of the country. Childhood morbidity and mortality can be effectively reduced by immunizing children against vaccine preventable diseases. To have received all basic vaccinations, a child must receive at least: one dose of BCG vaccine, three doses of DPT vaccine, three doses of polio vaccine and one dose of measles vaccine. NFHS-5(2019-21) reflects that 76.4% of children aged 12-23 months received all basic vaccinations according mothers recall /vaccination card. The immunization coverage was highest for the BCG vaccine (95.2%) while being lowest for the polio vaccine (third dose) i.e.73%. Immunization coverage is seen to decrease after first vaccination with lowest coverage for second dose of measles containing vaccine (31.9%)<sup>1</sup> Strengthening the parents and significant family

**Corresponding Author:- Neeti Sharma**

Address:- PhD Scholar, Child Health Nursing, Swami Rama Himalayan University, Uttarakhand.

members are the key targets for achieving important objectives of improving vaccination coverage, creating awareness, reducing hesitancy and many other issues. Their experiences of vaccination are important and to address all these problems as they also experience anxiety. As the cause of vaccine-related parental anxiety varies, targeted education is necessary to relieve common causes of vaccine anxiety, even among parents who vaccinate.<sup>2</sup>

Previous studies also suggest that health care providers should address parents' concerns about vaccination, especially if they have previously delayed or refused vaccines. It may also be beneficial for health information to be emphasized on the general importance of vaccination as an effective disease prevention strategy.<sup>3</sup> A qualitative study on maternal perception of severity, benefits and barriers to vaccination revealed subjects experience of vaccine related problems shocked them and caused them to delay further vaccination. Mothers also responded that for good decision making they needed to be well informed and have convincing information.<sup>4</sup>

A comprehensive approach is required to improve mothers' awareness regarding vaccination and its various aspects. Furthermore paucity of data from Himachal Pradesh prompted the conduction of current study and the awareness levels of mothers regarding immunization were studied over a period of months to determine the effectiveness of an interventional package.

### **Aims and Objectives:-**

1. To determine the effectiveness of an interventional package in terms of awareness of mothers regarding care of children during primary immunization.
2. To determine the mothers' attributes affecting their awareness level regarding immunization.

### **Materials and Methods:-**

#### **Participants and procedure**

The current study is quasi experimental, conducted on one fifty mothers of children receiving vaccination, with seventy five subjects in each interventional and control group. The selection of samples was done at the time of their visit for first vaccination of the child. Systematic random sampling was employed to enrol the mothers. The first subject was selected randomly thereafter a sampling interval of ten was maintained. Subjects for the control group were recruited first the prevent contamination. Interventional package on the care of children during primary immunizations including printed information booklet was delivered to the interventional group after their enrolment. The control group received the regular information on vaccination as provided by the vaccinating nurses. At every visit verbal reinforcement regarding the interventional package was given to the interventional group. Reassessment for awareness level was repeated at six weeks and nine months. Data was collected from February 2021 till Feb 2022. Ethical clearance for the study was given by ethical committee of Swami Rama Himalayan University, Uttarakhand Reference no – SRHU/HIMS/ETHICS/2019/6. Written consent regarding the study was also obtained from the primary caregivers. Administrative permission regarding the study was obtained from the Director of health services, Shimla (H.P).

#### **Measures:-**

Awareness among mothers was assessed using a self- structured and validated questionnaire. It consisted of 43 multiple choice questions. Correct responses were scored 1 and incorrect as zero. The scores were summed to derive a total score and potential range from 0 to 43. The coefficient for internal consistency of the tool was 0.93.

#### **Analysis plan**

The data obtained through the tools was coded and entered into excel worksheets. Further analysis was done using SPSS 26. For the analysis of significant differences between the groups unpaired t-test was used. For within group comparison of variables, repeated measure ANOVA was used. Post hoc analysis was done using Tukey's test for pairwise comparison to determine which of the pairs made significant differences in the variables. Association of scores with the socio demographic variables was established using chi square method.

#### **Results:-**

Majority mothers belonged to the age group of 21-25 years for both interventional and control group, followed by 26-30 years. As regards the educational status, 50% primary caregivers were educated up to senior secondary. Occupationally, equal proportion of subjects i.e. 52% in interventional and 48 % in control group were homemakers. Approximately 60 % in both interventional and control group belonged to nuclear families. Majority of i.e. 80%, in

both groups were from rural area. All of them were primigravida mothers. Both the groups were found homogenous with regard to their socio-demographic characteristics with  $p > 0.05$  for all variables. The pre-existing awareness of mothers (Table 1) in both groups was between good and average level and the difference was statistically not significant. Poor awareness was seen in 1.3% in control group only. None was found to have very good awareness. Post-test for mothers' awareness was conducted twice for interventional and control group during follow ups at second and fifth immunization event i.e. six weeks and nine months. The interventional group had significant rise in the number of primary caregivers whose awareness scores increased to very good level of awareness from 42.7% at six weeks to 50% at nine months (Figure 1). The control group however didn't show much improvement in their awareness scores. While none of the subject's awareness increased up to very good awareness in the control group, the number of primary caregivers in the good awareness category increased to 45.3% from 42.7% and was 43.8 % at nine months. The increase in the awareness score can be attributed to the effect of pretesting which however was later found not significant.

While the interventional group had significant increase in mean from birth till six weeks, the mean at nine months is not significantly from six weeks indicating the effectiveness of the interventional package in first few months after birth. The mean awareness scores in control group also didn't change much from their values at six weeks (Table 2).

Unpaired t-test was computed to determine significant differences in the mean awareness scores of interventional and control group. At first immunization event (birth) the mean awareness scores had no significant difference between them ( $p = 0.359$ ). Further assessments at six weeks and nine months revealed significant difference in awareness levels with  $p < 0.001$  indicating the effectiveness of interventional package in increasing primary caregivers' awareness regarding immunization. Repeated measure ANOVA compared mean awareness within the groups (both interventional and control group). Statistically, the differences were found significant for interventional group. Post HOC Tukey's test revealed that awareness improved significantly after implementation of interventional package; however awareness after six weeks is not significantly increased (Table 3). This necessitates that any informative intervention should be planned and is well received during early life of the child. Association of awareness of mothers with their attributes was determined using Chi Square (Table 4). It was observed that number of children influenced awareness levels among mothers regarding primary immunization.

### Discussion:-

Mothers are primary caregivers and decision makers for matters related their child's health. Previous studies propose that their awareness impacts the timeliness and post immunization care of the child. Hence their awareness regarding the schedule, minor and major vaccine related problems and post immunization care is an important aspect of this study. The results corroborate with previous studies on knowledge and vaccination compliance. Significant increase in knowledge level of mothers was also reported by other studies where post test scores were significantly higher than pre-test scores with  $p < 0.05$ .<sup>5,6</sup> Similar results were obtained by Jackson PT et al (2018) in a randomized controlled trial to assess effectiveness of information intervention among mothers related to DPT immunization and measles. The intervention had a positive effect on knowledge of mothers related to causes, symptoms, and prevention of tetanus but no effect on perceptions of vaccine efficacy<sup>7</sup>. A comparison of awareness levels done at birth and nine months in interventional group revealed that the interventional package was successful in increasing primary caregivers' awareness for, maximum age until which immunization is done, site of MR vaccine administration, symptoms associated with most vaccines to 100%. Alarming low level of awareness was observed (4%) related to, serious reactions after immunization and indication of allergy initially. This however increased to a motivating level of more than 70% at last assessment (nine months).

Association of mothers' awareness with their socio demographic attributes was studied. It was revealed that awareness among mothers was influenced by the number of children they had. An another study found that mothers from urban area were more knowledgeable compared to mothers from rural area.<sup>8</sup> An another study by Balbir Singh HK et al (2019) found that association between knowledge of mothers and their age, education and occupation was statistically significant.<sup>9</sup> Previous studies have also supported that barring a few variables, mothers awareness, attitude and practice related to immunization is not influenced by their socio demographic variables.<sup>10,11</sup>

### Limitation

The study was limited to children undergoing primary immunization in the selected health facility. Only literate mothers were enrolled for the study.

**Conclusion:-**

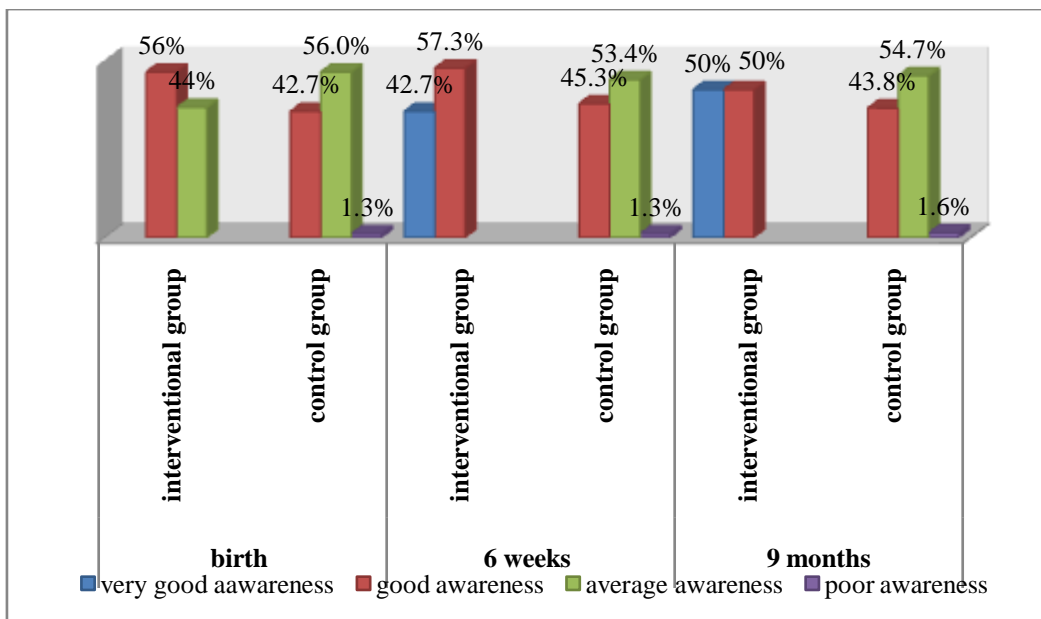
The study was conducted on mothers and children receiving primary vaccination to assess the effectiveness of an interventional package in terms of their awareness level. The interventional package was delivered to the intervention group at birth and reinforced at every immunization event. The control group received routine information. Awareness in the interventional group increased significantly in the interventional group in the initial weeks and then remained at the same level. The interventional package was found instrumental in increasing knowledge related to few aspects of immunization that needed attention. Mothers’ number of children was found to influence their awareness level.

**Conflict of interest**

Nil.

**Table No 1:-** Comparison of baseline awareness scores (at birth) of primary caregivers in interventional and control group.

Awareness category	Score range	Interventional group N=75		Control group N=75		$\chi^2$ value #	df	P* value
		n	%	n	%			
Good awareness	22-32	42	56	32	42.7	3.431	2	0.180
Average awareness	11-21	33	44	42	56			
Poor awareness	0-10	-	-	1	1.3			



**Figure 1:-** Awareness levels of primary caregivers in interventional and control group various immunization events.

**Table 2:-** Mean awareness score of primary caregivers in interventional and control group at various immunization events.

Time of Immunization event	Interventional Group Mean±Sd Median	Control Group Mean±Sd Median	Mean Diff.	Unpaired T-Test	P* Value
Birth Interventional Group (N=75) Control Group (N=75)	19.84±4.16 22	19.21±4.18 21	0.627	0.920	0.359
6 Weeks Interventional Group (N=)	32.52± 4.55 31	19.31±4.28 21	13.213	<b>18.334**</b>	<b>&lt;0.001**</b>

75) Control Group (N=75)					
9 Months Interventional Group (N=66)	32.76±5.91 32.5	19.33±4.26 21	13.429	<b>14.818**</b>	<b>&lt;0.001**</b>
Control Group (N=64)					
P Value(F-Test) Interventional Group (N=66)	<b>&lt;0.001**</b>	0.073			
Control Group (N=64)					

\*p <0.05 \*\* significant.

**Table 3:-** Pair wise comparison of awareness scores of primary caregivers (within the group) in the interventional and control group using Post Hoc Tukeys test.

Awareness scores of primary caregivers (M <sub>1</sub> )		Awareness scores of primary caregivers (M <sub>2</sub> )	Mean difference*	
			Interventional group (M <sub>2</sub> - M <sub>1</sub> ) Md	Control group (M <sub>2</sub> - M <sub>1</sub> ) Md
Immunization event	At birth	At 6 weeks	(32.52-19.84) 12.68**	(19.31-19.21) 0.11
		At 9 months	(32.9-19.84) 12.92**	(19.33-19.21) 0.12
	At 6 weeks	At 9 months	(32.76-32.52) 0.24	(19.33-19.31) 0.02

**Table 4:-** Awareness scores of primary caregivers in interventional group at fifth immunization event ( at9 months) and association with the selected variables.

Variables	Categories	Very good awareness n(%)	Good awareness n(%)	$\chi^2$ value	p* value
Age(in years)	Upto 20	3(4.5)	4(6.1)	2.707	0.608
	21-25	19(28.8)	14(21.2)		
	26-30	8(12.1)	11(16.7)		
	31-35	1(1.5)	3(4.5)		
	36-40	2(3)	1(1.5)		
Education	Upto matric	8(12.1)	8(12.1)	2.869	0.412
	Senior secondary	14(21.2)	19(28.8)		
	Graduate	5(7.6)	4(6.1)		
	Above graduate	6(9.1)	2(3)		
Occupation	Employed	11(16.7)	9(13.6)	0.533	0.766
	Self employed	5(7.6)	7(10.6)		
	Housewife	17(25.7)	17(25.7)		
Type of family	Nuclear	22(33.3)	22(33.3)	0.000	1.000
	Joint	11(16.7)	11(16.7)		
Locality	Urban	6(9.1)	6(9.1)	0.054	0.816
	Rural	29(43.9)	25(37.9)		
Number of children	I	18(27.3)	29(43.9)	9.574	0.008**
	II	12(18.2)	4(6.1)		
	>II	3(4.5)	0(0)		

\*p=0.05, \*\* significant

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