

Research Article

Teaching package improves mothers knowledge on vaccine preventable diseases and vaccination: a Quasi experimental study

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Received: 22 May 2014

Accepted: 10 June 2014

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ABSTRACT

Background: Today vaccination is a very essential part of child's health. Vaccination programme is the key step for the vaccine preventable diseases in children. Objectives of current study were 1. To assess the knowledge of mothers regarding selected vaccine preventable diseases and vaccination. 2. To find the effectiveness of teaching package on knowledge regarding selected vaccine preventable diseases and vaccination among mothers. 3. To find the association between pre-test knowledge score and demographic variables.

Methods: An evaluative approach with quasi experimental - Two group pre-test and post-test design was adopted. The sample comprised of 100 mothers in selected hospitals of Mangalore who were selected by purposive sampling technique and assigned to control and experimental group. On first day pre-test was conducted with a structured knowledge questionnaire to both control and experimental group and teaching package was given only to the experimental group followed by post-test and information booklet to both the groups on 7th day.

Results: The mean and standard deviation of post-test knowledge score of mothers in experimental group (27.80 ± 3.010) was much greater than pre-test value (10.44 ± 2.323). There is no change in pre and post-test knowledge score in control group (9.74 ± 1.805). The calculated value $t_{98}=34.54$ was greater than the table value 1.68 at 0.05 level of significance. This indicates that the teaching package was effective in improving the level of mothers knowledge.

Conclusion: The study findings concluded that the mothers were benefited by teaching package on vaccination and vaccine preventable diseases. Furthermore mass health education programs can be conducted to create awareness among general public.

Keywords: Effectiveness, Knowledge, Vaccine preventable diseases, Mothers

INTRODUCTION

Health is both responsibility as well as right. The promotion of health is social, and political as well as individual responsibility. It has been seen that five million were disabled by six childhood diseases in some developing countries including India.¹ Paediatrics is the branch of medicine that deals with the medical care from conception to adolescence. Treating of a child is different

than adult. Major difference between them is children are minor and adults can do a decision by them self.²

The period of growth and development extends throughout the life cycle; however, the period in which the principle changes occur is from conception to the end of adolescence. The development of child occurs progressively by increase in skill and capacity to function. Every child is an individual and should never be

considered as a typical boy or girl, one unit of a group who are all alike. Each child possesses its own rate and pattern of growth, immune power and status of health.³

In India, 72 babies are dying for every 1000 babies born in a year. Disease of early childhood preventable by vaccination remains a serious problem in developing countries. The major communicable diseases prevented by the vaccination are diphtheria, tetanus, haemophilus influenza type B (Hib), whooping cough, tuberculosis, poliomyelitis, mumps, rubella and hepatitis B.⁴

At birth, infants are protected against some disease because antibodies passed from the mother to fetus and after birth got antibodies from breast milk. But protection is temporary. Some parents fear to give vaccination to their children because they are worried about children will have serious reaction or may get the illness due to the belief that the components of vaccines are weakened or killed some times, only parts of the microorganism are used which can cause serious illness.⁵

In 2010, global DPT3 coverage was 68% up from 50% in 2005. However, 27 million children world-wide were not reached by DPT3 in 2010, including 9.9 million on south Asia and 9.6 million in sub-Saharan Africa.⁶ The coverage of childhood vaccines was 90% for Bacilli Calmette-Guérin (BCG) vaccine, 86% for the third dose of poliovirus vaccine, 85% for measles-containing vaccine, 75% for the third dose of hepatitis B vaccine, and 42% for the third dose of haemophilus influenzae type B vaccine. Despite improvement in global routine vaccination coverage many children have not received all recommended immunization of childhood.⁷

The field of pediatric vaccination is growing and changing as new vaccines are becoming available and previous diseases are being eradicated due to complicity and evolution of vaccines preventable diseases. The goal of vaccination is to protect the population from disease and disease transmission.⁸

Barriers of vaccination are knowledge deficits of patients/families, care providers; fragmented care, vaccine shortages, missed visits, missed reminder or recall systems opportunities.⁹ A cross sectional study was conducted in Ahmadabad to assess the knowledge of under-five children's mother on immunization. The sample size was 100 mothers. The respondents were tested by interviews and questionnaire. Result shows that post-test knowledge means score (28.4%) was significantly higher than that of pre-test mean score (12.4%). And the study revealed that mothers had inadequate knowledge regarding importance of immunization and its timings.¹⁰

Knowledge is enhanced with reinforcement. Mothers are the primary caregivers of children and they are the one actively involved in the wellness and illness of the child.

If the mothers are educated on the health aspects of children, many dreadful diseases can be prevented in the country. Hence the investigator felt the need to assess the knowledge and to evaluate the effectiveness of teaching package on selected vaccine preventable diseases and vaccination among mothers in selected hospitals of Mangalore.

METHODS

An evaluative approach with quasi experimental- two group pre-test and post-test design was adopted. The study was approved by Yenepoya University ethics committee. The sample comprised of 100 mothers who delivered first baby in the selected hospitals of Mangalore. Purposive sampling technique was used to select the samples and 50 mothers were assigned to experimental and 50 to control group conveniently. The tool validation was obtained from subject experts from department of nursing and pediatrics. The reliability coefficient was calculated by using Karl Pearson's correlation co-efficient, spilt half method. The reliability co-efficient was found to be $r_{(10)} = 0.92$. To get the co-operation of the mothers, self-introduction and orientation about the investigators study topics were given. An informed written consent was obtained from the mothers to participate in the study. On first day pre-test was conducted with a structured knowledge questionnaire to both control and experimental group and teaching package was given only to the experimental group. The teaching package consists of video assisted teaching plan for 45 minutes on vaccine preventable diseases such as tuberculosis, poliomyelitis, diphtheria, pertussis, tetanus, hepatitis-b, measles, mumps, rubella and Hib and vaccination for children. On the seventh day post test was conducted and information booklet was given to both groups.

Statistical analysis

Data was analyzed using descriptive and inferential statistics. Descriptive statistics were used to find out the frequency and percentage of demographic data, and the knowledge of participants. Un-paired 't' test was adopted to find out the effectiveness of teaching package between the groups and Paired 't' test to find out the effectiveness of teaching package within the groups. Chi square test was applied to find the association of pre-test knowledge scores with demographic variable.

RESULTS

Table 1 reveals that frequency and percentage distribution of demographic characteristics of the samples. The findings of the study revealed that in experimental group highest percentage (46%) of the sample were in the age group of 21-25 years and in control group it was 52% and most of them belongs to Muslim religion (40% and 58%) in both groups.

Table 1: Frequency and percentage distribution of demographic characteristics of the samples. N=100.

Sample characteristics	Experimental group		Control group	
	f	%	f	%
Age in years				
Below 20 years	08	16	02	04
21-25 years	23	46	26	52
26-30 years	14	28	20	40
Above 30 years	05	10	02	04
Religion				
Hindu	16	32	13	26
Muslim	20	40	29	58
Christian	14	28	08	16
Any other	-	-	-	-
Education				
No formal education	04	08	-	-
Primary	23	46	18	36
High school	16	32	08	16
Higher secondary	07	14	19	38
Graduate and above	-	-	05	10
Occupation				
House wife	27	54	25	50
Private employee	10	20	14	28
Government employee	01	02	11	22
Beedi worker	11	22	-	-
Coolie	01	02	-	-
Monthly income				
Below Rs. 5000/-	09	18	-	-
Rs. 5001-10000/-	28	56	05	10
Rs. 10001-15000/-	12	24	20	40
Rs. 15001 and above	01	02	25	50
Type of family				
Nuclear	39	78	42	84
Joint	11	22	08	16
Area of residence				
Urban	12	24	25	50
Rural	38	76	25	50
Dietary pattern				
Vegetarian	03	06	05	10
Non-vegetarian	47	94	45	90
Previous source of information				
Mass media	09	18	27	54
Health care professionals	17	34	19	38
Neighbourhood friends / relatives	24	48	04	08

f - Frequency, % - Percentage, N - Number of samples

According to educational status and occupation of the mothers, 46% had primary education in experimental group and 38% had studied upto higher secondary level control group and majority in both the groups (54% and 50%) were house wife. With regard to monthly income and type of family, the highest percentages (56% & 50%) of mothers were drawing Rs. 5001-10000 and Rs. 15000

respectively in experimental and control group and 78% belongs to nuclear family. In area of residence analysis reveals that majority (76% & 50%) of samples were from rural area from both groups. In both the groups most of the mothers were non-vegetarian (94% & 90%).

In the control group majority of the mothers received information regarding vaccine preventable disease and vaccination from mass media (54%) and in control group it was from neighborhood (48%).

Table 2 reveals that in pre-test 86% the mothers from experimental group had inadequate, 14% had moderately adequate and none of the samples had adequate knowledge whereas in control group, 94% had inadequate, 6% had moderately adequate and none of the samples had adequate knowledge. In post-test 94% of the experimental group mothers gained adequate knowledge and 6% had moderately adequate knowledge regarding selected vaccine preventable diseases and vaccination. There was no change between pretest and post-test knowledge level in the control group.

Figure 1 denotes that in experimental group the highest mean percentage (37%) of pre-test knowledge score was seen in the aspect of Poliomyelitis and polio whereas lowest (22%) in the area of haemophilus influenza-B (Hib) and its vaccine. In the control group highest mean percentage (29.66%) of pre-test knowledge score was obtained in the aspect of diphtheria, pertussis, tetanus and diphtheria pertussis tetanus (Dpt) and diphtheria tetanus (dt) and Tetanus Toxoid (TT) vaccines whereas lowest (16%) was obtained in the area of haemophilus influenza-B (Hib) and its vaccine.

Figure 2 shows that in experimental group the highest post-test mean percentage score (90.5%) was evident in the area haemophilus influenza-B (Hib) and vaccine for haemophilus influenza-B (Hib) and lowest in the area of hepatitis B and Hepatitis B (HB) vaccine (70.50%) whereas in the control group there is no change in level of knowledge between pre and post-test.

Table 3 depicts that overall the mean and standard deviation of post-test knowledge score of mothers in experimental group (27.80 ± 3.010) was much greater than pre-test value (10.44 ± 2.323). The calculated 't' value $t_{08}=34.54$ was greater than the table value 1.68 at 0.05 level of significance in experimental group.

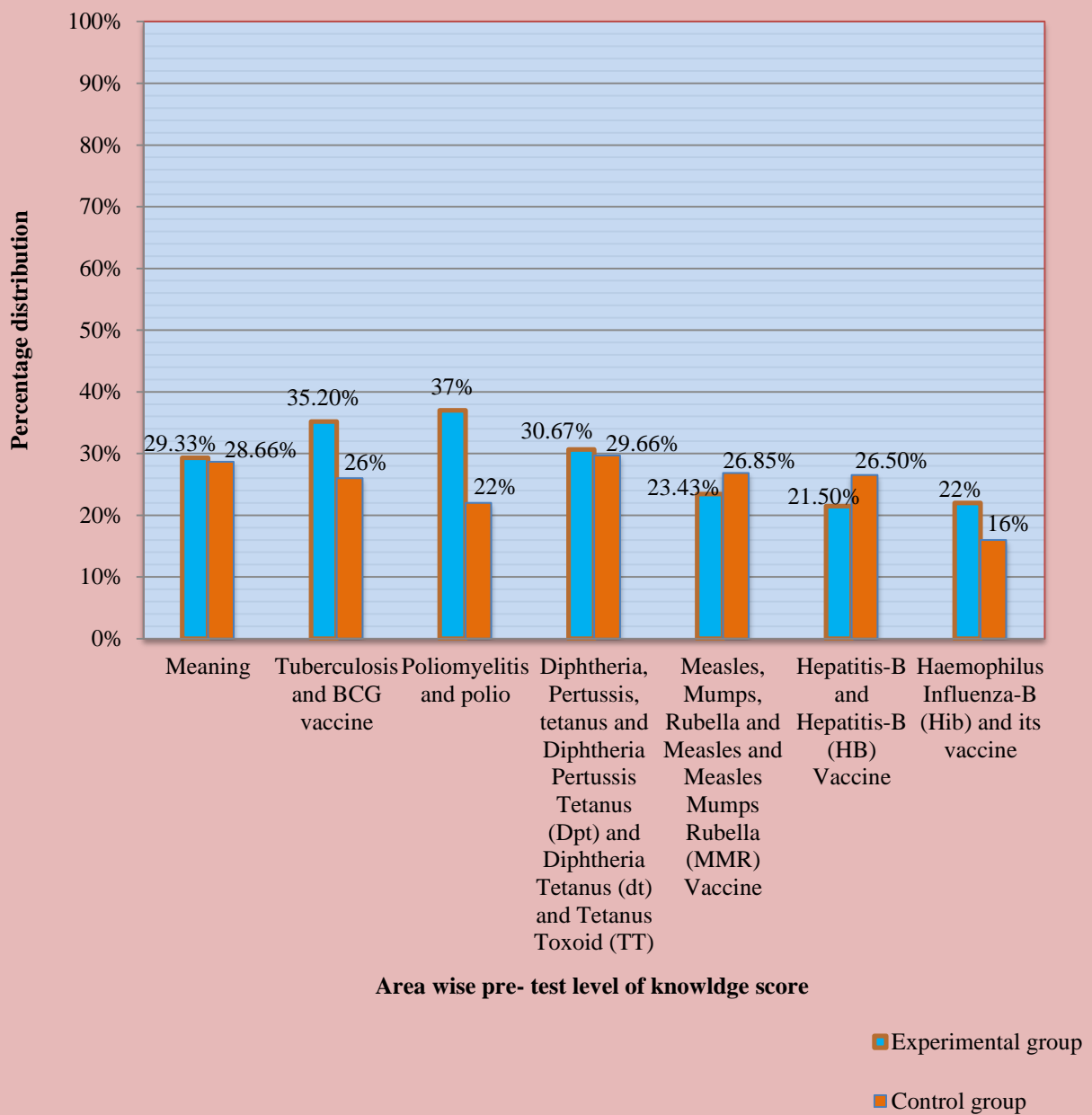
This indicates that there was an improvement in the level of mother's knowledge after exposed to teaching package.

Hence the null hypothesis was rejected and research hypothesis was accepted. There is no change in pre and post-test knowledge score in control group (9.74 ± 1.805). Hence there is no significant difference found in the control group.

Table 2: Frequency and percentage distribution of overall level of knowledge of samples in the pre- test and post-test. N=100.

Level of knowledge	Score	Pre-test		Post-test		Experimental		Control	
		Experimental		Control		Experimental		Control	
		F	%	F	%	f	%	f	%
Inadequate	0-12 (0-31%)	43	86	47	94	-	-	47	94
Moderate	13-25 (32-65%)	07	14	03	06	10	20	03	06
Adequate	26 – 38 (66-100%)	-	-	-	-	40	80	-	-

f - Frequency, % - Percentage, N - Number of samples

**Figure 1: Area wise pre- test level of knowledge scores of the samples.**

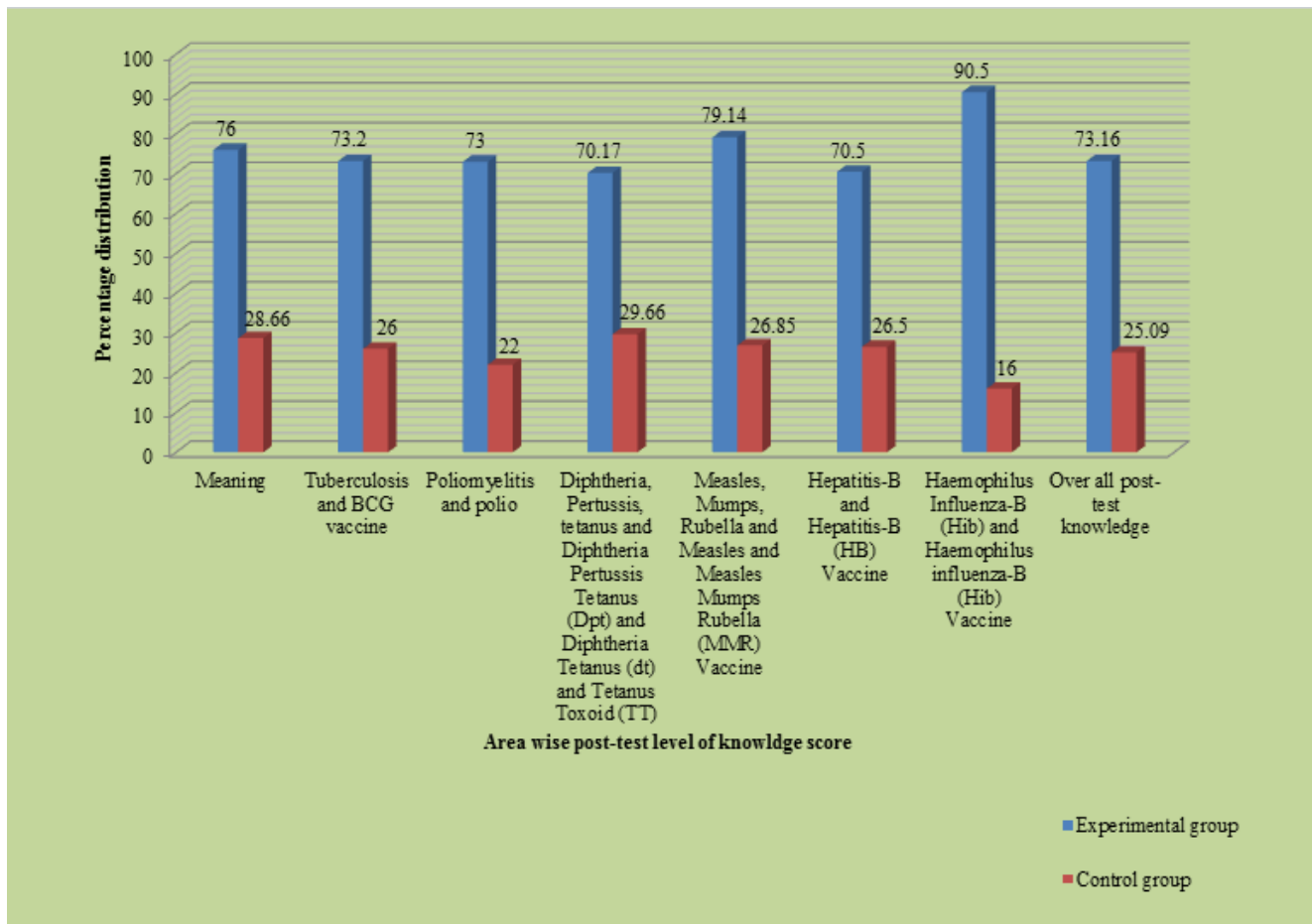


Figure 2: Distribution of post- test knowledge scores of the samples.

Table 3: Comparison of overall mean, standard deviation, mean percentage and 't' value of pre-test and post-test knowledge scores of experimental and control group (Paired 't' test). N=100.

Groups	Mean \pm SD		Mean%		't' test
	Pre test	Post test	Pre test	Post test	
Experimental	10.44 \pm 2.323	27.80 \pm 3.010	0.274	73.15	34.54*
Control	9.74 \pm 1.805	9.74 \pm 1.805	25.63	25.63	0

$t_{(98)} = 1.68$; $P < 0.05$; *significant, % - Percentage, N - Number of sample, SD - Standard deviation

Table 4 reveals that overall mean and standard deviation of post-test knowledge score in experimental group and control group were 27.80 ± 3.010 and 9.74 ± 1.805 . The calculated t-value - ('t'=35.574) was greater than the table value 1.66 at 0.05 level of significance.

This indicates that there was an improvement in the level of mother's knowledge after exposed to teaching package. Hence the null hypothesis was rejected and research hypothesis was accepted.

Table 4: Comparison of overall mean, standard deviation and 't' value post-test knowledge in control and experimental group (Un-paired 't' test). N=100.

Groups	Mean \pm SD	Mean%	't' value
Experimental	27.80 \pm 3.010	73.15	35.574*
Control	9.74 \pm 1.805	25.63	

$t_{(98)} = 1.66$; $P < 0.05$; *significant % - Percentage, N - Number of sample, SD - Standard deviation

Table.5 reveals that there was significant association between level of knowledge and selected demographic variables in experimental group in the aspect of area of residence. Hence the research hypothesis was accepted and null hypothesis was rejected. In control group there is no association between knowledge and demographic variables. Hence the null hypothesis was accepted and research hypothesis was rejected.

Table 5: Association between level of knowledge score and selected demographic variables of mothers in Experimental group and control group. (Chi-square test). N=100.

Sample characteristics	Median				Calculated value (χ ²)	
	Experi- mental group		Control group		Experi- mental group	Control group
	<10	<10	>10	<10		
Age in years						
Below 20 years	03	05	01	01	0.219	0.45
21-25 years	08	15	10	16		
26-30 years	07	07	08	12		
Above 30 years	01	04	00	02		
Education						
No formal education	02	00	00	00	0.187	0.095
Primary	09	02	07	11		
High school	06	14	03	05		
Higher secondary	02	10	07	12		
Graduate and above	00	05	02	03		
Occupation						
House wife	10	17	09	16	1.281	0.085
Private employee	03	07	05	09		
Government employee	00	01	05	06		
Beedi worker	06	05	00	00		
Coolie	00	01	00	00		
Area of residence						
Urban	01	11	09	16	4.358*	0.85
Rural	11	21	10	05		
Previous source of information						
Mass media	06	03	08	19	1.453	2.785
Healthcare professionals	04	13	10	09		
Neighbor- hood friends / relatives	09	15	01	03		

$\chi^2_{(1)} = 3.84$; $P < 0.05$; *significant

DISCUSSION

The present study revealed that majority (48%) of the mothers was between the age group of 21-25 years and were Muslims (54%). Highest percentage (41%) of the mothers were had primary education and were house wife (52%). Majority (33%) of the mothers monthly income was between Rs. 5001-10000 and were and belongs to nuclear family (81%). Majority (63%) of the mothers residing in rural area and were non-vegetarian (92%). Majority (36%) of the mothers were had received information from mass media. It was supported by similar Cross sectional study conducted, in VS General Hospital, Ahmedabad to assess the awareness and knowledge of mothers of Under Five children regarding Immunization. Center of post-partum unit, results revealed that mean age of the respondents was 28.4 years. (72%) of the respondents were housewives and (65%) of them were Hindus.¹¹ Also supported by similar quasi-experimental study conducted to assess the effectiveness of information booklet on vaccine preventable diseases in Bangalore. The highest percentage of respondents were (42%) between the age group of 20-24 years, had educational level up to primary (62%) and were house wife (48%).¹²

The present study revealed that the mean and standard deviation of post-test knowledge score of mothers in experimental group (27.80 ± 3.010) was much greater than pre-test value (10.44 ± 2.323). There is no change in pre and post-test knowledge score in control group (9.74 ± 1.805). The calculated 't' value $t_{98}=34.54$ was greater than the table value 1.68 at 0.05 level of significance. The overall mean and standard deviation of post-test knowledge score in experimental group (27.80 ± 3.010) and in control group (9.74 ± 1.805). The calculated 't'=35.574* value was greater than the table value 1.66 at 0.05 level of significance. Which indicates that the teaching package was effective on level of mothers knowledge. It was supported by a study on effectiveness of planned teaching programme regarding immunization among mothers of under-five children in selected hospital of Udupi. The findings revealed that the post-test knowledge score (26.53%) was higher than the pre-test knowledge score (13.5%). Therefore, planned teaching programme was found to be an effective media for educating mothers regarding importance of immunization.¹³ Another study was conducted in Udupi district, Karnataka to determine the knowledge of mothers on immunization of children and to the effectiveness of Structured Teaching Programme (STP) in selected pediatric wards. Result revealed that the 't' test ($t_{(49)} = 27.77$) showed that post-test knowledge means score (29.74%) were significantly higher than that of pre-test mean score. (16.16%) at $P < 0.01$. This indicated that the STP was effective in improving the knowledge level of mothers regarding immunization. Majority of the mothers (87.7%) strongly agreed that STP was highly effective to a great extent.¹⁴ It was supported by an evaluative study conducted to assess the

effectiveness of Structured Teaching Programme (STP) regarding immunization among 50 mothers of under-five children in selected pediatric hospital, at Pondicherry. The study finding shows that the post-test knowledge score (22.73) was higher than the pre-test knowledge score (12.78).¹⁵

This study found out that there was significant association between level of knowledge and selected demographic variables in experimental group such as area of residence. Hence the research hypothesis was accepted and null hypothesis was rejected and in control group. There is no association between demographic variable and knowledge of mothers on selected vaccine preventable diseases and vaccination. Hence the null hypothesis was accepted and research hypothesis was rejected. It was supported by a cross sectional descriptive study conducted in Egypt to assess the awareness and knowledge of mothers of under five years children regarding immunization. The result showed that Mothers' knowledge was significantly associated with appropriate vaccination of their children.¹⁶ It also supported by a pre-experimental study was conducted in a paediatric unit at Saint Peter's University hospital, New Brunswick. The result showed that there was no significant association between level knowledge and demographic variables.¹⁷

CONCLUSION

In the present study, samples were benefited with a teaching package on selected vaccine preventable diseases and vaccination. This study concludes that there was an improvement in the level of mother's knowledge after exposed to teaching package. Comparative study can be conducted on the primi-postnatal and multi postnatal mothers on a larger samples. A health education module can be developed on vaccine preventable diseases and also workshop can be organized among undergraduate students regarding vaccine preventable diseases in children.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Yenepoya University ethics committee

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DOI: 10.5455/2320-6012.ijrms20140850

Cite this article as: D'Souza VP, Umarani J.

Teaching package improves mothers knowledge on vaccine preventable diseases and vaccination: a Quasi experimental study. Int J Res Med Sci 2014;2:976-82.