

Pre-experimental study on effect of structured teaching program on ZIKA Virus disease, importance of pentavalent and JE vaccine.

Effect of structured teaching programme on knowledge of ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine among health workers of selected Block Primary Health Centre (BPHC), West Bengal.

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Abstract

Investigator conducted a pre experimental study with the objective of assessment of the effect of structured teaching programme on knowledge regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis (JE) vaccine among health workers at selected BPHC, West Bengal. The conceptual framework of the study was based on Bertalanffy's general system model. One group pre-test post- test research design was adopted. Non-probability convenience sampling technique was adopted to select 60 respondents. The tools used were a semi-structured questionnaire and a structured knowledge questionnaire. The findings of the study showed that in pretest, majority of the respondents (43.33%) had fair knowledge and in the posttest majority (73.33%) had excellent knowledge level. The findings also revealed that in the pretest majority (51.67%) of the respondents had poor knowledge level regarding ZIKA virus disease, 38.33% had good knowledge on pentavalent and 31.67% had poor knowledge level on Japanese Encephalitis vaccine in comparison to post test, majority (55%) had good knowledge level on ZIKA virus disease, 75% and 46.67% respondents had excellent knowledge level on both Pentavalent vaccine and Japanese Encephalitis vaccine. The findings of the study revealed that the mean post-test knowledge score of health workers (28.10) was higher than the mean pretest knowledge score (25) with a mean difference 7.73 which was found to be statistically significant as evident from 't' value [$t(59) = 25.73$] at 0.001 level of significance, indicating the effectiveness of structured teaching programme. The findings also revealed that there is no significant association between knowledge of the respondents and selected demographic variables. The findings of the study have several implications in nursing practice, education, administration and research. The study can be replicated on a large population for better generalization.

Background

Zika virus is similar to dengue fever and it is a arthropod born virus. This infection during pregnancy can cause birth defect called microcephaly. This virus first discovered in 1947 in Uganda. Zika virus was spreading day by day with neurological disorder on 2016,1st February WHO declared Zika is a public health emergency of International concern 80% cases are asymptomatic and when symptoms occur they are typically mild and nonspecific. Other way pentavalent vaccine provides the protection to a child from 5 life threatening disease such as diphtheria, pertusis, tetanus, hepatitis B and Hib. Hib is new addition, and the new vaccine Japanese Encephalitis is the leading cause of viral encephalitis. So awareness is necessary among health care workers to prevent the Japanese Encephalitis and meningitis caused by Hemophilus Influenzae type B and they should also know the Zika virus disease to detect microcephally. Since there are no such studies conducted to enhance the knowledge of health workers regarding Zika virus disease, importance of pentavalent vaccine and JE vaccine. So investigator selected this study to evaluate the effect of a planned teaching programme on Zika virus disease, importance of pentavalent vaccine and JE vaccine

Materials and Methods In this pre experimental research study the design was one group pretest and posttest, 60 health workers of Joynagar I block in south 24pgs in West Bengal were selected by nonprobability convenience sampling method. Semi structured tool and structured knowledge questionnaire was developed and validated by nine experts. Reliability was computed. Tool was pretested. The final study was conducted from 6/

11/2017 to 2/12/2017. Sample was selected by selection criteria before that formal permission taken from administrative level. On the first day demographic data were collected pretest was done on health workers and knowledge assessed. On the same day structured teaching programme regarding Zika virus disease, importance of pentavalent and JE vaccine was introduced. Sample was allocated into 2 groups of 30 each, Group A received the teaching and after one hour Group B received teaching. On the day 8th post test was conducted. Then the pretest and posttest knowledge were assessed by descriptive and inferential statistics.

Results The mean posttest knowledge score 28.1 of health workers was much higher than the mean pretest knowledge score 20.37 with a mean difference of 7.73 which was found statistically significant as evident from the 't' value of 25.73 for df (59) at 0.001 level of significance. This indicates that the mean difference between the pretest and posttest knowledge score is a true difference and not by chance. Hence null hypothesis is rejected and research hypothesis is accepted. Therefore, it could be concluded that the structured teaching programme on Zika virus disease, importance of pentavalent and Japanese Encephalitis vaccine is effective to improve the knowledge of health workers. The calculated chi square value denotes that the knowledge of health workers was not associated with age, working experiences, professional qualifications.

Conclusion In pretest most of the health workers had fair knowledge but after introduction of structured teaching programme most of the health workers scored excellent level of knowledge. So the structured teaching programme on knowledge regarding Zika virus disease, importance of pentavalent and JE vaccine was effective to increase the knowledge of health workers.

Key Word Zika virus disease, Pentavalent vaccine, JE vaccine, Health workers, structured teaching programme.

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I. Introduction

ZIKA virus (ZIKV) was first identified in rhesus monkeys in the ZIKA forest of Uganda in 1947 and has circulated in Africa and Asia for sixty years [1]. The rise in the spread of ZIKA virus has been accompanied by a rise in cases of microcephaly and Guillain-Barré syndrome. First identified in Uganda in 1947 in monkeys, ZIKA was later identified in humans in 1952. The first large outbreak of disease caused by ZIKA infection was reported from the Island of Yap in 2007. There are currently several countries experiencing ZIKA virus outbreaks [1]. It is a Flavi virus transmitted by Aedes mosquitoes, particularly Aedes Aegypti, and infection is frequently asymptomatic. Clinical manifestations include rash, mild fever, arthralgia, conjunctivitis, myalgia, retro-orbital pain, headache and cutaneous maculopapular rash [2].

The disease is mapped as it moves from Uganda to western Africa and Asia in the first half of the 20th century. First large ZIKA outbreak in humans has reported in the Pacific Island of Yap in the Federated States of Micronesia on 2007. An estimated 73% of Yap residents are infected with ZIKA virus. Outbreaks occur in 4 other groups of Pacific islands in 2013-2014. During the outbreak of ZIKA virus in French Polynesia, 2 mothers and their newborns are found to have ZIKA virus infection within 4 days of birth dated on 20th March, 2014. The infants' infections appear to have been acquired by trans-placental transmission or during delivery. Brazil's National Reference Laboratory confirms ZIKA virus is circulating in the country on 7th May 2015. This is the first report of locally acquired ZIKA disease in the Americas. WHO/PAHO released an epidemiological alert for possible ZIIKA virus infection in Brazil. Brazil reported an unusual increase in the number of cases of microcephaly among newborns on 30 October 2015 [3].

Pentavalent Vaccine WHO launched expanded program on immunization (EPI) with the aim of controlling these six childhood diseases: tuberculosis, diphtheria, pertussis, tetanus, polio and measles in 1974. Government of India (GOI) in 1978 adapted EPI with slight modification by replacing measles with typhoid. Later on typhoid was discontinued and measles included in the program and renamed as universal immunization program (UIP) in 1985. India is a developing country with a population of 1,210 million and high infant and under 5 mortality rate of 47 and 59 per 1,000 live births, respectively. Immunization is one of the most important public health interventions and a cost effective strategy to control the infectious diseases especially in children. Complete immunization coverage in India has increased from below 20% in the 1980s to nearly 61% at present, but still more than 1/3rd of the children remain un-immunized [9].

Japanese Encephalitis (JE) is the leading cause of viral encephalitis in Asia. The pathogen is a mosquito-borne Flavivirus, and its transmission is maintained through a enzootic cycle with Culex mosquitos, pigs and water

birds. Symptomatic JE, most commonly manifest as encephalitis, is rare and thought to occur in approximately 1 in 250 infections. However, of JE cases, the case fatality rate can be as high as 30%, and permanent neurologic or psychiatric sequelae can occur in 20-30% of survivors, such as paralysis, recurrent seizures, or inability to speak. There is no antiviral treatment for patients with JE, and human vaccination is the most effective tool against JE. Although human vaccines have been available since the early 1960s, there are still unnecessary JE morbidity and mortality due to a lack of vaccination programs in high risk areas [17].

Problem Statement Effect of structured teaching programme on knowledge of ZIKA virus disease, importance of pentavalent and Japanese encephalitis (JE) vaccine among health workers of selected Block Primary Health Centre (BPHC), West Bengal.

Objectives of The Study

1. To develop and validate an awareness programme on zika virus disease, importance of pentavalent vaccine and JE vaccine.
2. To assess the knowledge of health workers before and after administration of awareness programme.
3. To evaluate the effect of awareness programme in terms of changes in knowledge score.

Operational Definition

Knowledge: In this study, knowledge refers to the range of correct responses given by health workers regarding Zika virus disease, importance of pentavalent and JE vaccine as measured by structured knowledge questionnaire.

Zika Virus Disease It refers to a type of mosquito-borne Flavivirus that is typically transmitted by the Aedes species of mosquitos, typically experience mild, flu-like symptoms. Pregnant women are believed to be at risk of pregnancy complications if they contract Zika virus disease during pregnancy microcephaly (abnormally small skull) is a serious birth defect that has been linked to Zika infections in pregnant women.

Pentavalent Vaccine It refers to the fully liquid vaccine combining five antigens for protection against potentially life-threatening childhood diseases—diphtheria, tetanus, pertussis, hepatitis B, and illnesses caused by Haemophilus influenza type B.

Japanese Encephalitis Vaccine In this study, Japanese Encephalitis vaccine refers to the inactivated vaccine which prevents Japanese encephalitis (JE) disease, a serious infection caused by the Japanese encephalitis virus, and experiencing of fever, neck stiffness, seizures, coma, brain damage.

Structured Teaching Programme In this study, Structured Teaching programme refers to the systematically organized teaching strategies designed to provide information regarding Zika virus disease, importance of pentavalent vaccine and JE vaccine.

Effect In this study, Effect refers to the ability to change the knowledge of health workers regarding Zika virus disease, importance of pentavalent vaccine and JE vaccine.

Health Workers In this study, health workers refers to the health assistant (female) posted at sub-centre.

Assumptions The study assumes that

1. Health workers have some knowledge about Zika virus disease, importance of pentavalent and Japanese encephalitis (JE) vaccine.
2. Health workers are willing to participate in the study.

Variables Under Study

- Independent variable- In this study, the independent variable is the structured teaching programme on Zika virus disease, importance of pentavalent vaccine and JE vaccine.
- Dependent variable- In this study, the dependent variable is Knowledge of health workers on Zika virus disease, importance of pentavalent vaccine and JE vaccine.
- Demographic variable- In this study, demographic variables are age(in years),experience(in years), attended any in-service training on Zika virus, pentavalent vaccine and JE vaccine.

Delimitation The present study was delimited to-

- Health workers who are willing to participate.

Research Hypothesis H1: The mean posttest knowledge scores of health workers after exposure to structured teaching programme on Zika virus disease, importance of pentavalent vaccine and JE vaccine is significantly higher than the mean pretest knowledge score as evidenced by structured knowledge questionnaires at 0.05 level of significance.

Conceptual Framework Conceptual framework formalizes the thinking process so that others may read and know the frame of reference basic to the research problem. It is the process of moving from an abstract idea to concrete idea, more readily in a graphic form. Conceptual framework also gives directions for relevant questions on the phenomenon under study, points out a solution to practical problems and provides general criteria for knowing whether a problem has been solved or not.

Conceptual framework of the present study is based on **Bertalanffy's general system model** to assess the effect of structured teaching programme on knowledge of ZIKA virus disease ,importance of pentavalent and Japanese Encephalitis vaccine among health workers. The system approach has three major concepts-input, process and output.

Input This refers to the learner with their characteristics, experiences, learning needs and interest. In the present study, input refers to the selected health workers with their characteristics before administration of structured teaching programme such as age, duration of working experience, professional qualification, attended any inservice training on ZIKA virus disease, pentavalent and Japanese Encephalitis vaccine.

Process This refers to the different operational procedure in programme implementation. In this study it refers to the following:

- Development of the tool Structured teaching questionnaire to assess the knowledge regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine.
- Pretest of the respondents.
- Development of the structured teaching programme includes validating the structured teaching programme, modification and preparation of final structured teaching programme.
- Administration of structured teaching programme regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine.
- Assessment of the effect of structured teaching programme in terms of change in knowledge score.

Output This is the process by which information is received from each level of the systems. In the present study, output is evaluated through systematic collection of data for the input and process phases which results in increased knowledge in terms of change in knowledge score.

Context In the present study context refers to the setting in which structured teaching programme is administered.

The conceptual framework of this particular study is presented in the following figure

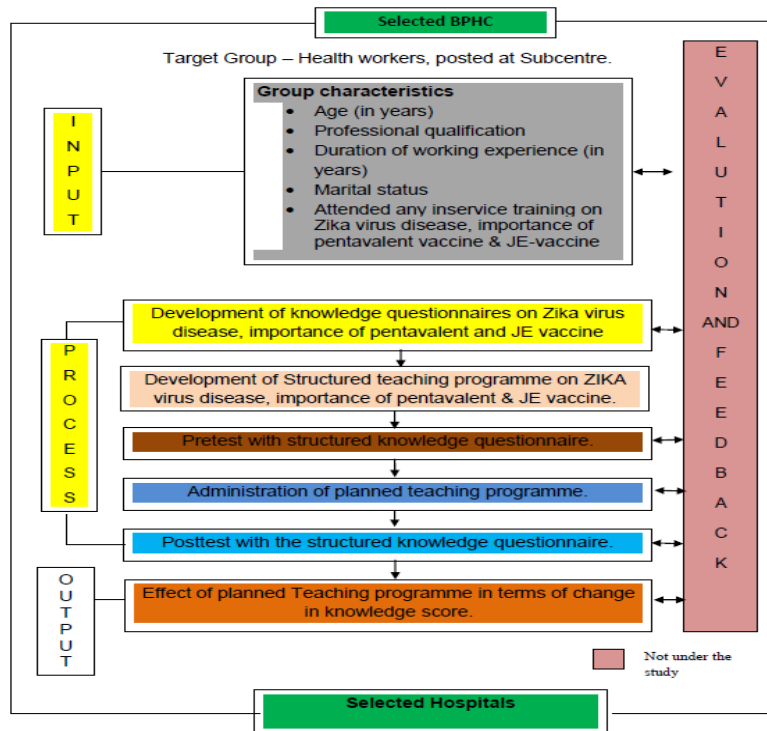


Figure 1: Conceptual framework based on Bertalanffy's general system model of structured teaching Programme for Health Workers

II. Research Methodology

Research approach To accomplish the objectives of the study, pre-experimental research approach was chosen to conduct the study.

Research Design One group pretest posttest research design was appropriate for this present study. The design can be presented as:

K1 X K2

K1 = Pretest knowledge score of health workers on day 1

X = Introduction of awareness programme on ZIKA virus disease, importance of pentavalent vaccine and JE vaccine.

K2 = Post test knowledge score of health workers on day 8

The research design of the present study is schematically presented in figure 2.

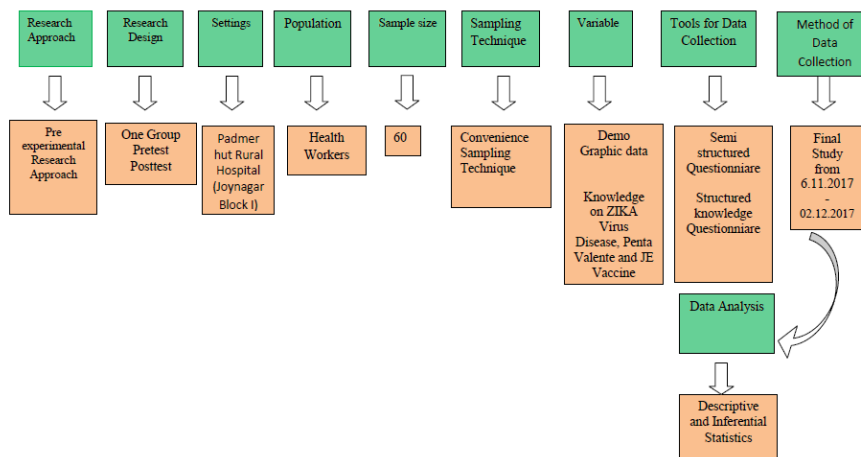


Fig.2: Schematic representation of research design

Variable Under Study

- Independent variable-Awareness programme on ZIKA virus disease, importance of pentavalent vaccine and JE vaccine.
- Dependent variable-Knowledge of health workers on ZIKA virus disease, importance of pentavalent vaccine and JE vaccine.
- Demographic variable-Age (in years), experience (in years), professional qualification, marital status, exposed any in-service training on ZIKA virus disease, pentavalent vaccine and JE vaccine.

Study Location The present study was conducted at Padmerhut Rural Hospital (Joynagar block I), south 24 Parganas, West Bengal

The rationales for selecting the setting were:

- Familiarity with the setting
- Availability of the subjects
- Feasibility of conducting the study.
- Administrative approval.

Population The present study population comprised of all health workers (Health assistant female) posted at sub-centre.

Sample Sample of the study was health workers posted at different sub-centres of Joynagar I block.

Sample Size The sample size was 60.

Sampling Technique: In the present study, the sampling technique was done by non-probability convenience sampling method.

Data Collection Tools and Techniques The most important and crucial aspect of any investigation is the collection of appropriate information, which provides necessary data for the study.

The tools developed for data collection in terms of the objectives of the study are given in the following table:

Table No.	Tool	Variable to be studied	Technique
I	Semi structured questionnaire	Demographic Characteristics	Paper pencil
II	Structured KnowledgeQuestionnaire	Knowledge regarding Zika virus disease, importance of pentavalent vaccine and JE vaccine.	Paper pencil

Table1: Data collection tools and techniques

Development of The Tool: The study aimed at effect of structured teaching programme on knowledge of ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine among health workers. Based on the objectives of the study, researcher developed data collection tools in order to obtain necessary information. Steps of development of tools are presented below-

Steps for Development of Tools

- Step 1- Relevant literature was reviewed.
- Step 2- Preparation of blueprint of structured knowledge questionnaire.
- Step 3- Preparation of first draft of tool.
- Step 4- Tools were given for validation to experts.
- Step 6- Reliability was computed.
- Step 7- Pretesting of the tool was done.
- Step 8- Final draft of the tool was prepared.

Description of Tools: In this study, two tools were used

Tool I It comprised of semi-structured questionnaire to collect demographic characteristics of health workers such as age(in years), year of working experience, professional qualification, marital status, exposure to in-service training on ZIKA, exposure to in-service training on pentavalent and Japanese Encephalitis(JE) vaccine.

Tool II A structured knowledge questionnaire to assess the knowledge of health workers regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis (JE) vaccine.

Questions were developed in accordance to the content. The questions covered all the areas of content. Total questions prepared in this tool was 30. The questions also covered all the domains, i.e, 60% from cognitive domain, 30% from affective domain and 10% from psychomotor domain. The tool II consists of three parts i.e. part A, part B and part C. Part A contains 11 questions related to history of ZIKA virus disease, concept, signs and symptoms and prevention of ZIKA virus disease. Part B comprises 10 questions related to concept of pentavalent vaccine and importance of pentavalent vaccine. Part C consists of 9 questions regarding concept of Japanese Encephalitis and importance of Japanese Encephalitis vaccine.

The questions prepared were all multiple choice questions consisting of only one correct response. 1 mark is allotted to each correct response. Total score was 30 .A response key was prepared.

A grading was prepared for the knowledge questionnaire.

Grading of Knowledge Score

Level of knowledge	Score	Percentage (%)
Excellent	>27	>90
Very good	24-27	81-90
Good	21-23	71-80
Fair	18-20	61-70
Poor	≤18	≤60

Maximum score = 30

Minimum score = 0

Table 2 Blueprint of domain wise distribution of items of structured knowledge questionnaire regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis (JE) vaccine.

Content Area	No. of Questions	Cognitive Domain	Affective Domain	Pschomotor Domain
A. ZIKA virus disease				
History of ZIKA virus disease	2	(2), 2, 3		
Concept of ZIKA virus disease	6	(4) 1, 7, 8, 9	(2) 5,10	
Signs & Symptoms	1	(1) 4	(1) 6	
Prevention	1	(1) 11		
B. Pentavalent vaccine				
Concept of Pentavalent vaccine	7	(3) 12, 15, 17	(2) 16, 21	(2) 18, 19
Importance of pentavalentvaccine	3	(1) 14	(2)1 3,20	
C. Japanese Encephalitis Vaccine (JE)				
Concept of JE	4	(4) 22,23,24,25		
Importance of JE vaccine	5	(2) 26, 27	(2) 28,30	(1) 29
Total	30	18	9	3
Percentages (%)	100	60	30	10

Validity of Tools In order to establish validity of prepared tool, blueprint, scoring grade and answer key was given to seven experts. The experts were chosen on the basis of their clinical expertise, experiences and interest in problem area. Among them three were from field of nursing and two were from community medicine and two were from NICU department of SSKM. The experts were requested to give their opinion and suggestion regarding the appropriateness, accuracy and relevance of items. Tools were modified according to their opinion.

Tool I It contains information regarding demographic data. Among 7 items, there was 100% agreement in 5 items (3, 4, 5, 6, 7) and 57.14% agreement in 2 items (1,2) which was modified as per expert's suggestions.

Tool II It contains structured knowledge questionnaire regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis (JE) vaccine among health workers. There were 30 items. Out of 30 items there was 100% agreement in 23 items and 85.71% in 4 items and 71.42% in 3 items. Modifications were done as per expert suggestions.

Pretesting of The Tool The pretesting of the tool was done to determine the ambiguity, clarity and feasibility of the tools on 10 health workers (health assistant female) of Bishnupur 1 Block. The average time taken was 30 minutes. No difficulty was found in administration of the tools.

Reliability Reliability of structured knowledge questionnaire was calculated using split half technique followed by Spearman Brown prophecy formula and the reliability coefficient was found $r = 0.79$, so it can be interpreted that structured knowledge questionnaire is reliable and has internal consistency.

Development of content on structured teaching programme regarding ZIKA virus disease, importance of pentavalent and JE vaccine The researcher designed and developed content on ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine after an extensive review of research and non-research literature, discussion with experts and guide.

The Steps Adopted in The Development of Content

- Review of research and non-research literature
- Preparation of first draft of content
- Development of content criteria checklist
- Content submission and validation by experts
- Modification of content as per the suggestion of the experts
- Preparation of final draft of content

Description of Content The content was based on ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine. The areas discussed in the content included history of ZIKA virus disease, concept of ZIKA virus disease, signs, symptoms, risk factors and prevention of ZIKA virus disease. It also includes the concept of pentavalent vaccine, importance of pentavalent vaccine and concept of Japanese Encephalitis (JE), importance of JE vaccine.

Development of Criteria Checklist for Structured Teaching Programme The term criteria means standard by which something may be judged (Oxford dictionary, 2002). A criteria list was developed on content regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine. The appropriateness was ensured by gathering opinion from seven experts. There were 100% agreement in all most area, and few modifications were suggested in briefing of content and language. A second draft of teaching programme was prepared with all suggested modifications. Bengali version and reverse translation was done with the help of language experts.

Ethical Consideration

- Ethical permission was taken from institutional ethics committee of IPGME& R, SSKM Hospital.
- Informed consent to be taken from each participant of the study

Administrative Approval Administrative permission was taken from

- The Principal, West Bengal Govt. College of Nursing, SSKM Hospital Campus.
- Director of Health Service, Health and Family Welfare Department of West Bengal.
- Joint DHS Nursing (Swastha Bhawan)
- CMOH of south and north 24 Parganas District.

- BMOH of selected block.

Pilot Study Pilot study is the miniature trial of methodology.

- Pilot study was conducted on 20 health workers at Barasat I Block of North 24 Parganas District, West Bengal.
- 20 health workers were selected by convenient sampling technique. Informed consent was taken from the health workers.
- Demographic data and pretest of knowledge questionnaire were administered.
- Structured teaching programme was given on that day. On the 8th day post-test of same questionnaire was taken.

The pilot study indicated that the main study would be feasible and practicable.

Problem Faced During the Pilot Study Though the health workers were busy, duo to the ongoing National programme, they participated for this study.

Data Collection Procedures for Final Study The final study was conducted from 06.11.2017 to 02.12.2017 at Padmerhat rural hospital, Joynagar I block, 24 Parganas (South). The following steps were taken to conduct the final research study:

- After taking administrative and formal permission from respective authority, the final research study was conducted.
- The investigator attended Joynagar I block and initial meeting was done with Block Medical Officer, Sr. PHN, PHN and supervisors. Detailed explanation was given about the purpose of the study and data collection process.
- The investigator attended the selected Block and introduced herself with the health assistant female, the purpose and usefulness of the study was explained to them. Written consent was taken from them prior to the study.
- They were assured for the confidentiality of their responses.
- Sample was selected according to the selection criteria by using non probability convenient sampling method.
- On the first day, demographic data were collected by using semi-structured demographic proforma and pretest knowledge of health workers was assessed by using structured knowledge questionnaire.
- On the same day structured teaching programme regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine was introduced to them.
- On the day eight post-test was conducted by using the same structured knowledge questionnaire.
- Termination of data collection procedure was done by thanking each respondent for their kind participation and co-operation.

Problem Faced During the Study No such problems were encountered by the investigator during data collection. All the selected health assistant female were interactive and cooperative. Throughout the procedure the investigator got adequate help and co-operation from the authority and other staffs of the selected Block.

Data Analysis for Final Study The data was analyzed by using descriptive and inferential statistics.

III. Analysis and Interpretation

Sections I Findings related to the percentage of agreement among expert on validation of content on ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine

Table 3 Percentage of agreement of expert's opinion regarding validity of content on structured teaching programme.

n=7

Criteria	Agree (%)	Partially Agree (%)	Disagree (%)	Remarks
Content Appropriate	85.17	14.29	-	Content to be added on pentavalent vaccine
Adequate	85.71	14.29	-	

Accurate	85.17	14.29	-	
Organization of the content				
Logical sequence	100	-	-	
Continuity	100	-	-	
Integrity	100	-	-	
Language				
Simple and understandable	95.71	14.29	-	Language to be modified
Comprehensive at the level of subjects	895.71	14.29	-	
Feasibility				
Acceptable and suitable to the subjects	100	-	-	

Data presented in table 3 reveals that there was 85.17% agreement in the areas of content that is appropriate, adequate and accurate.

The data also show that there was 100% agreement in the areas of organization that is logical sequence, continuity and integrity.

There was 87.14% agreement and 14.29% experts suggested the language should be simple and understandable according to the level of respondents. So, language has been modified as per expert's suggestion.

The data also indicate that all (100%) experts agreed that content was feasible, acceptable and suitable to the respondents.

Table 4 Finding related to number of agreement among experts to draw Content Validity Index (CVI).

Criteria	n=7		
	No. of Agreement	No. of Experts	CVI
Content			
Appropriate	06	07	0.85
Adequate	06	07	0.85
Accurate	06	07	0.85
Organisation of the content			
Logical sequence	07	07	01
Continuity	07	07	01
Integrity	07	07	01
Language			
Simple and understandable	06	07	0.85
Comprehensive at the level of subjects.	06	07	0.85
Feasibility			
Acceptable and suitable to the subjects.	07	07	01

The content was given to 7 experts for its validation. The criteria on which it was judged were content, organization of the content, language and feasibility.

Regarding the criteria of content, it was considered whether the content was appropriate, adequate, accurate. Among the 7 experts, 6 were agreed in the sub-criterias while some modification was suggested by one expert, necessary modifications were done as per the expert's suggestions. The CVI of the sub-criterias were calculated to be 0.85.

In the criteria of organization of the content, the sub-criteria was logical sequence, continuity and integrity. In this section also there was agreement among all the 7 experts in all the 3 sub-criteria. The CVI of each sub-criteria was calculated to be 01.

In the criteria of language, the sub-criteria were simple and understandable and comprehensive at the level of subjects. In this section 6 of the 7 experts were agreed in the sub-criterias while some modification was suggested by one expert, necessary modifications were done as per the expert's suggestions. The CVI of the sub-criterias were calculated to be 0.85.

Regarding the criteria of feasibility, the sub-criteria was acceptable and suitable to the subjects. All the 7 experts agreed on this sub-criteria. Calculated CVI was 01.

The total CVI of the content was calculated and the value of it was .92 against the referring value of 0.75 .So it was found valid.

Section II Findings related to description of sample characteristics related to demographic variables

Table 5 Frequency and percentage distribution of respondents according to age (in years), working experience (in years), professional qualification.

			n=60
Sample characteristics	Frequency (f)	Percentages (%)	
Age (in years)			
<35	03	05	
35-45	27	45	
46-50	12	20	
>50	18	30	
Working experience (in years)			
<15	27	45	
15-25	10	16.67	
26-35	17	28.33	
>35	06	10	
Professional qualification			
ANM	56	93.33	
GNM	4	6.67	

Data presented in table 5 shows that majority (45%) of respondents were in the age group of 35-45 years , 30% belonged to the age group of above 50 years, 20% to the age group of 46- 50 years and 5% respondents were in the age group of below 30 years .

The table 5 also shows that 28.33% respondents had 26-35 years of working experience, 16.67 % had 15-25 years of working experience, 45% had less than 15 years of working experience and 10% respondents were experienced for more than 35 years.

The data also depicts that majority (93.33%) of respondents were Auxiliary Nurse Midwives (ANM) and 6.67 % of them had professional qualification as General Nursing Midwife (GNM).

Table 6 Frequency and percentage distribution of respondents according to marital status, exposure to in-service training on ZIKA virus disease, Pentavalent and Japanese Encephalitis vaccine.

			n=60
Sample characteristics	Frequency (F)	Percentage (%)	
Marital status			
Married	59	98.33	
Unmarried	01	1.67	
Exposure to in-service training on ZIKAVirus Disease			
Yes	Nil	-	
No	60	100	

Exposure to in-service training on Pentavalent Vaccine		
Yes	60	100
No	Nil	
Exposure to in-service training on Japanese Encephalitis vaccine		
Yes	60	100
No	Nil	-

The data presented in table 6 depicts that most (98.33%) of the respondents were married and only 1.67% were unmarried.

The data also reveal that none of the respondents were ever exposed to in-service training on ZIKA virus disease.

The above table show that 100% respondents attended in-service training on pentavalent vaccine and Japanese Encephalitis vaccine.

Section III Findings related to knowledge of health workers regarding ZIKA virus disease, importance of Pentavalent and Japanese Encephalitis vaccine.

Table 7 Mean, median and standard deviation of pretest and posttest knowledge score of health workers regarding ZIKA virus disease, importance of Pentavalent and Japanese Encephalitis vaccine.

n=60

Respondents	Knowledge Score	Range	Mean	Median	Standard Deviation
Health Workers	Pretest	14 - 26	20.37	25	2.80
	Posttest	22 - 30	28.10	29	1.82

Maximum possible score =30

Minimum possible score=0

Data presented in the table 7 show that in pretest, the knowledge score of the health workers ranged between 14 - 26 and in post test score range was between 22-30.

It also shows that the mean posttest knowledge score (28.1) of the health workers was higher than the mean pretest knowledge score (20.37) with the median of 29 and 25 respectively.

The findings also depict that the standard deviation of the pretest score was 2.80 and in posttest it was 1.82 which indicated that there was more homogeneity in the posttest knowledge score, than pretest knowledge score.

Table 8 Frequency and percentage distribution of respondents according to obtained pretest and posttest knowledge level.

n=60

Knowledge Level	Pretest		Posttest	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Excellent (>90%)	Nil	-	44	73.33
Very good (81 - 90%)	6	10	12	20
Good (71 - 80%)	12	20	04	6.67
Fair (61 -70%)	26	43.33	-	-
Poor				
Poor (<60%)	16	26.67	-	-

Data presented in the table 8 shows that in pretest 43.33% respondents had fair knowledge level, 26.67% had poor knowledge level, 20% had good knowledge level and 10% had very good knowledge level. None of the respondent had excellent knowledge level.

But in the posttest maximum (73.33%) respondents had excellent knowledge, 20% had very good knowledge, 6.67% had good knowledge and no one had fair and poor knowledge.

So, it can be concluded that the respondents had higher level of knowledge in posttest than in pretest.

Table 9 Frequency and percentage distribution of respondents on ZIKA virus disease according to obtained pretest and posttest knowledge level on ZIKA virus disease.

Knowledge Level	Pretest		Posttest	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Excellent (>90%)	2	3.33	26	43.33
Very good (81 - 90%)	3	5	33	55
Good (71 - 80%)	10	16.67	01	1.67
Fair (61 -70%)	14	23.33	-	-
Poor (<60%)	31	51.67	-	-

n=60

Data presented in the table 9 show that in pretest 51.67% respondents had poor level of knowledge, 23.33% had fair knowledge level, 16.67% had good knowledge level, 5% had very good knowledge level and only 3.33% had excellent knowledge level ZIKA virus disease.

But in the posttest maximum (55%) respondents had very good knowledge, 43.33% had excellent knowledge, 1.67% had good knowledge and no one had fair and poor knowledge.

Table 10 Frequency and percentage distribution of respondents according to obtained pretest and posttest knowledge level on importance of Pentavalent vaccine.

Knowledge Level	Pretest		Posttest	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Excellent (>90%)	4	6.67	45	75
Very good (81 - 90%)	19	31.67	14	23.33
Good (71 - 80%)	23	38.33	--	--
Fair (61 -70%)	7	11.67	1	1.67
Poor (<60%)	7	11.67	--	--

n=60

Data presented in the table 10 show that in pretest 38.33% respondents had good knowledge level, 31.67% had very good knowledge level, 11.67% had fair and poor knowledge level and 6.67% had excellent knowledge level.

In the posttest maximum (75%) respondents had excellent knowledge level, 23.33% had very good knowledge level, 1.67% had fair knowledge level and no one had good and poor knowledge regarding importance of Pentavalent vaccine.

Table 11 Frequency and percentage distribution of respondents according to obtained pretest and posttest knowledge level on importance of Japanese Encephalitis vaccine.

n=60

Knowledge Level	Pretest		Posttest	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Excellent (>90%)	2	3.33	28	46.47
Very good (81 - 90%)	10	16.67	14	23.33
Good (71 - 80%)	13	21.67	5	8.33
Fair (61 -70%)	16	26.67	2	3.33
Poor (□60%)	19	31.67	3	5

Data presented in the table 11 show that in pretest 31.67% respondents had poor knowledge level, 26.67% had fair knowledge level, 21.67% had good knowledge level, 16.67% had very good and 3.33% had excellent knowledge level on importance of JE vaccine.

But in the posttest maximum (46.67%) of respondents had excellent knowledge, 23.33% had very good knowledge, 8.33% had good knowledge, 5% had fair knowledge and 3.33% had poor knowledge level.

Table 12 Area wise knowledge score of health workers regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine

n=60

KnowledgeArea	Maximum Possible Score	Mean		Mean%		Gain%		Modified Gain
		Pretest	Posttest	Pretest	Posttest	Pretest	Posttest	
A. ZIKA Virusdisease								
History of ZIKA virusdisease	02	0.3	1.96	15	98	83	85	0.97
Concept of ZIKA virusdisease	06	4.05	4.48	67.5	74.67	7.17	32.5	0.22
Signs and symptoms	02	1.38	1.91	69	95.5	26.5	31	0.85
Prevention	01	.65	.91	65	91	26	35	0.74
B. Pentavalentvaccine								
Concept of Pentavalentvaccine	07	5.55	6.8	79.28	97.14	17.86	20.72	0.86
Importance of Pentavalent vaccine	03	1.78	2.85	59.33	95	35.67	40.67	0.88
C. Japanese EncephalitisVaccine (JE)								
Concept of JE	04	2.41	3.46	60.25	86.5	26.25	39.75	0.66
Importance of JE Vaccine	05	3.63	4.72	72.6	94.4	21.8	27.4	0.80

The data presented in the table 9 shows that maximum knowledge gain of respondents happened in the area of history of ZIKA virus disease as per modified gain (0.97) ,followed by signs and symptoms of ZIKA virus disease, (.85), followed by prevention of ZIKA virus disease (0.74), followed by concept of ZIKA virus disease (0.22).

In the area of pentavalent vaccine, maximum knowledge gain of respondents happened in the area of importance of pentavalent vaccine as per modified gain (0.88), followed by concept of pentavalent vaccine (0.86).

Above table also depicts that in the area of importance of JE vaccine maximum knowledge gain of respondents occurred in the area of importance of JE vaccine as per modified gain(.80),followed by concept of JE disease (0.66).

Section IV Findings related to the effect of structured teaching programme in terms of change of knowledge score

HO – There is no significant difference between the mean pretest and posttest knowledge score of health workers regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine after administration of structured teaching programme.

H1 - The mean post test knowledge score of health workers after exposure to structured teaching programme on ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine is significantly higher than the mean pretest knowledge score as measured by structured knowledge questionnaires at 0.05 level of significance.

Table 13 Mean, median, mean difference, standard deviation (SD) and paired t' value of pretest and posttest knowledge score of health workers on ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccine.

	Mean	Mean difference	Median	SD	t' value
Pretest	20.37		25	2.80	
		7.73			25.73***
Posttest	28.10		29	1.82	

t' (df 59)=3.46 p<0.001

The data presented in the table 9 shows that the mean posttest knowledge score (28.10) of the health workers was much higher than the mean pretest knowledge score (20.37) with a mean difference of 7.73 which was found statistically significant as evident from the t' value of 25.73 for df (59) at 0.001 level of significance. This indicates that the mean difference between the pretest and posttest knowledge score is a true difference and not by chance. Hence, null hypothesis is rejected and research hypothesis is accepted. Therefore it could be concluded that the structured teaching programme on ZIKA virus disease, importance of pentavalent and Japanese Encephalitis (JE) vaccine is effective to improve the knowledge of health workers.

Section V Findings related to association between knowledge of health workers and selected demographic variables.

Table 14 Chi square value showing association between pretest knowledge score of health workers and selected demographic variables.

n-60

Variables	Knowledge score <Median	Knowledge score ≥ Median	Chi Square value (χ^2)
Age in yrs,			
31-40	09	16	0.151
41-50	06	13	
51-60	06	10	
Working Experience(In yrs)			
<10	11	14	0.986
10-30	07	15	
>30	06	07	
Professional Qualification			
ANM	50	5	0.401
GNM	4	1	

χ^2 df (2)=5.99, p>0.05 χ^2 df(1)=3.841,p>0.05

Data presented in the table 10 shows the association between knowledge score of health workers and age in years. The calculated chi square value (0.151) for df 2 at 0.05 level of significance was less than the table value(5.99).So, it could be concluded that knowledge score of health workers was not associated with their age .

Chi square value was also calculated to find out the association between level of knowledge and duration of working experience. The calculated chi square value (0.986) for df 2 at 0.05 level of significance was less than

the table value(5.99).So, it could be concluded that knowledge level of health workers was not dependent on their duration of working experience (in yrs).

The calculated chi square value (.401) for df 1 at 0.05 level of significance was less than the table value (3.84).So, it could be concluded that knowledge score of health workers was not dependent on their professional qualification.

As, no one had attended any in-service training related to ZIKA virus disease, So chi square value could not be calculated.

Data presented in the table10 shows that out of 60 health workers, everyone had attend in-service training related to pentavalent vaccine and JE vaccine, So chi square value could not be calculated.

IV. Discussion

Major findings of the study are summarized as below

Description of Demographic Variables

- Majority (45 %) health workers were in the age group of 35-45 years.
- Most (45 %) of the health workers had less than 15 years of working experience.
- Most of the health workers (93.33%) had ANM qualification.
- No one ever attended in-service training on ZIKA virus disease,
- All (100%) health workers attended in-service training on Pentavalent vaccine and JE vaccine.

Findings related to knowledge of health workers regarding ZIKA virus disease, importance of pentavalent and JE vaccine.

- In pretest, the knowledge level of the health workers ranges between 14 - 26 and in the posttest it ranges between 22 - 30.
- In the pretest, majority of the respondents (43.33%) had fair knowledge and in the posttest majority (73.33%) had excellent knowledge level.
- In the pretest maximum 51.67% respondents had poor knowledge, 38.33% had good knowledge on pentavalent vaccine and 31.67% had poor knowledge level on JE vaccine.
- Maximum knowledge gained by the respondent was in the area of history of ZIKA virus disease.

Findings related to effectiveness of structured teaching programme The structured teaching programme was effective in enhancing the knowledge of health workers in terms of change in knowledge score as the calculated t' value (25.73) was more than the table value (3.84) at 0.001 level of significance. **Findings related to association between pretest knowledge score and selected demographic variables.**

- There was no association between the pretest knowledge score of health workers with selected variables.

Discussion in relation to other studies On the basis of findings of present study and objectives of the study a discussion has been done.

Findings related to demographic variables In the present study, it was observed that majority (93.33%) of the respondent's professional qualification was ANM , majority (95%) of the respondents were in the age group of more than 35yrs, maximum (45%) had less than 15 years of working experience. In this study no one ever attended in-service training on ZIKA virus 63 disease, and all (100%) health workers attended in-service training on Pentavalent vaccine and JE vaccine. A similar study was conducted by Karen S moore on December, 2016 at Florida on knowledge of health workers on ZIKA virus disease. This study findings revealed that majority (76.5%) were community health nurse, most (99.6%) were more than 35 years of age group and majority (68.6%) had less than 15 years of experience and they never attended any in- service training regarding ZIKA virus disease [20]. Another study was conducted by Harapan Harapan, Alma Eletta et al on ZIKA virus infection on health care providers in Indonesia from 3rd May to 3rd June 2016, which revealed that majority (85.2%) had working experience of less than 15 yrs and majority (53.8%) were in the age of less than 30 yrs, 41% of the respondents were in the age group of 31 to 40 yrs, and 5.2% were more than 40yrs of age group and 10% attended in- service training on ZIKA virus disease[19]. These study findings are partially consistent with the present study. A similar study was conducted by Otieno, Susan Agunda dated on 2012-02-27 on assessment of knowledge of health workers on pentavalent vaccine in Nairobi, Kenya. Majority of them (74.6%) were nurse midwives, majority (66.6%) of them had less than 15yrs of working experience and majority (41.7%) of the respondents were in the age group of 30 to 40 yrs, 40.3% were in the age of more than 40yrs, and

18.1% were less than 30yrs of age group and most (62%) of the respondents had attended in- service training on pentavalent vaccine [22].

Another cross sectional study was conducted by Akram Ahmed, Muhammad Umair et al at Assam on knowledge of health workers regarding Japanese encephalitis vaccine in 2015. This study findings revealed that majority (25.6%) of respondents were nurse midwives and most (25.6%) of the respondents had less than 15 yrs of working experience and majority (47.2%) of the health workers were less than 30 yrs of age, 32.1% were 30 to 40 yrs of age group and 20.70% were more than 40 yrs of age group. These study findings are partially consistent with the present study [23]. Findings related to determine the knowledge level of health workers regarding ZIKA virus disease, importance of pentavalent and JE vaccine. In the present study, majority (51.67%) of the respondents had poor knowledge level, most (23.33%) had fair knowledge level, 16.67% had good knowledge level, 5% had very good knowledge level and 3.33% respondents had excellent knowledge level regarding ZIKA infection. A similar study was conducted by Harapan Harapan, Alma Eletta et al at Indonesia Feb 2017, revealed that 35.9% of them (159) had a good knowledge on Zika infection, which is not supporting the present study findings [19]. Another study by Karen S Moore on December, 2016 at Florida revealed that the mean total knowledge score was 10.95 and standard deviation was 3.05 of the community health nurses on ZIKA virus disease [20], which is not consistent with the present study. In present study, most (38.33%) of the respondents had good knowledge level, 31.67% had very good knowledge level, 11.67% had fair and poor knowledge level and 6.67% respondents had excellent knowledge level regarding importance of pentavalent vaccine.

Another study was conducted by Otieno, Susan Agunda dated on 2012-02-27 in Nairobi, Kenya. This study findings revealed that most (63%) of respondents had poor knowledge of all the five vaccines in Pentavalent Vaccine, 13% had good knowledge, 24% had fair knowledge on pentavalent vaccine. These study findings are inconsistent with the present study. [22]. In present study, 31.67% respondents had poor knowledge level, 26.67% had fair knowledge level, 21.67% had good knowledge level and 16.67% had very good knowledge level and 3.33% respondents had excellent knowledge level regarding importance of Japanese Encephalitis vaccine. Another cross sectional study was conducted by Akram Ahmed, Muhammad Umair et al at Dhingra in Darrang, of Assam on August, 2015 revealed that most (40.4%) of the respondents had good knowledge on JE vaccine [23]. Findings related to the association between the knowledge score and selected demographic variables. In the present study, it was found there was no association between the pretest knowledge score and selected demographic variables. The present study findings are dissimilar with the study conducted by Otieno, Susan Agunda on 27.02.2012 on knowledge of health workers on pentavalent vaccine which revealed that there was significant association between knowledge level of health workers and experience [22]. Another study was conducted by Akram Ahmed, Muhammad Umair Khan, et al at Assam on Aug 2015, on knowledge of health workers on JE vaccine that revealed that there was significant association between knowledge level of health workers and experience ($p < 0.05$) [23].

V. Conclusion:

In pretest most of the health workers had fair knowledge but after introduction of structured teaching programme most of the health workers scored excellent level of knowledge. So the structured teaching programme on knowledge regarding ZIKA virus disease, importance of pentavalent and Japanese Encephalitis vaccines was effective to increase knowledge level of health workers. The knowledge score of the health workers had no statistical significant association with the selected demographic variables.

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