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Original Article

Effectiveness of Health Education Techniques in Enhancing the Knowledge of Zika Virus Diseases among the Staff Nurses Working in Selected Hospitals of Biratnagar, Nepal

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Abstract

Background

Zika Virus Diseases has become a concern in the South-East Asia region. Aedes aegypti, the vector of the diseases, is already present in Nepal. Educating health workers is one of the most cost-effective measures to address emerging health problems. This study aimed analyses the effective technique to increase the knowledge among nurses about diseases.

Materials and Methods

Pre and post study design was used. Total 5 hospitals among 19 hospitals of Biratnagar Metropolis were randomly selected in first stage. In second stage,25 nurses from each 5 hospitals were selected randomly making total sample size of 125. Different health education techniques were assigned to groups using a lottery method. The health education techniques included participatory lecture with PowerPoint presentation, video session, pamphlet distribution, and poster presentation

Results

At the first post-test, the group subjected to video sessions and pamphlet showed highest mean knowledge scores (15.12, Std. deviation = 1.764 and 1.787, respectively). However, the participatory lecture group displayed the highest percentage increase in knowledge score (50.31%) in comparison to pretest. After the second post-test, the group exposed to poster presentations had the highest mean knowledge score (13.72, Std. deviation = 2.112). Nevertheless, the group undergoing participatory lectures with PowerPoint presentations still demonstrated the highest percentage increase in knowledge score (51.1%).

Conclusion

Participatory lecture with power point presentation was the most effective measure to disseminate information about Zika Virus Diseases as the difference in knowledge score was significant.

Keywords: *Health education, Nurses, Zika virus Diseases*

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Introduction

Zika Virus Disease (ZVD) is a global public health concern, with its rapid transmission and potential to cause significant health complications, including congenital anomalies and neurological disorders [1]. Zika Virus Diseases (ZVD) was declared as a Public Health Emergency of International Concern in 2016 [2]. The study of Epidemiology and Diseases Control Division stated possible risk of diseases with existing presence of the mosquito linked to the spread of Zika Virus in Kathmandu and other major cities of Nepal [3].

There is limited awareness on disease among nurses. Nurses play important role in identifying, preventing and managing ZVD cases. It is crucial to capacitate health human resources with effective teaching and learning strategies for better preparedness and response. Each person prefers different learning styles and adopting relevant and effective techniques for teaching influences the impact on the recipient group where effectiveness vary from one group to another [4].

Hence this research aimed to assess the effectiveness of different health education techniques in enhancing the knowledge of diseases among nurses.

Materials and Methods

This is a pre post study design done in five hospitals of Biratnagar Metropolitan. Intervention and data collection was completed in 70 days (2month 10 days) month with 2-month gap between the first and the second posttests in the groups. Ethical approvals were taken from the hospitals where the study was performed and from the organization of which the Audio-Video aid was used for study. Written consent was taken from the respondents. Those nurses available on the day of intervention and willing to participate were considered for the study alone. The nurses who already participated in ZVD focused health education program were excluded in the study. The smple size in current study was calculated in reference to the study done in Karachi, Pakistan where the knowledge prevalence of ZVD among Physician was 65% [8]. With this confidence level of 95%, Margin of Error 8% was taken. The sample calculation results to be 137. However, with study design to implement 5 different health education techniques in 5 different groups, the sample size was 125. Thus, the current study had sample size nurses with a Multistage sampling. For the sample selection 19 Hospitals of Biratnagar Metropolitan city was listed and by Simple random sampling 5 hospitals were selected. In the second stage, nurses working in all the departments were obtained and 25 nurses from each 5 hospitals were selected randomly making total sample population to be 125. Lottery methood was done to assign different forms of health education techniques to the selected interventional groups. Self- administered questionnaires based on the CDC manuals developed to train health workers for ZVD were used for data collection. The questionnaire was checked for reliability and validity by using it among 10 student nurses. The pretest was done among all 125 nurses prior to the intervention. Comprehensive health education was conducted in 5 interventional groups with 4 different health education tools being used and in one session, no AV-Aid was used. The tools used were pamphlet, power point presentation, poster and video. The message delivered via all measures were common that included knowledge about cause, vector, transmission, diagnosis, prevention and management of ZVD. With the same Pre-test questionnaires, post-test was conducted twice after the intervention. The first post-test was done very next day of the intervention to assess the immediate impact of the health education techniques and the second, after 2 months of the intervention. The association between variables was analyzed using Friedman test, ANOVA, Post-Hoc test, and Linear analysis model was done using SPSS Version 16.

Results

Out of 125 nurses that participated in the study, majority of them 63 (50.4%) were of age group 20-24 years and 29 (23.2%) of them were 25- 29 years. Others were of varying age group from 19 to 55 years old. 64% (n=25) of the participants who were educated through video session were 20-24 years of age. 64% of the participants taught through power point presentation were 25- 34 years of age. Among the participants educated through poster presentation, 44% were from age group 20-24 years and of the participants educated through pamphlet distribution, 72% were from 20- 24 years of age.

Table 1: Distribution of the participants for Age according to Health education techniques

Health education techniques used	Percentage distribution of participants as per the age-group								Total (%)
	> 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 55	
Video session (N=25)	8%	64%	24%	4%	0%	0%	0%	0%	100%
Participatory lecture with power point presentation (N=25)	0 %	4%	32%	32%	8%	0%	12%	12%	100%
Poster Presentation (N=25)	0%	44%	28%	24%	4%	0%	0%	0%	100%
Pamphlet Distribution (N=25)	8%	72%	16%	4%	0%	0%	0%	0%	100%
Lecture without AV-Aids(N=25)	4%	68%	16%	4%	4%	0%	0%	4%	

Majority of them, 68.0%, got 0-4 years of experience, followed by 16.8% with 5-9 years, 8.5% with 10-14 years,2.4 % 15-19 years and 30-34 years. 16.8% were from general medical ward, followed by 12.8% from post-operative ward and 11.2% from Intensive Care Unit and Emergency ward 10.4% Nurses participated were from OBG and Pediatric ward followed by 6.4 % from NICU and Orthopedic ward. The least participants were from post-natal ward and Operation Theater with 4.0% and 0.8% from Nutrition and Administrative department each. Qualification of the nurses as analyzed showed that 50.4% were qualified with PCL. Nurses, 25.6% were Auxiliary Nurse Midwives, 12.0% were with Bachelor of Nursing followed by 8.8% with Bsc. Nursing and 2.4% with Post Basic B Sc. Nursing. Only 0.8% of nurses participated had done Masters in Nursing.

78 (62.4%) of the total participants (n=125) had heard about ZVD prior to the intervention, majority (58.6 %) through television and internet. The study had 14 dropouts in the 2nd post-test with the mentioned reasons being change in job place and change in residence due to marriage. 3 dropouts belong to group with intervention of video session,3 from participatory lecture with power point presentation, 3 from group with pamphlets distribution, 3 from group where lecture without AV-Aids was held and 2 from the group where poster presentation was done. The dropouts did not largely impact on the analysis due to the distributed numbers in each 5 interventional groups.

Table 2: Comparison of the mean knowledge score of all the participants

Health Education Techniques	Pre-knowledge score (N=125)			1st Post Test Score (N=125)			% In creases in Knowledge score to the pre test	2nd Post-Test (N=111)			% Increase in Knowledge score to the pre test
	N	Mean	S. D.	N	Mean	S. D.		N	Mean	S. D.	
Video Session	25	5.92	4.245	25	15.12	1.764	48.42%	22	11.92	4.371	31.58%
Participatory Lecture with power point presentation	25	2.72	4.912	25	13.08	3.161	58.31%	22	12.44	4.234	51.1%
Pamphlet Distribution	25	5.92	5.634	25	15.12	1.787	48.42%	22	11.92	5.612	31.5%
Lecture without AV-Aids	25	4.80	4.787	25	14.36	2.430	50.31%	22	10.80	4.021	31.50%
Poster Presentation	25	11.92	2.827	25	14.32	1.547	12%	23	13.72	2.112	9.4%

The mean knowledge score prior to the intervention was least in group where participatory lecture with power point presentation was done, 2.72 with Std. deviation of 4.912. As per the 1st posttest the mean knowledge score was highest with 15.12 in Video session and Pamphlet distribution with Std. deviation of 1.764 and 1.787 respectively. But the percentage increase in knowledge score was seen high in participatory lecture with power point presentation with 50.31% increase in the knowledge score.

There was no association between the health education techniques used and qualification of the nurses (p= 0.736) and between the experience of the nurses and the health education techniques used (p=0.644). Age (0.002), qualification (p=0.004) and the department in which the nurses wok (p=0.02) was found to be associated significantly to the difference in knowledge score

Discussion

There was change in knowledge score in the 1st posttest, participatory lecture with power point showed significant relationship, with the video session. The analysis suggests that participatory lecture with power point presentation to be the most effective method of health education compared to other health education techniques as per the result of 1st post-test. The analysis between the health education techniques as per the study by the 2nd post- test also shows participatory lecture with power point presentation being significant to the poster presentation with p = 0.00.This might be due to the presence of the knowledge provider in the session and the clarification in the information when provided by verbal explanation which was more understood by the groups compared to other measures

where just the tools were distributed or one where only one way lecture was given.

The findings of the present study largely support Edgar Dale's cone of learning. As the cone explains that after 2 weeks, people tend to remember at least 50% of the thing that they see and hear and 70% what they do and say or they either receive or participate which in present study is via Video and participatory lecture with power point presentation done by the researcher [5] The percentage increase in knowledge score was highest persistently in both the post-tests where participatory lecture with power point presentation. The detailed information displayed during the presentation session as well as the personal presence of the researcher to explain the topic has largely impacted on the study participants where they were even able to retain the information about diseases after 2 months of the health education session.

The other study done in Arghakhanchi had a different scenario. The mean knowledge score in the group where video session was used in current study increased from 7.76 with Std. deviation of 4.245 in pre-test to 15.12 in 1st posttest with Std. deviation of 1.764. But the mean knowledge score has again declined to 13.24 with Std. deviation of 4.371 in 2nd posttest. However, the knowledge score is increased in comparison to pre-tests in following both the tests and is significant with p =0.000. Again, comparing video sessions to the other intervention, it shows significance only to the power point presentation (p=0.004) indicating that it is one of the effective measures compared to other techniques. The study of HIV-AIDS among the adolescents done in Argakhachi, Nepal where different techniques of health education were used concluded, the video session and participatory lecture method the most effective one [6]. This might be due to the age factor in the previous study where the participants involved were adolescents who preferred video.

The similar study done in Varanashi to disseminate knowledge regarding HIV-AIDS among undergraduates had a control group where increase in knowledge score was by 7.7% in post intervention test results [7]. Thus, even if the intervention is done or not done, the learner's choice does impact their knowledge, as they may gather information via another sources after the topic is brought to them. In the present study, as the participants are all nurses, they may have developed interest in knowing about the topic that had impact over their knowledge difference in the post-test though no AV-Aids were used to educate them. A similar study done in Pakistan among Healthcare Practitioners to know their Understanding of the Zika Virus Disease, found that merely 39.63% and 45.95% knew the potential complications of ZIKV and how ZIKV is diagnosed respectively [8]. More than half (52.25%) believed that ZIKV during pregnancy may be linked to microcephaly in newborns. Therefore, interpreting both the study results shows the need of health education among the health workers in both countries for the updated information about emerging diseases and its treatment and prevention

Regarding the source of information about the diseases, as per the study, out of 62.4% of the participants who heard about ZVD,30.3% of the participants heard about it from television, 28.3% via Internet sources, followed by 19.2% through newspaper, 9.1% from other nurses in hospital and also same percentage from the training session 2% of the participants heard about ZVD from doctors and also the same percentage (2%) heard about ZVD in a conference. Comparing this to same study from Karachi, Medical literature (50%) and mass media (32%) were the major sources of health information on inquiring about the knowledge towards ZIKV [8].

Similar study done by Farzianpour Fereshteh et al. revealed that the education in two interventional groups significantly increased knowledge level in comparison to control group but there was no significant difference between two educated groups [9]. Comparing this study to current study, homogeneous group reflected different impact of the different techniques used to educate them. Similarly, a quasi -experimental study done in Manipal University, India reflected the community participation effective with a p value of 0.001 in terms of knowledge gain to educate on vector borne diseases control [10]. This is similar to current study where participatory lecture is seen to be affected at end of 2nd post-test. The study done in Tamil Nadu to assess the impact of education campaign on community-based vector control as a supplementary strategy to mass drug administration (MDA) showed that there was significant improvement in interventional village.

Zika Virus Diseases emerged as a threat to public health and as per the sources described, Nepal being in tropical zone and with huge numbers of the vector of the diseases *Aedes egypti* and *Aedes albopictous* certainly becomes a territory of risk for Zika. Also, the loose border policies with two densely populated countries where few cases have been confirmed make the

country vulnerable. This study gave a light to present context of ZVD knowledge among the nurses working in hospitals of Biratnagar, Nepal where only 62.4% out of 125 staff nurses participated heard about ZVD and 37.6% have not even heard about the diseases. The Study highlighted that any techniques of health education used to disseminate knowledge about ZVD to the staff nurses' marks improved knowledge in the group but the participatory lecture with power point presentation is the most effective measure to disseminate knowledge about Zika Virus diseases when compared to lecture, poster, pamphlet and video session. The knowledgeable, skillful and competent health workers are bridge to fulfill the gap of health inequalities which on times is due to lack of health awareness. Thus, the study concludes the measures via which effective health education can be conducted to upgrade knowledge of our nurses working in hospitals. There is inherent need to educate our health workforce at present on ZVD as at present not all of the manpower is familiar to it.

Conclusion

The study highlighted that nurse currently in practice are likely to be unaware of the emerging new diseases. Any techniques of health education used to disseminate knowledge about ZVD to the staff nurse's marks improved knowledge in the group but participatory lecture with power point presentation is the most effective measure to disseminate information about ZVD as the difference in knowledge score was significant to all other the techniques as per the 1st pre-test score and with the poster presentation in the 2nd post-test score. There was significant association between the health education techniques used, age, working department of the nurses and the change in knowledge score and a weak association exists between the qualification of the nurses and knowledge score, whereas experience of the nurses does not hold significant association with change in knowledge score.

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Conflict of interest: None

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