Original Research Article

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Impact of health education on preventive measures of Rabies among primary school teachers in Mandalay, Myanmar

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ABSTRACT

Background: Rabies is an exceptionally fatal zoonotic disease and major public health problem in developing countries. Health knowledge of preventive measures of rabies among primary school teachers is paramount to cultivate their students and create a secure and safe environment since primary school students are the most vulnerable group. The study aimed to assess the effect of health education on knowledge of preventive measures of rabies among primary school teachers.

Methods: A pre and post-test intervention study was conducted among randomly selected 64 primary school teachers from 7 Townships in Mandalay from July to October, 2020. An educational intervention was conducted by contributing 4 sheets of pamphlets and appearing 5 minutes education video record and reassessment was done one month later.

Results: The mean knowledge scores before and after intervention were 40.59 ± 4.85 and 47.75 ± 4.02 showing statistically significant improvement (p<0.001). Mean of the improvement percentage was 19.38 ± 5.06 . Out of 64 participants, 37.5% had good knowledge in pre-test which improved to 95.3% in post-test (p<0.05). Although, age, marital status, having children and having stray dogs near school compound were adjusted in multiple linear regression, there was no statistical significance association with improvement percentage.

Conclusions: There is improvement of knowledge status, which is not influenced by sociodemographic factors, following educational intervention. This highlights the need of continuing medical education for preventive measures of rabies for both primary school teachers and primary school students.

Keywords: Health education, Knowledge of preventive measures, Rabies, Primary school teachers, Myanmar

INTRODUCTION

Rabies is a neglected tropical disease caused by rabies virus of the genus lyssavirus, and it is almost invariably fatal following the onset of the symptoms. Dog bites has become a serious and underestimated public health problem in recent years and is the most probable cause of rabies in worldwide. Although there are no global estimates of rabies incidence, studies suggest that rabies account for tens of millions of injuries annually.²

In South-East Asia region, 40% of human rabies deaths occur in children who are younger than 15 years. Dog bites is the primary cause of 96% of human rabies in South-East Asia Region (SEAR). It is found that only around 20% of the 19 million humans bitten by dogs in SEAR receive one or more doses of rabies vaccine for preventive measures.³ Even though government organization had several dog population control program, the more feasible and effective projects are still necessary to get successful rabies elimination program.⁴

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It is estimated that 150,000 to 200,000 people in Myanmar suffer from dog bites every year and the number of dogs is estimated to be 3.8 million. There were over 180,000 cases in 2017 and over 190,000 cases in 2018. Although effective human vaccines and immunoglobulin are available for rabies, there are about 200 deaths from rabies annually. In Mandalay region, there were increasing in prevalence of dog bites years by years. There were 19,702 people suffer from dog bites in 2016 and 32,735 people in 2018 according to regional data. Moreover, stray dogs usually wander around school compounds. Primary school teachers are role models of their students not only in academic purposes but also in educating process for the developments of their personality traits. They can create a secure and safe environment for their students.

In Myanmar, the information about knowledge of preventive measures of rabies is not included in the life skill education program and if the primary school teachers get the chance to educate about that, students will know the risks, complications and how to prevent rabies. This benefit could support their lifetimes, and the knowledge is expected to spread to their families and others in the community. In this study, contribution of 4 sheets of pamphlets were referred from WHO website and 5 minutes education video file from CDC website.^{3,4} The objective of the study was to find out the changes of level of health knowledge of preventive measures of rabies before and after the educational intervention among primary school teachers.

METHODS

Study site and participants selection

A pre and post-test intervention study was conducted among randomly selected 64 primary school teachers from (1) randomly selected school each from (7) townships in Mandalay by using self-administered questionnaire. Out of 96 primary school teachers from 7 selected schools, 9 to 10 teachers were randomly selected from each school and data collection period started from July to October 2020. Then, total 64 teachers were randomly selected to include from all different classes in primary level. We got permission from the Regional Education Officer, Township Education Officers and written informed consent from the participants before the research.

Questionnaires and detailed procedure

Self-administered questionnaires included 10 sociodemographic characteristics and 56 knowledge questionnaires under 16 main knowledge themes. Responses were Yes, No and Don't know respectively. These questionnaires were developed by referencing various previous literatures.⁵⁻⁷ WHO guideline and MOHS guideline.^{1,8} Content validity was approved by an expert from Disease Control Unit, Mandalay Regional Health Department. Confidentiality and anonymity of the subjects were maintained. Pilot study was done to clarify interpretation of questionnaires and Cronbach's alpha was 0.87.

The knowledge level was categorized as good for 80% and above of the total scores and poor for below 80% scores. After pre-test assessment, all school teachers from selected schools were contributed 4 sheets of pamphlets and shown the 5 min education video file. Pamphlets were taken from WHO website and video file was referred from CDC website that included first aid measures after dog bites, danger of stray dogs, pre- and post-exposure prophylaxis of rabies. Mediation time was lasted for about 15 to 20 minutes. Post-test assessment was done in the same population with same questionnaires at one month later.

Data collection and data analysis

The collected data was checked for completeness, errors and inconsistencies prior to data entry. Data entry, data cleansing and data analysis were done by using statistical package for social sciences (SPSS) data software (version 25). Statistical method of McNemar's test and 'paired t test' were used to know the difference before and after the intervention and statistical significance was set at p value <0.05.

For multiple linear regression, outcome was derived from calculating the improvement percentage. It was calculated from difference of post-test and pre-test with dividing by pre-test scores and the result was multiplied with hundred to describe the percentage. Multiple linear regression was done to know the associated factors on the effect of intervention, improvement percentage. Independents factors were age, marital status, duration of service, number of children, grade, presence of any stray dogs near the house, presence of any stray dogs near school compound and attending first aid training or not. The association between the variables was checked by "t test" and "Anova test". The variables showed statistical significance (p<0.1) were included in the final model. The required assumption tests for the multiple linear regression were done. The final model was explained by age, marital status, having children or not and having stray dogs near the school compound.

RESULTS

The characteristics of the participants were shown in table 1. About 75% were above 40 years of age and the mean age was 47.47±9.30 years and median age was 51 years. Almost all of them were female, 64.52% respondents were ever married and 56.45% of participant had children. Among them, 29.5% teachers had a dog at home, 85.1% of participants found stray dogs near their house and 95.16% also found stray dogs near school compound. Only 37.10% had attended first aid training.

Table 2 shows the impact of educational intervention on knowledge of participants. In pre-test assessment, only half of primary school teachers knew that rabies is a fatal disease and after educational intervention, knowledge level increased up to 89.1%.

Knowledge regarding rabies as an infectious disease improved up to 100 % from 90.6% after intervention. Additionally, knowledge about mode of transmission of rabies, signs and symptoms of a rabid dog and rabid person ranged from 20 to 90% prior to the intervention upgraded to a certain extent (range from 50 to 100%) after intervention. Moreover, 12.5% of teachers knew that there was no specific treatment for rabies before intervention, half of participants knew about that after intervention. However, some misconceptions were assessed as negative questions: "the dog is not active", "take traditional medicine" and "the animal that has bitten someone is killed" were remained nearly the same (90.6 to 81.25%, 100 to 98.4% and 87.5 to 82.5% respectively).

Table 3 shows that the mean knowledge scores before and after educational intervention were 40.59±4.85 and

47.75±4.02 (p<0.001). Mean of the improvement percentage was 19.38±5.06. Table 4 shows, out of 64 participants, 37.5% had good knowledge in pre-test and 95.3% had good knowledge in post-test and it was statistically significant.

Table 5 demonstrates the result of multiple linear regression of the outcome. Although it is not statistical significance in the association, the appropriate changes can be seen. If the teacher was less than 40 year old, she might have 3.27% to improve in knowledge score while comparing to the teacher who was more than 40 year old. When the teacher had never married, there would be 3.43% improvement in knowledge score while comparing to the teachers who ever married. If there were strays dogs near school compound, the teachers will have 10.59% improvement than the teachers whose school compounds had no stray dogs.

Table 1: Frequency distribution of socio-demographic characteristics of primary school teachers (n=64).

	Frequency	Percentage
Age (years)		
Mean±SD (47.47±9.30)		
≤40	15	24.19
>40	47	75.81
Sex		
Male	0	0.00
Female	64	100
Marital status		
Ever married	40	64.52
Never married	22	35.48
Having children		
Yes	35	56.45
No	27	43.55
Level of their students		
Below grade III	36	58.06
Grade III and above	26	41.94
Duration of services		
≤10 years	3	4.8
>10 years	59	95.2
Presence of a dog at home		
Yes	18	29.51
No	43	70.49
Presence of any stray dog near the house		
Yes	54	87.10
No	9	12.90
Presence of any stray dog near school compound		
Yes	59	95.16
No	3	4.84
Attending first aid training		
Yes	23	37.10
No	39	62.90

Table 2: Impact of educational intervention on knowledge of participants (n=64).

	Correct response	Correct response in
	in Pre-test (%)	post-test (%)
Rabies is a/an infectious disease	90.6	100
Methods of transmission of rabies are	70.0	100
(a)Scratched by a rabid animal	90.6	98.4
· /		
(b) Victim's abrasion is licked by the rabid dog	89.1	100
(c) Hug and live close the dog	71.9	79.69
(d) Bitten by rabid animal	96.6	96.9
e) Consumption of milk, including breast milk or cooked meat of rabid	48.4	50.0
animal		
Signs and Symptoms of a rabid dog with rabies infection are		00.4
(a) Biting without being disturbed	92.2	98.4
(b) Change in voice	76.6	95.3
(c) Salivation	95.3	100
(d) Refuse to eat and drink	90.6	96.9
(e) Running without reason	92.2	100
(f) The dog is not active	90.6	81.25*
(g) Lethargy and paralysis	23.4	59.4
Rabies is fatal.	56.3	89.1
Signs and symptoms of rabid person are		
(a) Itching and pain at the bite site.	68.8	100
(b) Fever, malaise, headache lasting for 2~4 days	60.9	89.1
(c) Tolerance to noise and bright light	78.1	89.06
(d) Aerophobia	32.8	79.7
(e) Often thirsty	59.4	68.75
(f) Anger, irritability and depression	93.8	96.9
(g) Hyperactivity	43.8	68.8
(h) Convulsion	96.9	100
Wound Management	70.7	100
(a) Wash with soap (10~15 min)	81.3	98.4
(a) Wash with soap (10~13 hill) (b) Take traditional medicine		
	100	98.4*
(c) Take topical cream	1.6	68.8
(d) Wound should be cleaned thoroughly with 70% alcohol/ethanol	95.3	95.3
(e) Cover the wound with dressings	39.1	73.44
(f) Take vaccination	100	100
(g) Take tetanus toxoid injection	68.8	82.81
The duration needed under constant surveillance after being bitten	64.10	65.03
by a dog is about 10 days.		
No availability of any specific treatment for a rabies patient	12.5	50.0
Rabies is preventable	90.6	98.4
Knowledge about pre-exposure vaccination	85.9	96.9
Necessity to take pre-exposure vaccination		
(a) Students	87.5	98.4
(b) Laboratory workers	59.4	96.9
(c) Veterinarian	90.6	100
(d) Wildlife rangers	73.4	95.3
(e) A person who has pet animal at home	85.9	96.9
Knowledge about post-exposure vaccination	85.9	100
Requirement of PEP after dog bites		
(a) If the bite has broken the skin and the wound is bleeding	89.1	95.3
(a) If the one has broken the skin and the would is breeding (b) If a mucous membrane has been exposed to saliva from a suspect		
animal	95.3	100
(c) If the animal that has bitten someone is killed.	87.5	82.5*
· ·		
(d) If the biting animal disappears during the observation period.	67.2	87.5
(e) If the biting animal displays erratic behavior Prevention and control of rabies	95.3	100

Continued.

	Correct response in Pre-test (%)	Correct response in post-test (%)
(a) The pet animals should be taken rabies vaccination regularly by		
veterinarians or health workers.	100	100
(b) Avoid the stray dogs.	95.3	100
(c) If you found the suspected rabid dog, you should inform the authority.	100	100
(d) The school compound should be securely walled with brick.	96.9	100
Necessity of rabies vaccination for a previously immunized person	81.3	98.4
To prevent the dog bites		
(a) All owners should learn how to communicate with their dogs so they can avoid dangerous situation.	98.4	100
(b) If a dog runs toward you, you should run and call for help.	28.13	70.31
(c) Do not disturb dogs that are eating, sleeping or feeding puppies.	95.3	98.4
(d) You can hit, kick or shout at a dog to prevent the dog bites.	35.94	60.94

Table 3: Distribution of score in improvement at pre-test and post-test.

Knowledge score	Mean ± SD	95% CI	P value
Pre-test score	40.59±4.85	39.38-41.80	< 0.001
Post-test score	47.75 ± 4.02	46.74-58.75	
Improvement percentage	19.38±5.06	15.62-23.14	

Table 4: Association between knowledge level and pre and post-test assessment.

		Post test			
		Good knowledge	Poor knowledge	McNemar's test	P value
Pre test	Good knowledge	24 (37.5)	61 (95.3)		
Fre test	Poor knowledge	40 (62.5)	3 (4.7)	6 10	< 0.05
	Total	100	100	6.48	<0.03

Table 5: Association of the improvement percentage and socio-demographic factors.

	N (%)	Univariate Exp (β) 95% CI	Multivariate Exp (β) 95% CI
Age (years)			
≥40	47 (75.81)	1	1
<40	15 (24.19)	4.82 (-3.85 - 13.49)	3.27 (-5.55 – 12.09)
Marital status			
Ever married	40 (62.50)	1	1
Never married	24 (37.50)	5.82 (-1.87 – 13.52)	3.43 (-11.38 – 18.25)
Having children	27 (43.55)	1	1
Not having children	35 (56.45)	5.57 (-1.91 -13.05)	2.13 (-12.24 – 16.49)
Absence of stray dog near the school compound	43 (70.49)	1	1
Presence of stray dog near the school compound	18 (29.51)	11.86 (-5.82 – 29.55)	10.59 (-7.34 – 28.51)

DISCUSSION

The aim of the study is to assess the effect of health education on knowledge of preventive measures of rabies among primary school teachers in Mandalay. Among the participants in the present study, three fourths of the participants knew all signs and symptoms of rabies among rabid animal in pre-test. After educational intervention, nearly hundred percent of participants gave correct response. This finding was quite different with the study

done in Egypt, among 436 households with similar questions, only one tenths of respondents gave the correct answer. However, after intervention, the knowledge score was slightly increased. It revealed that there is the same improvement of knowledge level between different study populations with different knowledge level.

The poor improvement was seen in misconception questions. People still think rabies can be treated with traditional medicine. Moreover, regarding with the signs

and symptoms of the rabies and rabid animal, some had wrong concept. In a study done in India showed among 270 participants, 37.7% applied substances like chili, turmeric and mustard oil to the dog bite wound. The misconception is still in common not only in developing countries but also in developed countries. The article done in United State pointed out there are people who still believe the immunization is needed to be injected for 14 days. More and extensive educational programs are required especially for prevention and wound management.

According to the significant difference between pre and post-test, there is effectiveness of health education on knowledge of preventive measures of rabies among primary school teachers. Some studies done in India showed the same result even tough the population is different. Also, a study in China demonstrated the education program is effective in communities although the authors used different intervention styles. Also, and the sum of the sum of

At the same time, an educational program was performed in Ilocos Norte, Philippines as part of a province wide rabies elimination program, rabies specific information was integrated into the curriculum of all public elementary schools in using a specifically developed teachers' manual. All participants in grades 1-5 before the curriculum integration was implemented and retested these cohorts 1 year later, after implementation. Awareness and detailed knowledge of rabies were increased significantly in al.¹⁹

In Sri Linka, an educational- entertainment campaign was introduced in 2009. The aim was to improve knowledge of prevention of rabies and dog bites among school children with educational intervention, insertion the health education in the school curricula in rural area. The scores were significantly improved both among the study and control groups after the intervention. The threat of rabies of pupils in Sri Lanka would be reduced if they are given appropriate information on rabies prevention as a part of the school curricula. Close collaboration with local education offices is key to successful implementation, which support to the eradication of rabies from Sri Lanka6. Effective educational intervention was also conducted amongst the 145 nursing students of a tertiary care hospital in Puducherry in 2015 through a lecture using audio visual aid by the investigator in the nursing college lecture hall for duration of 60 min.¹⁷

The present study showed the intervention was effective and it was not influenced by other factors. More than half of participants in this study have children and there was no association between number of children and health knowledge in post-test results. Although majority of participants found stray dogs near their house and school compound but that does not influence post-test findings. Only one third of respondents got the chance to attend first aid training one time. Another study conducted for an educational intervention on the various issues of rabies among 92 health workers working in non-government

organization also had only one training. Therefore, it is felt that for better retention of correct knowledge, such training is required more frequently.¹⁸

As a strength of the study, all selected primary school teachers were given adequate and suitable educational intervention. This study is beneficial not only for targeted age group but also for the whole community. But we still have some limitations. According to limited number of primary school teachers, benefits from this educational intervention were limited to other school teachers. Due to COVID-19 crisis, the important limitation of this study is there is no control group and the actual effectiveness of education (behavioral change) cannot be assessed.

CONCLUSION

Regardless of background characteristics of the participants, the education program is significantly effective. This is a great support to convince the fact that not only raising the knowledge of preventive measures of rabies among primary school teachers but also including this issue in life skill education program for high-risk persons. Therefore, it is anticipated that these findings could be usefully employed in spreading health knowledge against rabies among primary school students and public via primary school teachers and would be able to reduce rabies cases and deaths by 2030. Further exploration on misconceptions of the primary school teachers will need to be undertaken as a qualitative study. Further studies should be done with not only school teachers but also other population such as parents and households for both knowledge and practice assessment.

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REFERENCES

- Ministry of Health and sports. National Guidelines for Human Rabies Prophylaxis. 2015. https://mohs.gov.mm/Main/content/publication/rabie s-standard-operating-procedures-for-human-rabiesprophylaxis-2015. Last accessed on 21 December, 2020.
- WHO (2020) | The Weekly Epidemiological Record (WER). February 2020. WHO. http://www.who.int/wer/en/. Last accessed on 19th February, 2020.
- 3. WHO Rabies Prevention Website, http://www.searo.who.int/topics/rabies/en. Last accessed on 5th June, 2020.

- 4. CDC Website, Preventing Rabies, https://monkeysee.com/what-is-world-rabies-day/. Last accessed on 30th May, 2020.
- Nilsson. Effect of rabies education programs on rabies awareness, attitudes towards dogs and animal welfare among children in Lilongwe, Malawi. 2014. http://stud. epsilon.slu.se. Last accessed on 15th June, 2020.
- Kanda K, Obayashi Y, Jayasinghe A, de S. Gunawardena GSP, et al. Outcomes of a schoolbased intervention on rabies prevention among school children in rural Sri Lanka. International Health. 2015;7(5):348-353.
- 7. Sor S, Higuchi M, Sarker MAB. Knowledge of rabies and dog-related behaviors among people in Siem Reap Province, Cambodia. Tropical Medicine and Health. 2018;46:20.
- 8. WHO (2014) |PEP –Prophylaxis –guideline 15-12-2014.WHO. Last accessed on 16th December, 2020.
- 9. Ragab F, Khalaf SR. Health education program regarding rabies knowledge for households in rural areas, Assiut governorate, Egypt. Int J Nurs Res. 2018;4(1):13-22.
- Shirley P, Dobhal P, Verma M. Misconception towards a fatal disease- rabies and its prophylaxis. 2019:8.
- 11. Rohde RE. Common Myths and Legends of Rabies. Rabies. 2020;69-78.
- Kulkarni P, D SK, Siddalingappa H. Effectiveness of educational intervention on perception regarding rabies among women self help group members in urban Mysore, Karnataka, India. International

- Journal Of Community Medicine And Public Health. 2016;3(5).
- 13. Manoharan A, Chellaiyan VG, Madhusudan M. Effect of educational intervention on the knowledge of rabies among medical school students of Chennai. J Educ Health Promot. 2019;8:208.
- 14. Wu H, Chen J, Zou L. Community-based interventions to enhance knowledge, protective attitudes and behaviors towards canine rabies: results from a health communication intervention study in Guangxi, China. BMC Infect Dis. 2016;16:701.
- 15. Amparo ACB, Mendoza ECB, Licuan DA, Valenzuela LM. Impact of Integrating Rabies Education Into the Curriculum of Public Elementary Schools in Ilocos Norte, Philippines on Rabies Knowledge, and Animal Bite Incidence. Frontiers in Public Health. 2019;7.
- Anand N, Sudha V. Effectiveness of Educational Intervention on Knowledge and Attitude About Rabies and its Preventive Measures Among Nursing Students of a Tertiary Care Hospital in Puducherry. 2017;6(1):088-93.
- 17. Dasgupta. Effectiveness of Health Education on Knowledge Regarding Rabies among Health Workers of West Bengal. 2020;4:26-34.

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