

Effect of Nursing Intervention on Educating Rural women Regarding Snake Bite's Prevention, First Aid, and Treatment.

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Abstract: Background: Snakebite is considered a health problem in Egypt but knowledge regarding snakebites and its care is poor at the population level that requires more attention to increase their knowledge. **Aim:** The study was conducted to evaluate the effectiveness of nursing intervention on educating rural women regarding snake bite symptoms, first aid, prevention and treatment

Methods: Quasi-experimental design with pre-posttest was used. **A random sample** of 106 rural women who came to health centers to provide immunization to their children was taken **Setting:** This study was conducted at ShobraBakhum and Arab Elraml from Quesna district and Bemam and Elbendaria from Tala district in Menoufia Governorate. **Tool** of this study was an interviewing questionnaire included five parts as the following a- demographic data b- Knowledge about symptoms of snake bite c- knowledge about preventive measures d- knowledge about first aid e- knowledge about treatment. A computer based educational intervention was used and a booklet was given to the study sample to raise their knowledge about snake bite symptoms, first aid, prevention and treatment.

Results: After receiving educational nursing intervention, the level of total knowledge of the studied women about snake bite were high statistically improved in posttest than in pretest at p value <.001. As, the percentage of those who have fair knowledge improved from 0.0% in pretest to be 68.9% in posttest, and good knowledge improved from 0.0% in pretest to be 31.1% in posttest.

Conclusions and recommendations: Computer Based Educational Nursing Intervention was successful in improving the overall knowledge of the studied rural women regarding snake bites' symptoms, first aid, prevention and treatment. So, this study recommended that education programs and guidebooks to increase awareness about snake bites' symptoms, first aid, prevention and treatment are essential to help people manage snake bite and prevent its complications especially in rural areas.

Key words: snake bite, prevention, first aid, treatment

I. Introduction

Venomous snakebite is considered an important cause of global morbidity and mortality because venomous snakes are always found almost throughout the world^[1]. Snakes bite is a method of hunting and a mean of protection. The main risk factor for snake bite is working outside with one's hands as in farming, forestry, and construction.^[2] Some types of snakes may be poisonous commonly involved in poisonings include elapids as kraits, cobras and mambas, vipers, and sea snakes.^[3] But the majority of snake types do not have venom and kill their victim by squeezing them.^[2] Determining the type of snake that cause a bite is not possible to facilitate the treatment.^[3]

Snake bite is considered a neglected public health problem especially in many subtropical and tropical regions of the world, such as the Middle East, North Africa, South Asia, and Latin America. Although the morbidity and mortality rates from snake bite are high^{[1][4]} and the exact number of snake bites is unknown, an estimated 5.4 million people are bitten by snakes every year, as a result 1.8 to 2.7 million cases of poisoning are occur. According to the World Health Organization fact sheet on snake bites, an estimated 81,000 to 138,000 people die each year as a result of snake bites. Also, there are approximately 3 times more cases of amputations and other definitive disabilities were occur.^[5] In Egypt, there is still no controlled medical and geographical studies on the locally prevalent snake family intoxication.^[6]

Snakebite is an injury caused by the bite of a snake, especially a venomous snake. The most common symptom of a bite occurs from a venomous snake is the presence of two puncture wounds from the animal's fangs and sometimes venom injection from the bite may also occur.^{[1][7]} This may result in redness, swelling, and severe pain at the area, which may take up an hour to appear. In addition, vomiting blurred vision, tingling of the limbs, and sweating may result. Most bites are often occurring on the hands, arms or legs.^[7]

Fear occurs following a bite is common with symptoms of a racing heart and feeling faint. The venom may cause severe complications as such as bleeding, kidney failure, a severe allergic reaction, tissue death

around the bite, or breathing problems.^{[4][5]} Also, bites may result in the loss of a limb or other chronic problems. The outcomes depend on the type of snake, the amount of venom injected, the area of the body bitten, and the general health of the person bitten. Problems are often more severe in children than adults, due to their smaller size.^{[5][6]}

Snake bites can be prevented outdoor and indoor. Outdoor prevention include refraining from approaching or handling snakes in the field, the person should avoid reaching into spaces, holes, or underneath objects that snakes might be hide as patches of tall grass, piled leaves, rock and woodpiles^{[8][9]}. Also, the person avoid lie down or sit down in areas where snakes might be located and wear tall boots, long pants, and leather gloves when walking through or working in the dense vegetation areas. In addition a glue trap is best to be used.^[10]

Indoor prevention of snake bites include repairing all holes in the exterior of home to prevent snakes from entering the house, Controlling rodents inside the houses, storing firewood outside the houses, and cutting grass around houses is also important.^[11]

In addition, clearing an area, removing leaf litter around the houses, and tapping the ground with a stick while walking outside at dusk. Also, make breeding places for pigeons and chicks closed and away from Place of residence, and Keep rubbish and food away from house is important to keep snakes away.^{[12][13]}

First aid measures include that the rescuer should remove any jewelry or watches, as these could cut into the skin if swelling occurs. Also, the rescuer should keep the area of the bite below the level of the heart to slow the spread of venom in the bloodstream.^{[9][10]} Victim should remain calm as possible, and moving around will make venom spread faster through the body. The bite should be covered by clean, loose-fitting, dry bandage.^[8]

Pharmacological treatment with antivenom is important in treating venomous snakebite. Antivenom can improve the clinical outcomes for the victims of snake bite. In addition, Intravenous access should be achieved and hydration state should be determined and corrected. Also, vital signs must be closely monitored. Knowing the size, color and shape of the snake can help to determine the best treatment for a particular bite.^{[13][14]}

Lack of information about simple measures of prevention, occupational hazard risks and inappropriate first-aid measures all magnify the risk. In addition, poor access to health care services and consequent delay in anti-snake venom administration can lead to high fatality rates^[15]. The nurse has an important role in increasing awareness and educating rural people regarding snakebites, its first aid, prevention weather indoor or outdoor, and management through identifying and changing their knowledge, attitude, and practice in dealing with this problem.^{[3][15]}

1.1 Significance of the study

In Egypt, Snake-bite is a life-threatening medical emergency. It occurs frequently among rural people, especially those working in the fields. Snakes found in these areas due to its plain agricultural land and also, hot and dry climate provides an ideal environment for snakes to be occurred.^[16]

Houses in rural areas of Egypt are either made of mud or cements had many crevices where rodents flourish. Snakes have easy access to the interiors of houses searching for food. Also, Firewood and dried crowding stored in or near the house, breeding pigeons and chicks provide an easy shelter for snakes and rodents to appear. In Egypt, there are no correct statistical data on snake bites because many snake bites may become remedies and not referred to hospital.^[17]

1.2 Aim of the Study

This study aimed to evaluate the effectiveness of nursing intervention on educating rural women regarding snake bite, prevention, first aid, and treatment.

This aim could be fulfilled through the following objectives:

- Assess knowledge of rural women regarding general knowledge of snakebite.
- Assess knowledge of rural women regarding prevention, first aid and treatment of snake bite.
- Develop, implement and evaluate the effect of nursing intervention on educating rural women regarding snake bite, prevention, first aid and treatment.

Research Hypothesis:

- Women who receive educational nursing intervention regarding snake bite will have higher knowledge level in posttest about signs and symptoms of it than in pretest.

- Women who receive educational nursing intervention will have better knowledge practice about preventive measures, first aid and treatment of snake bite in posttest than in pretest.

II. Methods

2.1 Research design

Quasi-experimental design with pre-posttest was used to achieve the aim of the study because it fits the nature of the problem under investigation.

2.2 Settings

Multistage random sample technique was used to select the setting through the following stages:

The first stage began with random selection of the two districts from nine districts in Menofia Governorate. The two selected districts were Quesna and Tala.

Then random selection of two villages from each district through simple random technique was the second stage. The selected villages from Quesna district were ShobraBakhum and Arab Elraml. The selected villages from Tala district were Bemam and Elbendaria. The sample was taken the village health center.

2.3 Subjects

A random sample of 106 rural women, who came to health centers to provide immunization to their children was selected by taking their names, then arranges the names of the women by numbers, and selects the odd numbers to be included in the study. The sample taken from Quesna district was 58 women (28 from Shobra Bakhum health center and 30 from Arab Elraml health center).while the sample taken from Tala district was 48 women (25 from Elbendaria health center and 23 from Bemam health center). According to the following inclusion criteria:

- Rural women may be mother, grandmother, or aunt and came to health center to provide 6 month immunization to their children.
- The same rural women came to the health center after 3 month to provide 9 month immunization to their children.

2.4 Instruments

The data was collected through interview questionnaire that consisted of five parts. Two parts (signs of snake bite and first aid questionnaire) were developed by Sanjeev, 2014^[18] and some questions were added by the researcher in the area of first aid questionnaire for culture orientation and the other parts are developed by the researchers and designed after reviewing of the literatures on snake bite.

The questionnaire includes the following.

Part I: -Demographic data: - it included data about name, age, educational level, occupation.

Part II- Knowledge about snake bite consists of 8 questions about signs of snake bite that distinguishes it from other types of bites included 8 questions such as Two puncture marks from the snake's fangs, Swelling and redness around the wound area, Tenderness and pain around the wound area , sweating and others.

The correct answer take score one and incorrect answer take score zero.

8 questions; its total scores 8 degree <50% (<4 degree) considered of poor knowledge, fair knowledge 60%-75% (4-6 degree) and good knowledge > 75% (7-8degree).

Part III-Preventive measures: it included 10 questions as: Controlling rodents inside the houses, Storing firewood outside the house ,cutting grass around houses, clearing an area, devoid of leaf litter around the houses, wearing protective shoes while walking outside at dusk and while farming activities, tapping the ground with a stick, while walking outside at dusk, carrying a light source or a flame while walking outside at dusk, avoid placing hands between stones, make breeding places for pigeons and chicks closed and away from place of residence and keep rubbish and food away from your house is important to keep snakes away.

The correct answer take score one and incorrect answer take score zero.

The scoring System was categorized as follow

10 questions; its total scores 10 degree <50% (< 5) degree considered Poor knowledge, Fair knowledge 50%-75% (5-7.5 degree) and Good knowledge > 75% (8-10degree).

Part IV: - First aid questionnaire

This part included 10 questions 7 questions developed by^[18]as Bitten part of the body should not be immobilize, Aspirin should be given for pain relief, Beverages containing alcohol should be given to the patient for pain relief, tight band (tourniquet) should be applied proximal to the site of bite, Bitten site should be elevated, bitten site should be scratched, Blood must be sucked from the place of bite, and 3 questions

developed by the researcher as beverages should be given to the patient, ice should be applied to the bitten site, no need to remove shoes if the leg or foot was bitten.

The correct answer take score one and incorrect answer take score zero.

10 questions; its total scores 10 degree < 50% (< 5) degree considered Poor knowledge, Fair knowledge 50% - 75% (5-7.5 degree) and Good knowledge > 75% (8-10degree).

Part VI: Treatment questionnaire:

This part included 10 questions as Capturing of the offending snake for identification is essential in treating the patient, transferring the victim to the nearest hospital as early as possible is essential, Snake bite can be successfully treated in Egypt, Antivenom is available only in most hospitals in Egypt, Antibiotic should be given even with dry bite, The victim should be given tetanus toxoid, Antivenom should not be given to all cases of snake bite, and keeping a snakebite victim calm is important.

The correct answer take score one and incorrect answer take score zero.

10 questions; its total scores 10 degree < 50% (< 5) degree considered Poor knowledge, Fair knowledge 50% - 75% (5-7.5 degree) and Good knowledge > 75% (8-10degree).

2.5 Validity

The tool used by the researcher was tested for its content validity by committee of experts in community health nursing and medical nursing (two assistant professor of Community Health Nursing and professor in Medical Nursing).The experts performed an evaluation on the conceptual and semantic equivalence of the questionnaire so as to determine the content validity, questionnaire was submitted for expert evaluation by professionals to evaluate clarity, content and understanding of the questions and to analyze the representativeness of it.

2.6 Reliability

Application of test retest reliability of the tool was used to determine the internal consistency of the tool. This done through, administration of the same tool to the same subjects under similar conditions on one or more occasions. Cronbach's co-efficiency Alpha ($\alpha=0.97$).All items of the questionnaire were strongly reliable as $R= 94.6$.

2.7Administrative considerations

An official steps to obtain permissions to conduct this study were taken after explanation of the aim and objectives of this study to the centers directors. A written permission was taken from the director of each Health Center to obtain agreement for taking the approval for data collection and a permission to carry out the study. The objectives of the study and the contents of the tool were carefully explained by the researcher to the participants in this study.

2.8Ethical considerations

Human rights of subjects were protected as the participation in the study was voluntary. The current study was conducted with careful attention to ethical standards of research. As anonymity ,confidentiality and voluntary participation in the study.

2.9Pilot study

A pilot study was done after designing the questionnaire and before starting data collection. The pilot was done on 10% of the study sample. It was carried out to test the applicability and clarity of the questionnaire and detect any obstacles or problems that might arise during the actual collection of data and to estimate the time needed to fill the sheet. Based on the result of the pilot study, the necessary modifications and clarifications of some question were done. The pilot sample was excluded from the total sample to assure the stability of the result.

2.10Procedure

The data was collected in six months (3 months for pretest data collection and intervention application and 3months for posttest collection) the time of data collection starts from first of October 2018to the end of March2019. .

-At first, rural women were divided randomly into four groups according to their residence (Health center). Rural women who were agreed to participate in the study were included.

The subjects were interviewed before or after giving immunization to their children in Health Center individually. Implementation of the study was passed through three phases as the following:

Assessment phase: An interview was done in a comfortable environment. Orientation about researcher name, purpose, significance of the study was done. Subjects were interviewed to fill pre-test assessment tool using previously mentioned tool to collect data. This phase took about 15-20 minutes

Implementation phase: The study hypothesized that women who receive educational nursing intervention regarding snake bite will have higher knowledge level about signs and symptoms, prevention and treatment of snake bite in posttest than in pretest. This intervention was developed and given to rural women through using several teaching methods such as brain storming, discussion, role play and lectures. Illustrative media e.g. computer and structured booklet about snake bite which written in a simple Arabic and supplemented with pictures and to help understanding were used. The content of the booklet included general knowledge about snake bite as definition; risk factors, signs and symptoms, and complication were explained by the researcher in the first session and took about 15-20 minutes through the use of PowerPoint presentation on lab top system.

Second visit: it was carried out after one week from the first visit; the researcher explained the other points of the booklet that included prevention methods, first aid and how to manage snake bite using PowerPoint presentation on lab top system. This session took about 20-30 minutes. At the end of this session a summary and conclusion about the topic were done. In addition, the booklet was provided to the study sample to raise their awareness about snake bite.

Evaluation phase: Evaluation was applied through using the same tool after three months to perform posttest to the rural women to evaluate the effectiveness of nursing intervention on improving rural women knowledge about snake bite, prevention, first aid and treatment. This visit took about 20-25 minutes.

. The interview included the following 3 visits as the following:

Session	Content	Time	Method
1 st visit	- Perform pretest -Session of intervention include general knowledge about snake bite as definition, risk factors, signs and symptoms, and complication	-15-20 minutes -15-20 minutes	- Questionnaire - Teaching methods include: brain storming, discussion, role play and lectures provided through using of PowerPoint presentation on lab top system.
2 nd visit (after one week)	- Session of intervention include general knowledge about snake bite, its prevention, first aid and treatment	-20-30 minutes	PowerPoint presentation on lab top system was used and the booklet was provided.
3 rd visit(after 3 months)	- Perform posttest	- 20-25minutes	- Questionnaire

2.11 Statistical analysis

Data was coded and transformed into specially designed form to be suitable for computer entry process using SPSS(Statistical Package for Social Science) version 20. Graphics were done using Excel program.

Quantitative data were expressed as mean & standard deviation($X \pm SD$) and analyzed by applying paired t-test for comparison of the same group on pre and posttest.

Qualitative data were expressed as number and percentage (No & %).It was and analyzed by using chi-square test (X^2)for 2X2 table,

For comparison between the quantitative data at interval for the different groups, Kruskal Wallis Test was used and for two different groups, Mann-Whitney U Test was used

Significance of results:-

For all the statistical tests done, **P-value at 0.05 was used to determine significance regarding:**

- P-value > 0.05 to be statistically insignificant.
- P-value ≤ 0.05 to be statistically significant.
- P-value ≤ 0.001 to be high statistically significant.

III. Results

Table 1 represented the main age group of studied women was less than 30 years (60.4%) with mean age of 29.51 ± 1.07 . Regarding to level of education, the main educational level was university education as more than half of the studied women 55 (50.9%) had university education. Regarding to occupation, near to half of them were house wives 52 (49.1) and just over half of them were workers.

Figure 1 showed the level of total knowledge about snake bite symptoms among studied women highly improved from 0.0% fair knowledge at pretest to be 62.3% at posttest, and from 0.0% good knowledge at pretest to be 28.3% at posttest.

Table 2 showed that there was high statistical significant improvement in the level of total knowledge about prevention of snake bite among studied women on pre and post intervention at P value < .001. As, the good knowledge improved from 0.0% in pretest to 63.2% in posttest.

Figure 2 showed that the level of the studied women knowledge about first aid for snake bite was highly improved in posttest than in pretest as the percentage of those who have fair knowledge improved from 0.0% in pretest to be 51.9% in posttest and as the percentage of those who have good knowledge improved from 0.0% in pretest to be 47.2% in posttest.

Figure 3 revealed that, total knowledge level about treatment of snake bite among studied women improved from 0.0% fair knowledge at pretest to be 86.8% at posttest, and from 0.0% good knowledge at pretest to be 8.5% at posttest.

Table 3 illustrated that the levels of total knowledge of the studied women about snake bite were high statistically improved in posttest than in pretest at p value < .001. As, the percentage of those who have fair knowledge improved from 0.0% in pretest to be 68.9% in posttest, and good knowledge improved from 0.0% in pretest to be 31.1% in posttest.

Table 4 showed that, there were highly statistical significant differences among studied women in mean total score of their knowledge about prevention, symptoms, first aid & treatment of snake bite at pre-posttest at p-value < .001. Also, there was high statistical significant difference among rural women in mean of total score of their total knowledge about snake bite at pre-posttest at p-value < .001.

Table 5 demonstrated that, there were statistical significant differences among studied sample in the means of total score of knowledge about snake bite and their age group and occupation at pretest. Also, there were highly statistical significant differences among means of total score of knowledge about snake bite and their level of education and occupation at posttest.

Table (1): Sociodemographic characteristics of studied women

Items	No (n=106)	%
Age group		
<30 years	64	60.4
>30- <40 years	23	21.7
>40 years	19	17.9
Age		
Mean ± SD	29.51 ± 1.07	
Minimum	17.00	
Maximum	56.00	
Level of education		
not educated	7	6.6
read and write	2	1.9
primary education	2	1.9
secondary education	40	37.7
university	55	51.9
Occupation		
house wife	52	49.1
work	54	50.9

Figure (1) Effect of nursing educational intervention pre- posttest on level of the total knowledge about symptoms of snake bite among studied women.

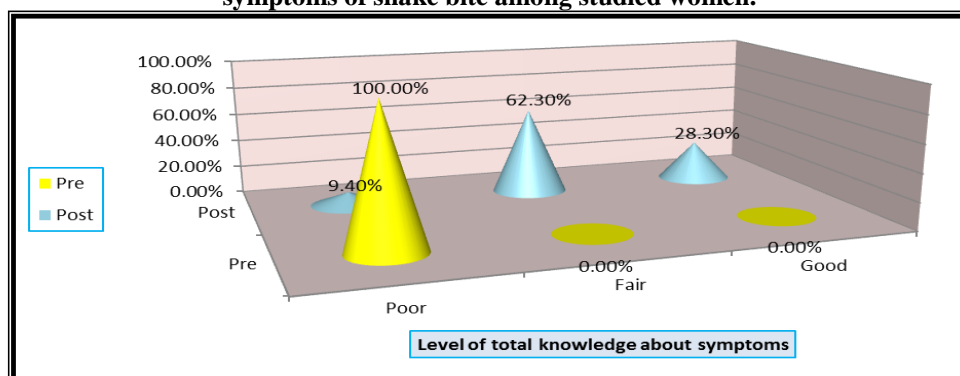


Table (2): Distribution of levels of total knowledge about prevention of snake bite among studied women on pre and post intervention (n=106).

Items	Levels of totalknowledge about prevention of	χ^2	P- Value
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	snake bite					
	Pre		Post			
	No	%	No	%		
Level of total knowledge about prevention.						
Poor (0-5) <50%	106	100.0%	5	4.7%	192.9 **	<.001
Fair (6-8) 50-75%	0	.0%	34	32.1%		
Good(8-10) >75%	0	.0%	67	63.2%		

Figure (2) Effect of nursing educational intervention on level of total knowledge about first aid of snake bite among studied women

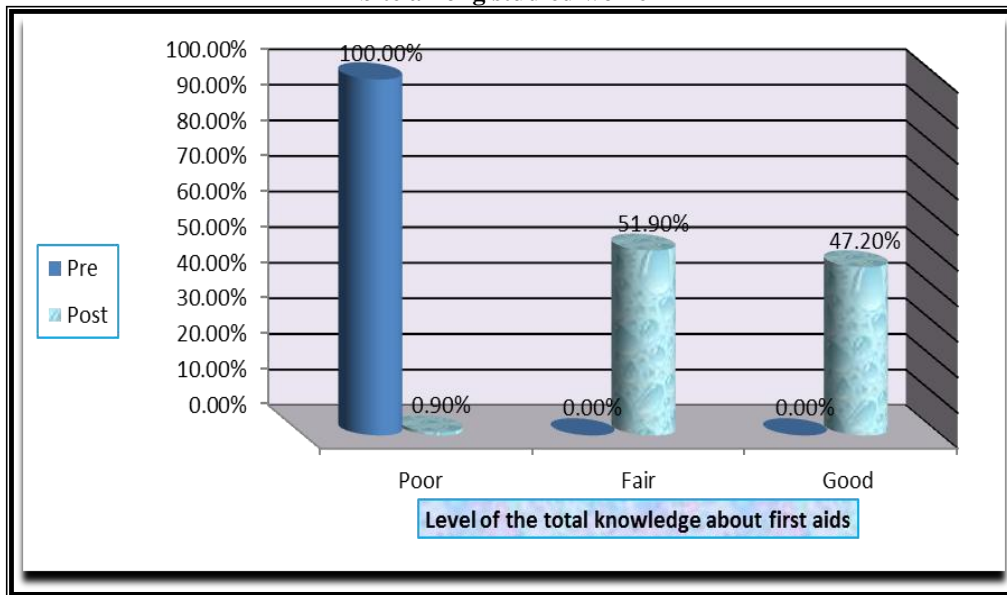


Figure (3) Effect of nursing intervention pre- posttest on level of total knowledge about treatment of snake bite among studied women.

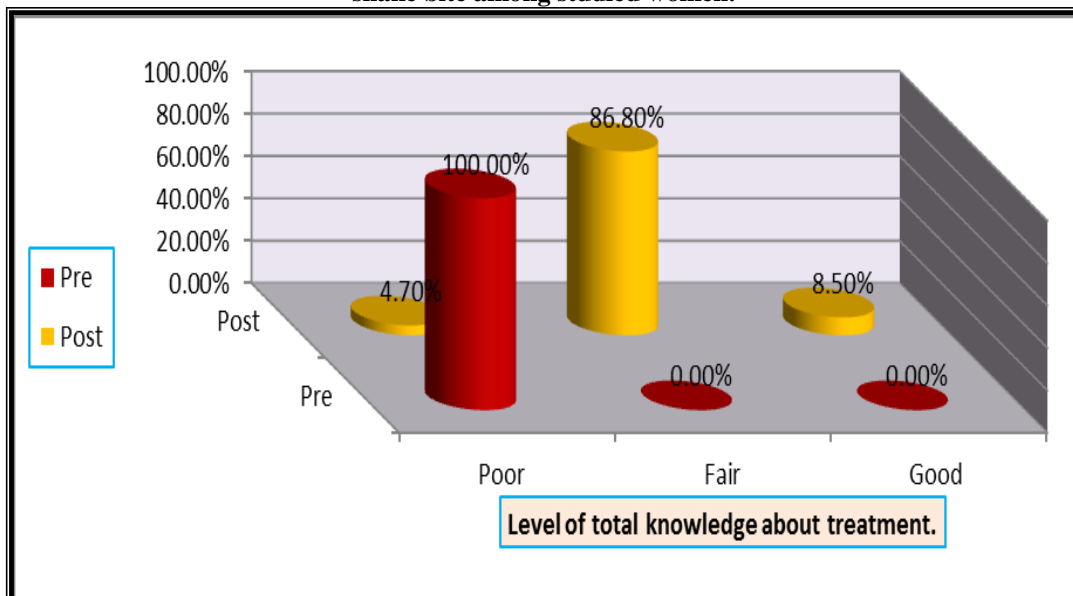


Table (3):Effect of pre- posttest intervention on studied women's levels of total knowledge about snake bite (n=106).

Items	Levels of total knowledge about snake bite				χ^2	P- Value
	Pre		Post			
	No	%	No	%		
Level of total knowledge						
Poor	106	100.0%	0	.0%	212.0**	<.001
Fair	0	.0%	73	68.9%		
Good	0	.0%	33	31.1%		

Table (4): Mean scores of response about knowledge about snake bite (prevention, symptoms, first aid and treatment) among the studied women on pre and post intervention.

Items	Mean scores of response about knowledge among the studied mothers(n=106)		t test	p-value
	Pretest Mean \pm SD	Posttest Mean \pm SD		
Total prevention	2.50 \pm 0.83	7.81 \pm 1.25	-36.266- **	<.001
Total first aid	2.04 \pm 1.12	7.30 \pm 1.16	-33.539- **	<.001
Total treatment	2.25 \pm 0.77	5.83 \pm 0.39	-42.964- **	<.001
Total symptoms	2.34 \pm 0.48	5.95 \pm 1.40	-25.106- **	<.001
Total knowledge	9.12 \pm 2.03	26.91 \pm 2.09	-62.730- **	<.001

Table (5): Distribution of the mean scores of total knowledge about snake bite of the studied women on pre and post intervention in relation to their demographic data.

Variables	Mean scores of total knowledge about snake bite for studied mothers on pre and post intervention (n=80)			
	Pre	t-test or F	Post	t-test or F
	Mean \pm SD	P -value	Mean \pm SD	P -value
Age group		Kruskal Wallis Test		Kruskal Wallis Test
<30	8.29 \pm 2.06	26.110	27.03 \pm 1.9	3.975
> 30 - <40	10.65 \pm 1.03	.000	26.43 \pm 1.4	.137
>40	10.05 \pm 1.3		27.05 \pm 3.2	
Level of education		Kruskal Wallis Test		Kruskal Wallis Test
Not educated	9.00 \pm 0.58	3.261	24.00 \pm 1.5	22.639
Read and write	8.00 \pm 1.4	.515	24.00 \pm 1.4	.000
Primary education	10.00 \pm 0.01		24.00 \pm 1.4	
Secondary education	8.80 \pm 1.9		27.47 \pm 2.4	
University	9.38 \pm 2.2		27.07 \pm 1.5	
Occupation		Mann-Whitney U test		Mann-Whitney U test
House wife	7.35 \pm 1.4	-8.973-	26.25 \pm 2.3	-3.626-
Work	10.83 \pm 0.57	.000	27.53 \pm 1.7	.000

V. Discussion

Snakebite is a global health problem associated with high morbidity and mortality around the world. Knowledge about symptoms, snakebite first aid measures and treatment are essential for optimal care of victims and also in counseling their caregivers and families on prevention. In addition understanding awareness and perceptions in risk populations facilitate designing of snakebite prevention and control programs.^{[19][20]}

This study aimed to evaluate the effectiveness of nursing intervention on educating rural women regarding snake bite symptoms, first aid, prevention and treatment.

Regarding sociodemographic characteristics of studied women, the present study in table (1) showed that all the sample were women, the main age group of studied sample was less than 30 years (60.4%) with mean age of 29.51 \pm 1.07. About 49.1% were house wives and just over half of them were workers. In addition, 50.9% of the studied sample had university education. This finding is supported by Godpower et al (2018)^[21] who studied Knowledge of venomous snakes, snakebite first aid, treatment, and prevention among clinicians in northern Nigeria, Nigeria. He reported that the main age group of the studied women was 30-39 years (67.7%). Also, 33.3% of the sample not working but 66.7% were but this finding is not supported in gender, as all the the sample in the other study was 70.6% male 29.4% was female. This discrimination could be due to differentiation in selecting study sample.

In addition, the findings are supported by Silva et al (2014)^[19] who studied awareness and perceptions on prevention, first aid and treatment of snakebites among Sri Lankan farmers. Sri Lanka. Who reported

that 39.8% of the sample had highest school education. This similarity could be due to similarities in sample characteristics.

In relation to the level of total knowledge of the studied sample about symptoms of snake bite, the present study in figure (1) showed highly statistically improved at posttest than in pretest as fair knowledge improved from 0.0% in pretest to be 62.3% in posttest, and good knowledge improved from 0.0% in pretest to be 28.3% in posttest. These findings are supported by^[21] who reported that after training, 93.3% of respondents reported correctly that the snakebite causes bleeding. Also, nearly three quarters of the study sample reported correctly identifying fang marks. This similarity could be due to the participants were interested to have more knowledge about snake bite.

On the other hand, the findings of the present study are not congruent with the study done by Mahmood et al (2019).^[22] Who reported that the majority of the respondents appeared not to have adequate knowledge about the specific symptoms of snakebite. In addition, there were no statistically significant differences between men and women's knowledge of symptoms. This discrimination might be due to the fact that, despite snakebite being a major public health issue, but health education about snake bite had been limited in the other study.

Concerning the effect of nursing educational intervention on total knowledge level about prevention of snake bite, the present study in table (2) showed that there was high statistical significant improvement in the level of total knowledge about prevention of snake bite among studied women on pre and post intervention. Good knowledge improved from .0% in pretest to 63.2% in posttest. This finding is supported by Taiebet al (2018)^[23]. Who reported that more than half of participants (62%) who participated in the study had an improvement in knowledge about prevention of snake bite in the post – training compared to pre-training. Also, overall score of total knowledge about prevention of snake bite was significantly increased in the post-training. This similarity could be due to that the sample were interested to have more knowledge about prevention of snakebite to prevent this problem.

In relation to the level of total knowledge about first aids of snake bite on the pre and post intervention. The present study in figure (2) showed that there were high statistical improvements in posttest than in pretest, as fair knowledge improved from 0.0% in pretest to be 51.9% in posttest. And, those who have good knowledge improved from 0.0% in pretest to be 47.2% in posttest. This findings is supported by^{[23][24][25]} who reported that After the training, the knowledge regarding first-aid and care is significantly improved. This similarity could be due to the importance of intervention in improving knowledge of participants about first aids of snake bite. This similarity could be due to the participants were interested to deal with snake bite problem at any time.

In relation to the effect of intervention on total knowledge level about treatment of snake bite. The present study in figure (3) revealed that levels of total knowledge about treatment of snake bite on pre and post intervention were high statistically improved. As, fair knowledge improved from 0.0% in pretest to be 86.8% in posttest and good knowledge improved from 0.0% in pretest to be 8.5% in posttest. This findings is supported by Inthanomchanh et al (2017)^{[26][27]}. who reported that Knowledge in relation to nearly half of the sample had inadequate knowledge regarding the management of snakebite before training but, 60.9 % of the sample knowledge were improved after training. This similarity of the results could be due to the effect of the intervention in improving knowledge of participants on snake bite treatment.

Concerning the effect of nursing intervention pre- posttest on levels of total knowledge about snake bite. The present study table (3) illustrated that the levels of total knowledge of the studied women about snake bite were high statistically improved in posttest than in pretest. As, the fair knowledge improved from 0.0% in pretest to be 68.9% in posttest, and good knowledge improved from 0.0% in pretest to be 31.1% in posttest. This finding is supported by^[20] who reported that about 52.9% had an adequate overall knowledge about snake bite, whereas 47.1% had an inadequate overall knowledge after training.

Regarding the mean scores of total knowledge about snake bite (prevention, symptoms, first aid and treatment) among the studied women on the pre and post intervention. The present study in table (4) showed highly statistical significant differences in mean total score of the studied women's knowledge about prevention, symptoms, first aid and treatment of snake bite at pre-posttest and the mean overall knowledge score of studied women in post-test was 26.91 ± 2.09 that indicates highly statistically significant difference in mean score of their total knowledge about snake bite at pre-posttest. This finding is supported by^[18] who reported that high statistical significant difference mean score total knowledge in pre-posttest as the mean overall knowledge score of respondents was $70.2 \pm 12.6\%$.

Also, These findings are supported by^[19] who reported that high percentages of the participants had more knowledge about practices of preventive measures, first aid measures and available treatment that minimize snake bites in houses and outside after intervention. This similarity of the results could support the claim that intervention has a main role in changing knowledge, attitude and practice of participants.

In relation to the distribution of total knowledge mean score about snake bite of studied rural women on pre - post intervention in relation to their demographic data. This study (table 5) demonstrated that, there were statistically significant differences among the means of total knowledge score and age group and

occupation in pretest of studied women. Also, there were highly statistically significant differences among the mean of total knowledge score about snake bite and their level of education and occupation in post-test. This finding is supported by Nazmul et al (2017)^[28] who reported that the overall knowledge score were higher among working respondents than non-working respondents.

Also, this finding is also supported by^[29] ^[30] who reported that knowledge regarding snakebite was significantly higher after training among Highly educated respondents compared to moderately educated respondents and among respondents who had working experience >20 years than < 10 years working experience. This similarity of the results could be due to that education and occupation increased experience and awareness regarding snakebite problem.

Limitations of the study:

-Some of the women fear to listen about snake bite and refuse to participate because it considered the topic as a bad omen.

- It was complicated to attain data about snake bite as there are no inclusive statistical records about snake bite cases.

VI. Conclusion & recommendations

This study concluded that the overall knowledge regarding snake bite's symptoms, first aid, prevention and treatment among the rural women was clearly deficient in pretest. But in posttest nursing educational intervention was successful in improving the overall knowledge of the studied rural women regarding snake bite's symptoms, first aid, prevention and treatment.

6.1 Recommendations

1-Health education programs to staff nurses are required to increase their knowledge about snake bite and how to use antivenom to motivate them applying healthy practices to manage snake bite and prevent complications.

2- Education programs and guidebooks to increase awareness about snake bites' symptoms, first aid, prevention and treatment are essential to help people manage snake bite and prevent its complications especially in rural area.

3-Curricula of school should include knowledge about snake bite to increase awareness regarding prevention of this problem.

4-Several studies need to be conducted on snake bite first aid, prevention and treatment in Egypt

5-The educational intervention program about snake bite management should be introduced through the mass media to add a lively, modern, colorful and attractive channel for the messages to reach the families.

References

- [1]. Kasturiratne A, Wickremasinghe AR, Silva N, Gunawardena NK, Pathmeswaran A, Premaratna R, et al. (2008).The global burden of snakebite: A literature analysis and modelling based on regional estimates of envenoming and deaths. *PLoS Med*.
- [2]. Ibrahim NM, El-Kady EM, Katamesh RA, El-Borei IH,&Wahby AF.(2013). Identification and discrimination of snake venoms from Egyptian elapids. *Toxicon* ;63:88-97.
- [3]. Michael GC, Grema BA, Aliyu I, Alhaji MA, Lawal TO, Ibrahim H, Fikin AG, Gyaran FS, et al.(2018). Knowledge of venomous snakes, snakebite first aid, treatment, and prevention among clinicians in northern Nigeria: a cross-sectional multicentre study. *Trans R Soc Trop Med Hyg.* 112(2):47-56. doi: 10.1093/trstmh/try028. PubMed PMID: 29617989.
- [4]. Salama WH, Abdel-Aty AM,&Fahmy AS.(2018). Rosemary leaves extract: anti-snake action against Egyptian Cerastescerastes venom. *J Tradit Complement*. doi: <https://doi.org/10.1016/j.jtme.2017.10.001>.
- [5]. World Health Organization.(2018). Prevalence of snakebite envenoming [cited 2018 Feb 22]. Available from: <http://www.who.int/snakebites/epidemiology/en/>.
- [6]. Wahby AF, Abdel-Aty AM, & El-Kady EM. (2012).Purification of hemorrhagic SVMs from venoms of three vipers of Egypt. *Toxicon* 2012;59:329-37.
- [7]. Chincholikar SV, Bandana P, Swati R (2014). Awareness of snakebite and its first aid management in rural areas of Maharashtra. *Ind J Comm Health.* 26: 311?315.
- [8]. Patil AA, Patil PP, Patil A (2012) Implementation of Information Technology in Snakebite Management: A Case Study of Rural Maharashtra (India). *Int. J. Comp. Applications* 44.
- [9]. World Health Organization.(2014). Neglected tropical diseases: Snakebite Accessed 11/17/2014.
- [10]. Herath HMP, Banneheka BMHSK, Amarakoon AMMC, et al. (2014). Awareness of first aid for Snake bites among villagers in a rural area. *Proceedings of the Peradeniya University International Research Sessions Abstract No 144.*
- [11]. World Health Organization.(2016).WHO Guidelines for the Production,Control and Regulation of Snake Antivenom Immunoglobulin available at www.who.int/bloodproducts/snake_antivenoms/SnakeAntivenomGuideline.pdf
- [12]. Centers for disease control and prevention. (2018).How to Prevent or Respond to a Snake Bite (available in Spanish and Vietnamese):www.bt.cdc.gov/disasters/snakebite.asp
- [13]. Naskar S, Debasis D, Mukherjee A, Chowdhury R, Mitra K,&Majumder D.(2015).. Knowledge on snakebite diagnosis& management among internees in a government medical college of Kolkata. *IOSR-JDMS*,; 4: 52–55.
- [14]. Akai A.(2013). Diagnosis and treatment of snakebite by Mamushi and Yamakagashi. *Chudoku Kenkyu.*;26:193–9.
- [15]. Gupta YK, Peshin SS (2014) Snake Bite in India: Current scenario of an old problem. *J ClinToxicol* 4: 1000182.
- [16]. Ogunbanjo GA, MBBS (SA), &FAFP(SA).(2009).Management of snakebites at a rural South African hospital. *Vol 51 No 3.S Afr Med J* 7:80(5):227–8.

- [17]. Gouda AS, Elnabarawy NA, Badawy SM.(2017). A study of snakebite envenomation cases admitted to Egyptian national poisoning center. *Acta Med Int* 2017;4:34-40.
- [18]. SanjeevVasantryo Chincholikar1, Patniak Bandana,&Raje Swati.(2014). Awareness of Snake bite and its first aid management in rural areas of Maharashtra *INDIAN JOURNAL OF COMMUNITY HEALTH / VOL 26 / ISSUE NO 03 / JUL –*
- [19]. Silva A, FaizMarikar, ArumugamMurugananthan and SunethAgampodi.(2014).Awareness and perceptions on prevention,first aid and treatment of snakebites among Sri Lankan farmers: knowledge practice mismatch? *Journal of Occupational Medicine and Toxicology* 9:20.
- [20]. Deb Prasad Pandey, Gita SubediPandey, Kamal Devkota& Matt Goode.(2016) Public perceptions of snakes and snakebite management: implications for conservation and human health in southern Nepal. *Journal of Ethnobiology and Ethnomedicine*. DOI 10.1186/s13002-016-0092-0
- [21]. Godpower C. Michael, Bukar A. Gremaa, Ibrahim Aliyub, Mohammed A. Alhajic, Teslim O. et al.(2018). Knowledge of venomous snakes, snakebite first aid, treatment, and prevention among clinicians in northern Nigeria: a cross-sectional multicentre study *Trans R Soc Trop Med Hyg* 2018; 112: 47–56 doi:10.1093/trstmh/try028 Advance Access publication 29 March
- [22]. Mahmood MA, Halliday D, Cumming R,Thwin KT, Myitzu M, White J, et al. (2019). Inadequate knowledge about snakebiteenvenoming symptoms and application of harmful first aid methods in the community in highsnakebite incidence areas of Myanmar. *PLoSNegITrop Dis* 13(2): 0007171. <https://doi.org/10.1371/journal.pntd.0007171>
- [23]. Taieb F, Dub T, Madec Y, TondeurL,Chippaux JP, Lebreton M, et al. (2018). Knowledge,attitude and practices of snakebite managementamongst health workers in Cameroon: Need forcontinuous training and capacity building. *PLoSNegl Trop Dis* 12(10): e0006716. <https://doi.org/10.1371/journal.pntd.0006716>
- [24]. NuwadattaSubedi1 ,Ishwari Sharma Paudel, Ajay Khadka, UmeshShrestha, VipulBhusanMallik and K. C. Ankur.(2018). Knowledge of first aid methods andattitude about snake bite among medicalstudents: a cross sectional observationalstudy. *Subedi et al. Journal of Occupational Medicine and Toxicology* (2018) 13:26 <https://doi.org/10.1186/s12995-018-0210-0>
- [25]. Parker-Cote J&Meggs WJ. (2018).First Aid and Pre-Hospital Management of Venomous Snakebites.*Trop Med Infect Dis*. 2018 Apr 24;3(2). pii: E45. doi: 10.3390/tropicalmed3020045.
- [26]. HarshalTukaramPandve, AnujaMakan, TejashreeArunKulkarni (2017) Assessment of Awareness Regarding Snakebites and its Related Issues among Rural Communities. *SF J Pub Health*.
- [27]. VongphoumyInthanomchanh, Joshua A. Reyer1, JoergBlessmen, KetkesonePhrasisombath, Eiko Yamamoto and Nobuyuki Hamajima.(2017). Assessment of knowledge about snakebite management amongst healthcare providers in the provincial and two district hospitals in Savannakhet Province, Lao PDR *Nagoya J. Med. Sci.* 79. 299 ~ 311, 2017 doi:10.18999/nagjms.79.3.299
- [28]. NazmulAhsan, RidwanurRahman, Robed Amin, &EnamulHoqueChowdhury.(2017). Knowledge of Snake Bite Management among Health Service Providers at a Rural Community of Bangladesh. *Journal of Current and Advance Medical Research* pISSN 2313-447X January 2017, Vol. 4, No. 1, pp. 3-8 <http://www.banglajol.info/index.php/JCAMR>
- [29]. Kashif Ali1,& , IshanPathak.(2017). Knowledge, Attitude and Practice regarding Snakes and Snakebite among Interns. *Indian Journal of Forensic and Community Medicine*, October-December 2017;4(4):229-231. DOI: 10.18231/2394-6776.2017.0049
- [30]. IshanPathak&ChandraMetgud.(2017). Knowledge, attitude and practice regarding snakes and snake bite among rural adult of Belagavi, Karnataka. *International Journal of Community Medicine and Public Health*