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Knowledge on First Aid Management of Snakebite among Community People of Kanchanpur District

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ABSTRACT

Background : Snakebites are a significant but often neglected health concern, with unclear information available to the general public regarding their management. Effective first aid for snakebites is crucial for medical professionals, paramedics, and community members. This study aimed to assess the level of knowledge regarding first aid management of snakebites among community members.

Methods: A descriptive cross-sectional research design was used in Beldadi-4 Rural Municipality, Kanchanpur, Nepal. Data were collected using a non-probability convenience sampling technique, targeting community members in the selected ward. An interview schedule was employed for data collection, which was then edited, coded, and tabulated. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS) software version 20, utilizing both descriptive and inferential statistics.

Results: The findings revealed that 72.6% of respondents had moderate knowledge of first aid for snakebites, while 18.9% had poor knowledge and only 8.4% demonstrated good knowledge. There was a significant association between respondents' knowledge levels and their exposure to snakebite situations.

Conclusions: The study concluded that most respondents possessed moderate knowledge of first aid management for snakebites. Awareness programs are necessary to improve understanding in this critical area.

Keywords: *Community, First aid, Knowledge, Snakebite*

INTRODUCTION

Snakebite is one of the most common medical emergencies and occupational hazards caused by the bite of snakebite, especially venomous snakes which ultimately affects individual health.[1] Snakebite envenoming, a neglected tropical illness, is brought on when a poisonous snake accidentally injects people with its highly specialized deadly secretion or venom. The snake injects venom through its fangs, which are modified teeth attached to a venom gland by a duct.[2]

The WHO has classified over 250 poisonous snakes as medically significant. It causes high mortality and morbidity in people, mainly due to acute injury and permanent sequelae, and has substantial financial consequences associated with its clinical management. Similar to other NTDs, snakebite affects mostly low-income communities, contributing to the worsening of the poverty–disease cycle. In the 2021-2030 NTD Roadmap, WHO urged the need to improve the robust and comprehensive evidence on the health and socioeconomic effects of snakebite in endemic countries.[3]

Globally, each year about 5.4 million people are bitten by snakes with 1.8 to 2.7 million cases of envenoming. Around 81410 to 137880 people die each year and around 3 times as many amputations and other permanent disabilities are caused by snakebites annually.[4]

South East Asia is the world's most heavily affected region with numerous venomous snake species, and inadequate snake bite control programs risking the life of people residing in this area.[5]

In Nepal around 40,000 individuals are reported to be bitten by snakes each year, with nearly 3000 people dying as a result. Terai region has the highest snakebite incidence as half of the population lives in Terai region, with an estimated 261 incidences per 100,000 people each year.[6]

Likewise, the annual incidence of snake bites is estimated at 15,000, with approximately 10% resulting in envenomation and a subsequent 10% mortality rate among those bitten by venomous snakes. The misconceptions about snakes and snakebites are prevalent among the Nepalese public, potentially impacting treatment outcomes.[7]

The WHO as aimed to reduce snakebite mortality by 50% by 2030. In 2019, globally, 63,400 deaths were attributed to snakebites, with South Asia bearing the highest burden among which India recorded the highest number of deaths, with 50,000 in 2019.[8]

The Government of Nepal is also committed to achieving the national target which is aligned with the W.H.O. target of a 50% reduction in deaths and disabilities due to snakebite envenomation by 2030. Most of the fatalities are due to communities being unaware, people practicing harmful traditional measures like using tight tourniquets and suction, victims not reaching hospitals on time, and inadequate training of the health care providers.[9]

A systematic review and meta-analysis conducted on Knowledge and awareness regarding snakebite and management of snakebite envenoming among health workers and the general population of different 12 countries including Nepal showed that only 56% have the higher knowledge.[10]

A study conducted on Knowledge regarding first aid measures for snakebites on the community in India showed that 65.50% have excellent knowledge.[1] A study on Knowledge of first-aid methods and attitudes about snakebite among medical students in Nepal showed that only 12.6% of preclinical and 69% of clinical students had adequate knowledge on first aid.[7]

There was much research conducted in developed countries to assess the knowledge of First aid Management of snakebites but in our country, there have been few studies conducted mostly focused on medical professionals. The early and proper management of snakebites is based on the knowledge of community people, in our country community people believe in traditional practices more than medical management their knowledge of first aid is crucial for early and proper management of snakebites. Therefore, the researcher is motivated to carry out this study to better understand the community people's knowledge of first aid for snakebites.

METHODS

A descriptive cross-sectional study design was used. The study was conducted at Beldadi Rural Municipality, Ward No. 4, in Kanchanpur District, which is located in far western Nepal in Province 7, as part of the Bachelor of Nursing Science Program. This area consists of 5 wards located in the Terai region and has reported snakebite incidents. Recently, an anti-snake venom facility was established at the primary healthcare center in Beldadi. The study population consisted of adults over 18 years of age from Beldadi Rural Municipality-4, Kanchanpur. The total population of Beldadi Rural Municipality is 2,183. Adults over 18 years of age who were willing to participate in the study. Individuals who were sick at the time of data collection were excluded.

A non-probability convenience sampling technique was used to select the sample. The sample size was estimated 95 participants based on a descriptive study conducted among community members in Bartoli, Gujrat, India.[1] A structured interview schedule was developed based on the research objectives and variables of the study, following an extensive literature review and consultation with the research guide and subject experts, in accordance with the WHO Snakebite Management Protocol and the National Guideline of Snakebite Management, 2019. The expert panel comprised five individuals, and the instrument was validated through face validation, with modifications made as per their advice. Initially, the instrument was developed in English, then translated into Nepali, re-translated into English, and reviewed by a language expert for comprehensibility and simplicity.

The instrument was divided into three parts:

Part 1: Socio-demographic information

Part 2: Exposure-related variables

Part 3: Questionnaire assessing knowledge of first aid management for snakebites, consisting of a total of 21 questions.

The content validity of the tool was established through extensive literature reviews, consultations with research guides, subject experts, and opinions from a language expert. Pretesting was conducted with a total of 30 subjects meeting the inclusion criteria in Beldadi Rural Municipality-3, Kanchanpur.

Reliability was measured using Cronbach's coefficient alpha, with a computed value of 0.81, which is acceptable. Approval and permission were obtained from the relevant authority, such as Birgunj Nursing Campus. Informed written consent was taken from each respondent, who was informed that their participation was voluntary and that they could withdraw from the study at any time without any compensation. The data collected was used solely for study purposes. Participants' confidentiality was maintained throughout the study by coding and ensuring that their information would remain confidential.

After presenting and obtaining approval for the research proposal from authorities, a request letter was issued by the research management cell of Birgunj Nursing Campus. The researcher introduced herself and explained the purpose of the study to the respondents prior to data collection. Following informed written consent, data was collected through an interview schedule based on the self-administered structured questionnaire. Confidentiality was upheld by not disclosing the participants' information.

Data was collected over two weeks, from 6th to 19th of Baisakh, 2081 (Nepali calendar). The average time for data collection with one respondent was approximately 30-40 minutes, with an average of 6-7 respondents interviewed per day. All collected data was reviewed, checked, and verified daily for completeness. Editing, organizing, coding, categorizing, and entering of data were performed using computer software.

Data analysis and interpretation were conducted according to the study objectives. Findings were analyzed using descriptive statistics for demographic information (frequency, mean, median, and percentage) and inferential statistics (chi-square analysis) through the Statistical Package for Social Sciences (SPSS) Version 20 to identify associations between dependent and independent variables, as applicable. The findings were presented in tables.

RESULTS

TABLE 1: Socio-demographic characteristics of the respondents n=95

Variable	Number	Percent
Age in Years		
18 to 20	8	8.4
21-39	33	34.7
40-59	39	41.1
60 and above	15	15.8
Gender		
Male	56	58.9
Female	39	41.1
Ethnic group		
Brahmin/Chhetri	63	66.3
Janajati	25	26.3
Dalit	7	7.4
Economic status		
Sufficient for 6 months	23	24.2
Sufficient for 1 year	44	46.3
Enough to save expenditure	28	29.5
Education		
No education	5	5.3
Basic education	15	15.8
Secondary Level Education	40	42.1
Higher Secondary Level Education	35	36.8
Occupation		
Agriculture	41	43.2
Private work	26	27.4
Government Job	18	18.9
Business	10	10.5

Table 1 presents the socio-demographic characteristics of the respondents (age, gender, ethnic group, economic status) out of 95 respondents, which shows the highest age group in the study was the 40-59 years age group which was less than half (41.1%). More than half of respondents were male i.e. 58.9%. Most respondents were Brahmin/Chhetri (66.3%). Nearly half (46.3%) of the respondents had income sufficient for 1 year less than half (42.1%) were secondary level. Less than half (43.2%) of respondent's occupation was agriculture.

TABLE 2: Exposure-related variables and source of information of the respondents n=95

Variable	Number	Percent
Bitten by snakebite		
No	86	95
Yes	9	5
Assisted snakebite victim		
Yes	53	55.8
No	42	44.2
Source of information		
Health Workers		
Books	35	
Family	27	36.8
Teacher	23	28.4
	10	24.2
		10.5

Table 2 depicts that only a few (9.5%) respondents were bitten by snakebite, and more than half (55.8%) assisted snakebite victims, one-third (36.8%) reported health workers as the main source of information on first aid management of snakebite.

TABLE 3: Respondents level of knowledge on first aid management of snakebite n=95

Level of Knowledge	Number	Percent
Poor <60%	18	18.9
Moderate 60-80%	69	72.6
Good >80%	8	8.4
Total	95	100

Table 3 illustrates the level of knowledge regarding first aid management of snakebite, in which the majority (72.6%) of the respondents had a moderate level of knowledge followed by (18.9%) of the respondents had poor knowledge and only (8.4%) of the respondents had a good level of knowledge.

TABLE 4: Association between respondent's knowledge level and socio-demographic variables n=95

Variable	Level of Knowledge				x^2	P-value
	Poor		Moderate to Good			
	Number	Percent	Number	Percent		
Age						
<40	9	9.4	32	33.6	.424	0.515
>=40	9	9.4	45	47.3		
Gender						
Male	9	9.4	47	49.4	.735	0.391
Female	9	9.4	30	31.5		
Ethnic group						
Brahmin/ Chhetri	11	11.5	51	53.6	.169	0.681
Other	7	7.3	26	27.3		
Economic Status						
Sufficient for 6 months	6	6.3	17	17.8	1.007	0.316
Enough to save following the expenditure	12	12.6	60	63.1		
Education						
Up to Basic	6	6.3	9	9.4	5.922	0.052
Secondary and above	12	12.6	63	66.3		
Occupation						
Agriculture	8	8.4	33	34.7	0.15	0.903
Others	10	10.5	44	46.3		

Table 4 illustrates the association between respondent's knowledge level and the socio-demographic variables of respondents. No statistically significant association was found between knowledge level and socio-demographic variables.

TABLE 5: Association between respondent's knowledge level and exposure-related variables n=95

Variable	Knowledge				x^2	P-value
	Poor		Moderate to Good			
	Number	Percent	Number	Percent		
Variable						
Bitten by snake						
Yes	1	1.0	8	8.4	0.3980	.528
No	17	17.8	69	72.6		
Assisted snakebite victims						
Yes	6	6.3	47	49.4	.450	0.033**
No	12	12.6	30	31.5		

**=*Statistically Significant*

Table 5 illustrates he association between respondents' knowledge level and exposure-related variables where the respondent who assisted the snakebite victim has a significant association (P value =0.033) with the level of knowledge.

DISCUSSION

In the present study, almost all (96.8 %) of respondents stated as soon as possible snakebite victims should be transported to the hospital. This finding is supported by the study conducted by (Subedi et al., 2018) who showed almost all (99%) respondents stated as soon as possible the victim should be transported to the hospital.[7]

In the present study, less than half (47.4%) of respondents stated the bite site should not be rinsed with water as soon as possible. This finding is supported by the study conducted (by Parajuli et al., 2022) which showed less than half (46%) stated the bite site should not be rinsed with water as soon as possible.[11]

A present study revealed that the majority (72.6%) of the respondents had moderate knowledge while a quarter (18.9%) of respondents had poor knowledge and only a few (8.4%) respondents had good knowledge. This finding is contrast to study conducted in south India by Thomas Beeson where 86% had poor knowledge about different domains of first aid measures.[12]

The current study discusses the association between the level of knowledge and their socio-demographic and exposure-related variables. The calculated P value of Age, Gender, Ethnic group, Economic status, Education, Occupation, and being bitten by a snake is more than 0.05. It concludes that it is statistically not significant. This is supported by study conducted by study conducted by Meenakshi (2020) which shows no association between level of knowledge and socio-demographical variable.[13] This is contrast to by the study conducted by Mary Minolin (2018) which shoed statistically significant association.[14] On the other side, the p-value of assisted the victim (exposure-related variable) was less than 0.05 and concluded that it was statistically significant for the respondent who assisted the snakebite victim. This is contrast to the study conducted by Meenakshi (2020) there is no significant correlation between individuals who had assisted snakebite victims and their knowledge of first aid. The study was conducted on only one ward of Kanchanpur district so findings might not be generalized beyond the study setting.

CONCLUSIONS

The study concluded that the majority of respondents had a moderate level of knowledge. The study further shows that there is a significant association between the level of knowledge and respondents who assisted snakebite victims. This suggest that while general knowledge is present, there is need for more targeted education program to enhance the depth of knowledge among the population.

The study would provide baseline information and a source of references for future researchers in related topics.

RECOMMENDATIONS

Based on the findings of the study, the researcher recommends conducting an education session for the community people about first aid management of snakebites. The study can be conducted on a large scale to identify the level of knowledge on first aid management of snakebites.

CONFLICT OF INTEREST

None

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