International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)
IJAMSCR |Vol.13 | Issue 3| Jul - Sept -2025
www.ijamscr.com
DOI : https://doi.org/10.61096/ijamscr.v13.iss3.2025.476-481
ISSN: 2347-6567

Research

The First Aid Protocols, Effective Treatment Strategies for Snake Bite

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Published on: 30 Jul 2025

Published by:
Futuristic Publications

Abstract

Background: Snakebite envenomation remains a critical medical emergency, particularly in rural and tropical regions. Prompt and effective first aid treatment strategies are essential to reduce morbidity and mortality. The first aid protocol for snakebite emphasizes rapid assessment, reassurance of the victim to minimize panic and systemic absorption of venom, and immobilization of the affected limb using a pressure immobilization technique when appropriate. Avoiding harmful traditional practices such as incision, suction, or application of tourniquets is crucial. Effective management also includes early transport to a healthcare facility equipped to administer antivenom and provide supportive care. Timely intervention, combined with community education and adherence to evidence-based protocols, significantly improves outcomes. This abstract highlights the importance of structured first aid approaches and coordinated core pathways as the cornerstone of effective snakebite treatment strategies.
Aim: To establish timely, evidence-based first aid and treatment strategies for snakebite victims to reduce complications and improve survival.
Method: A cross-sectional survey of 200 dental students (67 males, 133 females) assessed knowledge of nanorobotics in dentistry. Responses were analyzed using chi-square tests based on gender, age, and year of study.

Keywords: Snakebite, First aid, Envenomation, Immobilization, Antivenom, Emergency treatment, Evidence-based protocols, Venom management, Rural healthcare and Snakebite management strategies

INTRODUCTION

Snakebite envenomation is a significant global health concern, particularly in tropical and rural regions where encounters with venomous snakes are more common. Each year, millions of people are bitten by snakes, leading to substantial morbidity, disability, and death if not managed promptly and effectively. Early first aid plays a crucial role in limiting the spread of venom and preventing life-threatening complications. Effective first aid protocols focus on rapid assessment of the patient, calming and reassuring the victim to reduce anxiety-induced acceleration of venom absorption, and immobilization of the affected limb to slow systemic spread. Evidence-based strategies discourage outdated or harmful practices such as incision, suction, or the use of tight tourniquets, which con worsen local tissue damage and complicate definitive care. In addition to immediate core, timely transport to a healthcare facility of providing antivenom.

Methodology

Study Design and Area
A cross-sectional study was carried out at a tertiary care teaching hospital in Khammam.

Study Population
The study population included healthcare students, ranging from third-year to internship dental students, who responded to the offline paper-based questionnaire survey.

Study Instrument
A self-administered questionnaire was designed based on the topic The First Aid Protocols, Effective Treatment Strategies For Snake Bite. It consisted of 15 questions. Each participant filled in demographic data such as name, age, and year of study. Participants selected one
option from the provided answers for each question, which focused on social media use and e-professionalism.

Pilot Study
A pilot study was conducted on a small group of students to assess the validity and reliability of the questionnaire.

Sampling Method
Convenience sampling method was used to select participants for the study.

Inclusion Criteria
Students who were interested in the study and willing to participate were included.

Exclusion Criteria
Students who were unwilling to participate were excluded from the study.

Organizing the Study
The study utilized a paper-based version of the self-administered questionnaire consisting of 10 questions focusing on knowledge and awareness. It included sections for demographic data (Name, Age, Sex, and Year of Study). Participants were required to answer all questions by selecting one option from the provided answers.

Statistical Analysis
Data collected from the filled questionnaires were tabulated in an Excel worksheet and analyzed using SPSS version 29.

RESULTS

A total of 200 students took part in this with females (66.5%) and male of (33.5%). Age of the participants ranging from 18-25 years. In this study females were more likely to demonstrate perception in dissection room experiences than male. Significantly interns (39.0%) are the one most participated followed by IV BDS (37.0%) followed by III BDS (24.0%).

AGE					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	200	18	25	21.89	1.035

GENDER		
	Frequency	Percent
Male	67	33.5
Female	133	66.5
Total	200	100.0

YEAR OF STUDY		
	Frequency	Percent
III BDS	48	24.0
IV BDS	74	37.0
INTERNS	78	39.0
Total	200	100.0

Distribution and comparison of responses based on gender
Based on Gender

- 84.2% of Female participants have reported correct answers as its important to learn First aid for snake bite than Males 83.5%.
- 36.7% Female participants are interested in participating in first aid training session for snakebite than Males 33.3%.
- 62.5% Female participants reported correct answers for what does an antivenom contain than Males 47.5%.

Item	Response	Males		Females		Chi-Square value	P value
		n	%	n	%		
Q1	1	58	83.5	112	84.2	7.315	**0.006***
	2	6	8.9	12	9.0		
	3	3	4.4	6	4.5		
Q2	1	23	33.3	49	36.7	2.750	0.432
	2	8	12.6	16	21.6		
	3	32	42.5	65	40.5		
Q3	1	45	40.7	83	59.3	1.920	0.589
	2	7	29.2	17	20.8		
	3	16	47.1	18	22.9		
	4	6	42.9	15	17.1		
Q4	1	16	33.3	26	66.7	0.697	0.874
	2	23	36.4	65	63.6		
	3	25	39.1	45	60.9		
	4	3	42	7	58		
Q5	1	1	2.5	7	7.5	2.930	0.402
	2	8	7.1	24	32.9		
	3	6	6.4	9	60		
Q6	1	51	42.6	109	57.4	3.720	**0.06**
	2	5	21.7	18	18.3		
Q7	1	54	78.0	111	60.8	1.489	0.475
	2	11	20.7	16	29.3		
	3	1	1.2	0	0		
	4	1	1.2	6	12.1		
Q8	1	38	56.7	76	57.1	3.980	0.05*
	2	2	2.9	10	7.5		
	3	13	19.4	15	11.3		
	4	14	20.8	32	24.0		
Q9	1	43	71.2	104	68.8	0.671	0.413

	2	17	21.6	13	18.4		
	3	5	6.4	13	18.4		
	4	2	3.7	3	2.3		
Q10	1	7	13.6	15	15	7.241	0.065
	2	53	62.9	97	57.1		
	3	7	13.6	6	16.2		
	4	1	3.3	15	25.6		
Q11	1	2	3.3	13	6.7	2.655	0.448
	2	5	6.4	14	9.6		
	3	9	30	21	20		
	4	51	61.8	85	58.2		
Q12	1	2	2.9	32	24.0	6.418	0.003*
	2	49	73.1	73	54.8		
	3	8	11.9	15	11.2		
Q13	1	42	32.8	83	57.2	2.311	0.510
	2	6	16.1	17	13.9		
	3	11	29.3	17	13.9		
	4	8	11.2	16	12.8		
Q14	1	36	47.5	97	62.5	0.221	0.974
	2	15	28.5	8	11.5		
	3	7	16.8	12	13.2		
	4	9	18.2	16	18.8		
Q15	1	3	4.4	19	14.2	1.793	0.05*
	2	5	7.4	7	5.2		
	3	8	11.9	10	7.5		

P≤0.05 is statistically significant

Distribution and comparison of responses based on year of the study: Based on Year of Study

- 41.7% of IV BDS students are given the correct answers as snake venom effect the human body followed by 37.5% III BDS, followed by 20.8% Interns
- 86.1% of III BDS students have given the correct answer for First aid step for a snake bite followed by 72.7% Interns, followed by 71.2% IV BDS.
- 35.0% III BDS students have given the correct answer for the who invented anti snake venom followed by 35% IV BDS followed by 30% Interns

Item	Response	III BDS		IV BDS		INTERN		Chi- Value	P-Value
		n	%	n	%	n	%		
Q1	1	39	81.2	41	55.4	0	0	3.998	0.06
	2	5	10.4	4	5.4	75	96.1		
	3	3	6.2	2	2.7	2	2.5		
Q2	1	6	24	1	40	9	36	28.554	**0.06**
	2	3	16.7	2	22.2	33	61.1		
	3	2	20	1	10	7	70		
Q3	1	31	39.3	58	41.4	27	19.3	21.445	**0.08**
	2	4	16.7	6	25	14	58.3		
	3	12	35.3	2	35.3	10	29.4		
	4	1	7.1	8	57.1	27	35.7		
Q4	1	5	27.8	7	38.9	28	33.3	27.128	**0.246**
	2	2	9.1	6	27.3	14	63.6		
	3	7	30.4	6	26.1	10	43.5		
	4	34	39.3	55	43.3	26	17.3		
Q5	1	3	6.2	4	5.4	2	2.5	12.714	**0.048***
	2	5	10.4	6	8.1	7	8.9		
	3	2	4.1	12	16.2	9	11.5		

Q6	1	33	74.7	43	76.5	47	74.7	2.257	0.323
	2	7	10.4	7	10.4	9	9.1		
Q7	1	34	64.6	44	56.7	47	65.4	2.712	0.607
	2	8	29.6	10	14.7	9	13.3		
	3	1	1.8	6	12.7	14	18.7		
	4	5	13.5	14	18.6	8	8.6		
Q8	1	9	37.5	10	41.7	9	20.8	34.979	**0.06**
	2	1	8.3	2	16.7	9	75		
	3	9	25	6	21.4	55	53.6		
	4	29	51.9	56	29.6	5	18.5		
Q9	1	41	86.1	60	71.2	44	72.7	14.651	**0.08**
	2	3	5.8	4	11.1	12	13.2		
	3	3	4.7	6	15.6	14	15.4		
	4	1	2.4	4	7.5	8	7.5		
Q10	1	7	35	7	35	6	30	12.306	0.055
	2	33	37.1	59	40.6	51	22.4		
	3	1	7.7	6	46.2	6	46.2		
	4	2	20	2	20	6	60		
Q11	1	6	40	5	33.3	4	26.7	33.408	**0.076**
	2	3	13.6	3	13.6	16	72.7		
	3	7	23.3	12	40	11	36.7		
	4	37	39.5	54	43.8	45	17.1		
Q12	1	1	9.1	4	36.4	6	54.5	14.996	**0.474**
	2	39	38.6	53	41.2	53	20.3		
	3	8	25.8	13	41.9	10	32.3		
Q13	1	34	37.2	59	40.7	52	22.1	14.977	**0.748**
	2	5	21.7	8	34.8	10	43.5		
	3	6	21.4	9	32.1	13	46.4		
	4	8	47.1	8	47.1	1	5.9		
Q14	1	8	18.8	7	43.8	28	37.5	17.924	**0.006***
	2	3	23.1	1	7.7	9	69.2		
	3	8	42.1	9	47.4	2	10.5		
	4	29	35.8	57	40.6	39	23.6		
Q15	1	6	12.5	16	21.6	28	35.8	13.807	**0.032***
	2	4	8.3	1	1.3	7	8.9		
	3	6	12.5	7	9.4	5	6.4		

P≤0.05 is statistically significant

DISCUSSION

Snakebite remains a public health challenge in many parts of the world, especially in rural and underserved regions. The outcome of a snakebite largely depends on the speed and appropriateness of the first aid provided. Despite advances in medical treatment, deloys in proper core, use of outdated methods, and lack of awareness often contribute to poor outcomes.

Effective first aid protocols prioritize safety and simplicity. Immobilization of the affected limb using a splint and keeping the patient calm can significantly slow the spread of venom through the lymphatic system. This contrasts with older methods such as cutting the wound, sucking out venom, or applying tight tourniquets, which have been proven ineffective or harmful.

Another key aspect of snakebite management is rapid transport to a medical facility. The availability and timelycinistration of antivenom remain critical to neut venom and preventing severe systemic effects. Never, in many areas,

CONCLUSION

Effective first aid protocols and treatment strategies ore critical in reducing the morbidity and mortality associated with snahebite envenomation. Prompt recognition, reassurance of the victim, proper immobilization of the affected limb, and avoidance of harmful traditional practices form the cornerstone of immediate core. Equally important is the rapid transport of patients to healthcare facilities equipped to provide antivenom and supportive treatment. Public education, community engagement, and standardized training for first responders can greatly improve outcomes. By implementing evidence-based protocols and ensuring timely intervention, the impact of snakebites can be significantly minimized, ultimately saving lives and reducing long-term disability.

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