

## Original Research Article

# Study on awareness regarding snake bite hazards among people working in agriculture sector and health education about preventive and first aid measures

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### ABSTRACT

**Background:** Snake bite is a common medical emergency and an occupational hazard, more so in tropical India, where farming is a major source of employment. In India alone, it has been estimated that as many as 2.8 million people are bitten by snakes, and 46 900 people die from snakebite every year. The objective of the present study is to study the awareness about hazards of snake bite and to educate about preventive and first aid measures for snake bite.

**Methods:** This study was a community based longitudinal study conducted in 7 villages near Kurnool town. The sample size was 230. From each agriculture workers after obtaining consent pre-test was done to know their awareness regarding hazards of snake bites in agriculture fields and preventive and first aid measures in each village followed by post-test after health education.

**Results:** In this study 230 agriculture workers were participated. Among them 108 (46.95%) were males and 122 (53.1%) were females. Most of the study population were in the age group of 31-40 years (36.9%). Using torch during nights was 68.7% it was increased significantly to 83% after health education, using foot wear was only in 30.4% and increased significantly to 100%, using stick was in 76% and increased to 100% significantly.

**Conclusions:** The practice of using torch, wearing footwear, using stick while on field, avoid sleeping on ground in the field were significantly improved after health education. The first aid measure measures after snake bite like immobilization of bitten limb, reassure the person bitten by snake, avoid suctioning, avoiding tourniquet were also improved significantly after health education.

**Keywords:** Snake bite hazards, Agriculture workers, First aid and preventive measures

### INTRODUCTION

Snakebite is a common and neglected public health problem in tropical and subtropical region affecting people mostly of lower socioeconomic group. It mostly affects the farmers and those who work in the fields and thus one of the occupational injury. The public health issues of snakebite is neglected globally and it has only been added to WHO's list of neglected tropical diseases in June 2017.<sup>1</sup>

Snake bite is a common medical emergency and an occupational hazard, more so in tropical India, where farming is a major source of employment.<sup>2</sup>

The annual number of snakebites around the globe is estimated to be around 1.2-5.5 million. Of this, 81-95% occur in tropical regions of South Asia, South-East Asia, Sub-Saharan Africa and Latin America.<sup>3</sup>

In India alone, it has been estimated that as many as 2.8 million people are bitten by snakes, and 46 900 people die from snakebite every year.<sup>4</sup>

Large numbers of victims survive with permanent physical and psychological sequale, grossly affecting the ability to work and quality of remaining life.<sup>5</sup> Despite having this high disease burden, snakebite is still a neglected topic in the global health agenda.<sup>3</sup> Agriculture is the backbone of Indian economy where farmers health is nation's health. Snake bite is responsible for about 2.85%-5.3% of the mortality of total hospital admission in India in different states as compared to 20 per year in USA, every 3 to 5 years in Europe. The high mortality in India is due to climatic factors, rural predominance of population and their agricultural dependence. Nearly 3500 species of snakes exist in the world. India has about 216 varieties of snakes of which about 52 are venomous and of these only 4 varieties of snakes are commonly encountered as the cause of snakebite poisoning. They are Russell's viper, *Echis Carinatus* (Viperidae), Cobras (Elapidae) and pit viper (Crotalidae).<sup>6</sup> Half of the work force is employed in agriculture sector. Hence it is very important to improve the awareness regarding hazards of snakebite as well as its prevention. The objective of the present study is to study the awareness about hazards of snake bite and to educate about preventive & first aid measures for snake bite.

## METHODS

This study was a community based longitudinal study conducted in 7 villages (Dinnedevrapadu, Mamidalapadu, Munagalapadu, Masamasjid, Kallur, Peddapadu, Venkayapalle) near Kurnool town from 1<sup>st</sup> September-31<sup>st</sup> October. The study population includes all the agriculture workers residing in the study area. The sample size calculate was 230.

### Inclusion criteria

Inclusion criteria were all the agricultural workers above 18 years of age and giving consent to participate in the study.

### Exclusion criteria

Exclusion criteria were age below 18 years and not giving consent.

Questionnaire was prepared after pilot study to our study needs. Each agriculture workers after obtaining consent pre-test was done to know their awareness regarding hazards of snake bites in agriculture fields and preventive and first aid measures in each village. It includes using torch, footwear, stick while in the field and avoiding sleeping on the ground. First aid measures like immobilization of bitten limb, giving assurance of victim and avoid suctioning and tourniquet at the bitten site. Awareness regarding ASV (Anti-snake venom). And also

utilization of health care facilities for snake bite management. Health education was given regarding prevention of snake bite, first aid measures and health care utilization for snake bite management to study subjects to generate awareness about hazards of snake bites in agriculture fields and preventive and first aid measures using audio visual aids and posters. Three weeks after health education posttest was done and compare their awareness levels before and after education intervention. Statistical analysis was done using Epi info 7 software. Numbers, percentages and chi-square test were used to test the association.

## RESULTS

In this study 230 agriculture workers were participated. Among them 108 (46.95%) were males and 122 (53.1%) were females. The mean age of the participants was 37.5±9.38 years.

**Table 1: Age and sex distribution of study population.**

Age group (years)	Male (%)	Female (%)	Total
20-30	21 (33)	46 (68.6)	67 (29.1)
31-40	41 (48.2)	44(51.7)	85 (36.9)
>40	46 (58.9)	32 (43)	78 (34)

Table 1 shows most of the study population were in the age group of 31-40 years (36.9%) followed by >40 years and 20-30 years. There were 108 (46.9%) males and 122 (53.1%) females. Among males most of them were in the age group of >40 years (58.9%) and among females 20-30 years age group (68.6%) were more common.

Table 2 shows precautions taken by farmers to avoid snake bite. Using torch during nights was 68.7% it was increased significantly to 83% after health education, using foot wear was only in 30.4% and increased significantly to 100%, using stick was in 76% and increased to 100 significantly, Sleeping on ground at fields was observed in 82.6% and this habit reduced significantly to 24.3%, sleeping on cot at field was 17.4% and increased significantly to 75.6%, all three (torch, foot wear and stick) were used in 15.2% and increased significantly to 83% after health education.

Table 3 shows awareness regarding first aid measures after snake bite was observed in 26.5% of study population and this awareness was increased significantly in all persons.

Table 4 shows awareness regarding different types of first aid measures after snake bite. Immobilization of bitten limb was observed in 14.4% and it was increased significantly to 100% after health education, Reassurance of person bitten by snake was observed only in 4.3% and it was increased significantly to 100%, suctioning and application of tourniquet were observed in 6.5% and 85.6% respectively and they were reduced to 0% and

38.7% after health education, Awareness of anti snake venom was in 10.4% and it was increased significantly to 100% after health education.

after snake bite and it reduced to 39.1% after education, 9.5% consult RMP and it reduced to 0%, only 7.8% consult government or private hospital (Allopathic) and it was increased to 60.8% after health education.

Table 5 shows awareness regarding whom to consult after snake bite. Most of them were using traditional medicine

**Table 2: Precautions to prevent snake bite.**

Measures	Pre test	Post test	$\chi^2$ value	P value
Torch	158 (68.7)	191 (83)	12.93	0.003
Foot wear	70 (30.4)	230 (100)	242.27	<0.001
Stick	175 (76)	230 (100)	60.21	<0.001
Sleeping on ground at fields	190 (82.6)	56 (24.3)	156.89	<0.001
Sleeping on cot	40 (17.4)	174 (75.6)	156.89	<0.001
Torch, foot wear, stick	35 (15.2)	191 (83)	211.68	<0.001

**Table 3: Awareness regarding first aid measures after snake bite.**

	Pre test number (%)	Post test number (%)	$\chi^2$ value	P value
Yes	84 (36.5)	230 (100)	210.96	<0.001
No	146(63.5)	0 (100)		
Total	230	230		

**Table 4: Awareness regarding first aid measures after snake bite.**

First aid measures	Pre test	Post test	$\chi^2$ value	P value
Immobilisation	33 (14.3)	230 (100)	341.07	<0.001
Reassurance	10 (4.3)	230 (100)	417.84	<0.001
Suctioning	15 (6.5)	0 (0)	13.50	<0.001
Tourniquet	197 (85.6)	89 (38.7)	107.81	<0.001
awareness OF ASV	24 (10.4)	230 (100)	369.45	<0.001

**Table 5: Awareness regarding whom to consult after snake bite.**

Medical care	Pre Test	Post Test	$\chi^2$ value	P value
RMP	22 (9.5)	0 (0)	21.05	<0.001
Government, Private Hospital	18 (7.8)	140 (60.8)	143.48	<0.001
Traditional medicine	190 (82.6)	90 (39.1)	60.60	<0.001
Total	230	230		

## DISCUSSION

This study was educational intervention study to know the awareness levels regarding snake bite prevention, first aid measures after snake bite and whom to consult after snake bite.

In this study overall awareness regarding first aid measures after snake bite was 36.5%. Among these immobilization was 14.3%, reassurance was 4.3%, suctioning was 6.5%, applying tourniquet was 86.5% and awareness regarding ASV was 10.4%. In a study done by Patkak et al it is observed that all the study participants 400 (100%) said they would rush to the nearest health facility, 304 (76%) believed that they would tie a tourniquet at the site.<sup>7</sup> Other answers given by the study participants were washing with soap 58 (14.5%), Spitting

out the blood 56 (14%), Home based remedies 38 (9.5%), while 36 (9%) even considered visiting a local quack or faith healer after a Snake bite. When asked about measures taken upon seeing a Snake, maximum number of respondents 248 (62%) opined leaving the snake as it is, followed by calling a forest official or a professional snake rescuer 58 (14.5%).<sup>7</sup> In another study done by Chincholikar et al in Maharashtra among rural adults it is observed that awareness about first aid measures was less in all subjects.<sup>8</sup> However knowledge about symptoms of snake bite was higher in farmers, students as well as house-wives. It was also observed that educated people had more knowledge about types of snakes as compared to uneducated.<sup>8</sup> Silvi et al observed that high percentage of farmers were aware of most of the recommended first aid measures. However it was evident that a very high percentage of participants prefer the application of tourniquet as a first aid measures following snake bite

following snake bite. This practice, although considered a dangerous first aid measure, has been observed among nearly 50% of viper bite victims in Sri Lanka.<sup>9</sup>

This study shows awareness regarding whom to consult after snake bite –RMP was 9.5%, Government or Private Hospital was 7.8% and traditional medicine was 82.6%. A study done by Chincholika et al showed that awareness about first aid measures was less in all subjects.<sup>8</sup> However knowledge about symptoms of snake bite was higher in farmers, students as well as house-wives. It was also observed that educated people had more knowledge about types of snakes as compared to uneducated ( $\chi^2 = 18$   $p < 0.001$ ).<sup>8</sup> Another study done by Sharma et al (145) revealed that Snake bite victims consulted traditional healers less often during the intervention period (8%) compared with the pre-intervention period (23%) ( $p < 0.001$ ), and an increased proportion of victims (77% versus 55%) were transported directly to the Damak RCSC during the intervention period ( $p < 0.001$ ).<sup>10</sup>

## CONCLUSION

The present study is a community based longitudinal study conducted among people working in agriculture sector to know and improve the awareness regarding snake bite prevention and first aid measures. From this study it can be concluded that most of the study population prefers traditional medicine as treatment after snake bite. The practice of using torch, wearing footwear, using stick while on field, avoid sleeping on ground in the field were significantly improved after health education. The first aid measure measures after snake bite like immobilization of bitten limb, reassure the person bitten by snake, avoid suctioning, avoiding tourniquet were also improved significantly after health education. Awareness regarding ASV was also significantly improved.

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