

Management of Snake Bites in the Agricultural Sector

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Abstract:

Snake bites are the one that causes high rates of morbidity and mortality among workers in the agricultural sector. Snake bites can be a medical emergency that can endanger human life, and snake venom can damage local tissues, resulting in permanent disability and amputation. This study aims to identify farmers' knowledge related to snakebite management. A literature review searched three databases, Google Scholar, ScienceDirect, and PubMed, for all study designs between 2019 and 2023. The researcher found ten studies that met the inclusion criteria in the review. The high risk of snake bites for farmers makes it essential for farmers to know the most critical things in snakebite management. When bitten by a snake, the most important thing to do is first aid treatment in a threatening situation. Some factors that can affect the management of snake bites on farmers are the characteristics of farmers who are usually male with a low educational background and level of knowledge. In addition, low experience will affect the ability to handle first aid. Nurses can be present as extension workers to increase farmers' knowledge about first aid for snake bites to farmers.

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INTRODUCTION

Agronursing is a holistic and comprehensive nursing care and management service in agriculture that focuses on clients (individuals, families, groups, and communities) (Kurniyawan et al., 2023). Approximately 60% of Indonesia's population lives in rural areas, and most work in agriculture. Many of Indonesia's rural workforce work in the agricultural sector and are at risk of health problems related to farmer-environment interactions (Afandi et al., 2023).

Snake bites are a medical emergency that can cause permanent disability and even death. Snake bites can be a medical emergency that can threaten human life, and snake venom can disrupt respiratory function, cause bleeding disorders and kidney function, and damage local tissue, causing permanent disability and amputation (Wintoko & Prameswari, 2020). Venomous snake bites often occur in tropical areas where the main occupations are farmers, fishermen, hunters, and snake charmers. The Indonesian population is a group that is at high risk of being bitten by snakes because most of them work in the agricultural and plantation sectors (Rachmania & Ludyanti, 2022).

Management is the science and art of managing a process of utilizing resources and other resources effectively and efficiently (Hasibuan, 2019). Snakebite management awareness is good self-awareness followed by good knowledge and perceptions about handling venomous snake bites properly. Self-awareness is crucial in reducing the incidence of snake bites in farmers.

Farmers must be well aware of the importance of snakebite management to reduce morbidity and mortality from snakebites (Yunanto et al., 2022). The first aid method that can be given to someone who has a snake bite is to calm the victim, immobilize the victim's entire body by lying him in a recovery position, and immobilize the affected body part using either a splint, sling, or pressure bandage immobilization method (Kurniyawan et al., 2023). This study aims to identify farmers' knowledge related to snakebite management.

METHOD

This study uses a literature review design, which focuses on knowing the level of self-awareness of farmers in snakebite management, with a literature search process using three databases, namely Google Scholar, ScienceDirect, and PubMed with a publication year range of 2019–2023. The search was carried out using keywords in Indonesian and English. In the search for Indonesian language literature, some of the keywords used were "Gigitan Ular" OR "Ular Berbisa" OR "Hewan Berbisa" AND "Agricultural" OR "Pertanian" OR "Wilayah Pertanian" AND "Management" OR "Penanganan". Meanwhile, in the search for literature using English, the keywords used are "Snakebite" OR "Rattlesnake" AND "Agricultural" AND "Management."

The article search process begins with identifying keywords that have been determined. At the identification stage, there are 3,601 articles that match the keywords. Then, do a screening by selecting the year of publication of the journal article following the research. At the screening stage, 1,290 articles met the research criteria. After that, the articles were filtered according to the inclusion and exclusion research criteria. One hundred thirty-two articles met the inclusion and exclusion research criteria. Then, the articles were filtered by selecting the appropriate abstracts to focus on those that match the research criteria. In this step, 15 articles that match the research criteria were obtained. The next step is selecting the 15 articles according to their language, research design, outcomes, and other criteria. Finally, ten articles were determined according to the research criteria, which could then be continued at the analysis stage.

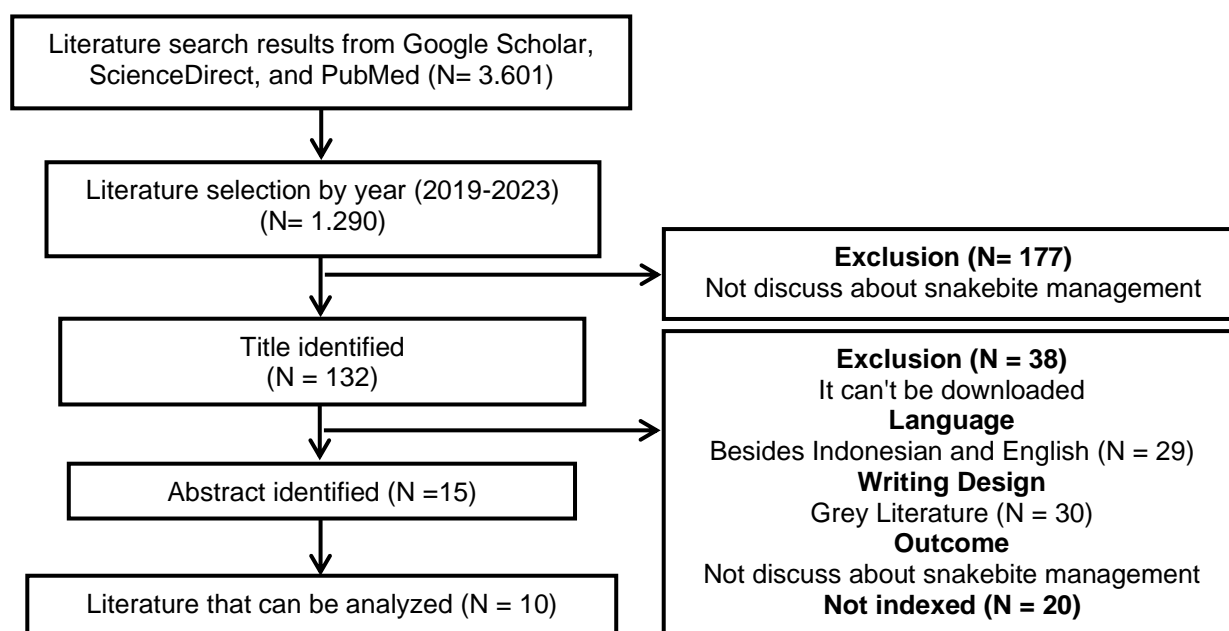


Figure 1. Flow Diagram of Analysis Literature Based on PRISMA (2009)

RESULT

Snakebite is a medical emergency that can threaten human life, and snake venom can interfere with respiratory function, cause bleeding, interfere with kidney function, and damage local tissue. Snake bites often occur in tropical areas (Wintoko & Prameswari, 2020). Several studies also say that the most important thing to do when bitten by a snake is first aid treatment in a threatening situation. Low experience will affect the ability to handle first aid performed (Namami & Yunanto, 2022).

Table 1. Demographic Data of Respondents (N=15)

| No. | Author and Jurnal Identity | Journal Title | Objective | Population and Sample | Method | Summary of Result |
|-----|--|--|---|---|---|---|
| 1. | Author : Yunanto, R, A., Wantiyah., Permatasari, N, N., Siswoyo and Setioputro, B. Jurnal Identity : Jurnal Kesehatan dr. Soebandi Vol. 10, No.1 (2022) | Self- Awareness Of Farmers In Snakebite Management In Panti District, Jember Regency | To find out the self- awareness of farmers in managing snake bites | The sample used was 100 farmers at the Panti Jember Regency using the cluster sampling technique | This research is a quantitative descriptive research with a survey approach, collecting data using a self- awareness questionnaire | Most of the farmers are male with an average age of 41.07 (SD=11.43), 12 years of farmer work experience (Min-Max 1- 50), and the education of the majority of farmers is high school (38%). Most respondents stated that some snakes in their area were non-venomous (71%). They performed first aid by immobilizing the bitten body part (79%), using a strong bandage above the bite wound (81%), and not giving alcoholic beverages to relieve pain (79%). Prevention and control measures taken to control rodents (rats) (92%) and clean the grass around the house (94%) are the best ways to prevent snake bites. Farmers also prefer modern medical methods (government hospitals or health centers) to treat snake bites (76%). Farmers in the Panti have good self-awareness of snake bites. Most farmers are knowledgeable about venomous and non- venomous snakes in their area. |

2. Author : Nekada, C, D., Amestiasih, T and Wahyuni, R.
Jurnal Identity : Jurnal Formil (Forum Ilmiah) KesMas Respati Vol. 5, No. 2, Oktober 2020, pp. 119-128
The Benefits of Handling Poisoning and Poisonous Animal Bites Education
To increase the knowledge and skills of health cadres in handling poisoning and poisonous animal bites
The population in this study was 323 cadres, and the sampling technique used purposive sampling, with 20 respondents who met the inclusion criteria. The inclusion criteria in this study were health cadres who were willing to become respondents in the area of Wedomartani Ngemplak Village, Sleman, Yogyakarta.
The method used is quantitative with a quasi-experimental design.
The level of knowledge before being given health education about handling poisoning and poisonous animal bites to the cadres of Wedomartani Ngemplak Sleman Yogyakarta in the good category was only 20%. In contrast, after being given health education, which had a good category, it increased to 85%. So, there was an increase in knowledge about handling poisoning and poisoned animal bites after being given health education and simulation.
3. Author : Yunanto, R, A., Wantiyah, dan Namami, I, Y.
Jurnal Identity : E-journal Pustaka Kesehatan Vol 10, No. 3, September 2022
Correlation between Self-Efficacy and Farmers' Skills in Performing First Aid for Snake Bites in Panti District, Jember Regency
To analyze the relationship between self-efficacy and the skills of farmers in performing first aid for snake bites in the Panti sub-district, Jember Regency.
The sample in this study were 100 farmers at the Jember Regency Panti
The research design uses a descriptive correlation with a cross-sectional approach. The instruments used were the General Self-Efficacy questionnaire and the skill SOP sheet.
The results of this study are:
A. Based on their age, farmers are entering adulthood with a median age of 40 years. Long worked as a farmer 12 years.
B. The majority of respondents were male (85%), ethnically Javanese (87%), had a high school education background (44%), and 89% of respondents stated that they did not have family members who work in the health sector
C. Self-efficacy scores according to age show a median value of 26 with a min of 15 and a max of 40. The self-efficacy indicators have a median value of a median level of 9 (min-max: 4-12), a median strength of 10 (min-max: 4-12), and a generality median of 7 (min-max: 4-16). Of the three, the highest is strength, and the lowest is generality

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| | | | | | | <p>D. Farmer's skill has a median of 16 with a nim-max of 11-35. The majority of respondents have low skills.</p> <p>E. After testing the correlation value of 0.235 ($p > 0.05$), there is no significant relationship between self-efficacy and farmer skills.</p> |
| 4. | <p>Author : Rachmania, D., Ludyanti, L., N.</p> <p>Jurnal Identity : Jurnal Pengabdian Masyarakat Bestari (JPMB), Vol. 1, No. 7, Oktober 2022</p> | <p>Improving Community Capacity in Snake-Biting First Aid</p> | <p>The purpose of this community service is to increase the knowledge and skills of the community in snake bite first aid</p> | <p>The community service activity was attended by 40 participants from the farming community in Blimbing Village, Rejotangan District, Tulungagung Regency</p> | <p>The method used in this community service activity is health education about snake bite first aid aimed at farming communities in Blimbing Village, Rejotangan District, Tulungagung Regency. Methods of counseling activities carried out include lectures, discussions, and demonstrations.</p> | <p>The age of respondents was as much as 45%, aged 25-35 years. Characteristics of education: 42.5% do not go to school, and 52.5% already know how to deal with snake bites. The ability of farmers in first aid for snake bites before being given counseling shows results as much as 52.5% in the less category, 40% in the sufficient category, and 7.5% in the good category. The community's ability after being given health education showed that almost all respondents (87.5%) were in a good category. A small portion (10%) is in the sufficient category and the rest (2.5%) is in the less category. The final results showed the participants' ability before and after the health education activities were carried out. The participants who were initially incapacitated had good skills in snake bite first aid for most respondents.</p> |
| 5. | <p>Author Ningrum, E, K., Agustina, D, M., Santoso, B, R.</p> <p>Jurnal Identity Jurnal Keperawatan Suaka Insan (JKSI), Volume 3 No.</p> | <p>Knowledge Level of Nurses About Snake Bites in the Emergency Room</p> | <p>To find out the description of the level of knowledge of nurses in the IGD Unit General Hospital, Banjarmasin, regarding snake bites</p> | <p>Population: 39 nurses working in the emergency room of Ulin Hospital, Banjarmasin Sample: 30 nurses from a population that meets the inclusion</p> | <p>The research was a quantitative descriptive study conducted from November 13, 2017, to April 19, 2018, with a snakebite questionnaire as an</p> | <p>The average age of the respondents was 26-35 years (67%), the average gender of the respondents was female (60%), the education level of the majority of respondents was DIII Nursing (63%), the majority of respondents had worked for 1-5 years (50%), 77% of respondents had never attended training</p> |

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| | 2, 1-8. https://doi.org/10.51143/jksi.v3i2.119 | | | criteria (willing to be a respondent, implementing nurse, education min D3 Nursing, working min 1 year in the ED) and exclusion (extended leave and continuing education) | instrument. After the data is collected, it will be analyzed using the univariate analysis method as a frequency distribution table. | in handling snake bites, and 70% of respondents had sufficient knowledge regarding the care of patients with snake bites. The knowledge nurses possess in the Emergency Room at Ulin Hospital, Banjarmasin, is quite good. Still, nurses should renew their skills by being more active in seeking the latest information, either through seminars or training, so they are not left behind without knowing the newest knowledge that can help provide nursing care. |
| 6. | Author Melli, P, W., Fikriyanti, Halimuddin Jurnal Identity JIM FKep Volume 5 No. 3 Tahun 2022 | Nurse Knowledge About Emergency Management of Snake Bites | To determine the level of knowledge of nurses in West Aceh district in dealing with emergency cases due to snake bites. | 76 nurses from 2 health centers in the West Aceh district, namely the Cot Seumeureung Health Center and the Drien Rampak Health Center | The research conducted was in the form of quantitative descriptive analysis by collecting data through an online questionnaire, which was conducted on December 23- 27, 2021 | Most nurses are 29 years old, with the majority of 10 years of work experience. Most respondents were female with good knowledge (51.3%) but had never handled cases of patients with snake bites. |
| 7. | Author Afni, A, C, N., Fakhrudin, N, S. Jurnal Identity Jurnal Kesehatan Kusuma Husada Vol. 11, No. 1, Tahun 2020 | First Aid and Assessment of Envenomation Severity in Snakebite Patients | To find out first aid given for the high incidence of snake bites as optimal treatment in prehospital. | The population in this study were patients who came to Gemolong Hospital with snake bite wounds. This hospital is around rice fields where the number of patient visits with snake bites is relatively high, especially for farmers during harvest and planting seasons. The sample in this study was 35 respondents. | This research method is a quantitative descriptive method using a total sampling technique. Data collection techniques with questionnaires include prehospital first aid and clinical signs and symptoms that appear in patients on arrival to determine the degree of envenomation severity. | The description of prehospital first aid performed by snakebite respondents included 40.3% by tying the snakebite wound with a rope, 31% by sucking the fig wound, 14.3% by tearing the wound with a knife, 8.5% by washing the wound using soap, and 2.9% of respondents burned the wound and gave burnt ginger to the wound area. The severity of the envenomation of respondents is as follows: 57.2% of respondents experienced degree 2 envenomation, 22.8% of respondents experienced degree 3 envenomation, and 20% of respondents experienced degree 1 envenomation. There were no respondents who experienced degree 4 |

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| | | | | | | envenomation. Traditional measures taken by responders can aggravate the wound and accelerate the spread of snake venom. The main principle suggested for the first handling a snakebite is to remain calm, immobilize the area with a pressure bandage, then refer to the hospital. |
| 8. | Author Ryandini, T, P. Jurnal Identity Jurnal Prosiding Nasional RORIKES, Vol. 1, No.1 (2020) | The Effect of Snake Bite Rescue Training on Handling Injured Victims of Honey Belimbing Farmers in Tasikmadu Palang Tuban Village | To determine the effect of snake bite rescue training on handling injured victims on honey starfruit farmers in the village of Tasikmadu Palang Tuban. | The population in this study was farmers, with a total sample of 35 people; samples were taken using systematic random sampling, totaling 32 respondents. | This study used pre- experimental research with a one-group pre- post test design or revealed a causal relationship involving one group of subjects and a data collection approach with cross-sectional. | Based on the study's results, it was found that 56% of respondents showed a lack of understanding in handling victims of snake bite injuries. They did help by removing venom by sucking, slicing the wound, rubbing chemicals on the bite, compressing it with hot water or ice, and binding firmly to the bite. However, after being given training, most of the respondents, namely 78%, showed good knowledge behavior in handling snakebite injuries, namely the act of helping by resting/immobilizing the victim, giving boards/hard mats along the legs or arms, bandaging from the palms up (fingers not bandaged).), bandage the elbow and forearm with a 90° bend, and use a mitela to support the hand. |
| 9. | Author Yunanto, R. A., Sulistiyorini, L. Jurnal Identity Jurnal Kesehatan dr. Soebandi, Vol. 9, No. 2, Tahun 2021 | A Descriptive Study Of Snakebite Victims At Two Public Hospitals Of Jember | The research aimed to describe the snakebite cases in the agricultural area from two public hospitals in Jember. | This study's population was snakebite patients who received treatment and care in those public hospitals from 2017 to 2019. the researcher used 162 medical records to explore the data. This study used the total sampling | This was a cohort design study with a retrospective approach. The researcher carried out this study in two public hospitals of Jember: dr. Soebandi hospital and Kalisat hospital. | The results showed that the age range of victims bitten by snakes was 1-79 years (male) and 4-75 years (female). It was found that the average age of the victims was 40.95, and most of the victims who snake bit were male. Most victims are farmers who do not work (mother and child), and snakes bite more in bright conditions (morning or evening). It was also found that the rainy season has the most reports of bite cases. Many victims also reported that |

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| | | | | method as the sampling technique | | they were bitten on the legs, arms, and head. The types of snakes that bit the most were <i>Trimeresurus Albolabris</i> and <i>Naja Siputatrix</i> . The prehospital management that is carried out is usually constriction using rope or cloth, but some of them don't do anything. The most commonly reported symptoms were swelling acute pain, and dizziness. It was also noted that most of the victims experienced mild and moderate poisoning. Treatment of snakes using the first dose. As well as nurses also revealed several diagnoses, such as acute pain, risk of infection, and skin problems. Generally, the length of stay of most patients is one day. |
| 10. | Author Wibawa, K, B, P., Mulyantari, N, I., Yasa, I, W, P, S. Jurnal Identity Jurnal Medika Udayana Vol. 11, No. 8, Tahun 2022 | Characteristics of Patients with Snake Bites at Sanglah General Hospital, Bali | This study aims to determine the description of patients who are victims of snake bites at Sanglah General Hospital. | Sampling was carried out using the existing population within a predetermined time limit until 50 appropriate data were finally obtained. | This is a descriptive study with a cross-sectional approach where data is only taken at one time. The samples included in this study were snakebite patients registered at Sanglah General Hospital during the study period. Patients with incomplete medical record data were excluded from this study. | There were a total of 50 patients who met the study inclusion criteria. Ages varied from 5 years to 77 years, with an average of 38.06 ± 17.0 years. Most of the patients were students (32%), followed by farmers (26%) and housewives (14). %. The dominant sex is male, with a percentage of 64%. All patients received anti-venom treatment, and none had comorbidities. As many as 74% of cases get the bite site on the leg. |

DISCUSSION

The incidence of snake bites is still a problem that is quite dangerous, especially in venomous snakes. Farmers have a relatively high risk of experiencing snakebite incidents, considering they work in the agricultural sector. Farmers generally have the characteristics of being male with an average age of 41 years, 12 years of working experience, and a high school education background (Yunanto et al., 2022). This is supported by another journal, which states that based on their age, farmers are adults with a median age of 40; the majority are male, have worked as farmers for 12 years, and have a high school education background (Yunanto et al., 2022). However, another study that took respondents from farming communities found respondents aged 25-35 years, with the majority having no school education (Rachmania & Ludyanti, 2022).

Victims of snakebite have an age range of 1-79 years for male victims and 4-75 years for female victims, but the majority of snakebite victims are male. Most of the victims are farming families who do not work, such as mothers and children, and it usually occurs in bright conditions from morning to evening during the rainy season. Victims are typically bitten on the legs, arms, and head (Yunanto & Sulistyorini, 2021). This description is in line with a study of snakebite patients in Bali, which stated that the majority of victims were male. The ages of snakebite victims varied with an age range of 5-77 years, with most cases in students, followed by farmers, then housewives, and the majority received bites on their feet (Wibawa et al., 2022).

There is a high risk of snakebite incidents to farmers, so farmers need to know how to do first aid when a snakebite incident occurs. In research at the Gemolong hospital, farmers' knowledge regarding first aid that can be done is still low with the actions taken in the form of tying snakebite wounds with rope, sucking wounds, tearing wounds with a knife, washing wounds using soap, and responding to burns and giving burnt ginger in the wound area (Afni & Fakhrudin, 2020). This is in contrast to research in Panti, Jember, where the majority of farmers have known the correct first aid measures in dealing with snakebite cases in the form of immobilizing the bitten body part, using a strong bandage over the bite wound, not giving alcoholic drinks to relieve pain and know how to prevent it (Yunanto et al., 2022). Farmers' knowledge level can be increased through health education about first aid for snake bites. Farmers' knowledge level can be increased through health education about first aid for snake bites. This is evidenced by the results of a study (Ryandini, 2020), which stated that 56% of respondents did not understand how to handle snakebite wound victims. Still, after being given training, the majority of respondents, namely 78%, demonstrated good knowledge behavior in handling snakebite wounds. This is also supported by research (Rachmania & Ludyanti, 2022); the ability of farmers to first aid for snake bites before being given counseling shows results of 52.5% in the less category, and the ability of the community after being given health education shows results for almost all respondents (87.5%) is in the good category.

In addition to the farmer's level of knowledge, it is also vital to improve the ability of nurses to handle snakebite cases. An overview of nurses' knowledge level at the Ulin Hospital Emergency Unit, Banjarmasin, 70% of respondents have sufficient knowledge about snakebite patient care. In research in West Aceh, the majority of respondents have a good level of knowledge (51.3%) but have never handled snake bite cases (Melli et al., 2022).

CONCLUSION

Characteristics of farmers are usually males with low educational backgrounds and low levels of knowledge. However, this can be improved with health education regarding the right actions in performing first aid: immobilizing the bitten body part, using a strong bandage over the bite wound, and not giving alcoholic beverages to relieve pain. Nurses can be present as educators to increase farmers' knowledge about first aid for snake bites to farmers.

REFERENCES

- Afandi, A. T., Kurniawan, E. H., Cahyani, S. D., Fajriati, W. N., Oktaviana, A. D., Nur, K. R. M., & Kurniawan, D. E. (2023). The Effect of STH Worm Infection on the Nutritional Status of Farmers in the Agronursing Area: Literature Review. *Health and Technology Journal (HTechJ)*, 1(4), 427–436. <https://doi.org/10.53713/htechj.v1i4.90>
- Afni, A. C. N., & Fakhruddin, N. S. (2020). Pertolongan Pertama dan Penilaian Keparahan Envenomasi pada Pasien Gigitan Ular. *Jurnal Kesehatan Kusuma Husada*, 11(1), 91-98.
- Hasibuan, M. (2019). *Manajemen Sumber Daya Manusia*. PT. Bumi Aksara.
- Kurniawan, E. H., Yustiana, T. S., Shofiyyah Firdaus, P., Nasywa Ramadhanti, S., Tri Afandi, A., Endrian Kurniawan, D., & Rosyidi Muhammad Nur, K. (2023). Nursing First Aid to Emergency Events in Agricultural Areas: Literature Review. *Health and Technology Journal (HTechJ)*, 1(5), 491–500. <https://doi.org/10.53713/htechj.v1i5.100>
- Kurniawan, E. H., Cahyani, P. S. R., Khoiriyah, A. A., Purnomo, F. K. A., Afandi, A. T., Kurniawan, D. E., & Nur, K. R. M. (2023). Coping Mechanisms Used by Farmers to Encounter Psychosocial Problems: Literature Review. *Health and Technology Journal (HTechJ)*, 1(4), 445–454. <https://doi.org/10.53713/htechj.v1i4.84>
- Melli, P. W., Fikriyanti, & Halimuddin. (2022). Pengetahuan Perawat Tentang Penanganan Kegawatdaruratan Gigitan Ular (Snake Bite). *JIM Fkep*, 5(3), 199-203.
- Namami, I. Y., Wantiyah., & Yunanto, R. A. (2022). Hubungan Efikasi Diri dengan Keterampilan Petani dalam Melakukan Pertolongan Pertama Gigitan Ular di Kecamatan Panti Kabupaten Jember. *E-journal Pustaka Kesehatan*, 10(3), 139-155.
- Nekada, C. D., Amestiasih, T., & Widayati, R. W. (2020). Manfaat Edukasi Penanganan Keracunan dan Gigitan Binatang Beracun. *Jurnal Formil (Forum Ilmiah) KesMas Respati*, 5(2), 119-128.
- Ningrum, E. K., Agustina, D. M., & Santoso, B. R. (2018). Tingkat Pengetahuan Perawat Tentang Gigitan Ular Di Ruang Unit Gawat Darurat. *Jurnal Keperawatan Suaka Insan (JKSI)*, 3(2), 1-8. <https://doi.org/10.51143/jksi.v3i2.119>
- Rachmania, D., & Ludyanti, L. N. (2022). Peningkatan Kemampuan Masyarakat dalam Pertolongan Pertama Gigitan Ular. *Jurnal Pengabdian Masyarakat Bestari (JPMB)*, 1(7), 641-650.
- Ryandini, T. P. (2020). Pengaruh Pelatihan Snake Bite Rescue terhadap Penanganan Korban Cedera pada Petani Belimbing Madu di Desa Tasikmadu Palang Tuban. *Jurnal Prosiding Nasional FORIKES*, 1(1), 43-47.
- Wibawa, K. B. P., Mulyantari, N. I., & Yasa, I. W. P. S. (2022). Karakteristik Pasien dengan Gigitan ular di RSUP Sanglah Bali Periode 2019-2020. *Jurnal Medika Udayana*, 11(8), 65-69.
- Wintoko, R., & Prameswari, N. P. (2020). Manajemen Gigitan Ular. *Jurnal Kedokteran Universitas Lampung*, 4(1), 45-52.
- Yunanto, R., Permatasari, N. N., & Setioputro, B. (2022). Self-Awareness Of Farmers In Snakebite Management In Panti District, Jember Regency. *Jurnal Kesehatan dr. Soebandi*, 10(1), 53-61.

Yunanto, R., & Sulistyorini, L. (2021). Snakebite Cases in Agricultural Area of Jember: A Descriptive Study of Snakebite Victims at Two Public Hospitals of Jember. *Jurnal Kesehatan dr. Soebandi*. 9(2), 67-155.