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Farmers' Knowledge of Handling and Preventing Emergencies in Agricultural Areas

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Abstract:
The incidence of work accidents in agricultural areas is quite a lot such as pesticide exposure incidents, exposure to sharp agricultural machinery or equipment, animals and plants that can injure, and positions that are not ergonomic so that it requires immediate handling. This study aims to analyze farmers' knowledge about handling and preventing emergencies in agricultural areas. This study uses the literature review method using 3 databases, namely Google Scholar, Science Direct and PubMed by considering the publication time span for the last five years, from 2020 to 2024. We used 10 studies that met the inclusion criteria in the review. It was found that some farmers have knowledge about the attitude and ability to handle emergencies. Some farmers have good knowledge, but their attitudes and knowledge related to handling emergencies are still quite low. Low knowledge and attitude towards handling emergencies can lead to undesirable outcomes such as death or long-lasting physical disability. Farmers' knowledge is also important to reduce the risk of work accidents in agricultural areas. Factors that cause a lack of knowledge and attitudes related to handling emergencies are the lack of awareness of farmers and the attitude of farmers who are too indifferent to work accidents, as well as the lack of education and training related to handling or first aid related to work accidents. For this reason, support from the government and health workers is needed to provide education and training to improve farmers' knowledge.

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INTRODUCTION

Farmers are informal workers who are the largest and most numerous professionals in Indonesia working on open land. Based on Indonesian Law No. 19 of 2013, farmers are Indonesian citizens individually or their entire families who carry out farming in the fields of horticulture, plantations, food crops, and animal husbandry (Wurarah et al., 2020; Kurniyawan et al., 2024). Agriculture is a human activity related to the production process that will create food that humans can consume from plants or animals by considering economic factors and trying to renew and develop it (Monoarfa et al., 2023; Nur et al.,2023). The interaction between farmers and the environment will lead to several health problems, so an occupational safety and health approach is needed to prevent and treat occupational accidents or emergencies that occur in farmers (Bakara et al., 2024).

An emergency condition is an event caused by an accident that can occur anywhere and anytime and occurs suddenly and requires immediate treatment. The accident itself means an

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unplanned, unexpected, and sudden incident caused by several factors called external agents. An accident can result in physical and psychological disabilities. According to data from the International Labor Organization (ILO), there was one worker who died every 15 seconds caused by work accidents in 2013. In Indonesia in 2013, the number of cases of work accidents was relatively high, 35,917 cases and data from the Ministry of Manpower and Transmigration showed that no less than six workers died every day due to work accidents (Lestari, 2020).

In working, farmers risk experiencing work accidents such as exposure to pesticides, being exposed to sharp agricultural machinery or equipment, animals and plants that can injure, non-ergonomic positions, and hot weather while working (Bagas et al., 2020). Pesticide exposure while working is one of the emergency conditions experienced by farmers that can affect the health conditions of farmers so that it can cause acute injuries or chronic diseases in farmers (Rianto et al., 2019; Putri et al., 2024). It has been estimated that around 20,000 farmer deaths each year are caused by pesticide exposure. The incidence of occupational accidents due to pesticides continues to increase until it reaches 2 million pesticide poisonings, with 40,000 deaths yearly (Febriana et al., 2023).

Apart from pesticide exposure, snakebite cases are farmer work accidents and emergencies that must be treated immediately. Farmers have a high risk of snake bites because they work in nature, and snakes live in nature, usually on plants. Snake bites can cause farmers to experience severe injuries, such as injury, disability and even death (Ryandini, 2020). In 2013, it was estimated that snakebite cases worldwide reached 237,379-1,184,550 cases, with a mortality rate in the Asia Pacific region of 15,385-57,636 cases. In Indonesia, no significant data is officially reported on snakebite incidents (Namami et al., 2022).

The number of emergencies and work accidents is due to low knowledge and education, so workers become unsafe and ignore occupational safety and health more (Monoarfa et al., 2023). Knowledge is an understanding or awareness of a matter or fact obtained from an experience or education. Most farmers lack knowledge and understanding of the risks that impact their health and safety, such as injury, physical disability, accidents, and even death (Farid et al., 2019). Increased knowledge is needed for farmers to reduce the risk of work accidents, and skills are needed to handle emergencies to prevent the severity that occurs due to an accident. This can be done by providing training and education to farmers regarding first aid or action when an accident occurs.

METHOD

This study uses a literature review methodology that focuses on knowing farmers' knowledge of the prevention and handling of embassies in the agricultural environment. The literature search used 3 databases, namely Google Scholar, ScienceDirect, and Pubmed, with a publication time span of the last 5 years, from 2020 - 2024. The literature search uses two language keywords, namely Indonesian and English. The keywords used using Indonesian are "Knowledge" OR "Training" AND "Farmer" AND "Handling" OR "Prevention" AND "Emergency" OR "Accident" AND "Agriculture". Meanwhile, for keywords with English, use the keywords "Knowledge" OR "Training" AND "Farmer" AND "Handling" OR "Prevention" AND "Emergency" OR "Accident" AND "Agriculture".

The literature search began using predetermined keywords and obtained as many as 2,470 from the three databases. Then, filtering was carried out by paying attention to the year of publication of journal articles from 2020 to 2024. In this screening, 737 journal articles were obtained. Furthermore, filtering was carried out by selecting the appropriate title, and 352 journal articles were obtained. Subsequently, the articles were screened using inclusion and exclusion criteria. Inclusion criteria: 1) Title 2) Year of publication 2020 - 2024 3) Field of study of nursing and medicine 5)

Indonesian and English 6) Downloadable. Exclusion criteria: 1) Research that is not related to farmers' knowledge in handling or preventing emergencies and accidents in agricultural areas 2) Publication year less than 2020 3) Not a research article 4) Not a field of study of nursing and medicine 5) Not in Indonesian or English. Then, screening was carried out by considering the inclusion and exclusion criteria and screening suitable abstracts to focus on the issues discussed in the study. A total of 52 suitable journal articles were obtained. The 52 journal articles were further screened based on the results and other criteria to obtain 10 journal articles. The ten journals then proceeded to the analysis stage.

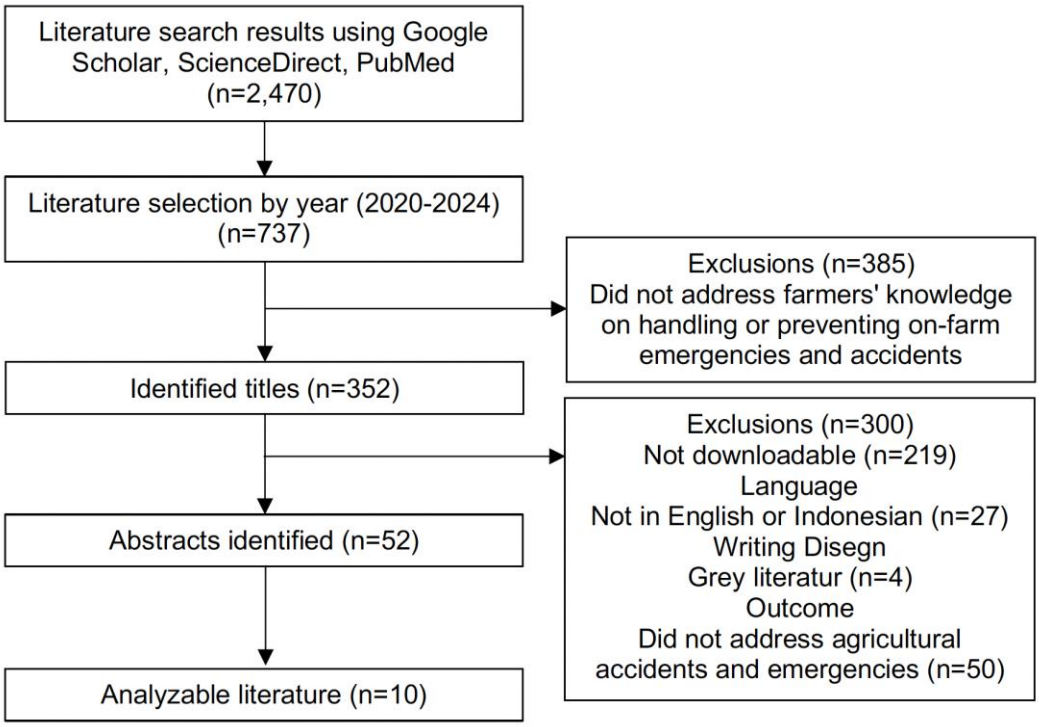

Figure 1. Literature Search Process

RESULT

Table 1. Result of Literature Analysis

No ID	Author and Journal Identity	Title	Objective	Population and Sample	Methods	Result
A1	Author: Namami, I. Y., Wantiyah., & Yunanto, R. A Journal Identity: Health Library e-Journal, vol 10 (no.3), September 2022	Relationship between Self-Efficacy and Farmers' Skills in Performing Snake Bite First Aid in Panti District, Jember Regency	This study aims to analyze the relationship between self-efficacy and farmers' skills in performing first aid for snake bites in Panti District, Jember Regency.	This study took a sample of 100 farmer respondents and the population was all farmers in Panti sub-district. The instruments used in this study were the General Self-Efficacy (GSE)	The study used a descriptive correlational method with a cross-sectional approach, and used the Spearman rank test for bivariate data analysis.	The study resulted in no significant relationship between self-efficacy and farmers' skills. Farmers showed a lack of skill in handling snake bite first aid in the work environment

No ID	Author and Journal Identity	Title	Objective	Population and Sample	Methods	Result
				questionnaire and the skills SOP sheet.		and lacked self-efficacy and lacked skill in handling snake bite wounds.
A2	Author: Lestari, D. Y Journal Identity: DRG Medical Health Scientific Journal. Suherman VOL. 02 NO. 02, DECEMBER 2020	Relationship between Workers' Knowledge and Prevention of Work Accident Emergency in Sukaindah Village 2018	This study aims to determine the relationship between knowledge and prevention of work accident emergencies in Sukaindah village.	The population in this study were 183 farmers in Sukaindah Village in 2019 and the sample used in the study was 64 farmers.	This research is an analytic survey research with a Cross Sectional approach used to see the relationship between one variable and another. The sampling technique used simple random sampling. The instrument used in this study was a questionnaire. Univariate analysis was also used to describe the characteristics of each variable.	Knowledge of prevention of occupational accident emergencies in workers, especially farmers in Sukaindah village is known Most of them have good knowledge, but there is no relationship between knowledge and prevention of occupational accident emergencies in workers
A3	Author: Lian, P., Zhuo, Z., Qi, Y., Xu, D., & Deng, X. Journal Identity: Agriculture 2021, 11, 726. https://doi.org/10.3390/agriculture11080726	The Impacts of Training on Farmers' Preparedness Behaviors of Earthquake Disaster—Evidence from Earthquake-Prone Settlements in Rural China	This study aims to explore the quantitative impact of training on rural households' earthquake disaster preparedness behavior.	In this study, Sichuan Province in China was selected as the sample frame. According to the predetermined random number table, 20-23 households were randomly selected from the family list of each sample village as sample rural households.	This study used the Probit method and the Poisson method to analyze the quantitative relationship between training and earthquake disaster preparedness behavior.	The results of the study are that disaster prevention and mitigation training can encourage farmers to have and improve earthquake disaster preparedness behavior.
A4	Author: Monoarfa, J., Akbar, H., Asriadi, M., Tutu, C. G., & Magdalena, H Journal Identity: Preventif Journal Vol. 7/No. 2/	Relationship between Knowledge and Attitude with Work Accidents among Farmers in Lobong Village, Passi Barag	This study aims to analyze the relationship between behavior and work accidents among farmers in Lobong Village, Passi	The population used in this study were all farmers living in Lobong Village and the number of samples used was 60 farmers.	The method used in this research is quantitative with a cross sectional study design.	The results of the study stated that there was a relationship between knowledge and attitudes with work accidents in farmers in lobong village, passi barat sub-

No ID	Author and Journal Identity	Title	Objective	Population and Sample	Methods	Result
	April/2023; pISSN 2540-8283 eISSN: 2620-3294 DOI : http://dx.doi.org/10.37887/epj	Subdistrict, Bolaang Mongondow Regency	Barat Subdistrict, Bolaang Mongondow Regency.			district, bolaang mongondow district, so that socialization by the government was needed to develop farmers' knowledge.
A5	Author: Ryandini, T. P. Journal Identity: FORIKES 2020 National Proceedings: Various Perspectives in Health Development Ponorogo, 2 August 2020	Effect of Snake Bite Rescue Training on Handling Injury Victims in Honey Belimbing Farmers in Tasikmadu Village, Palang Tuban	The purpose of the study was to determine the effect of snake bite rescue training on the handling of injured victims in honey star fruit farmers in Tasikmadu village Palang Tuban.	The population in the study amounted to 35 people, the majority of whom were farmers in honey star fruit in Tasikmadu village Palang Tuban.	This research method is pre-experimental (one group pre-post test design). Samples were taken using systematic random sampling and data analysis using the Wilcoxon test.	The results of the study state that Snake Bite Rescue has an influence on the Behavior of Handling Injured Victims in Honey Starfruit Farmers and it is hoped that Snake Bite Rescue Training can be applied by starfruit farmers for handling when exposed to snake bites.
A6	Author: Shammi, M., Sultana, A., Hasan, N., Mostafizur Rahman, M., Saiful Islam, M., Bodrud-Doza, M., & Khabir Uddin, M. Journal Identity: Journal of the Saudi Society of Agricultural Sciences 19 (2020) 161–173	Pesticide exposures towards health and environmental hazard in Bangladesh: A case study on farmers' perception	This study aims to determine the level of perception and behavior of farmers towards the use of pesticides and their risks to the environment and human health.	The population used was Bangladeshi farmers in two areas namely Savar Upazila (SU) and Mehendiganj Upazila (MU). A sample of 100 farmers from SU and 50 farmers from MU was taken.	This study used questionnaires. There were three questionnaires, the first containing basic social information about the respondents, e.g. gender, age and education. The second questionnaire was about pesticides, and the third questionnaire was about farmers' experience with pesticides..	The results of the study stated that farmers in both areas did not have adequate knowledge on PPE and pesticide storage. The study also showed that there is a lack of awareness among farmers to report incidents of pesticide poisoning.
A7	Author: Monger, A., Mahat, K., Dorjee, Om, N., Mongar, P., Dorji, T., Jamtsho, S., Wangdi, K., Wangdi, C.,	Assessment of exposure to pesticides and the knowledge, attitude and practice among farmers of	This study aimed to assess pesticide exposure and knowledge, attitudes and practices among	The study population was farmers in four Dzongkhags (regions) randomly selected from household lists provided by government	A controlled cross-sectional study of farmers in selected locations in Bhutan was conducted to characterize the level of pesticide exposure and	The results of the study showed that 17% of farmers had high knowledge, but 59% of farmers had low knowledge about pesticide

No ID	Author and Journal Identity	Title	Objective	Population and Sample	Methods	Result
	Jamtsho, T., & Chettri, V Journal Identity: PLOS ONE | https://doi.org/10.1371/journal.pone.0286348 May 30, 2023	western Bhutan	farmers in western Bhutan.	officials. A sample size of 399 participants was enrolled in the study consisting of 295 exposed farmers and 104 healthy, unexposed farmers.	assess their knowledge attitudes and practices on safe pesticide handling and also using a questionnaire.	application. The results of the attitude assessment showed that quite a number of farmers had a lack of caring attitude and poor practices in handling pesticides.
A8	Author: Fibriansari, R. D., Maisyaroh, A., Prasetya, E., Prodi, W. Journal Identity: :BORNEO NURSING JOURNAL (BNJ) Vol. 2 No. 1 of 2020	Improving Basic Life Support (BHD) Skills for Hazardous Materials in Farmers.	The objective of this study was to improve the ability of farmers to perform basic life support (BHD) due to hazardous materials among farmers in Lumajang district.	The population used in this study has been selected by random sampling as many as 30 respondents.	The design of this design is that the researcher takes measurements on both groups with a pre test then given treatment, then takes measurements again with a post test.The sampling technique used is consecutive sampling technique, which is a sample selection technique by selecting all individuals encountered and fulfilling.	Results from the study showed a significant improvement in farmers' ability to provide Basic Life Support (BHD) after the training. This suggests that BHD training is important to improve farmers' knowledge and skills in dealing with emergencies in farming areas.
A9	Author: Lundqvist, O., Svennefelt, C. A. Journal Identity: Jurnal of Agromedicine ISSN: 1059-924X (Print) 1545-0813 (Online) Journal homepage: www.tandfonline.com/journals/wagr20	Safe Farmer Common Sense' - A National FiveYear Education-Based Program for Prevention of Occupational Injuries in Swedish Agriculture Background, Process, and Evaluation	The objective of this study was to determine the benefits of this program in encouraging farmers to be more active in performing various types of measurable measures aimed at preventing occupational hazards and injuries on their own farms.	The population used in this study was 1244 including a control group of farmers on Swedish farms.	The research method was interviews conducted in person during individual visits to the farms and by telephone.	The research revealed that the program motivated Swedish farmers to increase their efforts in injury prevention activities both immediately and many years after the program. The program in question is a five-year national, education-based program for occupational injury prevention

No ID	Author and Journal Identity	Title	Objective	Population and Sample	Methods	Result
						in Swedish agriculture.
A10	Author: Geleta, D. H., Alemayehu, M., Asrade, G., & Mekonnen, T. H. Journal Identity: BMC Public Health (2021) https://doi.org/10.1186/s12889-021-10254-5	Low levels of knowledge and practice of occupational hazards among flower farm workers in southwest Shewa zone, Ethiopia: a cross-sectional analysis	The aim of this study was to measure the level of knowledge and occupational hazard safety practices of flower farm workers in Ethiopia.	The population used in this study was 451 flower farm workers interviewed with a response rate of 95.7%.	Flower farm-based cross-sectional survey. The sampling technique used was stratified sampling.Data were collected using structured methods and interviewer administered questionnaires.	This study revealed a low level of knowledge and safety practices towards occupational hazards. Knowledge of occupational hazards is strongly influenced by the level of education and length of employment. .

DISCUSSION

The administration of nursing care and management of nursing services to healthy and sick clients throughout the human life cycle in the agricultural context is known as agronursing (Afandi et al., 2023). The agricultural sector is one of the sectors that plays an important role in the world, especially in developing countries. Low knowledge and motivation about using personal protective equipment (PPE) in farmers can cause work accidents in the workplace. A study by Monoarfa et al. (2023) stated a significant relationship between knowledge and attitudes with work accidents in farmers. Good knowledge and understanding will raise awareness of the risks at work to minimize accidents at work. Farmers with adequate knowledge can work according to procedures and try to keep themselves safe from work accidents. In addition to knowledge, attitude also affects the readiness and willingness of individuals to act. A positive attitude will reduce carelessness at work, and one can consider the right actions. Attitude is influenced by several things, such as personal experience, culture, and other people around or work partners. This research is also supported by Geleta et al. (2021), who state that good knowledge and skills in handling emergencies can create a work safety culture and minimize hazards while working.

The sample inclusion criteria used are farmers who have worked for more than 3 months and the exclusion criteria are farmers who are sick, on leave, and pregnant. The low level of knowledge about farmer work safety is also influenced by the implementation of health and safety programs such as health and safety training, compliance with existing safety standards and regulations, and the development of health and safety policies in general, which are still below standards in developing countries. The study also stated that the level of knowledge related to occupational hazards is influenced by education, experience, and length of service. Occupational training aims to improve and develop the capacity of workers to overcome the risk of occupational accidents and emergencies. To anticipate the increase in work accidents, written health and safety instructions (e.g., labels, symbols, pictograms) can be provided so that farmers can easily understand and comply with available safety instructions and guidelines. Generally, occupational accidents occur due to low knowledge of farmers, unwillingness to use personal protective equipment, and

indifference of the majority of farmers towards hazardous agents such as pesticides, which can lead to emergencies in the work environment of farmers (Bryan et al., 2022).

According to Alwall (2020), farmer common sense is not enough; safe farmer common sense is needed to make real change, and the key is in the farmer's head. In trying to develop this concept, inspiration was found in other programs, such as the FarmSafe Program in New Zealand,17-19 which originated from an Australian approach to farm safety. In addition, this study revealed that eliminating risk factors was the most common action, such as preventing falls, improving animal handling systems, installing guards on machinery, installing fences around manure pits, fixing electrical hazards, preventing slips, etc. The existence of the national Akal Sehat Farmer Safety program extension activities on the actions of Swedish farmers to improve agricultural safety had a good impact, because farmers who attended the extension began to take preventive actions that had been taught, such as preparing action plans, changing work routines, increasing the use of PPE, and attending further education/training to increase farmers' knowledge. This is also supported by research by Fibriansari et al. (2020), which states that in an effort to increase knowledge, training and education or provision of information related to farmer work accidents can be provided so as to reduce the risk of emergency events in agricultural areas.

The level of education of farmers is a factor that affects farmers' knowledge. Someone with a higher education will have higher knowledge than someone with a low education. This may be due to the absence of education about BHD obtained from formal schools. In the study, the respondents who were farmers mostly had a high school education. One of the things that can be trained is the ability to provide basic life support (BHD). Basic life support is a simple effort to handle life-threatening situations so that a person can temporarily maintain his life. The study states the high rate of injury in farmers. The community requires emergency services where this emergency condition requires immediate health services to reduce mortality and prevent disability and this can be done with education and training, which is an important component of a comprehensive effort to improve occupational safety and health in agriculture.

However, some studies also state that there is no significant correlation between knowledge and the handling and prevention of emergencies in farmers, such as in research Namami et al. (2022) showing that there is no relationship between self-efficacy and farmers' skills in providing first aid for snake bites in the work environment and farmers in Panti District, Jember Regency with test results p value = 0.235 (p>0.05). This is because a person's behavioral actions have nothing to do with self-efficacy. Research Lestari (2020) also states that there is no relationship between knowledge and prevention of work accident emergencies in workers, especially farmers in Sukaindah village. Still, there is a relationship between attitudes and the prevention of emergencies. Some respondents have good knowledge, but several factors cause respondents (farmers) to have low ability to prevent emergencies and work accidents, such as a lack of awareness and concern for emergencies or the attitude of farmers who ignore and underestimate the risk of work accidents and emergencies.

Research by Monger et al. (2023) used a controlled cross-sectional study of farmers in selected locations in Bhutan to characterize the level of pesticide exposure and assess their knowledge, attitudes, and practices regarding safe pesticide handling. This study aims to determine the level of pesticide exposure, identify associated risk factors, and assess knowledge, attitudes, and practices regarding proper handling and safe management. While research conducted by Shammi et al. (2020) is a survey of Bangladeshi farmers in two regions: Savar Upazila (SU) and Mehendiganj Upazila (MU). SU farmers reported different mass communication devices as the main source of information, while 36% of farmers from UM reported other farmers as their source of information followed by pesticide dealers (28%), the purpose of this study was to determine the level

of perception and behavior of farmers regarding the use of pesticides and to evaluate the driving factors associated with environmental hazards and human health.

According to research by Namami et al. (2022), there is no significant relationship between self-efficacy and farmers' skills. This is supported by farmers who lack mastering skills in handling first aid in the event of a snake bite. Meanwhile, according to research conducted by Lestari (2020), there is no relationship between knowledge and the prevention of work accident emergencies among farm workers.

CONCLUSION

Farmers risk occupational accidents such as exposure to pesticides, sharp agricultural machinery or equipment, animals and plants that can injure, non-ergonomic positions, and hot weather while working. The incidence of emergencies and occupational accidents is due to low knowledge and education, so workers become unsafe and more neglectful of occupational safety and health. These emergencies include natural disasters, work accidents, injuries, snake bites, and pesticide use. One way to improve farmers' ability to reduce risk is to increase their knowledge and skills in managing emergencies in agricultural areas. The knowledge provided is in the form of training where farmers in the agricultural environment are not only given basic knowledge related to emergency problems that may occur, but farmers are also given knowledge related to how to report emergencies, prevention, treatment, and transportation.

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