

Occupational accidents in a woodcraft village in Vietnam

Ly Truong Thi¹, Thu Vu Van^{2*}

¹Faculty of Social Work, Trade Union University, Vietnam

²Faculty of Occupational Safety and Health, Trade Union University, Vietnam

Corresponding author:

Assoc. Prof. Dr. Vu Van Thu,
Faculty of Occupational Safety
and Health, Trade Union
University, Dong Da District,
Hanoi, 10000, Viet Nam

E-mail: thuvv@dhcd.edu.vn

ORCID: <https://orcid.org/0000-0003-3134-9670>

Date of submission: 10.07.2024

Date of acceptance: 25.11.2024

Date of publication: 01.01.2025

Conflicts of interest: None

Supporting agencies: None

DOI: <https://doi.org/10.3126/ijosh.v15i1.66573>



Copyright: This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/)

ABSTRACT

Introduction: In Vietnam, wood craft villages are facing a fairly common situation of occupational accidents. This study focuses on studying the current situation of injuries caused by occupational accidents to workers in wood craft villages. Potential causes of occupational accidents are also researched, analyzed and clarified.

Methods: This is a cross-sectional study conducted from June to August 2022. The article is based on the quantitative research results of 385 questionnaires. The research subjects are workers directly involved in wooden furniture production in La Xuyen wood craft villages. The convenience sampling method was used to select suitable survey subjects.

Results: In La Xuyen wood craft village, up to 98.7% of workers have had at least one occupational accident. 39.0% have had two times and 15.8% have had three times or more occupational accidents. Hand and foot injuries are the most common type of occupational accident, accounting for 87.3%. Men had more occupational accidents than women. On average, each man has 1.98 times occupational accidents, 1.6 times higher than the number of women having occupational accidents.

Conclusion: The situation of occupational accidents in wood craft villages is alarming and quite common at different levels. The main cause of occupational accidents is due to workers' limited awareness of occupational accident prevention and the lack of safe working procedures in the workplace. It is necessary to open training courses on how to operate machinery and use personal protective equipment to workers in woodcraft villages in Vietnam.

Keywords: Occupational, occupational accidents, safety, woodcraft village

Introduction

In many countries around the world, craft villages play an important role in the economic development of the informal sector as well as the national economy. However, the prevention of occupational accidents has not yet been taken care of. In India, craftsmen play a crucial role, providing jobs and becoming the main means of livelihood for people in many localities.¹ With limited working conditions, workers often have occupational accidents while during working.¹ The research results in Rwanda show that the rate

of workers exposed to hazards at work in craft villages is very high. There are still many limitations in occupational accident prevention activities for workers at the workplace.² Research in Pakistan also shows that common workers in craft villages suffer more work accidents due to workers lack of safety skills and no training.³

In Vietnam, craft villages are where the main craft industries are concentrated. Workers in craft villages always face a series of risks. Workers are exposed to many dangerous and harmful factors

in the workplace.⁴ Injuries in self-employed workers are more frequent and more severe than those in the official zone.⁵ Craft villages are places where communities engage in small and medium-scale production of a variety of goods.^{6,7,8}

For craft villages in Vietnam, the production technology and equipment are mostly outdated and patchy, with incomprehensive skills.⁹ ILO's research in Vietnam indicates that manual workers here have the highest rates of workplace injuries in the country.¹⁰

Like other occupations, workers in woodcraft villages also have to face the risk of occupational accidents and the common labor situation. Research by Effah et al at the Sokoban Wood Village Enclave in Ghana shows that owners of wood manufacturing units here often ignore occupational safety and accident prevention.¹¹ In Turkey, a study conducted on workers in the furniture manufacturing sector in Sakarya province illustrated that the cases of workers suffering from work accidents and occupational diseases are higher than the general ratio all over the country.¹²

In Vietnam, wood processing workshops mainly apply manual technology with traditional tools such as hand saws, chisels, and hand carvings.¹³ Research in a woodcraft village in Hien Giang commune, Thuong Tin district, Hanoi shows that unsafe working conditions, messy machinery and equipment, garbage, noise, dust, etc. greatly affect the safety and health of workers, including children.¹⁴ The ILO conducted a study to assess the prevalence of occupational injuries and diseases in six craft villages in Vietnam. Research results show that both workers and employers take little action to prevent and handle dangers in the workplace.^{15,16,17}

It can be seen that, in the world as well as in Vietnam, workers in craft villages in general and wood craft villages in particular are having to work in unsafe conditions, they are often exposed to a working environment with many risks that do not ensure occupational safety and hygiene. So, this study focuses on studying the current

situation of injuries caused by occupational accidents to workers in woodcraft villages and also to analyze and clarify the potential causes of injuries to workers in the workplace.

Methods

This is a cross-sectional study conducted from June to August 2022. The data and results of the article are based on the primary source of information obtained from the quantitative research method, which is a questionnaire survey for those directly participating in the production stages of the timber industry in La Xuyen wood craft village. The convenience sampling method was used to select suitable survey subjects. Because the number of workers varies according to the actual production situation in the area, it is difficult to determine the specific amount of the population, so we selected a survey sample with the sample calculation formula below:

$$n = \frac{z^2(p * q)}{e^2}$$

Where:

n is the sample size,

z is the z-score associated with a level of confidence,

p is the sample proportion

e is the margin of error

With a confidence level of 95% with a corresponding z-value of 1.96, the allowable error is within $\pm 5\%$. Assume the largest possible $p * q$ is $0.5 * 0.5$. The sample size will be calculated as:

$$n = \frac{1.96^2(0.5 * 0.5)}{0.05^2} = 384.6$$

The primary information was collected directly in La Xuyen craft village through 385 questionnaires with workers who are directly involved in furniture production in the area.

According to the provisions of Vietnamese law: "Occupational accident means an accident that causes injuries to any bodily part and function of an employee or causes death, and occurs during the course of work, in connection with their performance of a job or a task".¹⁸ In this study, occupational accidents in La Xuyen wood craft village are defined as accidents that cause any

damage to workers when they perform work related to wood craft.

After surveying 385 employees with a paper questionnaire, the authors used Epi data software, version 3.2 to enter data and Statistical Package for the Social Sciences (SPSS) software, version 22.0 to process the data. With descriptive statistics, the results are described by calculating frequencies and percentages. Chi-Square test with definition $\alpha = 0.05$, 95% confidence level is used to test the relationship between factors such as the number of years working in carpentry, gender, average working time per day and the number of times workers had an accident while working. The research results ensure anonymity for participants. The purpose of the study was informed to participants before proceeding. All 385 people agreed to participate and agreed to let the authors use the research results anonymously.

Results

La Xuyen craft village is a traditional woodworking village in Yen Ninh commune, Yen Yen district, Nam Dinh province. Most of the households here are engaged in the production, processing, transportation, and wood trading and wood products.¹⁹ Most of the machines used to produce and process wood products in La Xuyen originated from Vietnam, China, Taiwan and Malaysia, some are old machines imported from Japan such as forklifts, planers, handled milling machines.²⁰

The study was conducted on the basis of survey results of 385 workers from 18 to 65 years old who are directly involved in the production stages of the timber industry in La Xuyen. The average age of survey participants was 38.74 years old. Characteristics of survey subjects are presented in table 1.

Table 1: Characteristics of survey subjects

Characteristics		Number of participants (%)
Gender	Male	198(51.4)
	Female	187(48.6)
Age (years)	≤30	95(24.7)
	31-40	149(38.7)
	41-50	79(20.5)
	51-65	62(16.1)
Working experience as a carpenter (years)	≤10	69(17.9)
	11-20	127(33.0)
	>20	189(49.1)
Average working time per day (hours)	6	19(4.9)
	7	28(7.3)
	8	276(71.7)
	9	30(7.8)
	10	32(8.3)
Type of work being done	Self-employed	103(26.8)
	Get a job for someone else but work in their own home	280(72.7)
	Work for another household	2(0.5)

Of the 385 survey participants, there were 198(51.4%) men and 187(48.6%) women. 189(49.1%) people said they had worked in carpentry for more than 20 years. 127(33.0%) people said they had worked in carpentry for 11-20 years. The number of people who have worked in carpentry for 10 years or less is 69(17.9%) people. Regarding the working time 71.7% of respondents

said that they work an average of 8 hours a day, 12.2% said they work an average of less than 8 hours a day, the rest accounted for 16.1% said that they are working more than 8 hours a day on average. Among workers who work more than 8 hours per day, 7.8% work for an average of 9 days and 8.3% of jobs for an average of 10 days.

Regarding the form of work, workers mainly work in their own houses or work in other village households. Up to 72.7% of respondents said that they are currently employed by others but work in their own houses, or receive goods at home. Besides, 26.8% said that they work for their own family. Only 0.5% said they are currently going to work in another household.

About the situation of occupational accidents, the result of the study shows that only 5(1.3%) people said they had never had an accident at work. That is, up to 98.7% of workers have had at least one

occupational accident. Of these, the highest rate is 43.9% who have had an occupational accident once. Next, 39.0% have had occupational accidents twice and 15.8% of workers have had occupational accidents 3 times or more. With a median of 2.00, the research results show that up to 50% of workers in La Xuyen wood craft village participating in the survey have had 2 times or more occupational accidents. With a mean of 1.80, it shows that on average, workers in La Xuyen wood craft village have accidents 1.8 times. Someone had 7 times occupational accidents during the production process (Table 2).

Table 2: Correlation of the number of times having had an occupational accident by gender, career age and average working time per day

Characteristics		0 times (%)	1 times (%)	2 times (%)	≥3 times (%)	p-value, Cramer's V
Gender	Male	2(1.0)	70(35.4)	81(40.9)	45(22.7)	p =0.000 Cramer's V=0.226
	Female	3(1.6)	99(52.9)	69(36.9)	16(8.6)	
Average working time per day (hours)	6	0(0.0)	8(42.1)	8(42.1)	3(15.8)	p =0.665 Cramer's V=0.090
	7	0(0.0)	18(64.3)	8(28.6)	2(7.1)	
	8	3(1.1)	113(40.9)	114(41.3)	46(16.7)	
	9	1(3.3)	14(46.7)	10(33.3)	5(16.7)	
Number of years working in woodcraft (years)	10	1(3.1)	16(50.0)	10(31.3)	5(15.6)	p =0.682 Cramer's V=0.072
	≤10	2(2.9)	34(49.3)	21(30.4)	12(17.4)	
	11-20	1(0.8)	54(42.5)	52(40.9)	20(15.7)	
	>20	2(1.1)	81(42.9)	77(40.7)	29(15.3)	

With p value <0.05, the test results show there is a difference between men and women in the number of occupational accidents. However, the Cramer's V is equal to 0.226, it is interpreted as a low degree correlation. Men had more occupational accidents than women. The rate of men who have had 3 times or more occupational accidents is 22.7% while that of women is only 8.6%. The rate of men who have had 2 times occupational accidents is 40.9% while that of women is 36.9%. On the contrary, the rate of women who had no occupational accident is 1.6%, higher than that of men, which is 1.0%. The proportion of women who have had only one occupational accident is 52.9%, while that of men is 35.4%. On average, each male has had 1.98 times occupational accidents, which is 1.6 times higher

than the number of women having occupational accidents.

With p value =0.665 >0.05 and Cramer's V=0.090, the test results on the relationship between the working time of the worker and the number of occupational accidents show that there is no difference in the number of occupational accidents between people with different average working time.

Regarding the relationship between occupational age and occupational accident status, with p-value =0.682 >0.05 and Cramer's V=0.072, the test results also show that there is no difference between occupational age and occupational accident status. The types of occupational accidents that workers have experienced in La Xuyen wood craft village have also been investigated. The results of this study show that the type of occupational accidents

is flesh-wound to the hands, feet occupying up to 87.3%. The number of people who have accidents and injuries to the neck, shoulders is relatively small. The number of people with shoulder injuries only accounted for 1.6%. The proportion

of workers injured in the head area is 2.3%. Meanwhile, up to 8.1% of workers said they had lost fingers and toes due to occupational accidents (Table 3).

Table 3: Types of occupational accidents

Type of injury	Ever been (%)	Never been (%)	Total (%)
Loss of fingers and toes	68(17.7)	317(82.3)	385(100.0)
Broken arm, broken leg	32(8.3)	353(91.7)	385(100.0)
Smashed, broken hands, fingers, hands, feet	32(8.3)	353(91.7)	385(100.0)
Injury to different areas of the body	30(7.8)	355(92.2)	385(100.0)
Head trauma	9(2.3)	376(97.7)	385(100.0)
Injury to the neck	0(0.0)	385(100.0)	385(100.0)
Injuries affecting movement of hands and feet	32(8.3)	353(91.7)	385(100.0)
Injury to muscles in hands and feet	336(87.3)	49(12.7)	385(100.0)
Shoulder injury	6(1.6)	379(98.4)	385(100.0)
Damage to the tendons	32(8.3)	353(91.7)	385(100.0)
Cable Line	33(8.6)	352(91.4)	385(100.0)
Eye damage	40(10.4)	345(89.6)	385(100.0)
Loss of fingers and toes	31(8.1)	354(91.9)	385(100.0)
Other injuries (specify)	12(3.1)	373(96.9)	385(100.0)

Dropping wood on the body is one of the most common risks here. The survey results also showed that 32(8.3%) people said that they had ever been stabbed or cut off their fingers, toes, hands and feet; broken arm, broken leg; injuries affecting movement of hands and feet; and damage to the tendons.

An outstanding feature when coming to craft villages is that the situation of wood dust and shooting wood is quite common. These dangerous and harmful factors are the main causes of eye injuries for workers. The survey results also showed that up to 10.4% of the respondents said that they had ever suffered eye damage caused by sawdust and wood fragments. In addition, 7.8% of workers said that they had at least once got injuries in other body parts and 3.1% said that they also suffered other types of injuries.

La Xuyen as well as most of the wood craft villages today have a small production scale, the local people mainly use simple one, most machines and equipment in the village do not have technical documents to guide and operate safely. Therefore, machinery and equipment cause high risks of occupational accidents.

One of the other causes of occupational accidents in La Xuyen that needs to be mentioned is the cause related to the lack of awareness and understanding of workers here about occupational safety due to lack of training on occupational safety and hygiene. In La Xuyen most workers work with the habit of "3 zero" which are: (1) workers are not trained or instructed on occupational safety and hygiene; (2) workers are not allowed to sign labour contracts with the owner of the manufacturing facility; and (3) workers do not receive regular health checks.

Among 385 survey participants, 5.7% said that they did not know at all and 56.4% knew little about information related to occupational accident prevention. In addition, only 1.8% of workers here knew that they could nominate them to participate in training courses on occupational safety and occupational accident prevention and 2.3% said that when they were new they participated in this training course. Meanwhile, up to 95.8% of survey respondents said that they had never attended training courses on occupational safety and occupational accident prevention.

Occupational accidents in the wood industry are often caused by workers working with dangerous machinery such as wood planers, table disc machines, and vertical milling machines. The survey results showed that up to 22.7% of

respondents said that they often have to be exposed to sharp, uncovered details and 11.4% of respondents said that they frequently contact unprotected machinery. These are the primary factors that lead to occupational accidents.

Table 4: Personal protective equipment (PPE) used at work

Type of PPE	Yes (%)	No (%)	Total (%)
Workwear, protective clothing	56(14.5)	329(85.5)	385(100.0)
Glove	48(12.5)	337(87.5)	385(100.0)
Face mask	372(96.6)	13(3.4)	385(100.0)
Safety helmets	81(21.0)	304(79.0)	385(100.0)
Shoes, boots	64(16.6)	321(83.4)	385(100.0)
Safety glasses for workers	48(12.5)	337(87.5)	385(100.0)
Other tools	8(25.0)	377(75.0)	385(100.0)

At families as well as wood production workshops, most workers have not used the minimum personal protective equipment in the production process. Although the working environment is dangerous with sharp parts, jelly, highly damaging, polluted with lots of dust, splashes, easy to slip and trip, up to 87.5% said that they do not use protective glasses. 85.5% of respondents said that they do not use protective clothing or pants. 87.5% said that they do not use gloves. 79.0% do not use protection hats and 83.4% do not use cushions and support workers (Table 4). The only protective equipment that 96.6% of respondents said that they are useful is a mask. The regularly used masks for local workers are sold at the market, without guaranteed standards.

Discussion

Nowadays, the development of wood product production makes a positive contribution to the economic and social development of Vietnam. Woodwork provides for local people but has many potential risks of occupational accidents. Through the case study of the traditional craft village of La Xuyen, it has been shown that occupational accidents in the craft village are alarming and quite common, ranging from minor occupational accidents to others.

In the woodcraft village, men often suffer more serious occupational accidents than women. This difference is also understandable because although men and women may be doing the same

carpentry, men are often to accept more important jobs and use machines and equipment, especially those with stealthy dangerous elements. Women are often to accept simpler jobs, so they are less susceptible to occupational accidents than men. The severity level of men's occupational accidents is also often more critical than women's.

The main reason leading to the current status of occupational accidents in La Xuyen traditional craft village is that workers have not well taken measures to prevent occupational accidents. The awareness of workers about the prevention of occupational accidents is still very limited. With a small production scale, mainly in the form of households, production activities are mainly spontaneous, without safe working procedures as well as labor safety regulations. At the workplace of workers, there are no instructions on occupational safety. Although the working environment is dangerous, most workers rarely use personal protective equipment during the process of working. The only personal protective equipment used by workers here is masks.

In La Xuyen, activities to raise awareness for workers about the necessity of implementing measures to prevent occupational accidents and ensure labor safety have received little attention. Local authorities and people do not attach importance to measures to ensure labor safety. The level of understanding of working safety procedures among workers is still limited. This is

also the reason why occupational accidents in La Xuyen carpentry village still occur frequently and seriously.

Conclusions

To better control occupational safety and health risks for workers in wood craft, Vietnamese local authorities need to further strengthen their attention on ensuring occupational safety and health in the area, and promote propaganda and education to raise people's awareness in the prevention and control of occupational diseases or accidents. They also need to open training courses on instructions to operate machines and use personal protective equipment safely, and reduce

References

1. Ray A, Rai A, Tripathi S. Occupational Health Hazards and Musculo-Skeletal Disorders of Handicraft Workers in India. *Trends in Biosciences*. 2018 Dec;11(48):4417-8. Available from: <https://www.researchgate.net/publication/332555205>
2. Abel M, Gacohi J, Mokaya D. Factors Associated with Occupational Hazards in the Integrated Craft Production Centers Kigali, Rwanda. *Journal of Medical Science and Clinical research*. 2020 May 5;8(5):424-9. Available from: <https://dx.doi.org/10.18535/jmscr/v8i5.78>.
3. Noman M, Mujahid N, Fatima A. The assessment of occupational injuries of workers in Pakistan. *Safety and health at work*. 2021 Dec;12(4):452-61. Available from: <https://doi.org/10.1016/j.shaw.2021.06.001>.
4. International Labour Organization. Safety + Health for All An ILO Flagship Programme Key facts and figures (2016–2020). 2020 Dec 15 [Cited 2023 Nov 2]. Available from: <https://www.ilo.org/publications/safety-health-all-key-facts-and-figures-2016-2020>.
5. Phung DT, Nguyen HT, Mock C, Keifer M. Occupational injuries reported in a population-based injury survey in Vietnam. *International Journal of Occupational and Environmental Health*. 2008 Jan;14(1):35-44. Available from: <https://doi.org/10.1179/oeh.2008.14.1.35>.
6. Anh DN, Tacoli C, Thanh HX. Stay on the farm, weave in the village, leave the home. The Gioi Publishers: Ha Noi. 2004. Available from: <https://mobile.nypl.org/research/research-catalog/bib/hb990099176430203941>
7. Think VV. Occupational safety and health management contrasts with informal labor in craft villages in Vietnam. 2020 Mar. [Cited 2023 Nov 8]. Available from: <https://www.researchgate.net/publication/339842693>.
8. Dang TD, Mahanty S, Mackay S. "Living with pollution" Juggling Environmental and Social Risk in Vietnam's Craft Villages. *Critical Asian Studies*. 2013 Nov 18;45(4):643-69. Available from: <https://doi.org/10.1080/14672715.2013.851163>.
9. Nghiem DX. Some key policies to develop sustainable craft villages in Vietnam. Retrieved from Ministry level project 2010. Ministry of Planning and Investment, Central Institute for Economic Management. 2010 Dec [Cited 2023 Nov 17]. Available from: https://ciem.org.vn/portals/0/CIEM/Nghiem_%20DT%20Cap%20Bo%202010.pdf
10. International Labour Organization. Summary Report of Research Products Developed within the SafeYouth@ Work Project (GLO/18/65/USA). 2020. [Cited 2023 Nov 17]. Available from: https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/-lab_admin/documents/publication/wcms_734355.pdf.

the risks of occupational accidents for workers in the craft village.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors would like to express their gratitude to the workers who participated in in-depth interviews, responded to the research using questionnaires and also to the management authorities for their support.

11. Effah B, Antwi K, Adu G, Boampong E. The safety culture of artisans at the Sokoban wood village enclave, Ghana. *American International Journal of Contemporary Research*. 2013 Dec;3(12):121-8. Available from: http://www.aijcrnet.com/journals/Vol_3_No_12_Dember_2013/16.pdf.
12. Komut O, Yaşar ŞŞ, Yaşar M. Occupational health and safety awareness in wood, wood products and mushroom production sector in Turkey. *Turkish Journal of Forestry*. 2020 Sep 30;21(3):260-6. Available from: <http://dx.doi.org/10.18182/tjf.741635>.
13. Vietnam Chamber of Commerce and Industry. Support the Association to conduct strategic research on the development of the wood processing industry. Retrieved from WTO Centre. Vietnam Chamber of Commerce and Industry. 2014.[Cited 2024 Jan 8]. Available from: <https://wtocenter.vn/file/15556/Nghien%20cuu%20Nganh%20Go%20-%20NSO5.pdf>.
14. International Labour Organization. Prevention and Elimination of Child Labour in Traditional Craft Villages. ILO: Ha Noi. 2013 [Cited 2024 Jan 8]. Available from: <https://www.ilo.org/publications/prevention-and-elimination-child-labour-traditional-craft-villages>.
15. Ly TT. Occupational accidents in La Xuyen Traditional Woodcraft Village, Yen Ninh, Y Yen, Nam Dinh- Current situation and solutions. Paper presented at the Presentation at Proceedings of the national conference "Science of occupational safety and health: Awareness and opportunities for sustainable development. 2021.[Cited 2024 Feb 4]. Available from: <https://doi.org/10.58671/aswj.v10i2.24>
16. Ly TT. Occupational accidents in wood processing villages: Risk identification and prevention solutions. *Journal of Occupational Safety and Health*. 2022 Apr;4:25-8.
17. Ly TT. Confrontations and solutions to prevent occupational accidents in wood craft villages. *Journal of Scientific Research Trade Union*. 2022 May;26:106-9. Available from: <https://vjol.info.vn/index.php/DHCD/article/view/68329/57790>.
18. National Assembly of Vietnam. Law on occupational safety and hygiene. Law No: 84/2015/QH13 dated June 25, 2015.[Cited 2024 Feb 15]. Available from: <https://thuvienphapluat.vn/van-ban/Lao-dong-Tien-luong/Luat-an-toan-ve-sinh-lao-dong-2015-281961.aspx>
19. Que TTK. About La Xuyen wood carving village. *Journal of Intangible Cultural Heritage*. 2015 May;2(51):53-6. Available from: https://dsvh.gov.vn/Upload/files/5111_Ve%20lang%20nghe%20cham%20khac%20go%20La%20Xuyen.pdf.
20. Phuc TX, Quang DV, Quyen NT, Cam CT. Timber craft villages in the context of integration Current status and policy choices for sustainable development. Retrieved from Forest Trends and the Vietnam Timber and Forest Products Association. 2018 Jan [Cited 2024 Feb 25]. Available from: <https://goviet.org.vn/upload/aceweb/content/Bao%20cao%20lang%20nghe%20go%20-%201%20Feb%202018.pdf>.