

The level of knowledge and practice of workers towards occupational hazards in the floriculture industry in Western Oromia, Ethiopia

Abstract

Objective: This study aimed to assess the level of knowledge and practice of workers towards occupational hazards in the floriculture industry in Western Oromia.

Methods: Institutional based cross-sectional study was conducted from July to August 2024 to assess knowledge, practice and associated factors towards occupational health hazards among 656 workers in a floriculture industry by using a simple random sampling method. A structured face-to-face questionnaire was used to collect the data. Bivariate and multivariate regression was used to identify associated factors.

Results: A total of 656 participants were included in the study sample with a 100 % response rate. The majority of participants were female workers (81.4%) with a mean age of 24.85 ($\pm$ 6.31). only 38.9% of workers received training on existing health-hazardous areas, whereas 5.6% were oriented on the safety sign and symbols. The level of knowledge and practice of workers had towards occupational health hazards were 55.0% and 29.4% respectively.

Conclusion: The provision of training and awareness creation on safety signs and symbols were the important area that needs the intervention of employers and responsible bodies.

Keywords: employees, floriculture, health hazards, knowledge, practice

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Abbreviations: AOR, adjusted odd ratio; IRB, ethical review board; MSDS, material safety data sheet; OHS, occupational health and safety; PPE, personal protective equipment; SPSS, statistical package for the social sciences; USD, United States dollar; WHO, world health organization

Introduction

Creating awareness and safe practice of occupational health hazards is the key issue in improving workplace problems. In the workplace, many industrial accidents are caused as a result of the unsafe act and unsafe conditions.¹ The report of the Ethiopian confederation trade union indicated that the fast-growing flower farm workers are living with poor working conditions including high levels of potential injuries due to inadequate training in occupational health and safety.² The most suffering employees to health-hazardous activities are employees engaged in cutting flowers, packing, spraying, mixing, and weeding flowers.^{3,4} World Health Organization (WHO) shows that many peoples in developing countries are severely poisoned by pesticides due to their being widely used and easily available. Studies indicated that in China and Kenya, the expansion of floriculture has both impacts on workers' health conditions and environmental issues like water quality, and greenhouse emissions waste.^{5,6} This flower industry activities had both global and local challenges in Eastern African Countries like climate change, carbon footprint, disposal fees, pollution of water, and negative impact on special habitats.⁷ Floriculture is a major public health issue⁸ however most workers are not aware of the health effects of activities in the industry. The Knowledge and practice of workers on occupational health hazards are minimal including low awareness of health and safety, high temperatures in the greenhouse, and prolonged standing work,^{9,10} low educational levels.¹¹ Floriculture can affect the environment as a result of uncontrolled high chemical usage, depletion of water resources, and risk to workers' safety.¹² Our study aimed to assess the level of

knowledge and practice of employees towards occupational health hazards in floriculture industry in Western Oromia.

Methods & materials

An institutional-based cross-sectional study was conducted from July to September 2024 in Western Oromia where a total of 3010 employees engaged in floriculture farm considered a source of the study population and the study participant was 656 workers. Administrative staff those activities were not directly linked with the farm were excluded from the study and face to face administrative questionnaire was held for study participants. Knowledge questions were addressed by asking the workers about occupational hazards (labels, symbols, guidelines, Material Safety Data Sheet (MSDS), healthy effects, and routes of exposure) used. The level of knowledge is categorized as poor knowledge when it is less than 50% and good knowledge when the respondents answer greater than 50% out of the total questions of knowledge.¹³ Also, the safe practice questions were assessed by asking workers who use safety and health instructions like using MSDS properly, using Personal Protective Equipment(PPE) correctly, proper disposal of chemical containers, and others all questions were rated in percentage as 0-50% ($\leq$ 8marks) being poor/unsafe practice and $\geq$ 50% (9-18 marks) as considered as a good or safe practice.¹⁴ A questionnaire was first prepared in English and translated to the local language into Afan Oromo and then independently back-translated to English with adjustment of the Afan Oromo version. Socio-demographic issues, organizational factors, and right at work were included in the content of the questionnaires. Before the actual data collection, the tools were pre-tested in 5% employees working in other floriculture industry found in Sebeta city near to Addis Ababa, about their awareness and practice towards occupational hazards.

The collected data were entered, cleaned, and edited using EPI INFO version 7.00 statistical software, and SPSS version 23.0 was

used for statistical analysis. Descriptive data including frequency tables, graphs, and percentages were applied for categorical variables whereas means and standard deviations were used for continuous variables. Bivariate logistic regression analysis was used to determine the association of one independent variable with the outcome variable, and those variables with a P-value < 0.2 were exported to multivariate logistic regressions for further analysis and to control confounding factors, and remove insignificant variables. The degree of association between independent and outcome variables was assessed using an odds ratio with a 95% confidence interval.

Ethical consideration

The study was carried out after getting permission from the ethical review board (IRB) of Ambo University. Informed consent was also obtained from the floriculture industry and from study participants to participate in the study. Confidentiality was granted for information collected from the industry and by removing the name of study participants from the questionnaires.

Result

A total of 656 participants were included in the study with a 100 % response rate, which is conducted face-to-face interview survey without interruption of the employee's daily working activities.

Socio-demographic characteristics of workers in the floriculture industry

Out of the 656 respondents, 534(81.4%) were female workers. The majority of workers from the nearest urban areas (82.5%) and (24.2%) of them were not attended formal education. Three hundred forty-four (52.4%) of the participants were married and 45.4% were single. The majority of the employees (75%) served 1-5 years in the floriculture industry whereas 21.2% of them served more than 5-10 years in this premises. Whereas 96.2% of participants' monthly salary was between the range of 1000 to 2000 Birr (31.3 to 62.6 USD) interval at the time of data collection (Table1).

Table 1 Socio-demographic characteristics of floriculture workers of Western Oromia (N =656)

Category of variables	Frequency(n)	Percentage (%)
Sex:		
Male	122	18.6
Female	534	81.4
Age		
Mean	24.85 (+ 6.31)	
<18 years	87	13.3
18- 28 years	408	62.2
28-38 years	140	21.3
>38 years	21	3.2
Educational level:		
No formal Education	159	24.2
Primary school (1-8 grades)	250	38.1
Secondary school (9-12 grades)	245	37.3
Diploma above	2	0.3
Marital status:		
Single	298	45.4
Married	344	52.4
Widowed	2	0.3
Separated/Divorced	12	1.8
Residence:		

Table 1 Continued....

Urban	541	82.5
Rural	115	17.5
Work experiences		
Mean	3.84(+ 3.22)	
1-5 years	492	75
5-10 years	139	21.2
>10 years	25	3.8
Monthly Salary		
Mean	1247.7(+353.24)	
>1000 birr	12	1.8
1000-2000 birr	631	96.2
>2000 birr	13	2

Organizational factors workers in the floriculture industry

The improvement of workplace health and safety at workplace is one of the major issues to create harmonious industrial relationships. Organizational improvements are one of the indicators of harmonious industrial relationship creation, so the study results only 255(38.9%) workers received training on health-hazardous activities whereas 37(5.6%) were oriented by management on the safety sign and symbols. Twelve percent (12.0%) of employees received regular supervision and communication of health and safety at the workplace while 95(14.5%) of employees had awareness of the farm health and safety policy. About 512(78%) of employees were engaged in overcrowded working conditions and 73.8% of them were employed in greenhouse unit production (Table 2).

Table 2 Organizational characteristics in floriculture of Western Oromia, (N =656)

Category variables	Frequency (n)	Percent (%)
Working hours per day		
<8 hours	26	4
8 hours	630	96
Working Unit/department		
Spray	43	6.6
Green house	484	73.8
Irrigation	19	2.9
Packing house	110	16.8
General conditions of working departments		
Ventilated	144	22
Overcrowded	512	78
Training on existing health hazards		
Yes	255	38.9
No	401	61.1
Participation in the promotion of health and Safety		
Yes	112	17.1
No	544	82.9
Received orientation on safety symbols/signs		
Yes	37	5.6
No	619	94.4
Regular supervision & communication of health and safety		
Yes	84	12.8
No	572	87.2
Having awareness of on-farm health and safety policy		
Yes	95	14.5
No	561	85.5

Table 2 Continued....

Adequate provision of welfare sanitary facility		
Yes	383	58.4
No	272	41.5
Provision of Personal protective device		
Yes	162	24.7
No	493	75.2
Used MSDS at the workplace		
Yes	274	41.8
No	382	58.2
Received induction training		
Yes	199	30.3
No	457	69.7
Received on-the-job training of OHS		
Yes	32	4.9
No	624	95.1

The right of workers in the floriculture industry

From the four dimensions of decent work agenda, right at the workplace is one of the main components. The majority of the employees don't experience violence at the workplace however, verbal abuse is 10.8% followed by blamed for mistakes by 2.6%. Two hundred ninety-four (44.8%) employees were forced by their employers to work rapidly pace work, while 28.8% of the workers don't have the right to decide to take a break. Almost all (97%) of the respondents were not encouraged by their management to participate in decision-making at the workplace while 59.2% of them complain about their tasks performed which involve their values. Only 59.0% of the workers have entitled to the right to take annual leave (Table 3).

Table 3 The right of workers toward occupational health hazards in the floriculture industry, Western Oromia, (N =656)

Variable category	Frequency (n)	Percent (%)
Experienced any violence at work		
None	552	84.1
Physical Assault	7	1.1
Verbal abuse	71	10.8
Blamed for mistake	17	2.6
Mistreated unlike others	9	1.4
Forced to work rapid pace work		
Yes	294	44.8
No	362	55.2
Decide the right to take a break		
Yes	467	71.2
No	189	28.8
Encouraged by management to participate in decision-making at work		
Yes	20	3
No	636	97
Tasks performed involve personal value		
Yes	389	59.3
No	267	40.7
Having awareness of rights and obligations at work		
Yes	521	79.4
No	135	20.6
Forced by the employer to work		
Night Work (10pm to 06am)	14	2.1
When Injured	2	0.3

Table 3 Continued....

Perform in hazardous conditions without any protection	25	3.8
Work on the weekly rest day	81	12.3
Work on public holiday	90	13.7
Perform tasks not a part agreement	56	8.5
Not enforced	388	59.1
Entitled the right at work		
Annual Leave	387	59
Maternity/Paternity Leave	196	29.9
Mourning Leave	73	11.1

The level of Knowledge and Practice of workers toward occupational health hazards

The level of employees' knowledge of occupational health hazards in the floriculture industry is presented in Figure 1.

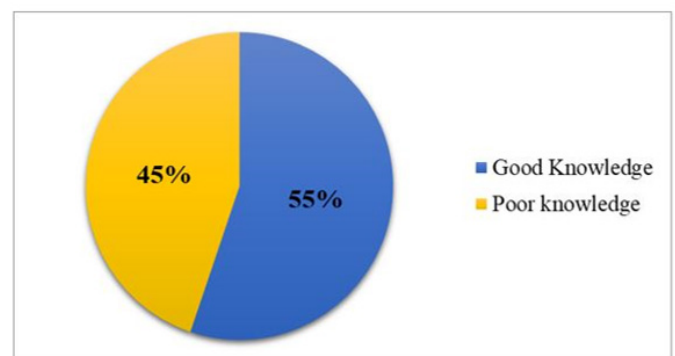


Figure 1 The knowledge of employees about occupational health hazards in the floriculture industry in Western Oromia.

The level of safety practices of employees towards health hazards in the floriculture industry is presented in Figure 2.

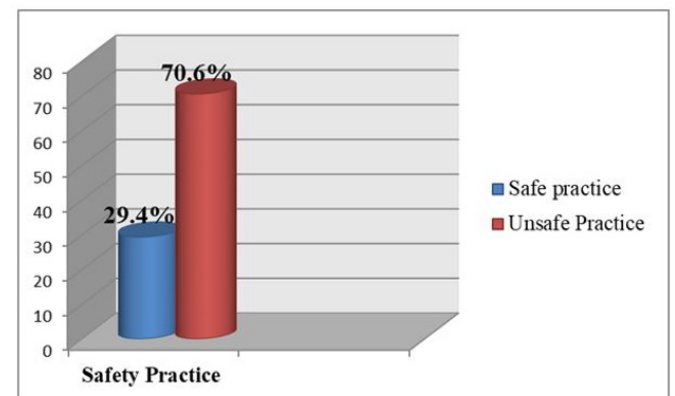


Figure 2 The safety practice of employees towards occupational health hazards in the floriculture industry in Western Oromia.

Of the total employees, only 29.4% of the workers had safe practices towards occupational health hazards in the floriculture industry.

Factors affect the knowledge of workers on occupational health hazards in the floriculture industry

In the model first bivariate analysis checked for one independent variable with outcome variables (knowledge). Moreover, those variables fit the criteria in the bivariate analysis and then entered into multivariate analysis. In the bivariate model variables such as sex,

work experience, monthly salary, working unit, training on existing health hazards, farm health and safety policy induction and safety symbols/signs, participation in the promotion of Occupational Health and Safety(OHS), regular supervision, and communication of health and safety at workplace, using of MSDS, forced to work rapid pace work, having awareness of the right and obligation at work, forced to work by employers, tasks performed interfere with the personal value and entitled the right at work are full fill the criteria and entered to the

next model multivariate model. Finally, sex, monthly salary, working unit, training on existing health hazards, induction training, training on safety signs and symbols, use of MSDS, forced to work rapid pace work, having awareness of the right and obligations at work, forced to work by employers, tasks performed interfere with the personal value are variables statically significant towards knowledge of workers on health hazards in floriculture industry (Table 4).

Table 4 Factors that affect the knowledge of workers about occupational health hazards in the floriculture industry, Western Oromia, (N =656)

Category of Variables	Good Knowledge	Poor Knowledge	COR (95%CI)	AOR (95CI %)	p-value
Sex					
Male	83(68.0)	39(32.0)	1.00	1.00	
Female	279(52.2)	255(47.8)	1.945(1.28- .95)	2.81(1.5 - 5.28)	0.001
Work experiences					
1-5 years	269(54.7)	223(45.3)	0.46 (0.20-1.07)		
5-10 years	84(60.4)	55(39.6)	0.37(0.15-0.89)		
>10 years	9(36.0)	16(64.0)	1.00		
Monthly Salary					
>1000 birr	4(33.3)	8(66.7)	11.00(1.6-75.5)	11.83(1.02- 137)	0.048
1000-2000 birr	347(55.0)	284(45.0)	4.5 (0.99 -20.47)	5.85(1.07- 1.96)	0.041
>2000 birr	11(84.6)	2(15.4)	1.00	1.00	
Working Unit/department					
Spray	33(76.7)	10(23.3)	1.00	1.00	
Green house	265(54.8)	219(45.2)	2.73(1.31 -5.66)	1.719(0.64- 4.57)	
Irrigation	15(78.9)	4(21.1)	0.88(0.24 - 3.26)	0.94(0.22- 3.95)	
Packing house	49(44.5)	61(55.5)	4.11(1.84 -9.15)	2.89(1.05- 7.98)	
Received training on existing health hazards					
Yes	191(74.9%)	64(25.1%)	1.00	1.00	
No	171(42.6%)	230(57.4%)	4.01 (2.845.67)	1.79(1.11- 2.87)	0.016
Participation in the promotion of health and Safety					
Yes	94(83.9)	18(16.1)	1.00		
No	268(49.3)	276(50.7)	5.38(3.16 -9.15)		
Received orientation on safety symbols/signs					
Yes	30(81.1)	7(18.9)	1.00	1.00	
No	332(53.6)	287(46.4)	3.70 (1.60 -8.56)	2.84(1.04- 7.76)	0.042
Regular supervision of health safety					
Yes	61(72.6)	23(27.4)	1.00		
No	301(52.6)	271(47.4)	2.39(1.44 - 3.96)		
Having awareness of on-farm health and safety policy					
Yes	76(80.0)	19(20.0)	1.00		
No	286(51.0)	275(49.0)	3.84(2.26- 6.53)		
Used MSDS at the workplace					
Yes	217(79.2)	57(20.8)	1.00	1.00	
No	145(38.0)	237(62.0)	6.22(4.35 - 8.89)	3.94(2.37- 6.56)	0.0001
Received induction training					
Yes	140(70.4)	59(29.6)	1.00	1.00	
No	222(48.6)	235(51.4)	2.51(1.76 - 3.58)	2.12(1.35- 3.34)	0.001
Forced to work rapid pace work					
Yes	207(70.4)	87(29.6)	1.00	1.00	
No	155(42.8)	207(57.2)	3.18 (2.29 -4.40)	2.25(1.37 - 3.72)	0.001
Tasks performed involve personal value					
Yes	204(52.4)	185(47.6)	1.00		
No	158(59.2)	109(40.8)	0.76 (0.55- 1.04)	1.71(1.09 - 2.69)	0.02

Table 4 Continued....

Having awareness of rights and obligations at work					
Yes	324(62.2)	197(37.8)	1.00	1.00	
No	38(28.1)	97(71.9)	4.2(2.77- 6.35)	3.28(1.95 - 5.54)	0.0001
Forced by an employer to work					
Night Work (10pm to 06am)	6(42.9)	8(57.1)	1.33 (0.45 - 3.91)	0.79(0.21 - 2.97)	
Perform in hazardous conditions without any protection	15(60.0)	10(40.0)	0.67 (0.29 - 1.52)	0.55(0.20 - 1.53)	
Work on weekly rest day	52(64.2)	29(35.8)	0.56(0.34 - 0.95)	0.58(0.28 - 1.21)	
Work on public holiday	71(78.9)	19(21.1)	0.27(0.15 - 0.46)	0.33(0.17 - 0.66)	0.002
Perform task not a part agreement	24(42.9)	32(57.1)	1.33(0.76 - 2.35)	0.63(0.32 - 1.24)	
Not enforced	194(50.0)	194(50.0)	1.00	1.00	
Entitled the right at work					
Annual Leave	215(55.6)	172(44.4)	0.62 (0.37 - 1.03)		
Maternity/Paternity Leave	115(58.7)	81(41.3)	0.55(0.32 - 0.95)		
Mourning Leave	32(43.8)	41(56.2)	1.00		

Discussion

This finding indicated that 55% of employees of floriculture farms in western Oromia, Ethiopia had a good knowledge of occupational health hazards. This is lower than the level of knowledge (85.3%) of workers on the health effects of pesticides in the Bahirdar floriculture industry,¹⁵ this large number may show that only compared with the health hazards related to pesticides. Whereas only 29.4% of floriculture employees had good safety practices, however, 70.6% of them didn't follow safe practices regarding occupational health hazards while they are working.

Due to the nature of floriculture task demands females as compared to males, so in this finding majority (81.4%) of the participants were engaged females. The female workers had good knowledge (1.95 times) than male workers of the existed health hazards in their working area. As per Ethiopian labor proclamation no 1156/2019, it prohibits activities that jeopardize the health and safety of young workers less than the age of 18 years.¹⁶ However, in this study, about 87(13.3%) of employees were young workers or less than 18 years old. The majority (96.2%) of the employees earned a monthly salary between 1000- 2000 birr (31.3-62.6 \$USD) at the time of data collection. This indicates that in Ethiopia there is no minimum labor wage, so it depends on the interest of the employing organization. Thirty-nine percent (39%) of employees were trained on existing health hazards (chemical hazards). This is higher than the study conducted in the rift valley of Ethiopia among pesticide sprayers on a farm.¹⁷ Regular supervision and communication on health and safety issues are lower than in the study conducted in Ethiopia in the area of occupational health and safety management practice.¹⁸

The knowledge of employees engaged in packing houses is statically significant towards health hazards when compared to other task units [AOR= 2.89, 95% CI, 1.11-2.87]. The provision of training at the workplace is an important issue for the improvement of the health and safety of workers. However, this finding shows that the availability of training for employees on existing health hazards and induction training before starting a new job are statically significant in determining the knowledge of employees about occupational health hazards this showed that on-job training safety and health is a key element in controlling health hazards in the workplace.¹⁹⁻²¹

One of the factors that affect the good knowledge of workers in the farm industry is having low knowledge and usage of the material

safety data sheet (MSDS) for the precaution of health hazards at the workplace, which is statically significant with poor knowledge [AOR=3.95, 95% CI, 2.37-6.56], and the awareness of workers of safety signs and symbols, when compared with had received orientation on safety signs and symbols is statistically significant. So awareness creation is the key improvement of the knowledge of workers about occupational health hazards.

Right at work is one of the components of the four dimensions of decent work agenda. Fundamental rights at work is an issue to abolish forced labor.²² The study identified the right to have awareness of the right and obligations at work as an essential element for workers to exercise their fundamental rights. In this study, we identified workers were forced to work in rapid pace activities, perform activities that coercion with their personal values, and enforced to work on public holidays. Labor proclamation prohibits unlawful for a worker to intentionally obligate in the workplace any act which endangers his/her life.¹⁶

Limitation of study

This study collects data from a large number of participants however, it lacks an observational study. So we recommend other researchers use both quantitative and qualitative data.

Conclusion & Recommendation

This finding identified the magnitude of knowledge and practice towards occupational health hazards among floriculture workers was low. The majority of employees engaged in flower farms were practiced unsafely in floriculture industries. Induction training, training on existing health hazards and awareness creation on safety signs and symbols were statically significant, and participation of workers in occupational health and safety decisions and having awareness of the right and obligations at work was significant. Therefore an intervention is needed in this area to improve the knowledge and practice of workers towards occupational health hazards by providing appropriate occupational health and safety services among this sector of the working population.

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Authors' contributions

WT participated in the whole research the study design, and data collection analyzed the data, and drafted the paper and the correspondence author. AT, HO, FN, JD, and AS participated in the data collection, analysis, and manuscript writing. All authors read and approved the manuscript.

Conflict of interest

The authors declare that there is no conflict of interest.

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