ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

COMPARATIVE CROSS SECTIONAL STUDY ON OCCUPATIONAL HEALTH PROBLEMS AMONG WORKERS IN FLORICULTURE INDUSTRY, HOLETA, ETHIOPIA

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Table of Contents

List of tables

List of figures

Abbreviation and Acronyms

AAU- Addis Ababa University

BSC: - Bachelor of Science

CI: - confidence interval

FGD: - Focus group discussion

PI: - Principal investigator

PPE- Personal protective equipment

SAB – Spontaneous abortion

SPSS- statistical package for social science

Abstract

Back ground: - Floriculture is labor intensive industry in which a number of citizens in Ethiopia rely on it and currently it is on vast expansion over the country. In spite of its creation of job opportunity it imposes various health challenges on the workers.

Objectives: the specific objectives of this study are to assess the magnitude and determinants of common illness symptoms encountered by the workers of floriculture industry.

Methods: - Mixed method approach; using Comparative cross sectional quantitative study on 958 randomly selected respondents of floriculture workers and general population; a qualitative study on purposively selected respondents from floriculture workers were conducted to obtain result on illness symptoms encountered in the past 12 months prior to data collection and associated factors. The data was collected using a pre-tested and structured questionnaire for the quantitative study and qualitative data was obtained from workers of floriculture through in-depth interview and focus group discussion with predesigned interview guide.

Results: - A total of 958 respondents with a response rate of 98.4% were included in this study. The prevalence of respiratory and skin disorder illness symptom were 462 (75.5%) and 232 (48.6%) versus 178(37%) and 68 (14.1%) for floriculture workers and general population respectively. Awareness of workers on risks of working in floriculture has association with reported respiratory and skin disorder illness symptom as those who were not aware about risks were less likely to report illness symptom. Use of personal protective equipment and pre training doesn't show significant association with illness symptom of workers. Majority of respondents didn't wear full personal PPE since only less than 30% of workers who have reported having PPE have boots, facemask and goggles. In the qualitative result respondents mentioned that the type of pre-training that is being provided to workers focuses on safety of flowers rather than how workers keep themselves away from the potential risks.

Conclusions and recommendations: - According to these study respondents of floriculture workers have reported high prevalence of developing illness symptom in the past 12 months of time prior to data collection. Thus employers' should give training on protection on workers from the potential hazard and fulfill personal protective equipments to workers.

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1. Introduction

1.1 Background

Floriculture can be defined as “a discipline of horticulture concerned with the cultivation of flowering and ornamental plants for gardens and for floristry, comprising the floral industry.” It can also be defined as “The segment of horticulture concerned with commercial production, marketing, and sale of bedding plants, cut flowers, potted flowering plants, foliage plants, flower arrangements, and noncommercial home gardening(1). Floriculture as an industry has begun first in England in 1800 where flowers were grown and distributed to other estates. Since then it continues to distribute over the world being the profitable industry. Now a day’s flower is grown in developing countries of Latin America and Africa to be exported to Europe and North America being a source of foreign currency for these countries (2).

Ethiopia is suitable for this industry mainly due to the high altitude and favorable temperature (3). This makes the country to attract investors that are interested to invest on this sector. Flower industry relies on usage of toxicant pesticide and other chemicals in order to supply importers of flowers insect and pest free flowers (4).Floriculture industry is labor intensive; it has created job opportunity especially for those who have been deprived due to low educational level and for those who are poor. In the past few years it has been a source of the biggest foreign currency of the exports for the country (3) .

Even though the industry is in vast expansion over the country the environmental and occupational health impact of the industry is not well documented. Even there is scarcity of document on the potential workers health problems; studies on different country had associated working in floriculture with potential health problems of workers. The reason for this health challenge for the workers have been discussed by different scholars to be intensive pesticide usage, high temperature in green house and high physical activity. Studies at different time have shown association of the working in flower industries with the potential impact on reproductive health problems, respiratory health problems, skin problems such as dermatitis and neurological development problem (1, 5).

1.2 Rationale of this study

Currently Ethiopia has become one of the major growers of cut flower in Africa. But research towards the existing health problem on the workers and the level of prevention of health hazards are scarce. Available study lack the comparison of the workers illness symptoms with the general population which makes it less conclusive (6). In this study the illness symptoms of the floriculture workers was assessed in the workers working in floriculture and it was compared with the general population. In addition this study has tried to look at some of factors association with occupational health in floriculture workers. Thus this study will help researchers, policy makers and employers to be aware of health issues of the workers.

2. Literature review

2.1 Workflow in floriculture industry

Activities performed routinely in flower farming can be seen by classifying as cultivating and post harvest activities. Cultivating activities are performed in greenhouse; essential microcosm designed for providing essential physical environment for horticulture plants despite outside weather. Those activities performed by workers include constructing flowerbeds, applying fertilizers and pesticides, planting, working in flower beds, weeding and cutting, irrigation, harvesting flowers, raising flowerbeds, pruning and carrying organic waste. Those activities performed in greenhouse are also supported by irrigation room where fertilizers and pesticide mixing and preparation take place. Post harvest activities are performed in pack house; where harvested flowers are arranged in the way it would be exported. Work activities performed in pack house include arranging stems, cleaning the post-harvest area, classifying, cutting, and packaging flowers, collecting trash and carrying flowers to the cold storage rooms. The whole activities performed in flower farms are supported by administrative and supervisor activities (7-9).

2.2 Occupational health and safety

International labor organization(ILO) and world health organization(WHO) has jointly define Occupational health in 1950 as a science and an art which aims at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and to summarize, the adaptation of work to man and of each man to his job(ILO/WHO). Thus occupational health and safety is concerned about attainments of the workers well being in the work place to the maximum achievements maintaining the work environment at all time safe. Work environment can be a potential hazard for the workers engaged exposing workers for chemical, physical, biological hazards. According to occupational safety and health; hazard is something that can cause harm if not controlled (10).

Agriculture is one of the occupation in which many peoples in the world are engaged; in developing countries about 63% of the population rely on agriculture (11). It is also one of the occupations which are hazardous to the workers' health. The potential hazards in agricultural works are lengthy time of work, weather, sharp tools and equipments and extensive chemical usage are few among the many (4, 12).

Floriculture is one of the profitable agri-business worldwide where many peoples who are deprived of work at the early times are engaged (4). Apart from its benefit in terms of income to the workers; workers are facing different health challenges.

2.3 Flower industry in Ethiopia

Flower trading in Ethiopia dates back to the 19th and it shows a prominent+ progress after the year 2000. The flowers grown in the country are summer flowers, cut flowers and roses. Over 80% of the flowers grown and exported are roses. The first rose producer has started in 1997 and the second in 1999 (13). The majority of floriculture industries are located around 51 Km radius from Addis Ababa where these areas are characterized with high altitude of 2400-2600 m^2 a. s .l, cool nights and high daily temperatures being suitable to cultivate long size roses. The other reason to select this area is its proximity to Addis Ababa enhancing ease access to the international air port. The rest are located in the low lands around shore of Lake Zeway where small and medium sized roses are grown. The Floriculture started to show a great progress from 2005 to 2009 and its foreign currency was $ 12,128 in 2005 after years it reaches $ 131,518 in 2009. The total area covered by floriculture industry in 2005 over the country was around 369 hectares. In 2010 the total area covered by floriculture was 1600 hectares creating job opportunities for around 35,000 peoples in which majority are women with 80 % of total workers on temporarily basis. The exported value of cut flowers in the first 10 months period of 2010 was US$250 million. Currently there are more than 89 producers and exporters of flowers which are largely owned by foreigners and partially jointly with citizens (14).

2.4 Occupational health problems in floriculture

Various health effects are observed in settings that handle the intensive use of pesticides. Acute illnesses such as rash seizure and gastrointestinal illnesses and chronic diseases like cancer and reproductive health problems have been reported to be associated to pesticide exposure (5). Studies have shown reproductive health problems among women's exposed to pesticides such

as spontaneous abortion(SAB), premature infant birth, malformed child and Menstrual cycle disturbances and delayed time to pregnancy (15, 16).

Study on employment in the Ecuadorian cut-flower industry and the risk of spontaneous abortion revealed that the odds of reporting a history of SAB were approximately 2.6 times for those mothers who reported working in the flower industry in the previous six years of the study as compared to those women who did not (17).

Meta analysis which have been conducted by Idrovo and Sanin who reviewed two studies on adverse reproductive outcome of women working in Colombian floriculture shows an increased risk of certain reproductive health problems among women's working in flower industry with a pooled estimator of spontaneous abortion 2.24; that of premature infant birth was 1.49, and of birth defects 1.31 (18).

Parental working in floriculture and thus exposure to pesticide has also shown association on children's neurobehavioral development. Studies conducted to assess the neurobehavioral development of children's who grow around the cut flower industry have been assessed and children's whose parents have a history of exposure to pesticide before and after the mothers have been pregnant was compared with those children's who reside far from the floriculture industry. The result of this study have shown an increased risk of association of the neurobehavioral developmental delay of children's who have a history of potential exposure to pesticide (19-21). In addition, farm work in general were associated with deficit in cognitive and psychomotor function (22).

Pesticide exposure has also been associated with different illness symptom ranging from mild illness symptom in a mild exposure to strong illness symptoms (23). A study by Del Prado-lu has shown association of workers' illness with pesticide exposure. In this study respondents have reported predominantly general symptoms of illness weakness, fatigability and lethargy) with 63.8% and other symptoms like headache, easily fatigability, blurring of vision and palpation were among the common symptoms reported (24). Another study conducted by Jinky Leilanie Lu show that the most common symptom encountered by cut flower farmers is weakness with a 44 % followed by fatigue and muscle pain with 19% (25). Chlorothalonil (tetrachloro-1, 3-benzenedicarbonitrile, CAS 1897-45-6) is one of the pesticides which have

been used in horticulture including floriculture as a fungicide. This pesticide has been reported to be used in tent factory and different health symptoms were reported by the workers in certain tent factory. Following this; Research conducted in Portuguese tent factory has shown an outbreak of contact dermatitis and conjunctivitis among workers in the factory that are exposed to this chemical (26).

2.5 Determinants of the health problems

According to Del Prado Lu the major risk factors for the symptoms observed in the study are reentering the sprayed area, selling the pesticide container, carrying the pesticide to home and eating and drinking within the farm (21). Illness symptoms encountered were associated with risk factors such as farm use, exposure to pesticide while applying it and inhalation of pesticide and mists. Those who entered a newly sprayed area were observed to encounter the health symptoms 20 times more than those who don't enter (22).

In addition to this studies have shown age, total working year, work intensity and pre employment training as the major determinants of the health problems that have been expressed by the respective studies. A study on Ecuadorian cut flowers have shown increased history of SAB by 3.4 fold as working year increases from 3 years to 6 years(15).

Farm workers who use PPE during mixing and spraying pesticides had a lower Chance of developing the health incident (19). Despite the benefit of PPE most farm workers will not apply them. This safety measures include glove wearing, aprons and closet which will prevent the insertion of the chemicals to the workers body. Boots were used by the majority of farm workers while gloves and aprons were not used by the farmers. Only PPE like cloth face masks handkerchiefs which does not give full protection were used by the majority of farm workers (20).

The reason for not applying safety measures include inadequate supply of PPE by the employer , low awareness of the potential hazard, lack of pre employment training of the workers(19).

Based on the above reviews Occupational health problems and associated factors in floriculture are summarized on conceptual frame work shown below (Figure 1). This conceptual framework was developed assuming illness symptom (respiratory and skin disorder illness symptom) of

workers will also be associated with factors which are associated with other health problems as reviewed from the literatures. As shown in the conceptual frame work illness symptoms of floriculture workers can be associated with socio demographic variables such as sex, age and income. In addition illness symptoms of workers can also be associated with institutional and environmental factors like pre-employment training periodic medical checkup, availability of PPE, high temperature, lack of precaution in working environment and behavioral factors like improper utilization of PPE and cigarette and alcohol consumption.

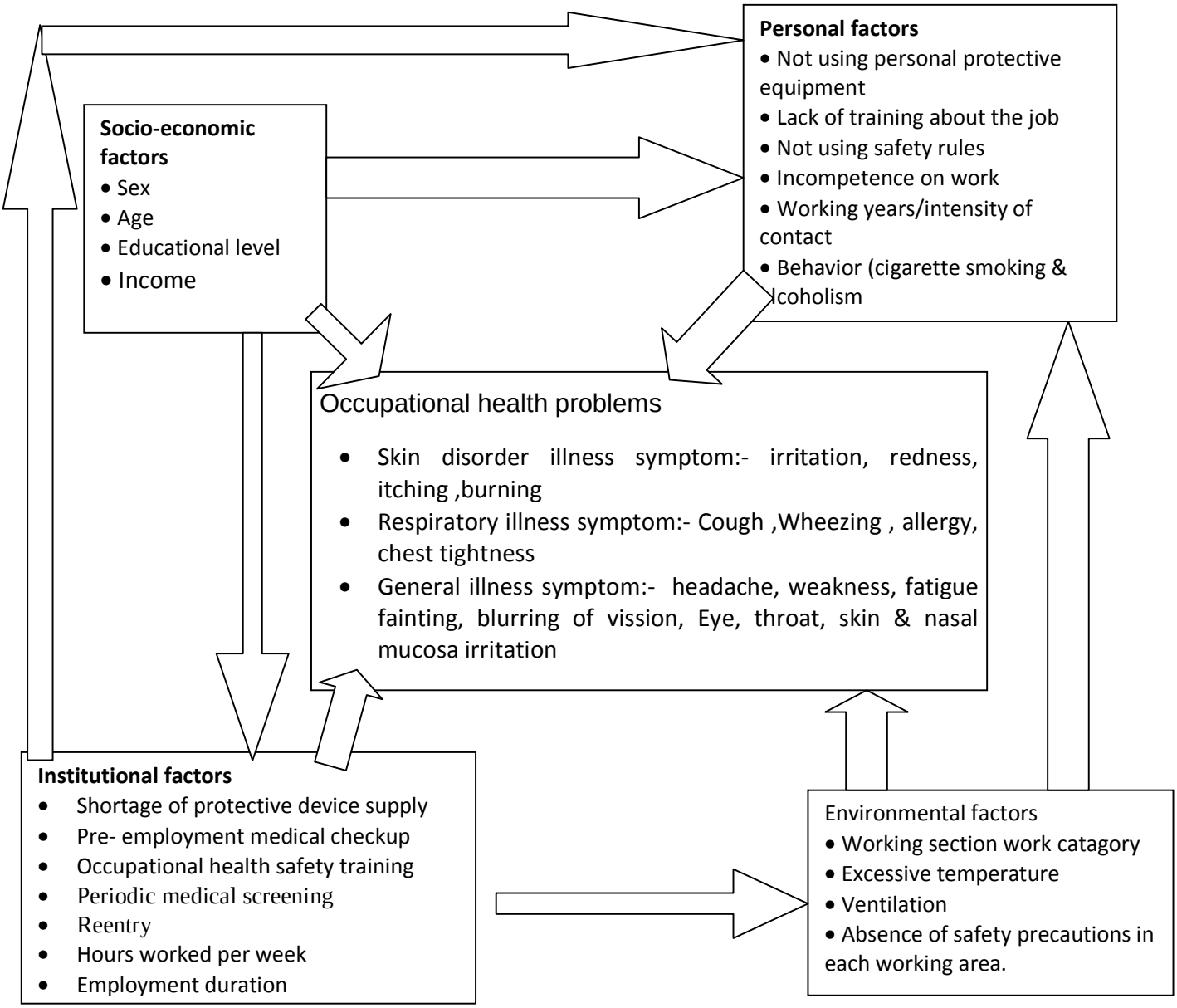

Figure I Conceptual framework for this study Holeta, Ethiopia February 2012

3. Objective

3.1 General objective

The general objective of this study was to assess the potential illness symptoms arising on the workers working in flower industry in Ethiopia.

3.2 Specific objectives

1. To assess the magnitude of common illness symptoms of workers in flower industry
2. To compare the illness symptoms between the workers of the floriculture and the general population.
3. To assess the factors associated with illness symptoms among the workers of floriculture.

4. Methodology

4.1 Study area

The study was conducted on January 2012 in Holeta town of Finfine surrounding Oromia special zone which is located 29 Kms away from the central city of Ethiopia Addis Ababa. The total population of this town is 30,003 with 8 Kebeles residence and 7,518 total households. The altitude of this town ranges from 2250m - 2500m and the average daily temperature ranges from minimum 6^0c to maximum 21^0c so the flowers that are grown in this area are highland flowers. There are 17 floriculture industries in Holeta town with 8,374 workers. Almost all farms grow roses except one who grows chrysanthemum flower in addition to roses.

4.2 Study design

Comparative quantitative cross sectional study to assess the magnitude of the potential illness symptoms arising in floriculture industry and supportive qualitative study (in depth interview and focus group discussion) and assessment of the working environment was conducted to support the quantitative result of the study .

4.3 Source population

All flower industry workers in Holeta and residents of holeta town were the source population for this study.

4.4 Study population

Randomly selected samples of workers from Holeta floriculture industry and residents of Holeta town are study population from whom this research was operational.

4. 4.1 Inclusion criteria

Farms who were functional before one year prior to the study and workers who have worked more than one year were recruited for the study. This was on assumption that workers working at least one year are sufficiently exposed to potential hazards.

For comparison purpose individuals who are in the age group 18-35 (based on similar studies which express much of the floriculture respondents age is 18-35) and who are engaged in certain work or house wives was selected (6).

4.4.2 Exclusion criteria

Workers and individuals who were not found at farm and at home respectively at the time of data collection were excluded from the study. Supervisors and administrative office workers were excluded from the study; this is on assumption that this workers undergo only controlling thus they will not be exposed to the potential working environment hazards.

4.5 Sample size determination

Sample size calculation for the first objective to assess the magnitude of common illness symptoms of workers in flower industry was conducted using single proportion formula.

$n = Z_{\alpha/2}^2 pq/d^2$ Where - α=0.05 -the probability that the result of this study will be by chance.

n= 336 -$Z_{\alpha/2} = 1.96$: -standard score corresponding to 95% CI

- P= 67.7%:- proportion of skin disorder in floriculture industry which gives maximum sample size from similar study Conducted in Sebeta Eth
- d=5% :-margin of error

Sample size calculation for the second objective; to compare the illness symptoms between the workers of the floriculture and the general population is conducted using two proportion formulas.

$P_1 = 67.7\%$ using the proportion of skin disorders among floriculture workers (proportion of the disease among the exposed) (6);

P_2= 57.7% assuming this study will detect a minimum of 10% difference among floriculture workers and comparison group for skin disorder group based on literatures (13).

$$n = \frac{[(Z\alpha/2P_0(1-P_0)+Z\beta P_1(1-P1)]^2}{P_1-P_0}$$ $n_1 = 386$, $n_2 = 386$

n_1: sample size for the floriculture population, n_2: sample size for the comparative group

Where: - P (pooled proportion) = $(P_1+r P_2)/1+r$, P = (67.7+57.7)/2 = 62.7

- α =0.05 the probability of detecting minimum of 10% difference that will be committed by chance.

-β= 20% the probability of rejecting a true difference

- r=1 the proportion of n_1 to n_2 is 1 to 1

n_1 = 425, n_2= 425; n_{total}= 850 :- By considering 10% non response rate

Sample size calculation for the objective to assess factors associated with illness symptoms among the workers of floriculture.

The sample size for the determinants of health symptoms in floriculture is calculated and the Maximum sample size comes from general illness symptom and factor signing working agreement(6). The sample size for this objective is calculated using double proportion formula as shown below.

$$n = \frac{[(Z\alpha/2P_0(1-P_0)+Z\beta\ P_1(1-P1)]^2}{P_1-P_0}$$ n1= 221; n2=221, n_{total}=935

Where P_1= 88.58(proportion of workers who develop illness symptom and who signed working agreement); P_2=96.10 (proportion of workers having illness symptom and not having signed working agreement).

Where: - P (pooled proportion) = $(P_1+r\ P_2)/1+r$, P = (88.58+96.10)/2 = 92.29

- α =0.05 the probability of detecting minimum of 12% difference that will be committed by chance.

-β= 20% the probability of rejecting a true difference

- r=1 the proportion of n_1 to n_2 is 1 to :- By considering 10% non response rate n_{total}= 487

❖ For incorporating the sample size which answers the three objectives the maximum among the three will be taken.

- The sample size for the third objective is maximum giving total of 487 for floriculture workers. Since the proportion of sample for floriculture workers and general population was 1:1 we take equal number of samples (487) for the comparison group giving a total of 974.

Samples included for addressing the qualitative study: - A total of 6 in-depth interview and 2 focus group discussion containing (6 and 7 discussants) were conducted among purposively selected respondents.

4.6 sampling procedure

4.6.1 Sampling procedure for quantitative data collection

4.6.1.1 Sampling procedure for floriculture workers

Based on the inclusion criteria 15 of 17 farms found in Holeta have meet inclusion criteria and included in this study. After allocating 487 samples of respondents to 15 industry proportionally based on number of workers in each industry; the sample which was taken from each industry was distributed proportionally to the four sections of workers (greenhouse, pack house, irrigation and spraying). Then after the samples allocated to each working section was also distributed to different groups of worker within each section of worker. After such distribution of samples lottery method was used to draw samples of respondents from workers of each group which fulfill the inclusion criteria. The sampling procedure is summarized in the figure below (Figure II).

4.6.1.2 Sampling procedure for general population

In case of general population the samples were distributed to 8 kebeles of Holeta proportionally according to the size of households available in each kebele. After such allocation households where study subjects drawn were selected every house hold number divided by samples taken from each kebele. Finally if persons fulfilling inclusion criteria in selected house hold is more than one person lottery methods were used to take one respondent where as if at least one person is not found fulfilling inclusion criteria the next house hold was used (Figure II) .

4.6.2 Sampling procedure for the qualitative part

Qualitative data collection was undertaken among individuals who were not included in the quantitative data collection. In-depth interviewees were conducted among purposively selected workers who have worked more than three years and supervisors. Focus group discussions (2 FGD) were conducted for one FGD 6 green house workers and for the 2nd FGD 2 irrigation and 5 spraying workers were purposively selected before sampling for the quantitative data in respective working section.

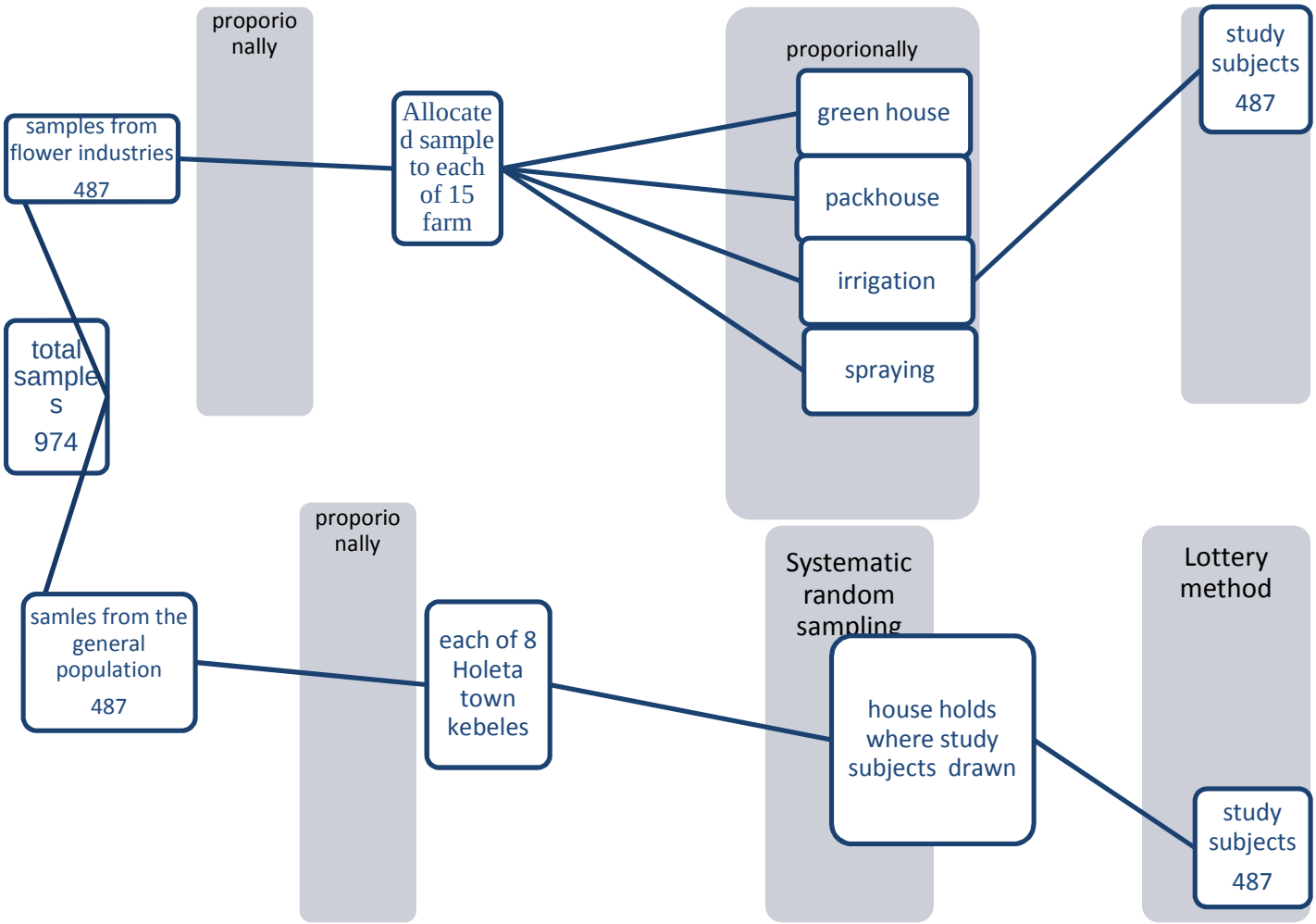

Figure II sampling procedure chart used for the study Holeta, Ethiopia January 2012

4.7 Data collection Methods

4.7.1 Quantitative data collection methods

The data was collected using a pretested and standardized questionnaire which was adopted from similar studies (6, 27-29). The questionnaire was pretested in 98(10%) of actual sample size for the study in Menagesha town (town found next to Holeta) one flower farm workers and one kebele residents a week prior to the actual data collection period; following the pretest the questionnaire was modified for actual data collection. In addition observation checklist for each respondent was filled by data collectors by observing the type and status of PPE used by respondents while data collection. Data was collected by six diploma health professionals through face to face interviews where it was supervised by principal investigator and one MPH 2^{nd} year student.

4.7.2 Qualitative data collection methods

Semi structured Interviewee guide and checklist was used for qualitative part data collection. During in-depth interviewee and FGD tape recording and note taking was taken place. Finally two focus group discussions were conducted by discussants selected prior to quantitative data collection sampling where discussion was moderated by PI and note taking takes place. Six in-depth interviewees were held on workers stayed at least 3 years and supervisors.

The environmental assessor inspected the working environment by the check list used to guide the inspection process.

4.8 Operational definition

Respiratory illness symptom: - is an ill feeling participants have answered subjectively having at least one of respiratory illness symptoms in the 12 months of period prior to the study(6, 27).

Skin disorder illness symptom:- is an ill feeling participants have answered subjectively having at least one of skin disorder symptoms in the 12 months of period prior to the study(6, 28).

Excessive heat: - if the worker found sweating or wears light cloths when naked. If the investigator feels sudden heat when enters into the working environment(6, 11).

Excessive dust: - if the investigator experiences sudden sneezing up on entering the industry or if the workers eye brows, hair, nostrils and cloths are observed by investigator to be covered with dust particle.

4.9 Variables

- **Dependent variable**:
    - Respiratory illness symptom
    - Skin disorder illness symptom

Independent variables :-

- Socio demographic and economic factors: - age, sex, religion, educational status, Ethnicity, marital status, income
- Utilization of PPE
- Awareness about work environment hazard
- Pre employment training
- Re-entry
- Pre training
- Pre- employment medical checkup
- Periodic-medical checkup

4.10 Data processing/ management

The data was coded by principal investigator and entered to Epi info version 3.5.1 computer software. Incomplete data was excluded from entry. The data was entered through giving unique and similar questionnaire ID number on questionnaire of each respondent hardcopy and soft copies entered to the computer. Before exporting the data to statistical package for social sciences (SPSS) the data was checked and cleaned for computer consistency through running frequencies, sorting the data in ascending order and identifying the missing or mistyped variables. The syntax list and find was used to identify the inconsistent unique questionnaire Id and the variable entered was compared with the hardcopy and corrected for any inconsistency. After such cleaning for each variable the data was exported to SPSS version 16 for further analysis.

4.11 Data analysis

4.11.1 Data analysis for quantitative part

Descriptive statistic such as frequency and percentage were used to present data. The result was presented by cross tabs, simple frequency tables and figures. Analytic methods of analysis using binary logistic method were used to show association of each factor with illness symptoms using OR with 95% CI. Variables which have a p-value of at least 0.3 in binary logistic regression were included in the multivariate analysis to avoid excessive number of independent variables and model fluctuation(11). Independent effect of each variable in the multivariate analysis was seen after controlling for covariates; finally the result showing the crude and adjusted odds ratio (AOR) was used to express the result of analysis.

4.11.2 Data analysis for qualitative part

Thematic analysis was used for the analysis of the results of focus group discussion and in-depth interview. Focus group discussion and in-depth interviewee was transcribed word by word after repeated listening. The transcribed data was then translated to English language from Afan-Oromo and Amharic language. The complete translation of respondents saying was breakdown into small expressions (codes) that expresses the meaning of the saying each respondents. The coded data was categorized according to the similarities of the meanings of codes. The categorized data then was given theme that expresses the meaning of each category. Finally each theme was concluded by at least one respondents saying.

4. 12 Data quality management

Data collection instrument was pretested in Menagesha town (set up where data collection will not take place). The data collectors and supervisors were trained for two days on the data collection process (tools questioning techniques and ethical issues). The principal investigator with supervisor supervised the data collection process routinely and the correction was made at the spot if there is any unclarity on questionnaire handling and questioning process. Filled questionnaire was checked for completeness, accuracy and consistency daily. Every morning the data collectors, supervisor and principal investigator discussed on the previous day data collection process and any unclarity faced was clarified before going to the daily work.

4.13 Ethical consideration

The ethical approval and clearance was obtained from the AAU school of public health ethical review committee. Official letters of support were obtained from the AAU school of public health and were given to all farms of floriculture, Holeta municipal office and investment office where the study was operational. Respondents was asked for verbal consent to participate in the study after hearing Participant information sheet which explains the aim, beneficence, maleficent, rights of respondents, confidentiality of the study and who will conduct the study. Based on acknowledgment of advantage of PPE in other studies respondents were given advice to use PPE.

4.14 Dissemination and utilization of the result

The result of this study will be presented to Addis Ababa university school of public health. The result will also be communicated to Ethiopian horticulture producers and exporters association (EHPEA'S) and respective flower farms where the study was conducted and pre-test have undertaken. In addition the result will be availed through publication.

5. Results

5.1 Socio demographic characteristics of respondents

The sample size for this study was 974 among whom 16 (1.6 %) was non respondents (10 from floriculture group and 6 from the general population group) finally 958 respondents (477 from floriculture workers and 481 from the general population) were recruited for this study with a response rate of 98.4%. Among the respondents 481 were from the general population group where as 477 were from the floriculture groups. The median age for floriculture group respondents were 25 with minimum 15 and maximum 66 where as the median age for general population group 28 with minimum 18 and maximum 35. The median monthly salary of floriculture group respondents is 420 with minimum of 180 and maximum of 850; while the median of monthly house hold income for general population were 908 with minimum of 150 and maximum 10,000; median monthly household income for floriculture workers were 180 with minimum 180 and maximum of 1618.median is 420 birr. Two hundred fifty three (53.0%) of respondents of floriculture workers and all of general population group respondents were urban dwellers. Twelve (2.5%) of floriculture respondents were in the age group less than eighty years where sixty nine (14.5%) were in the age group above 38 years old. Among the general population respondents 89(18.5%), 12(2.5%), 109(22.7%), 114(23.75), and 17(3.5%) were housewives, farmers, merchant governmental employee and nongovernmental employee respectively. The result of socio-demographic variables is summarized in the table below (Table1) showing 354(74.4%) of floriculture group respondents and 327(68.0%) of general population group were females; the majority of respondents were unmarried (50.5%) among floriculture group where from the general population the majorities were married respondents (65.7%). The majority of respondents of both groups were with ethnic group Oromo and educational status of primary education (84.7%, 41.9%) and (69.0% and 49.7%) of floriculture and general population group respectively. Majority of floriculture workers have educational level of at most illiteracy where general population respondents have educational level of secondary and above with 241(45.9%) and 252(50.3%) respectively. Two of respondents from floriculture workers reported they have no religion.

Table 1: Socio demographic variables of respondents Holeta, Ethiopia January 2012

Characteristics	**Floriculture**	**General population**	**Total**
	Frequency (%)	Frequency (%)	Frequency (%)
Sex (n=958)			
Male	123(25.8)	154(32.05)	277(28.9)
Female	354(74.2)	327(68.0)	681(71.1)
Education (n=958)			
Illiterate	219(45.9)	84(17.5)	303(31.6)
Primary	200(41.9)	155(32.2)	355(35.0)
2^0 and above	59(12.2)	242(50.3)	301(31.4)
Marital status (n=958)			
Unmarried	241(50.5)	134(27.9)	375(39.1)
Married	186(39.0)	316(65.7)	502(52.4)
Ever married	50(10.5)	31(6.4)	81(8.5)
Family size(n=958)			
≤2 family	173(36.3)	127(26.4)	300(31.3)
3-4 family	174(36.5)	209(43.5)	383(40.0)
≥5 family	130(27.3)	145(30.1)	275(28.7)
Ethnicity (n=958)			
Oromo	404(84.7)	332(69.0)	736(76.8)
Amara	51(10.7)	83(17.7)	134(14.0)
Gurage	14(2.9)	48(10.0)	62(6.5)
Others	8(1.7)	18(3.7)	26(2.7)
Age (n=877)			
18-22	163(34.2)	82(17.0)	245(25.6)
23-27	114(23.9)	152(31.6)	266(27.8)
28-32	89(18.7)	144(29.9)	233(24.3)
33-37	30(6.3)	103(21.4)	133(13.9)
Religion (956)			
Orthodox	392(82.2)	337(70.1)	729(76.1)
Protestant	77(16.1)	129(26.8)	206(21.5)
Muslim	6(1.3)	15(3.1)	21(2.3)

5.2 Selected work place factors

Among 477 respondents of floriculture workers 249(52.2%) are employed as daily laborer where 212(44.4%0) and 16(3.4%) respectively employed as permanently and temporarily; 196(41.1%) have signed working agreement; 32(6.7%) have taken pre-employment medical checkup where 88(18.4%) have reported to have periodic medical checkup., 103(21.6%) of respondents have reported that they have entered recently sprayed area, 99(20.8%) have worked overtime, 366(76.7%) go their home with their cloth in which they have worked wearing it and 41(8.6%) have reported that they was transferred from one working section to other. Some additional characteristics of institutional relationship were summarized in the Table below.

Table 2: Selected work place parameters of Floriculture workers Holeta, Ethiopia January 2012

Characteristics	Frequency (n=477)	Percentage
PPE availably		
Yes	251	52.6
No	226	47.4
Working hour/day		
<8 hours	9	1.9
8 hours	466	97.7
>8 hours	2	0.4
Service year		
≤23	98	20.5
24-36	90	18.9
37-60	155	32.5
≥ 31	134	28.1
Happiness		
Unhappy	220	46.1
Neutral	112	23.5
Happy	145	30.4
Awareness of risk		
Yes	400	83.9
No	77	16.1

PPE – personal protective equipment

The majority of respondents were from greenhouse 317(66%) following by 86(18.0%), 50)10.7%) and 24(5.2%) pack-house, spraying and irrigation workers respectively. Workers working section distribution with sex is shown in the Figure 1below.

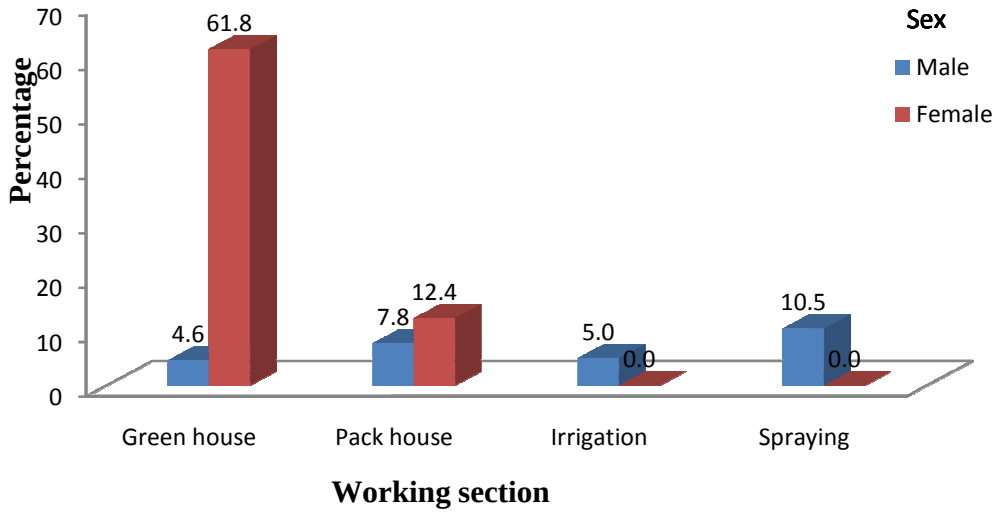

Figure 1: Working section distribution of floriculture workers respondents with sex, Holeta Ethiopia. January 2012.

Two hundred four of respondents (81.3%) from those who have reported having PPE equipment have reported having gauntlet gloves where 72(28.7%), 74(29.5%), 37(15.1%) and 21(10%) have reported having boots, coverall, facemask and goggles. In addition 8.7% have reported having coat, 12(4.8%) short glove; 7(2.8%) having apron and 1(0.4) having plastic bag. Available personal protective equipment used by the respondents with proper utilization and with their sex is summarized on Figure below respectively.

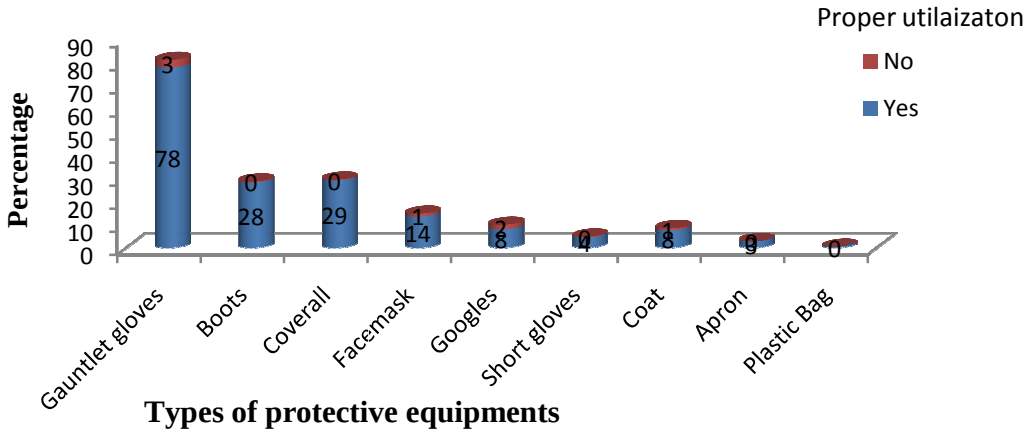

Figure 2: Available Personal protective equipments of respondents of floriculture workers with proper utilization Holeta Ethiopia, January 2012.

5.3 Reported illness symptom

5.3.1 Reported skin disorder symptoms

Two hundred thirty two (48.6%) of respondents from the floriculture worker groups and sixty eight (14.1%) of the general population group respondents have developed at least one of skin disorder illness symptom in the 12 months period prior to data collection. The majority of respondents from floriculture group have developed itching followed by eczema, burning sensation and redness on their skin in the past 12 months with 196(41.1%), 190(39.8%), 155(37.5%) and 179(32.55%) respectively. The result of the skin disorder illness symptom of both floriculture and general population respondents is summarized in the Figure 3 below. Among those who have developed at least one of skin disorder symptom 129(56%) respondents of floriculture have developed on the symptom on their face where 32(47%) of general population have developed so. The summary of respondents' part of body parts attacked by at least one of the skin disorder symptom is shown in Figure 4.

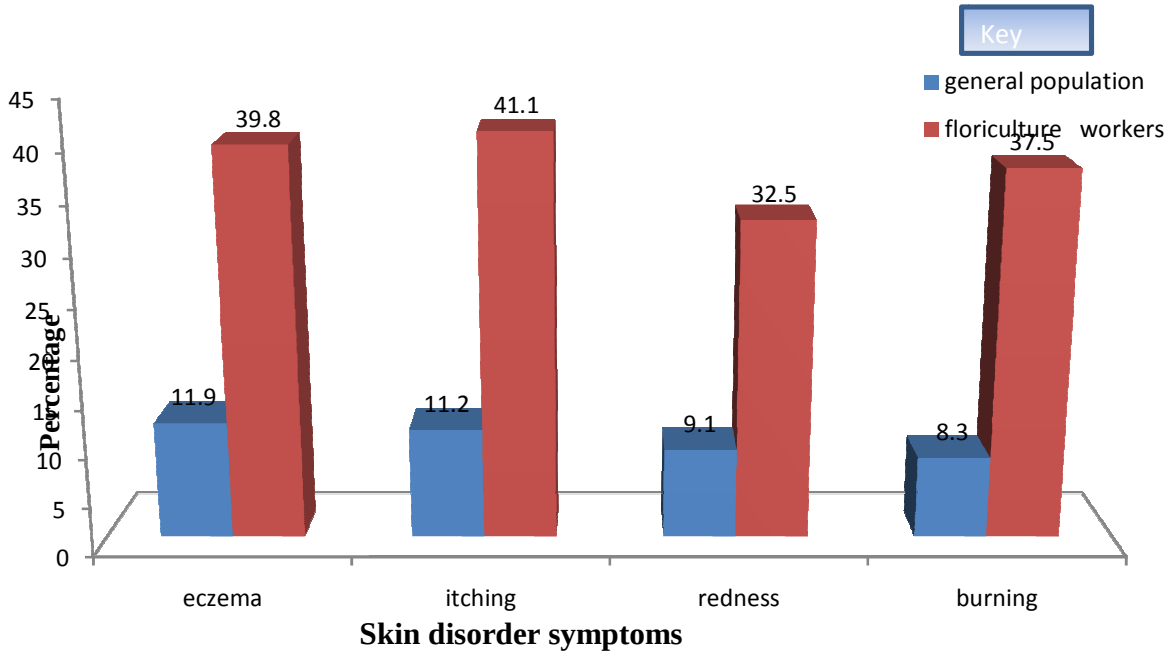

Figure 3: Reported skin disorder symptoms developed by respondents in the 12 months of period prior to data collection Holeta Ethiopia, January 2012

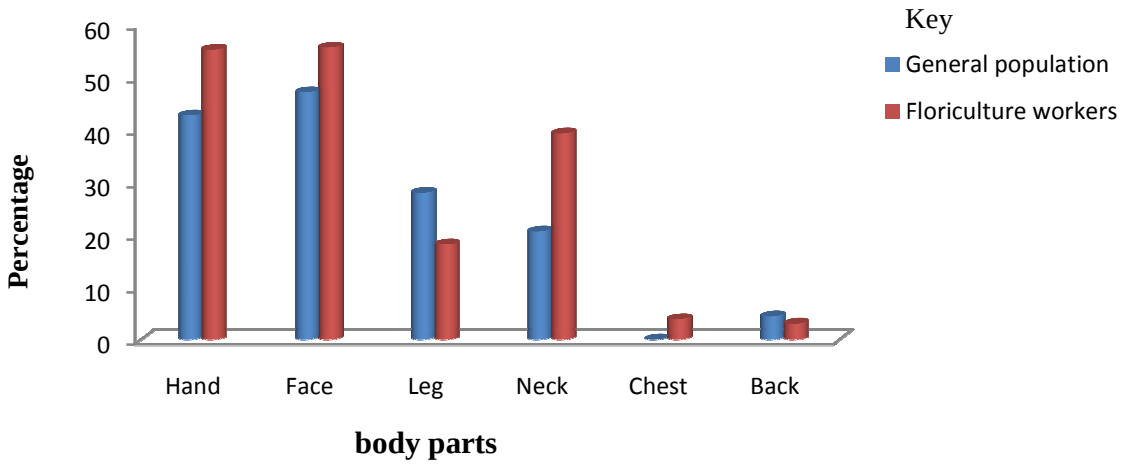

Figure 4: Body parts of respondents where at least one of skin disorder symptoms have occurred Holeta Ethiopia, January 2012

5.3.2 Reported respiratory illness symptoms

Three hundred sixty one (75.5%) of respondents of floriculture workers and two hundred three (42.2%) of respondents of the general population have reported developing at least one of respiratory illness symptom in the 12 months of period prior to data collection. Majority of respondents of floriculture group reported developing chest tightness with 259(54.30%) where the general population group developed sneezing with 101(21%) and least of both groups go to asthma with 15(3.1%) and 21(4.4%) respectively. The summary of different respiratory illness symptom is summarized in the Figure 8 below.

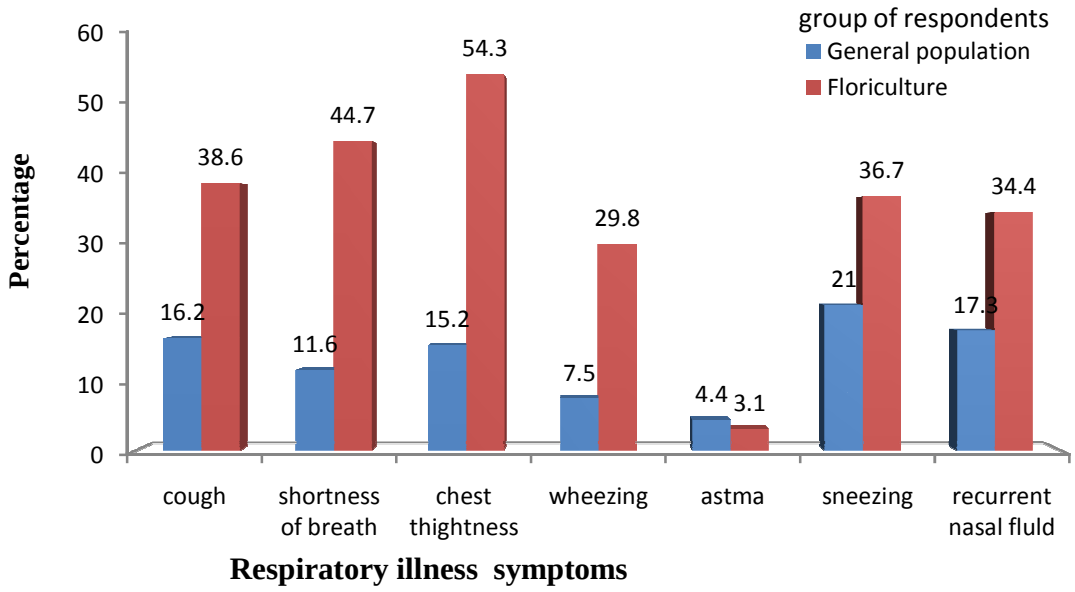

Figure 5: Reported respiratory illness symptoms developed ny respondents in 12 months of prior to data collection respondents, Holeta, Ethiopia January 2012.

5.3.3 Reported general illness symptoms

Majority of floriculture group respondents reported developing fatigue 356(74.6%) followed by headache 334(70.0%) and the least goes to fainting 90(18.9%) where the general population respondents have reported developing headache 284(59.0%) followed by fatigue 231(48.0%) and at the same time the least goes to fainting with a magnitude of 13(2.7%) in the past 12 months of period prior to data collection.

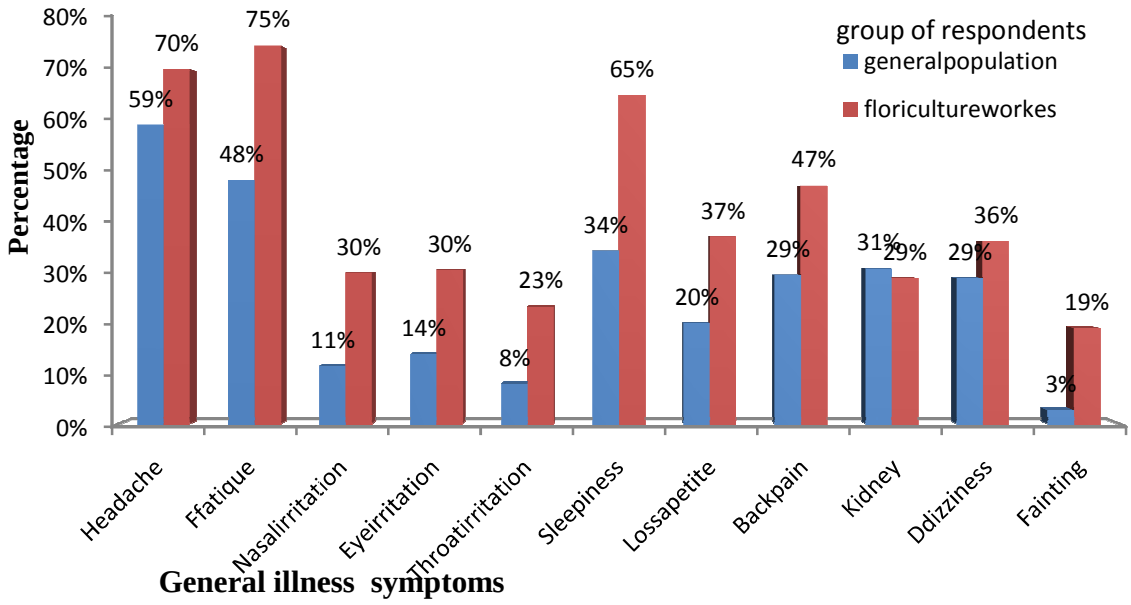

Figure 4: Reported general illness symptoms developed by respondents in the past 12 months of prior to data collection Holeta, Ethiopia January 2012.

5.4 Behavioral characteristics of respondents

Some Behavioral characteristics of respondents floriculture workers and general population group were assessed accordingly 34(7.1%) and 56(11.6%) of respondents drink alcohol, 5(1.0%) and 4(0.8%) are smokers, 175(36.7%) and 163(34.9%) undertake cooking in the main house part and 99(20.0)% and 110(22.9%) use chemicals in their house environment respectively. The result of the above behavioral characteristics including fuels in use for those who undertake cooking in the main house, type and reason for home chemical usage is summarized in the table below.

Table 3: Behavioral characteristics of respondents Holeta, Ethiopia January 2012

Characteristics	**Floriculture**	**General population**	**Total**
	Frequency (%)	Frequency (%)	Frequency (%)
Alcohol (n=958)			
Yes	34(7.1)	56(11.6)	90(9.4)
No	443(92.9)	425(88.4)	868(90.6)
Smoking(n=958)			
Yes	5(1.0)	4(0.8)	9(0.9)
No	472(99.0)	477(99.2)	949(99.1)
Cooking in main house(n=958)			
Yes	175(36.7)	168(34.9)	343(35.8)
No	302(63.3)	313(65.1)	615(64.2)
Fuel in use			
Wood	96(54.9)	55(32.7)	151(43.0)
Charcoal	149(84.2)	138(82.1)	287(83.7)
Electric	3(1.7)	45(28.6)	48(14.0)
Kerosene	28(16.0)	81(48.2)	109(31.8)
Household chemical use(n=958)			
Yes	99(20.8)	110(22.9)	209(76.8)
No	378(79.2)	371(77.1)	749(78.2)
Reason for HH chemical Use			
Destroy insects	93 (93.9)	107(97.3)	200(95.7)
Destroy rodents	6(6.1)	3(2.7)	9(4.3)
Types of chemical(n=209)			
Insecticide aerosol	54(54.5)	82(82.83)	136(65.1)
DDT	13(13.1)	7(7.07)	20(9.6)
Unknown	32(32.3)	19(19.19)	51(24.4)

5.5 Bivariate analysis

5.5.1 Bivariate analysis for respondents' illness symptom

5.5.1 .1 Bivariate analysis of reported respiratory illness symptom

In bivariate analysis floriculture workers are 4 times more [OR of 4.26(3.23-6.62)] to develop respiratory illness symptom than general population. Respondents who have Educational level of primary education are 36% [OR of 0.64(0.46-0.88)] less where those who have secondary and above educational level are 62 % [OR of 0.376(0.27-0.52)] less to develop respiratory illness symptom than illiterate respondents. Those who have family size of 3-4 are 28% lower to develop respiratory illness symptom than who have 1-2 family size where married respondents are 36% lower to develop than unmarried ones. The other variable like smoking, sex and household chemical use doesn't have significant association with developing respiratory illness symptom (Table 4).

Table 4: Summary of bivariate analysis for reported respiratory illness symptom of respondents Holeta, Ethiopia January 2012

Characteristics	**Respiratory illness symptom**		**COR(95% of CI)**
	Yes frequency (%)	No *frequency (%)*	
Group			
General population	203(42.2%)	278(57.8%)	1.00
Floriculture	361(75.7%)	116(24.3%)	4.262(3.232-6.620)
Sex			
Female	*404(59.3%)*	277(40.7%)	1.656(0.803-1.416)
Male	160(57.8%)	117(42.2%)	1.00
Education			
Illiterate	279(55.0%)	228(45.0%)	1.00
Primary	187(70.6%)	78(29.4%)	0.636(0.460-0.880)
2^0 and above	98(52.7%)	88(47.3%)	0.376(0.269-0.525)
Marital status			
Unmarried	239(63.7%)	136(36.3%)	1.00
Married	266(53.0%)	236(47.0%)	0.641(0.488-0.843)
Ever married	59(27.2%)	22(72.8%)	1.526(0.896-2.600)
Family size			
≤2 family	192(64.0%)	108(36.0%)	1.00
3-4 family	265(56.1%)	215(43.9%)	0.720(0.528-0.982)
≥5 family	157(57.1%)	118(42.9%)	0.748(0.535-1.047)
Smoking			
Yes	4(44.4%)	5(55.6%)	0.556(0.148-2.083)
No	389 (41.0%)	559 (59.0%)	1.00
Household chemical use			
Yes	124(59.3%)	85(40.7%)	1.024(0.750-1.400)
No	440(58.7%)	309(41.3%)	1.00
Alcohol			
Yes	50(55.6%)	40(44.4%)	1.00
No	514(59.2%)	354(40.8%)	0.861(0.556-1.333)
Cooking in main house			
Yes	208(60.6%)	135(39.4%)	1.121(0.856-1.467)
No	356(57.9%)	259(42.1%)	1.00

* Significant at p-value <0.05.

5.5.2 Bivariate analysis Skin disorder symptom

In bivariate analysis floriculture workers are 6 times higher (OR 5.75(4.21-7.87)) to develop skin disorder illness symptom than general population. Educational level have shown significant association in which those who have a primary level education and at least secondary level education are 11.8% and 66.8% lower to develop skin disorder symptom than those who are at most literate. In addition married respondents are 36% lower to develop skin disorder illness symptom where other variables like sex, age, household chemical usage cooking in the main house doesn't show significant association (Table 5).

Table 5: Summary of bivariate analysis for reported skin disorder illness symptom of respondents Holeta, Ethiopia January 2012

Characteristics	Skin disorder illness symptom		COR(95% of CI)
	Yes frequency (%)	No frequency (%)	
Group			
General population	68(14.1)	413(85.9)	1.00
Floriculture	232(48.6)	245(51.4)	5.751(4.205-7.866)*
Sex			
Male	74(26.7)	203(73.3)	1.00
Female	*226(33.2)*	455(66.8)	1.363(0.999-1.858)
Education			
Illiterate	119(39.3)	184(60.7)	1.00
Primary	128(36.1)	227(63.9)	0.872(0.635-1.196)
2^0 and above	53(17.7)	247(82.3)	0.332(0.228-0.483)
Marital status			
Unmarried	133(35.5)	242(64.5)	1.00
Married	130(25.1)	372(74.1)	0.636(0.475-0.851)*
Ever married	37(45.7)	44(54.3)	1.530(0.941-2.487)
Family size			
≤2 family	106(35.3)	194(64.7)	1.00
3-4 family	109(28.5)	274(71.5)	0.728(0.526-1.007)
≥5 family	85(30.9)	190(69.1)	0.819(0.578-1.160)
Smoking			
Yes	2(22.2)	7(77.8)	0.624(0.129-3.023)
No	298 (31.4)	651 (68.6)	1.00
Household chemical			
Yes	77(36.8)	132(463.2)	1.376(0.997-1.898)
No	223(29.8))	526(70.2)	1.00
Alcohol			
Yes	26(28.9)	64(71.1)	0.881(0.546-1.420)
No	274(31.6)	594(68.4)	1.00
Cooking			
Yes	116(33.8)	116(68.7)	1.197(0.902-1.588)
No	184(29.9)	431(70.1)	1.00

* Significant at p-value <0.05.

5.5.2 Bivariate analysis for workers illness symptoms

5.5.2.1 Bivariate analysis for reported respiratory illness symptom of floriculture workers

Bivariate analysis of reported respiratory illness symptom shows those who are not aware of the possibilities of risks are 57% [COR of 0.421(0.256-0.719)] lower in reporting having respiratory illness symptom and workers who have reported reentering sprayed area before the smell of chemicals comes out are 80% [COR of 1.821 CI (1.03-3.22) higher in reporting respiratory illness symptom (Table 6). Pre-training and having PPE didn't show significant association with reported respiratory illness symptom having [COR 0.89(0.44-1.80)] and [COR 1.15(0.75-1.74)] respectively.

Table 6: Bivariate analysis summery for reported respiratory illness symptom of floriculture workers respondents Holeta, Ethiopia January 2012

Characteristics	**Respiratory illness symptom**		**COR(95% of CI)**
	Yes frequency (%)	*No frequency* (%)	
Sex			
Male	98(79.7)	25(20.3)	1.00
Female	*263(74.3)*	91(25.7)	0.737(0.447-1.215)
House hold chemical use			
No	280(74.1)	98(25.9)	1.00
Yes	81(81.8)	18(18.2)	1.575(0.900-2.758)
Cooking			
No	234(77.5)	68(22.5)	1.00
Yes	127(72.6)	48(27.4)	0.769(0.501-1.180)
Working agreement			
Yes	*143(73.0)*	53(27.0)	0.780(0.511 -1.189)
No	218(77.6)	63(22.4)	1.00
Happiness			
Not happy	159(72.3)	61(27.7)	0.596(0.357-0.999)*
Neutral	84(75.0)	28(25.0)	0.686(0.377-1.248)
Happy	115(81.4)	2719.6)	1.00
Awareness of the risk			
Yes	314(78.5)	86(21.5)	1.00
No	47(61.0)	30(7.8)	0.429(0.256-0.719)*
Re-entry			
Yes	86(83.5)	17(16.5)	1.821(1.031-3.216)*
No	275(73.5)	99(26.5)	1.00
Service year			
≤23	79(80.6)	19(19.4)	1.00
24-36	109(68.6)	50(31.4)	0.524(0.287-0.958)*
37-60	107(78.1)	30(21.5)	0.858(0.451-1.633)
≥ 61	66(79.5)	17(20.5)	0.934(0.449-1.940)

* Significant at p-value <0.05.

5.5.2.2 Bivariate analysis for reported skin disorder illness symptom of floriculture workers

Residence, awareness of risks and reentering recently chemical sprayed area has shown significant association with workers reported skin disorder symptom. Accordingly rural dwellers were 36.6% lower, those who have no aware of risks 61.1% lower and those who have reentered recently sprayed area have 63.9% higher to report skin disorder symptom. Pre-training and having PPE didn't show significant association with reported skin disorder illness symptom having [COR 0.89(0.49-1.62))] and [COR 0.97(0.68-1.36) respectively.

Table 7: Bivariate analysis summery of reported skin disorder illness symptom of floriculture worker respondents January 2012

Characteristics	**Skin disorder illness symptom**		**COR(95% of CI)**
	Yes frequency (%)	No frequency (%)	
Residence			
Urban	137(54.2)	116(45.8)	1.00
Rural	95(12.4)	129(42.4)	0.624(0.434-0.896)
Marital status			
Unmarried	116(45.1)	125(54.9)	1.00
Married	85(45.7)	101(54.3)	0.907(0.618-1.331)
Ever married	31(62.0)	19(38.0)	1.758(0.942-3.283)
Happiness			
Not happy	98(44.5)	122(55.5)	1.00
Neutral	56(50.0)	56(50.0)	1.245(0.789-1.964)
Happy	78(53.8)	67(46.2)	1.449(0.951- 2.208)
Awareness of the risk			
Yes	209(97.8)	191(2.9)	1.00
No	23(92.2)	54(7.8)	0.389(0.230-0.659)
Overtime			
No	179(47.4)	199(52.6)	1.00
Yes	53(53.5)	46(46.5)	1.281(0.822-1.996)
Re-entry			
Yes	60(58.3)	43(41.7)	1.639(1.054-2.548)
No	172(46.0)	202(54.0)	1.00
Alcohol			
Yes	13(38.2)	21(61.8)	0.633(0.309-1.296)
No	219(49.4)	224(50.6)	1.00
Cooking in main house			
Yes	91(52.0)	84(48.0)	1.237(0.852-1.796)
No	141(46.7)	161(53.3)	1.00
House hold chemical use			
Yes	232(55.6)	44(44.4)	1.419(0.910-2.215)
No	177(46.5)	201(53.4)	1.00

* Significant at p-value <0.05.

5.6 Multiple logistic regression analysis

5.6.1 Multiple logistic regressions for reported illness symptom of respondents

5.6.1.1 Multiple logistic regression analysis for reported respiratory illness

Symptom of respondents

After adjustment for covariate only being floriculture respondent was significantly associated with reported respiratory illness symptom where other factors like educational level, marital status and family size didn't show significant association. As shown in the model summary below floriculture workers are 3.5 times more to report developing respiratory illness symptom with an [AOR 3.508 CI of (2.528-4.868)] (Table 8).

Table 8 Summary of model development reported respiratory illness symptom of respondents with selected variables January 2012

Characteristics	**Respiratory illness symptom**		**COR(95%CI)**	**AOR(95% CI)**
	Yes	No		
	Frequency (%)	Frequency (%)		
Group				
General population	203(42.2)	278(57.8)	1.00	1.00
Floriculture	361(75.7)	116(24.3)	4.262(3.232-6.620)*	3.508(2.528-4.868)*
Education				
Illiterate	279(55.0)	228(45.0)	1.00	1.00
Primary	187(70.6)	78(29.4)	0.636(0.460-0.880)*	0.794(0.559-1.129)
2^0 and above	98(52.7)	88(47.3)	0.376(0.269-0.525)*	0.790(0.524-1.191)
Marital status				
Unmarried	239(63.7)	136(36.3)	1.00	1.00
Married	266(53.0)	236(47.0)	0.641(0.488-0.843)*	1.029(0.720-1.469)
Ever married	59(27.2)	22(72.8)	1.526(0.896-2.600)	1.569(0.871-2.827)
Family size				
≤2 family	192(64.0%)	108(36.0%)	1.00	1.00
3-4 family	265(56.1%)	215(43.9%)	0.720(0.528-0.982)*	0.809(0.553-1.183)
≥5 family	157(57.1%)	118(42.9%)	0.748(0.535-1.047)	0.879(0.588-1.315)

* Significant at p-value <0.05.

5.6.1.2 Multiple logistic regression analysis for reported skin disorder illness Symptom of respondents

In multiple logistic regression being floriculture respondents and house hold chemical usage becomes significantly associated with reported skin disorder illness symptom where the rest variables such as house hold income, sex, family size, educational level and marital status lack significance of association. As shown in the model summary below floriculture workers are 5.524 times higher with an AOR 5.52 CI of (3.78-8.71) where those who use chemicals in their household are 63% higher in developing skin disorder illness symptom (Table 9).

Table 9: Model summary for reported skin disorder illness symptom of respondents Holeta, Ethiopia January 2012

Characteristics	**Skin disorder illness symptom**		**COR(95%CI)**	**AOR(95% CI)**
	Yes	No		
	Frequency (%)	Frequency (%)		
Group				
General population	68(14.1)	413(85.9)	1.00	1.00
Floriculture	232(48.6)	245(51.4)	5.751(4.205-7.866)*	5.524(3.780-8.707)*
Sex				
Male	74(26.7)	203(73.3)	1.00	1.00
Female	*226(33.2)*	455(66.8)	1.363(0.999-1.858)	1.187(0.837-1.682)
Education				
Illiterate	119(39.3)	184(60.7)	1.00	1.00
Primary	128(36.1)	227(63.9)	0.872(0.635-1.196)	1.172 (0.821-1.637)
2^0 and above	53(17.7)	247(82.3)	0.332(0.228-0.483)*	0.732 (0.455 -1.176)
Marital status				
Unmarried	133(35.5)	242(64.5)	1.00	1.00
Married	130(25.1)	372(74.1)	0.636(0.475-0.851)	0.969 (0.666-1.409)
Ever married	37(45.7)	44(54.3)	1.530(0.941-2.487)	1.793 (1.019 -3.156)
Family size				
≤2 family	106(35.3)	194(64.7)	1.00	1.00
3-4 family	109(28.5)	274(71.5)	0.728(0.526-1.007)	0.790 (0.532 -1.175)
≥5 family	85(30.9)	190(69.1)	0.819(0.578-1.160)	0.865 (0.571 -1.311)
House hold chemical use				
Yes	124(59.3)	85(40.7)	1.376(0.997-1.898)	1.629 (1.137 -2.326)*
No	440(58.7)	309(41.3)	1.00	1.00
Cooking in main house				
Yes	116(33.8)	116(68.7)	1.197(0.902-1.588)	1.167(0.852-1.598)
No	184(29.9)	431(70.1)	1.00	1.00

* Significant at p-value <0.05.

5.6.2 Multiple logistic regression analysis for workers of floriculture respondents

5.6.2.1 Multiple logistic regression analysis for reported respiratory illness symptom of floriculture workers

After adjustment for covariates only awareness of workers on possibilities of risks with working in flower industry show statistically significant association with reported respiratory illness symptom where other variables like working agreement, happiness and sex didn't show significance(Table 10). Those workers who are not aware of the risks in working in floriculture industries are 55.8% lower to report developing respiratory illness symptom.

Table 10 Model development summary for respiratory illness symptom of workers of floriculture industry Holeta, Ethiopia January 2012

Characteristics	Respiratory illness symptom		COR(95%CI)	AOR(95% CI)
	Yes frequency (%)	No frequency (%)		
Sex				
Male	98(79.7)	25(20.3)	1.00	1.00
Female	263(74.3)	91(25.7)	0.737(0.447-1.215)	0.800(0.434-1.473)
Happiness				
Not happy	159(72.3)	61(27.7)	1.00	1.00
Neutral	84(75.0)	28(25.0)	0.596(0.357-0.995)*	0.884(0.508- 1.540)
Happy	115(81.4)	27(19.6)	0.686(0.377-1.248)	1.211(0.693-2.117)
Working agreement				
Yes	143(73.0)	53(27.0)	0.780(0.511 -1.189)	1.008(0.619-1.713)
No	218(77.6)	63(22.4)	1.00	1.00
Re-entry				
Yes	86(83.5)	17(16.5)	1.821(1.031-3.216)*	1.665(0.871 -3.179)
No	275(73.5)	99(26.5)	1.00	1.00
Awareness of the risk				
Yes	314(78.5)	86(21.5)	1.00	1.00
No	47(61.0)	30(7.8)	0.429(0.256-0.719)*	0.442(0.253-0.770)*
Service year				
≤23	79(80.6)	19(19.4)	1.00	1.00
24-36	109(68.6)	50(31.4)	0.524(0.287-0.958)	0.558(0.299-1.041)
37-60	1 07(78.1)	30(21.5)	0.858(0.451-1.633)	1.008(0.508-1.999)
≥ 61	66(79.5)	17(20.5)	0.934(0.449-1.940)	1.208(0.572-2.866)
House hold chemical use				
Yes	280(74.1)	98(25.9)	1.575(0.900-2.758)	1.394(0.776- 2.494)
No	81(81.8)	18(18.2)	1.00	1.00
Cooking in main house				
Yes	234(77.5)	68(22.5)	0.769(0.501-1.180)	0.765(0.486-1.204)
No	127(72.6)	48(27.4)	1.00	1.00

* Significant at p-value <0.05.

5.6.2.2 Multiple logistic regression analysis for reported skin disorder illness symptom of floriculture workers

Awareness of the workers with possibilities of risks in working in floriculture and residence has significant association with reported skin disorder illness symptom where other variables like re-entry loss significance after adjustment for covariates. As shown in model summary below thos workers who were not aware of possibilities of risk are 56.8% lower in reporting respiratory illness symptom (Table 11).

Table 11: Model summary for skin disorder illness symptom of floriculture worker respondents Holeta, Ethiopia January 2012.

Characteristics	Skin disorder illness symptom		COR(95%CI)	AOR(95% CI)
	Yes frequency (%)	No frequency (%)		
Residence				
Urban	137(54.2)	116(45.8)	1.00	1.00
Rural	95(12.4)	129(42.4)	0.624(0.434-0.896)*	0.663 (0.453-0.970)*
Marital status				
Unmarried	116(45.1%)	125(54.9%)	1.00	1.00
Married	85(45.7%)	101(54.3%)	0.907(0.618-1.331)	0.554 (0.323-0.952)
Ever married	31(62.0%)	19(38.0%)	1.758(0.942-3.283)	1.660(0.864- 3.188)
Happiness				
Not happy	98(44.5%)	122(55.5%)	1.00	1.00
Neutral	56(50.0%)	56(50.0%)	1.245(0.789-1.964)	1.131 (0.698-1.883)
Happy	78(53.8%)	67(46.2%)	1.449(0.951- 2.208)	1.379 (0.868-2.219)
Household chemical use				
Yes	232(55.6%)	44(44.4%)	1.419(0.910-2.215)	1.421 (0.787-1.958)
No	177(46.5%)	201(53.4%)	1.00	1.00
Overtime				
Yes	179(47.4%)	199(52.6%)	1.281(0.822-1.996)	1.164 (0.727 -1.865)
No	53(53.5%)	46(46.5%)	1.00	1.00
Awareness of the risk				
Yes	209(97.8%)	191(2.9%)	1.00	1.00
No	23(92.2%)	54(7.8%)	0.389(0.230-0.659)*	0.432(0.248 – 0.752)*
Re-entry				
Yes	60(58.3%)	43(41.7%)	1.639(1.054-2.548)*	1.546(0.954-2.504)
No	172(46.0%)	202(54.0%)	1.00	1.00
Cooking				
Yes	91(52.0%)	84(48.0%)	1.237(0.852-1.796)	1.192(0.801-1.775)
No	141(46.7%)	161(53.3%)	1.00	1.00
Alcohol				
Yes	209(97.8%)	191(2.9%)	0.633(0.309-1.296)	0.635(0.300-1.341)
No	23(92.2%)	54(7.8%)	1.00	1.00

* Significant at p-value <0.05.

Qualitative result

The qualitative data was analyzed under three themes which are common heath problems, cause of health problems and possible prevention method for the health problems as mentioned by the key- informants and focus group discussants. Each theme has different categories and the contents or codes of each category are described under respective category. Finally themes, categories and codes used for analyzing of this study result were summarized in Table 12.

- **Common health problems encountered**
  - ✓ **Respiratory health problems**

The common respiratory health problems mentioned to be encountered by workers were cough, chest tightness, recurrent nasal fluid and asthma.

  - ✓ **Skin disorder health problems**

The common skin disorder health problems stated by discussants and key informants were burning sensation, itching and rash.

  - ✓ **Other health problems**

The other common health problems reported to be faced by discussants and key informants were headache, typhoid and typhus, abdominal pain, kidney problem, anemia, common cold, fatigue, sweating, back pain, fainting, falling and cutting by thorns.

As one respondent talk about the health problems she encountered

> *'' previously I was healthy; after I join this work when I sweep the dust I will cough, I feel chest tightness', there is a sound feeling on my heart(wheezing) from my nose watery fluid drops out burning sensation on my back body and headache. Before coming here I haven't seen any illness on my selves when the temperature is high I feel chest tightness and fatigue.'' (Female greenhouse worker)*

- **Cause of health problems**
  - ✓ **Working situation**

The cause of health problems working situation was discussed to be from the chemicals, high temperature, dust and cold weather inside cold room.

One respondent mentioned the situation

> *''me myself I have followed the occurrence of the health problems when I sweep the surface in which the flower grows (flower bed) the dust splashes. Then I feel chest tightness when I touch my skin I feel burning sensation and I develop rash (shefeta).''*
> *Female green house worker*

The other respondent said

> *''chemical and dust when the ground is swiped it will change your body when the temperature is high also we feel burning sweating and fatigue.'' (Female greenhouse worker)*

- ✓ **Institutional factor**

Some institutional factor such as lack of enough rest to be given for workers who develop health problems, low income level to fulfill workers need for proper nutrition, unavailability of personal protective equipments and lack of urgent replacement of perforated personal protective equipments has been thought as a cause of health problems.

> *''If we face health problems when we say we are sick and go to health institution ask for sick leave they answer the institution will be punished and they give us maximum of 1 or 2 days of sick leave will be written to us even it by insulting us saying 'those workers of floriculture are disturbing us'.'' (Female greenhouse worker)*

Another key informant said that

> *''When any workers get sick we (supervisors) report to office they take the workers to health institution and he /she get health service. After that he/she will be given5 or 6 days of sick leave. When he/she finish he/she come back to work.'' (Female greenhouse supervisor)*

- ✓ **Individual factor**

Workers improper utilization of available PPE and not informing health problems encountered and out of use PPE (perforated) for change was among individual behavioral factors of respondents that contribute for the attained health problems.

One discussant from sprayers expresses the situation

> *‘’If Protective equipment is perforated it will not be replaced in short period of time for example last time one of our colleague his boots were perforated and chemical reach him through it and he become sick.’’ (Male; spraying worker).*

One key informant described

> *‘’One shouldn’t spray while his boots is perforated but workers do this; if there is wound on his leg the chemical can enter his body and create health problems we have already informed this to workers. Thus due to not informing workers may face health problems.’’ (Male; spraying supervisor)*

One discussant mentioned that

> *‘‘the type of gloves mater for the utilization; for example the previous glove was tight enough to our hands so it was comfortable to remove herbs because it catches herbs tight to our fingers where the latter one is very big it doesn’t catch herbs tight to fingers so it is not comfortable for work.’’ (Female; greenhouse worker)*

- ❖ **Prevention methods :-**
  - ✓ **Hygienic**

Workers have reported to wash their exposed parts immediately after spraying and utilization of plastic bags for mixing acids was explained among the measures that are undertaken to minimize the possibilities of hazard. In contrast greenhouse workers have reported lack of soap and the shower already available is not enough to be used by workers other than chemical sprayers thus fulfillment of this condition have been thought to minimize health problems.

- ✓ **Personal protective equipment**

If protective equipments such as Gloves, protective material of mouth and eyes for workers have been fulfilled the possible health problems will be minimized. In addition the coverall that is available for spraying workers is discussed to be made of cloth which is not waterproof.

One discussant mentioned that

> *''In this situation materials are not fulfilled' since we are not using full protection this is the main thing which is creating health problems'' (male spraying workers)*

One of respondent indicated the situation as follows:

''if protection to our mouth and our eye is available; dusts will not be inhaled. If such things are fulfilled it will reduce the health problems'' (female greenhouse worker)

- ✓ **Safety measure**

Informal Pre employment training is stated to be given by supervisors and former workers but the target of the training is to keep the quality of flowers and to explain working agreement between the workers and employers. It have been stated that regarding safety measures to be applied to safeguard workers health was not given go workers. In addition medical screening was mentioned as a way for early prevention of health problems but as mentioned by discussants there is no periodic medical checkup even sometimes there is checkup for their status but the result of the checkup was not disclosed for them.

One spraying discussant

> *''There is no medical checkup; we don't have knowledge when to take medical checkup in what time interval; We don't know the possible problem we are facing since we don't have medical checkup we don't know our blood is normal or under normal but the chemical is hurting our body''(male spraying discussant)*

Table 12: Themes, categories and codes as identified from qualitative data January2012

Themes	Categories	Codes
Common health problems	Skin health problems	burning sensation, itching and rash
	Respiratory health problems	Cough chest tightness, recurrent nasal fluid and asthma.
	Other health problems	Headache, typhoid and typhus, abdominal pain, kidney problem, anemia, common cold, fatigue, sweating, back pain, fainting, falling, cutting by thorns.
Cause of health problems	Work environment factor	Chemicals, high temperature, dust and cold weather inside cold room.
	Institutional factor	Lack of enough rest, low income level, unavailability of full PPE, no urgent replacement of perforated PPE
	Individual factor	Improper utilization of PPE, not early informing of health problems and perforated PPE
Possible prevention methods	Personal protective equipment	Gloves, protection to mouth and eyes, water proof coverall
	Hygienic factor	Immediate washing of exposed parts, fulfillment of shower
	Safety measures	Training, medical checkup

Observation checklist

In the observation checklist in most farms great heat have been observed specially during afternoon and when the door of greenhouse is kept closed for a while. Dust is observed to cover workers face specially during sweeping the ground. In some farms Safety measures such as don't drink water in greenhouse is posted inside greenhouse farms and protective wearing to control oneself from excessive heating is posted around offices of some farms. In one farm who and where to contact for first aid purpose was posted around the office. Black board at the door where spraying taking place has been observed but those boards doesn't have any information about reentry time specification.

There was no health institution located around any farm; apart from 3 farms who have employed nurses most haven't employed any health professional. In most farms individuals are assigned and trained for health issues of first aid and first aid kit have been observed. Written safety rules and regulations as code of conduct are observed among all farms except 2 farms.

Among the total respondents only 187(39.02%) were observed to have gauntlet gloves; from which 112(59.9%), 25(13.4%) and 50(26.7%) are made up of leather, cloth and rubber respectively and where 113(60.4%) are perforated and 144(74.9%) are water proof. Boots were wear by 58(12.2%) respondents from which 56(96.6%) are made of rubber and 9(15.5%) are perforated. Coverall cloth were observed to be worn by 68(14.5%) of respondents from which 14(20.6%) are perforated. Face mask, coat, goggles, apron and one hand glove have been observed to be worn by 26(5.5%), 21(4.4%), 6(1.3%), 4(0.84%) and 1(0.21%) of respondents respectively.

6. Discussion

The two study groups' general population and floriculture workers are socio- demographically comparable with each other. Females account for 71.1% of the total population in which 68.0% of the general population and 74.2% of floriculture workers are females.

General population groups have lower prevalence of reported illness symptoms in the past 12 months of period than floriculture workers. The prevalence of reported respiratory illness symptom was 361(75.5%) among floriculture workers where the general population group is 203(42.2%). In addition the prevalence of reported skin disorder illness symptom is 232(48.6%) and the general population is 68(14.1%). Floriculture workers have also reported increased prevalence of illness symptoms like headache, fatigue, loss of appetite and sleepiness. The reason for such difference might be due to floriculture working environment is amenable to different hazard like use of pesticides, high temperature inside greenhouse and workload which are mentioned in the qualitative result by workers. In addition since workers may have thoughts about the potential health problems due to working in floriculture they may recall incidents of illness symptoms better than the general population.

Among floriculture groups asthma is 3.1% which is comparable with study done by Prado Lu(24). But the prevalence of asthma for the respondents of the general population in this study was slightly higher than floriculture workers with a prevalence of 4.4% and 3.1% respectively. The reason might be those who have asthmatic history might have less probability of joining floriculture industry for employment as they might have information on possibilities of risks.

Female participants account for much percentage which is opposite to study done in La Trinidad but comparable with studies done in Uganda(25, 30). In this study female respondents that work in floriculture were 71.1% and that from Uganda 54% but in La Trinidad 48%. The possible difference might arise due to the reason the respondents of this study are employed where those from La Trinidad are farm owners.

According to the study Cole DC.61% of floriculture workers where 31% of control groups have developed Skin disorder symptom compared to this the result of this study show lower prevalence of skin disorder in floriculture group accounting 48.6% and 14% among the

comparison group(31). The reason for such difference may be the former is the result found by physician test where the later is based on interviewer administered questionnaire.

Reentering recently sprayed area in which there is obvious chemical smell without proper gear increase risk of illness symptom due to workers entered newly sprayed area the possibilities of dermal and respiratory entry of chemicals will increase since there will be suspended chemicals over the air (8, 32). According to study of Jinky lailina lu reentry have been found 20 times higher risk of developing illness unlikely no significance was found in this study (25). When we look at the possible reason of difference might be those respondents in this study are asked re entry before the smell of chemicals is out where in the former one it is asked in the time difference of 12 hours of spraying.

Majority of respondents of floriculture workers have developed fatigue followed by headache with 75.5% and 70% which also similar with studies done by Jainky Lailina Lu but with higher in magnitude in this study. The reason for this discrepancy might be some of environmental or socioeconomic differences of these two groups. This research is conducted in third world country where there might be environmental stressors other than occupational factors. The result is also similar but with some lowers magnitude in this study done in sebeta Ethiopia. It may be due to the reason in this study respondents absent at the time of data collection were excluded where the case is not true in the latter one.

Respondents who were aware of the potential health problems due to working in floriculture industry were more likely to report respiratory and skin disorder illness symptom. This can be explained as since workers have thought about risks any illness will be recalled due to the reason respondents are thinking health problems can reach them because of their occupation. In addition since it is a cross sectional study one couldn't identify which comes first awareness or illness symptoms. Thus respondents might be aware of the health problem after encountering the health problems. Residence has shown significant association with reported skin disorder illness symptom; as workers of rural dwellers have lower chance of reporting skin disorder symptom. This might be due to Rural residents might have lower awareness due to limited information access on the possibilities of risks because of limited information channels. Thus as seen in the association of awareness with reported skin disorder illness symptom those who have lower

awareness reported skin disorder symptom than respondents who were aware of potential health problems.

Pre training doesn't have significant association with illness symptoms according to the qualitative study the training that is given to farmers focuses on the safety of flower rather than how workers keep themselves apart from the possible risks. In addition every segment of educational level and age has no significant difference in illness symptom encountered by the respondents' of floriculture groups.

Availability of personal protective equipment doesn't show any significance differences in reporting both respiratory and skin disorder illness symptom which is discrepant from other studies this might be due to the fact gained from qualitative data workers are not having full personal protective equipment and from those available perforated and not water proof materials are vast(6). Even though workers reported to have personal protective equipment when they are asked to types of personal protective equipments available to them majority have only Gauntlet gloves where only few percentage of respondents have boots, face mask and goggles. Thus the fact that only having gauntlet gloves, face mask or boots couldn't protect the route of entry of hazards through respiratory organs and exposed parts of skin.

Alcohol consumption and cigarette smoking is almost null in this study compared to study done by Prado Lu and in la Trinidad but it is comparable with study done in Sebeta Ethiopia (6, 24, 25). The reason for such difference might be explained as most of respondents of this study are female which is also true in the latter study thus socio cultural differences of these groups with the first one might account for lower conception of alcohol and cigarette.

7. Strength and limitation of the study

7.1 Strength of the study

The following are the strength of this study

- The study assesses the health issues of floriculture workers; as floriculture is an industry which is in expansion in Ethiopia thus it will be a valuable document to be used by policy makers and employers.
- The study used comparative methods to assess the illness symptom of workers in floriculture industry and compared it with illness symptom of general population which enables it more conclusive than previous studies
- This study used lottery methods to recruit respondents from the available working section accordingly there is no way in which respondents name are going to be named by data collectors' thus increasing confidentiality of respondents.
- In addition respondents of general population are also recruited in the same way as flower workers increasing comparability of these two groups.
- Both quantitative and qualitative method was used increasing the validity of this study.

7.2 Limitation of the study

This study could have the following limitation

- The study hasn't used any chemical or physical examination test for the outcome or exposure variable; only the respondents' response to the questioners administered by the interviewer is considered thus the result may be inflated (overestimated) and underestimated.
- Respondents of the general population are not told about the topic or the reason of data collection thus it may create different among this two comparison groups.
- Being cross sectional study doesn't allow the study to establish causal relationship between determinants and illness symptom.
- Recall bias may occur since respondents are asked for illness symptoms which have occurred in the past 12 months of period.

8 .Conclusions and Recommendations

8.1 Conclusion

According to this study respondents of floriculture workers have reported high prevalence of developing illness symptom in the past 12 months of time prior to data collection. Reported prevalence of respiratory, skin and general illness symptoms are higher in workers of floriculture than the general population.

Awareness of the workers on the health risks of working in floriculture has shown a significant association with developing illness symptom where other variables pre-training, availability of PPE and reentering recently sprayed area didn't show significant association with reported illness symptom. Although this factor doesn't show significance in association but qualitative part result revealed that training which has been given didn't focus on workers and workers didn't have full PPE.

8.2 Recommendations

Based on the study finding the following recommendation have been set

- There is an increased prevalence of reported illness symptom in floriculture thus workers should gain training on the protection of themselves from potential hazards.
- Farm administers and supervisors should note and monitor whether re-entry time specification have been set at the time spraying is started and posted for the workers enforce if not.
- Employers should have to fulfill full personal protective equipment (PPE) for workers and hygiene keeping environment.
- Further studies should be conducted to identify the possible causes of illness symptom
- There is no health institution in any farm and workers have reported not having periodic medical examination so employers should have to fulfill such services.
- In the farms where there is periodic screening workers should aware of the interval of periodic medical screening and the result should be disclosed for them.

9. References

1. Getu M. Ethiopian floriculture and its impact on the environment: Regulation, Supervision and Compliance. Mizan law of reviewSeptember 2009 3(2).
2. Kargbo.A, Mao.J, Wang.C. The progress and issues in the Dutch, Chinese and Kenyan floriculture industries. African Journal of BiotechnologyNov. 2010;9(44):7401-8.
3. Ethiopia EoJi. A Series of Studies on Industries in Ethiopia: March 2008.
4. VIDEA. A look at the global flower industry. Deceptive beauty2002;1(5):1-13.
5. Sanborn. M, Kerr.K.J, Sanin L.H, Cole. D.C, Bassil.K.L, Vakil. C. Non-cancer health effects of pesticides. Can Fam Physician2007;53:1712-20.
6. Defar.A. Assessment of occupational induced health problems in floriculture industry in west shewa,Oromia Ethiopia. Addis Ababa: Addis ababa university; 2011.
7. Mena N, Proaño S. Sexual harrasment in the work place: the cut floer industry. Northern Sierra of Ecuador: International Labor Rights Fund 2005.
8. Brouwer R, Marquart H, Mik Gd, Hemmen JJv. Risk Assessment of Dermal Exposure of Greenhouse Workers to Pesticides after Re-Entry. Archives o f environmental contamination and Iloxicology1992;23:273-8.
9. Illing HPA. Is working in greenhouses healthy? Evidence concerning the toxic risks that might affect greenhouse workers. Occup Med1997;47:281-93.
10. WikipediaNovember 2010. Occupational safety and health.
11. Yiha.O, Kumie.A. Assessment of occupational injuries in Tendaho Agricultural Development S.C, Afar Regional State. Ethiop J Health Dev2010;24(3):167-74.
12. Cole.D. Occupational Health Hazards of Agriculture. Washigton D.CMay 2006.
13. Joosten. F. Development strategy for the export-oriented horticulture in Ethiopia 17 march 2007
14. Global development solution LLC. Towards a globally competitive Ethiopia: the role of service and urbanization case studies-Rose and polo shirt value chain18 February, 2011
15. Bretveld R, Thomas CM, Scheepers PT, Zielhuis GA, Roeleveld N. Pesticide exposure: the hormonal function of the female reproductive system disrupted? Reproductive Biology and Endocrinology2006;4(30).
16. Abell.A, Juul.S, Bonde.J.P. Time to pregnancy among female greenhouse workers. Scand J Work Environ Health 2000;26(2):131-6.
17. Handal.AJ, Harlow.D. Employment in the Ecuadorian cut-flower industry and the risk of spontaneous abortio. BMC International Health and Human Rights2009;8(9).
18. Idrova .AJ, Sanin.LH. Adverse reproductive outcomes among women working in Colombian floriculture: a summary of the evidence through met analysis BiomedicalDec.2007;27(4):490-7.
19. Handal.J.A, Lozoff.B, Breilh.J, Harlow.D.S. Effect of Community of Residence on Neurobehavioral Development in Infants and Young Children in a Flower-Growing Region of Ecuador. Environmental Health Perspectives 2007;115(1):128-3.
20. Grandjean. P, Harari.R, Debes.F. Pesticide Exposure and Stunting as Independent Predictors of Neurobehavioral Deficits in Ecuadorian School Children. Pediatrics2006;117(3):546-56.
21. Jurewicz.J, Hanke.W. Prenatal and childhood exposure to pesticides and neurobehavioral development: review of epidemiological studies. Int J Occupational Medicine and Environmental health 2008; 21(2): 121-32.

22. Kamel F, Rowland AS, Park LP, Anger WK, Baird DD, Gladen BC, et al. Neurobehavioral Performance and Work Experience in Florida Farmworkers. Environmental Health Perspectives November 2003;111(14):1765-82.
23. Tomenson JA, Matthews GA. Causes and types of health effects during the use of crop protection chemicals. Int Arch Occup Environ HealthAugust 2009;82(8):935-49.
24. 24. Prado-Lu JLD. Pesticide exposure, risk factors and health problems among cutflower farmers: a cross sectional study. Occupational Medicine and Toxicology 2007;2(9).
25. Lu Jl. Risk factors to pesticide exposure and associated health symptoms among cut-flower farmers. International Journal of Environmental Health ResearchJune 2005;15(3):161-9.
26. Lensen G, Jungbauer F, Gonçalo M, Coenraads PJ. Airborne irritant contact dermatitis andconjunctivitis after occupational exposureto chlorothalonil in textiles. Contact Dermatitis 2007;57(3):181-6.
27. Faria NMX, Facchini LA, Fassa AG, Tomasi E. Pesticides and respiratory symptoms among farmers. Rev Saude publica2005;39(3):973-81.
28. Susitaivial P, Flyvholm M-A, Meding B, Kanerva L, Lindberg M, Svensoon A, et al. Nordic Occupational Skin Questionnaire(NOSQ-2002): a new tool for surveying occupational skin diseases and exposure. Contact Dermatitis2003;49:70-6.
29. Flyvholm M-A, Susitaival P, Meding B, Kanerva L, Lindberg M, Svensson A´, et al. Nordic Occupational Skin Questionnaire – NOSQ–2002. Nordic questionnaire for surveying work-related skin diseases on hands and forearms and relevant exposures. TemaNord Copenhagen: Nordic Council of Ministers; 2002.
30. Donohue CR. Socio -economic impact study of the floriculture industry in Uganda: Agribusiness Development Centre (ADC)2003.
31. Cole DC, Caprio F, Math JJM, Lion N. Dermatitis in ecuadorian farm workers. Contact Dermatitis1997;37:1-8.
32. Ciesielski S, Loomis DP, Mims SR, Auer A. Pesticide exposures, cholinesterase depression and symptoms among North carolina migrant farmworkers. American journal of public healthMarch 1994;84(3):446-51.

Annexes

I. English version questionnaire

Addis Ababa University College of Health Science Department of Community Health Questionnaire for comparative cross sectional study to assess occupational health problems of floriculture industry workers Holeta ,Ethiopia February 2012

Consent form

1. **Participant's Information sheet**

Good morning/afternoon I am_____ I am here for collecting information for the study which is conducted by Addis Ababa university. I have few questionnaires which will generally assess socio-demographic and some illness symptoms of the participants. As a chance you are one of the possible participants that we come across by chance. After hearing the following general things about the study if you are willing we will proceed with interviewing.

Title of the study:-Comparative cross sectional study on occupational health problems among workers in floriculture industry Holeta, West Shewa zone, Ethiopia

Background:-Floriculture is labor intensive industry in which number of citizens of Ethiopians rely and currently it is on vast extension over the country . In spite of its creation of job opportunity it imposes various health challenges on the workers.

Objective: - the objective of this study is to assess the magnitude and determinants of common health symptoms encountered by the workers of floriculture industry

Benefit: - this study will not give any direct benefit to the participants; but the information which will be gained from the participants will help policy makers and employers to be aware of health issues of the workers for possible intervention.

Risk: - the study will not impose any risks on the participants.

Right of the respondents:- any participant will participate on this study voluntarily. At any time he /she can quit from giving answer for the questionnaire that he/she is not willing to answer or even he/she can stop.

Confidentiality: - first of all the name of participants will not be asked and you are not expected to tell your name for the interviewer Any information that you will tell me will be kept confidential.

2. **Informed consent**

I have read or it has been read to me all conditions stated above in the language I understood. I will assure my willingness to participate in this study through my signature below.

Signature_____

Name of data collector_____ signature_____

Date of interview----------Time started---------- Time completed----------

Result of interview:

1. Completed 2. Respondent not available 3. Refused 4. Partially completed

Checked by: Supervisor Name----------signature----------Date---------

Part I: Socio- Demographic Characteristics

Ser.No	Questions	Option		
101	What is your residence?	1.urban 2. rural		
102	sex	1. male 2. female		
103	Age in years of respondent?			
104	What is your marital status?	1. single 2.married 3.widowed 4. divorced		
105	What is your ethnicity?	1. Oromo 2. Amhara 3.Gurage 4. Tigray 5. Others/specify…….		
106	What is your Educational level?	1.Illiterate 2.Read & write 3.Primary(1-8grades) 4.Secondary(9-12) 5.College/Diploma/Degree		
107	What is your religion?	1.Orthodox 2.Muslim 3. Protestant		

		4.Other		
108	What is your salary/monthly income?	……		
109	How much Family do you support support?			
110	Income from other source monthly or yearly?			

Part II workers general information regarding the institution

Ser.No				
208	What is your working section/jobcatagory?	1.greenhouse 2. pack house 3. irrigation 4. spraying		
201	What is your pattern of employment?	1. permanent 2.temporary 3. daily laborers		
202	Have you signed employment agreement when you were employed?	1.yes 2.no		
203	Have you take pre employment medical checkup?	1.yes 2.no		
204	If the answer for Q203 is **Yes** what type of medical checkup do you undergo?	1. Physical examination 2. Blood test 3. Other/specify		
205	Do you have periodic medical checkup?	1. Yes 2. No		
206	If the answer for Q205 is **Yes** what type of medical checkup do you undergo?	1. Physical examination 2. Blood test 3. Other/specify		
207	If the answer for Q205 is **Yes** at what time interval do you take your periodic medical checkup?			
208	What is your working section/jobcatagory?	1.greenhouse 2. pack house 3. irrigation		

		4. spraying		
209	What is Service duration in the same jobcatagory?	_____		
210	Have you ever transferred from one working section to other?	1.yes 2.no		
211	If Q210 is **Yes** from which to which section of work did you transferred?			
212	If Q210 is **Yes** what was the reason of your transfer?	1. Health problem 2. Work load to the transferred room 3. other		
213	What is your Total services year in the farm?	_____		
214	Are you happy by your current Job?	1. very happy 2. happy 3. neutral 4. unhappy 5. very unhappy		
215	Do you have personal protective equipment?	1.yes 2. no		
216 If yes for question No 215 Which type of PPE does you have?				
	Gauntlet gloves	1. Yes 2. no		
	Coverall	1. Yes 2. no		
	Facemask	1. Yes 2.no		
	Google	1.yes 2.no		
	Other PPE	1.yes 2.no		
218	If for other PPE yes specify Other PPE?	_____		
219	Do you use your PPE properly? (All times when you are at work)	1. yes 2. 2.no		
219A	Gauntlet gloves	1. Yes 2. no		
219B	Coverall	1. Yes 2. no		
219C	Facemask	1. Yes 2.no		
219D	Google	1.yes 2.no		

219E	Other PPE	1.yes 2.no		
220	If the answer for one of question number 219A-E is No what is the reason for not using?	1. not comfortable for work 2. don't believe it prevent from hazard 3. other/specify		
If other reason specify here_____				
221	If the answer for question number 207 is "No" why you didn't have it?	1.Not provided by the organization 2.Not comfortable for work 3.not aware regarding the presence of such equipment		
	Gauntlet gloves	2. Yes 2. no		
	Coverall	2. Yes 2. No		
	Facemask	2. Yes 2.no		
	Google	1.yes 2.no		
222	Have you taken pre employment occupational safety training?	1. yes 2. 2.no		
223	What hours per day do you spend working here?			
224	Do you work overtime?	1. Yes 2. No		
225	Do you think that working in the farm can expose to different health problems?	1. Yes 2. No		
226	If the answer for question number 214 is "Yes" please list some health problems?			
227	If the answer for question number 214 is "Yes" what could be the possible causes of the problems?			
228	Do you go your home before changing your cloth you work on here?	1. Yes 2. No		
229	Do you re-enter sprayed farm because the smell of chemicals comes out?	1. Yes 2. No		
230	If the answer for Q229 is **Yes** how often do you re-enter?	1. Always 2. Sometimes		

Part III. Questions in this section are going to be asked for the previous 12 months of time prior to data collection. So make sure that during asking any question in this section you have specified in the previous 12 months.

3.1 respiratory illness symptom				
Ser.No	Questions	Option	skip	code
301A	Do you usually cough during working time (excluding clearing throat or single cough)?	1. yes 2. no		
301B	Do you ever troubled by shortness of breath?	1. Yes 2. 2no		
301C	Does your Chest ever feel tight or Your breathing becomes difficult?	1. yes 2. no		
301D	Have you ever had wheezing or whistling at any time in the past? If "No" please skip to next Question?	1. yes 2. no		
301E	Have you ever had asthma?	1. yes 2. no		
Rhinitis, Sneezing, and Recurrent nasal fluid All questions are about problems when you DO NOT have a cold or the flu.				
301F	Have you ever had a problem with sneezing, or runny or blocked nose when you DID NOT have a cold or flu?	1. yes 2. no		
301G	In the past 12 months have you had a problem with Recurrent nasal fluid or a runny or blocked nose when you DID NOT have a cold or the flu?	1. yes 2. no		
3.2 Skin disorders				
302A	Have you ever had eczema which was coming and going for at least six months in the last 12 months?	1. yes 2. 2.no		
302B	Have you had this itchy rash at any time in the last 12 months?	1. yes 2. no		
302C	Have you had this redness y rash at any time in the last 12 months?	1. yes 2. no		
302D	Have you had this burning at any time in the last 12 months?	1. yes 2. no		
303	The above skin disorders Major attack at any of the	1.Hand		

	following body places?	2. face 3. .Leg 4. neck		
3.3 general illness symptom				
Ser.No				
304	In the past 12 months, have you had a problem with headache when you came into the work place?	1. yes 2. 2.no		
305	In the past 12 months have you had a problem with fatigue when you were at rest?	1. yes 2. no		
306	In the past 12 months have you had a problem with irritation of the following?			
	Eye	1.yes 2.no		
	Noses	1.yes 2.no		
	Throat	1.yes 2.no		
307	In the past 12 months have you had a problem with sleepiness during Working time?	1. yes 2. 2.no		
308	In the past 12 months have you had frequent problem with loss of appetite?	1. yes 2. no		
309	In the past 12 months have you had frequent problem with Back pain?	1. yes 2. no		
310	Have you had Kidney problem?	1. Yes 2. 2.no		
311	In the past 12 months have you had a problem with Dizziness when you were at work?	1. yes 2. no		
312	Have you ever Faint in the farm during working hours?	1. Yes 2. no		
313	When does The above disease symptoms manifested?	1.before joining this work 2.after joining this work		
314	Did you visit health facility following disease symptoms?	1. Yes 2. no		
315	If “yes” for Question number 315 Who would cover medical cost?	1. the staff 2. the worker/yourselves		
316	Have you ever had sick leave for medical process?	1. Yes 2. 2.no		

317	If “yes” for question number 317 for how long?	1.Till recovery 2.Work while on medication. 3.Other/specify		
318	If “no” for Question number 315 what was the reason?	1. The firm has no health facility 2. Lack of break 3. Lack of money 4. Other		

Part IV: - Part IV: Related questions (worker’s behavior information) Tobacco smoking

Ser. No	Questions	Option		
401	Do you smoke cigarette?	1. Yes 2. no		
402	How often do you smoke?	_____		
403	Do you drink Alcohol?	1. Yes 2. 2.no		
	Cooking			
404	In your home is cooking and/or baking undertaken in the main house?	1. yes 2. 2.no		
405	If “Yes” to what type of fuel is in use?	1.Biomass 2.Butagas (Kerosene) 3.Animal dung 4.Electricity 5. Other specify ___		
406	Do you use any insecticide or herbicide chemicals in your home environment?	1. Yes 2. No		

English version Questionnaire for the general population

Part I Questionnaire for assessing Socio demographic and economic factor for respondents

Ser.No	Questions	Option	Skip	Code
101	What is your kebele?	1.urban 2. rural		
102	sex	1. male 2. female		
103	What is your age?			
104	What is your marital status?	1. single 2.married 3.widowed 4. divorced		
105	What is your ethnicity?	1. Oromo 2. Amhara 3.Gurage 4. Tigray 5. Others/specify…….		
106	What is your Educational level?	1.Illiterate 2.Read & write 3.Primary(1-8grades) 4.Secondary(9-12) 5.College/Diploma/Degree		
107	What is your religion?	1.Orthodox 2.Muslim 3. Protestant 4.Other		
109	How much Family do you support?			
109	What is your occupation?	1. house wife 2. government employee 3. farmer 3. merchant 4. daily laborer		

		5 other/ specify		
110	How much is Monthly income?			
111	Income from other source monthly or yearly?			
112	If the answer for Q109 is farmer do you use chemicals in your farm?	1. Yes 2. No		
113	If the answer for Q112 is yes who will mix or spray chemicals?	1. Respondent 2. Other family members 3. Employ other person		
114	If the answer for Q113 is respondent do you use personal protective equipment during mixing or spraying? If so which of the following did you use?	1. Yes 2. No		
	Gauntlet gloves	1. Yes 2. no		
	Coverall	1. Yes 2. no		
	Facemask	1. Yes 2.no		
	Google	1.yes 2.no		
	Other PPE	1.yes 2.no		

Part III Questionnaire on health symptom

3.1 respiratory illness symptom				
Ser.No	Questions	Option	skip	Code
301A	Do you usually cough during working time (excluding clearing throat or single cough)?	1. Yes 2. no		
301B	Do you ever troubled by shortness of breath?	1. Yes 2. No		
301C	Does your Chest ever feel tight or Your breathing becomes difficult?	1. Yes 2. No		
301D	Have you ever had wheezing or whistling at any time in the past? If “No” please skip to next Question?	3. yes 4. no		
301E	Have you ever had asthma?	3. Yes 4. No		
Rhinitis, Sneezing, and Recurrent nasal fluid				

All questions are about problems when you DO NOT have a cold or the flu.				
301F	Have you ever had a problem with sneezing, or runny or blocked nose when you DID NOT have a cold or flu?	3. yes 4. no		
301G	In the past 12 months have you had a problem with Recurrent nasal fluid or a runny or blocked nose when you DID NOT have a cold or the flu?	3. yes 4. no		
	3.2 Skin disorders			
302A	Have you ever had eczema which was coming and going for at least six months in the last 12 months?	3. yes 4. 2.no		
302B	Have you had this itchy rash at any time in the last 12 months?	3. yes 4. no		
302C	Have you had this redness y rash at any time in the last 12 months?	3. yes 4. no		
302D	Have you had this burning at any time in the last 12 months?	3. yes 4. no		
303	The above skin disorders Major attack at any of the following body places?	1.Hand 2. face 3. .Leg 4. neck		
	3.3 general illness symptom			
Ser.No				
304	In the past 12 months, have you had a problem with headache when you came into the work place?	3. yes 4. 2.no		
305	In the past 12 months have you had a problem with fatigue when you were at rest?	3. yes 4. no		
306	In the past 12 months have you had a problem with irritation of the following?			
	Eye	1.yes 2.no		
	Noses	1.yes 2.no		
	Throat	1.yes 2.no		
307	In the past 12 months have you had a problem with sleepiness during Working time?	3. yes 4. 2.no		
308	In the past 12 months have you had frequent problem with loss of appetite?	3. yes 4. no		

309	In the past 12 months have you had frequent problem with Back pain?	3. yes 4. no		
310	Have you had Kidney problem?	3. Yes 4. 2.no		
311	In the past 12 months have you had a problem with Dizziness when you were at work?	3. yes 4. no		
312	Have you ever Faint during working hours?	3. Yes 4. No		
313	Did you visit health facility following disease symptoms?	3. Yes 4. No		

Part IV questions which assess respondents' behavioral issue

401	Do you smoke cigarette?	3. yes 4. no		
402	How often do you smoke?	_____		
403	Do you drink Alcohol?	3. yes 4. 2.no		
	Cooking			
404	In your home is cooking and/or baking undertaken in the main house?	3. yes 4. 2.no		
405	If "Yes" to what type of fuel is in use?	1.Biomass 2.Butagas (Kerosene) 3.Animal dung 4.Electricity 5. Other specify ___		
406	Do you use any insecticide or herbicide chemicals in your home environment?	3. Yes 4. No		
407	If Q406 is **Yes** What are the chemicals you use?			
408	For what purpose do you use the chemicals?			

II. Amharic version questionnaire

በአዲስ አበባ ዩኒቨርሲቲ የጤና ሳይንስ ኮሌጅ የህብርትሰብ ጤና ሳይንስ ክፍል በአበባ ልማት ሰራተኞች የጤና ችግሮችን ለመዳሰስ ለሚደረግ ጥናት የተዘጋጀ መጠይቅ

የጠያቂውስም_____ ፊርማ_____

መጠይቁየተሞላበትቀን_____ የተጀመረበትሰዓት_____ የተጠናቀቀበትሰዓት_____

የመጠይቁ ግምገማ:- 1. ተሟሌቷሌ 3. ተጠያቂውአሌተገኙም

2. ተቋውሞ 4. በከፊልተሞልቷል

I. የተሳታፊዎች መረጃ ቅፅ

ጤና ይስጥልኝ_____ እባላለሁ። የመሁጣሁት በአዲስአበባ ዩኒቨርሲቲ ለሚደረግ ጥናት መረጃ ለመሰብሰብ ነዉ። እርሶ የዚህ ጥናት ተሳታፊ መሆን ከሚችሉ ሰዎች መካከል አንዱ ሲሆኑ ከእርሶ ጋር የተገናኘነዉ እንደ እድል በእጣ በተደረገ ምርጫ ነዉ። የተወሰኑ መጠይቆች በማህበራዊና በጤና እክል ምልክቶች ዙሪያአለኝ። የሚከተሉትን ነገሮች ስለጥናቱ ከተገነዘቡ በኋላ ፍቃደኛ ከሆኑ ወደ መጠይቆቹ እናልፋለን።

የጥናቱ አላማ፡- በአበባ ልማትሰራተኞች ላይ የሚከሰቱ የጤና እክል ምልክቶች ግዝፈትንና ተያያዥ ጉዳዮችን መዳሰስ።

ጥቅም፡- ይህ ጥናት በቀጥታ ለተሳታፊዎች የሚሰጠዉ ጥቅም የለም ነገር ግን ከተሳታፊዎች በሚገኘዉ መረጃ ፖሊሲ አዉጪዎችና የአበባ ድርጅት ባለቤቶች የሰራተኞችን የጤና እክሎች እንዲያዉቁና መፍትሄ እንዲሹ ይጠቁማል።

ጉዳት፡- እዚህ ጥናት ላይ በመሳተፍ ተሳታፊዎችምንም አይነት ጉዳት አይደርስም።

ምስጢራዊነት፡-ተሳታፊዎች ስማቸዉን እንዲጠቅሱ አይጠበቅም። ማንኛዉንም ተሳተፊዎች የሚሰጡት መረጃ በሙሉ ሚስጥራዊነት እንዲጠበቅ የጥናቱ ስነ ምግባር ያስገድዳል በመሆኑም ተሳታፊዎች የሚሰጡት መረጃ ሚስጥራዊነቱ ይጠበቃል።

II. የፍቃደንነት መግለጫ ቅፅ

ከዚህ በላይ ስለጥናቱ የተፃፈዉን መግለጫ በሚገባኝ ቋንቋ አንብቤ ወይንም ተነቦልኝ ተረድቻለሁ። በመሆኑም በዚህ ጥናት ለመሳተፍ :-

እስማማለሁ 2. አልስማማም

ጥናቱን የሚአካሂደዉ ሰዉ አድራሻ

ስም መአዛ ገዙ ስልክ ቁጥር. 09120327976 Email meaza.gezu@gmail.com

ክፍል አንድ ማህበራዊና ስነ- ሕዝባዊ ገጽታዎችን በተመከተ

ተ.ቁ	መጠይቅ	አማላጭ	ይለፍ	ኮድ
	ክፍሌ አንድ፡- ማህበራዊና ስነ- ሕዝባዊ ገጽታዎችን በተመሆከተ (Socio Demography information related			
101	የመኖሪያ ቦታ	1.ከተማ 2. ገጠር		
102	ጸታ	ı. ወንድ 2. ሴት		
103	የተሳታፊዉ/ዋ እድሜ			
104	የጋብቻ ሁኔታ	ı. ያላገባ/ች 2. ያገባ/ች 3. የፈታ/ች 4. የሞተባት		
105	ብሄር	ı. ኦሮሞ 2. አማራ 3. ጉራጌ 4. ትግሬ 5. ሌላ/ይጠቀስ----------		
106	የትምህርት ደረጃ	ı. ያልተማረ 2. መሰረተ ትምህርት 3. አንደኛ ደረጃ_1-8 4. ሁለተኛ ደረጃ 9-10 5. ኮሌጅና ከዚያ በላይ		
107	ሀይማኖትዎ?	1.ኦርቶዶክስ 2. ሙስለሊም 3. ፕሮቴስታንት 4. ሌላ/ይጠቀስ		
108	የወር ደሞዝዎት ስንት ነዉ?			
109	የወር ወይም የአመት ገቢወት ከሌላ የገቢ ምንጭ?			
110	እርሶ የሚደግፉት የቤተሰቦ ብዛት ስንት ነዉ?			

ክፍል 2 ፡- ሰራተኛዉንን ድርጅቱን ግንኙነት ሚመለከቱ መጠይቆች

ተ.ቁ	መጠይቅ	አማራጮች	ይለፍ	ኮድ
201	የቅጥር ሁኔታ	1. ቋሚ 2. ኮንትራት 3. የቀን ሰራኛ		
202	መጀመርያ ሲቀጠሩ የቅጥር ፎርም ፈርመዋል?	ı. አዎ 2. የለም		
203	በመጀመርያ ወደ እዚህ ስራ ሲሰማሩ የጤና ምርመራ ተደርጎለቶላ?	ı. አዎ 2. የለም		
204	**ለQ203** መልሱ አዎ ከሆነ የተደረገለት ምን አይነት ምርመራ ነዉ?	1. የአካል የጤና ምርመራ (physical examination)		

		2. የደም ምረመራ(blood test) 3. ሌላ/ይጠቀስ----------		
205	ስራዉን ከጀመሩ በኋላ ተከታታይ የጤና ምርመራ ይደረግሎታል?	ነ. አዎ 2. የለም		
206	**ለQ205** መልሱ **አዎ** ከሆነ የተደረገለት ምን አይነት ምርመራ ነዉ?	1. የአካል የጤና ምርመራ (physical examination) 2. የደም ምረመራ(blood test) 3. ሌላ/ይጠቀስ----------		
207	**ለQ205** መልሱ **አዎ** ከሆን በስንት ጊዜ ልዩንት ነዉ ምርመራ የሚደረግሎት?			
208	የስራ ክፍል	1.ግሪንሀዉስ 2.ማሸጊያ (pack house) 3.መስኖ (irrigation) 4.መድሃኒትመርጨያ (spraying)		
209	በአሁኑ የስራ ክፍል ምን ያህል ጊዜ ቆዩ?			
210	ከአንድ የስራ ክፍል ወደ ሌላ ክፍል ተዘዋዉረዉ ያዉቃሉ?	1. አዎ 2. የለም ⟶	213	
211	**Q210 መልሱ አዎ** ለከተዘዋወሩ ከየት ወደ የትኛዉ ክፍል ነዉ የተዘዋወሩተ?(ከአንድ በላይ መልስ ቻላል)			
212	**Q210 መልሱ አዎ ከሆነ** ለመዘዋወሮ ምክንያት ምንድን ነበር?	1. በህመም ምክንያት 2.ወደ ተዘዋወረኩበት ክፍል የስራ ጫና ስለነበር 3. ሌላ/ ይጠቀስ----------		
213	በአበባ ልማት ስራ የቆይታ ጊዜ በወር?			
214	በስራዎት ደስተኛ ኖት?	1. በጣም ደስተኛ 2. ደስተኛ 3. ከፉም ደስታም አይሰኝም 4. ደስተኛ አይደለሁም 5.በጣም ደስተኛ አየደለሁም		
215	የሰዉነት መከላከያ አልዎት?	ነ. አዎ 2. የለም ⟶	221	
216	ለ **Q216** መልሱ **አዎ** ከሆን የትኛዉ መከላከያ ነዉ የልዎት?			
	ረጅም ጓንት	1. አዎ 2. የለም		
	ቦት ጫማ	1. አዎ 2. የለም		
	የፊት መሸፈኛ	1. አዎ 2. የለም		
	ሙሉ ልብስ	1. አዎ 2. የለም		
	አይን መከላከያ	1. አዎ 2. የለም		
	ሌላ	1. አዎ 2. የለም ⟶	219	
218	ለ **Q217 ሌላ** መልሱ **አዎ** ከሆነ ሌላ መከላከያ ካለ የጠቀሱ?			
219	ካለ የሰዉነት መከላከያዎን በአግባቡ ይጠቀማሉ?(ሁሌም በስራ ላይ እያሉና ሁሌም በአጠቃቀሙ መሰረት)			
	ረጅም ጓንት	1. አዎ 2. የለም		
	ቦት ጫማ	1. አዎ 2. የለም		

	የፊት መሸፈኛ	1. አዎ 2. የለም		
	ሙሉ ልብስ	1. አዎ 2. የለም		
	አይን መከላከያ	1. አዎ 2. የለም		
	ሌላ	1. አዎ 2. የለም		
220	ለ **Q219 ቢያንስ ለአንዱ መከላከያ መልሱ የለም** ከሆን በአግባቡ የማይጠቀሙበት ምክንያት?	1. ለስራ ስለማየመች 2. መከላከሉን አላምንበትም 3. ሌላ (ጠቀስ)----------		
221	ለ**Q211 መልሱ የለም ከሆነ** የሰዉነት መከላከያ ለምን አልኖሮትም?(ለእያንዳንዱ መከለ ከፊት ለፊቱ በተሰጠዉ ቦታ ላይ ቁጥሩን አስቀምጡ)	1. ድርጅቱ ስለማያቀርብ 2. እየተሰጠ ለመዉሰድ ቸልተኛ ሆነዉ 3. እንዲህ አይነት መከላከያ መኖሩን ባለማዉቅ		
	ረጅም ጓንት			
	ቦት ጫማ			
	የፊት መሸፈኛ			
	ሙሉ ልብስ			
	አይን መከላከያ			
222	የስራ አካባቢ ደህንነት ስልጠና መጀመርያ ሲቀጠሩ ወስደዋል?	1. አዎ 2. የለም		
	በቀን ምን አህል ሰአት ስራ ልኢ ያሳልፋሉ?	3.		
223	ከመደበኛ ስራ ሰአት ዉጪ ስራ የሚሰሩበት ጊዜ አለ?	1. አዎ 2. የለም		
225	የአበባ ልማት ስራ ላይ መቀጠር ለጤና እክል ያጋልጣል ብለዉ ያምናሉ?	1. አዎ 2.. የለም		
226	ለ **Q225**መልሱ አዎ ከሆነ የጤና ችግሮቹንምን ምን ምን ናቸዉ?			
227	ለተራ ቁጥር 225 መልሱ አዎ ከሆነ የጤና ችግሮቹ መንስኤ ምንድነዉ?			
228	ከስራ መልስ ስራ የሰሩበትን ልብስ ለብሰዉ ወደ ቤቶ ይሄዳሉ?			
229	መድሀኒት እንደተረጠጨ የመድሀኒቱ ሽታ ሳይወጣ ወደ እርሻዉ የሚገቡበት አጋጣሚ አለ?	1.አዎ 2.ለም		
230	ለ Q229 መልሱ አዎ ከሆነ ወደ እርሳዉ የሚገቡበት አጋጣሚ መቼ መቼ ነዉ?	1. ሁልጊዜ 2. አንዳንዴ		

ክፍል ሶስት የጤና ችግር ምልክቶች ዙርያ የሚመለከቱ መጠይቆች

ከዚህ በታች የተዘረዘሩት የጤና ችግሮችላለፉት12 ወራት ለተከሰቱት ብቻነው:: 301 የመተንፈሻ አካል የጤና ችግሮች ላይ የሚያተኩር ጥያቄዎች (Respiratory problems)				
301ሀ	በስራ ወቅት በተደጋጋሚ **የማሳል** ስሜት አለብዎት?(ጉሮሮዎን ማጽዳት የሚደረግን ሳጨምር)	ነ. አዎ 2. የለም		
301ለ	**በትንፋሽ ማጠር** ተቸግረህ ያዉቃሉ?	1.አዎ 2. የለም		
301ሐ	**ደረት ክብድ ክብድ** ማለት ወይም የአተነፋፈስ ችግር አጋጥሞት ያዉቃል?	ነ. አዎ 2. የለም		
301መ	**ደረት ላይ ሲጥ ሲጥ (ሰሲተነፍሱ የመቃተት)** የማለት ስሜት ይሰማህል?	1. አዎ 2. የለም		

301ሠ	ለመጠይቅ **መ** መልሱ አዎ ከሆነ **አስም** አለብዎ?	1.አዎ 2. የለም		
301ረ	**የማሰነጠስ** ችግር ነበረብዎት?	1. አዎ 2. የለም		
301ሰ	ላለፉትወራት **የአፍንጫ ፈሳሽ** መብዛት ወይም **የአፍንቻ መደፈን** ኢጋጥሞት ያዉቃል?	1. አዎ 2. የለም		
302. የቆዳሊይችግሮች				
302ሀ	ላለፉት12 ወራት ሄድ መጣ እያለ የሚያቸግረ ቢያንስ ስድስት ወር የቆየ **ሽፍታ** ነበለብዎት?	1. አዎ 2. የለም		
302ለ	ላለፉት 12 ወራት በማንኛዉም ጊዜ ቆዳዎ ላይ **የማሳከክ ስሜት** ኖሮበዎት ያዉቃል?	1. አዎ 2. የለም		
302ሐ	ላለፉት 12 ወራት በማንኛዉም ጊዜ ቆዳዎ ላይ **መቅላት** ኖሮበዎት ያዉቃል?	1. አዎ 2. የለም		
302መ	ላለፉት 12 ወራት በማንኛዉም ጊዜ ቆዳዎ ላይ **የማቃጠል** ስሜት ኖሮብዎተ ያዉቃል?	1. አዎ 2. የለም		
303	ከላይ የተተቀሱት የቆዳ ችግር በዋነኝነት የሚያጠቃዉ የሰዉነት ክፍሎ የቱ ነዉ?	1. እጅ 2. ፊት 3. እግር 4. አንገት 5. ሌላ ይጠቀስ		
ከዚህበታችየተዘረዘሩትየጤናችግሮችሊሆፉት12 ወራትሆተከስቱትብቻነው:: ክፍሌሦስት:- ላልችየጤናመታወክምልክቶች(Other health symptoms)				
305	ላለፉት 12 ወራት ወደ ስራ ሲሰማሩ **የራስ ህመም** (headache) ነበረብዎ?	1. አዎ 2. የለም		
306	ላለፉት 12 ወራት ወደ ስራ ሲሰማሩ **የድካም ስሜት** ነበረብዎ?	1. አዎ 2. የለም		
307	ላለፉት 12 ወራት **የማቃጠል** ስሜት ነበረብዎ?			
307ሀ	**የአፍንጫ**	1. አዎ 2. የለም		
307ለ	**የአይን**	1. አዎ 2. የለም		
307ሐ	**የጉሮሮ**	1. አዎ 2. የለም		
308	ላለፉት 12 ወራት **እንቅልፍእንቅልፍ** (sleepiness) የማለት ስሜት ነበረብዎ?	1. አዎ 2. የለም		
309	ላለፉት 12 ወራት **የምግብ ፍላጎት ማጣት** ወይንም **መቀነሥ** (loss apetite) በተደጋጋሚ ገጥሞዎታል?	1. አዎ 2. የለም		
310	ላለፉት 12 ወራት **የጀርባ ህመም** (backpain) በተደጋጋሚ ገጥሞዎታል?	1. አዎ 2. የለም		
311	**የኩላሊት** ችግር አለብዎ?	1. አዎ 2. የለም		
312	ላለፉት 12 ወራት **የድብርት ስሜት** በስራ ወቅት ኢጋጥሞዎታል?	1. አዎ 2. የለም		
313	ባልታሰበ ሁኔታ ስራ ቦታ **ዕራስን ስቶ መዉደቅ** ኢጋጥሞታል?	1. አዎ 2. የለም		
315	ከላይ የተጠቀሱት ችግሮች ባጋጠምዎት ጊዜ ህክምና ቦታ ሄደዋል?	1. አዎ 2. የለም ——→ 320		
317	ለመጠይቅ 316 መልሱ አዎ ከሆነ የህክምና ወጪዉ በማንነዉ የተሸፈነዉ?	1. በሰረተኛዉ 2. በድርጅቱ 3. ሌላ/ይጠቀስ----------		

316	ህክምና በሚያደረጉበት ጊዜ እረፍት ይሰጥዎታል?	1. አዎ 2. የለም		
317	ለመጠይቅ 318 መልሱአዎ ከሆነ ለምን ያህል ጊዜ?	1. ህክምናዉንእስከጨርስ 2. እየታከምኩ እሰራለዉ 3. ሌላ/ይጠቀስ----------		
318	ለመጠይቅ 316 መልሱ የለም ከሆነ ላለመታከምዎ ምክንያት?	1. ድርጅቱ ህክምና ማእከል የለዉም 2. ድርጅቱ የህክምና እረፍት ስልማይሰጥ 3. የአቅም ማነስ 4. ሌላ ምክንያት ካለ ይጠቀስ		
319	ሌላ ምን የጤና ችግር ገጥሞዎታል?			
320	ከዚህ በፊት ያሉትን የበሽታ ምልክቶች የቤተሰቦ አባል ያጋጠመዉ አለ?	1. አዎ 2. የለም		
321	ለ **Q322 መልሱ አዎ ከሆነ** የቤተሰቦ አባል ለእርሶ ዝምድናዉ ምንድን ነዉ?	1. አባት 2. እናት 3. ባል/ሚስት 4. ልጅ 5. እህት 6. ወንድም 7. ሌላ		

ክፍል አራት :- ተዛማጅነት ያላቸው ጥያቄዎች፡ የሰራተኛው ስነ-ባሃሪ ልይ የሚያተኩሩ፡፡

401	ሲጃራ ያጨሳሉ?	1. አዎ 2. የለም	
402	ለ **Q401 አዎ ከሆነ** በምን ያህል ጊዜ ልዩነት ነዉ የሚያጨሱት?		
402	ለ **Q401 መልሱ አዎ ከሆነ** በቀን በአማካኝ ምን ያህል ሲጃራ ነዉ የሚያጨሱት?		
403	መ ጠ ጥ ይጠጣሉ?	1. አዎ 2. የለም	
404	በቤ ትዎ ዉስጥ ምግብ የሚበስለዉ በዋናዉ ቤት ዉስጥ ነዉ?	1. አዎ 2. የለም	
405	የሚጠቀሙት የማገዶ አይነት **(ከከአንድ በላይ መልስ ይቻላል)**	1. እንጨት/ከሰል 2. ቡታጋዝ 3. ኤሌክትሪክ 4. ሌላካለ ይጠቀስ	
406	በቤት ዉስጥ የሚጠቀሙት ፀረ ተባይ ወይም ፀረ ነፍሳት ኬሚካል ይጠቀማሉ?	1. አዎ 2. የለም	
407	ለ**Q406 መልሱ አዎ ከሆነ** ካለ ሚጠቀሙት ኬሚካል ምንድን ነዉ?		
408	**ለQ406 መልሱ አዎ ከሆነ** የሚጠቀሙት ለምን ተግባር ነዉ?		

ለህብረተሰቡ የጥናት ቡድን የሚጠየቅ መጠይቅ

በአዲስ አበባ ዩኒቨርሲቲ የጤና ሳይንስ ኮሌጅ የህብርትሰብ ጤና ሳይንስ ክፍል በህብረተሰቡ ላይ ያሉ የጤና ችግሮችን ለመዳሰስ ለሚደረግ ጥናት የተዘጋጀ መጠይቅ

የጠያቂውስም_____ ፊርማ_____

መጠይቁየተሞላበትቀን_____ የተጀመረበትሰዓት_____ የተጠናቀቀበትሰዓት_____

የመጠይቁ ግምገማ:- 1. ተሟሌቷሌ 3. ተጠያቂውአሌተገኙም

2. ተቋውሞ 4. በከፊልተሞልቷል

II. የተሳታፊዎች መረጃ ቅፅ

ጤና ይስጥልኝ_____ እባላለሁ። የመሁጣሁት በአዲስአበባ ዩኒቨርሲቲ ለሚደረግ ጥናት መረጃ ለመሰብሰብ ነዉ። እርሶ የዚህ ጥናት ተሳታፊ መሆን ከሚችሉ ሰዎች መካከል አንዱ ሲሆኑ ከእርሶ ጋር የተገናኘነዉ እንደ እድል በእጣ በተደረገ ምርጫ ነዉ። የተወሰኑ መጠይቆች በማህበራዊና በጤና እክል ምልክቶች ዙሪያአለኝ። የሚከተሉትን ነገሮች ስለጥናቱ ከተገነዘቡ በኋላ ፍቃደኛ ከሆኑ ወደ መጠይቆቹ እናልፋለን።

የጥናቱ አላማ፡- በህብረተሰቡ ላይ የሚከሰቱ የጤና እክል ምልክቶች ግዝፈትንና ተያያዥ ጉዳዮችን መዳሰስ።

ጉዳት፡- እዚህ ጥናት ላይ በመሳተፍ ተሳታፊዎችምንም አይነት ጉዳት አይደርስም።

ምስጢራዊነት፡-ተሳታፊዎች ስማቸዉን እንዲጠቅሱ አይጠበቅም። ማንኛዉንም ተሳተፊዎች የሚሰጡት መረጃ በሙሉ ሚስጥራዊነት እንዲጠበቅ የጥናቱ ስነ ምግባር ያስገድዳል በመሆኑም ተሳታፊዎች የሚሰጡት መረጃ ሚስጥራዊነቱ ይጠበቃል።

II. የፍቃደንነት መግለጫ ቅፅ

ከዚህ በላይ ስለጥናቱ የተፃፈዉን መግለጫ በሚገባኝ ቋንቋ አንብቤ ወይንም ተነቦልኝ ተረድቻለሁ። በመሆኑም በዚህ ጥናት ለመሳተፍ

1. ተስማምቻለዉ 2. አልተስማማሁም

ጥናቱን የሚአካሂደዉ ሰዉ አድራሻ

ስም መአዛ ገዙ ስልክ ቁጥር. 0912032797

Email meaza.gezu@gmail.com

ተ.ቁ	መጠይቅ	አማላጭ	ይለፍ	ኮድ
	ክፍሌ አንድ፡-ማህበራዊና ስነ- ሕዝባዊ ገጽታዎችን በተመሆከተ(Socio Demography information)			
102	ጸታ	3. ወንድ 4. ሴት		
103	የተሳታፊዉ/ዋ እድሜ			
104	የጋብቻ ሁኔታ	5. ያላገባ/ች 6. ያገባ/ች 7. የፈታ/ች 8. የሞተባት		
105	ብሄር	6. ኦሮሞ 7. አማራ 8. ጉራጌ 9. ትግሬ 10. ሌላ/ይጠቀስ----------		
106	የትምህርት ደረጃ	3. ያልተማረ 4. መሰረተ ትምህርት 3. አንደኛ ደረጃ_1-8 4. ሁለተኛ ደረጃ 9-10 5. ኮሌጅና ከዚያ በላይ		
107	ሀይማኖት	1.አርቶዶክስ 2. ሙስለሊም 3. ፕሮቴስታንት 4. ሌላ/ይጠቀስ_____		
108	እርሶ የሚደግፉት የቤተሰብ ብዛት?			
109	ስራዎ ምንድን ነዉ?	1. የቤት እመቤት 2.የመንግስት ሰራተኛ 3. ገበሬ 3. ነጋዴ 4. የቀን ሰራተኛ 5 ሌላ/ይጠቀስ_____		
110	የወር ደሞዝዎት/ገቢዎት ስንት ነዉ?			
111	የወር ወይም የአመት ገቢወት ከሌላ የገቢ ምንጭ?			
112	ለ108 መልሱ **ገበሬ** ከሆነ በእርሻዎ ላይ ኬሚካል ይጠቀማሉ?	1. አዎ 2. የለም		
112	ለ112 መልሱ **አዎ** ከሆነ ኬሚካሉን የሚበጠብጠዉ የሚረጨዉማን ነዉ?	1. እርሶ 2. ሌላ ሰዉ ቀጠረዉ 3. ሌላ የቤተሰቦ አባል		
113	ለ113 መልሱ መላሹ ተሳታፊዉ(በተራ ቁጥር 1 ላኢ ተመለከተዉ ከሆነ አራስዎን መከላኪያ በሚሰሩበት ጊዜ ይጠቀማሉ? (ከተጠቀሙ በሚጠቀሙት መከላኬአ ላኢ አከብቡ-ከአንድ በላይ መልስ ይቻላል)	1. ረጅም ጓንት		
		2. ቦት ጫማ		
		3. የፊት መሸፈኛ		
		4. ሙሉ ልብስ		

		5. አይን መከላከያ		
		6. ሌላ/_____		
ክፍል 3፡- ከዚህበታችየተዘረዘሩትየጤናችግሮችሊሆፉት12 ወራትለተከሰቱትብቻነው፡፡ 3.1 የመተንፈሻ አካሌ የጤና ችግሮች ሊይ የሚያተኩር ጥያቄዎች የመተንፈሻ አካሊት ችግሮች				
ሀ	በስራ ወቅት በተደጋጋሚ የማሳል ስሜት አለብዎት	1. አዎ 2. የለም		
ለ	በትንፋሽ ማጠር ተቸግረህ ያዉቃሉ?	1. አዎ 2. የለም		
ሐ	ደረት ክብድ ክብድ ማለት ወይም የአተነፋፈስ ችግር አጋጥሞት ያዉቃል?	1. አዎ 2. የለም		
መ	ደረት ላይ ሲጥ ሲጥ የማለት ስሜት ይሰማሀል?	1. አዎ 2. የለም		
ሠ	ለመጠይቅ መ መልሱ አዎ ከሆነ አስም አለብዎ?	1. አዎ 2. የለም		
ረ	የማስነጠስ ችግር ነበረብዎት?	1. አዎ 2. የለም		
ሰ	ላለፉትወራት የአፍንጫ ፈሳሽ መብዛት ወይም የአፍንቻ መደፈን አጋጥሞት ያዉቃል?	1. አዎ 2. የለም		
302. የቆዳ ላይ ችግሮች				
ሀ	ላለፉት 12 ወራት ሄድ መጣ እያለ የሚያቸግረ ሽፍታ ነበለብዎት?	1. አዎ 2. የለም		
ለ	ላለፉት 12 ወራት በማንኛዉም ጊዜ ቆዳዎ ላይ የማሳከክ ስሜት ኖሮበዎት ያዉቃል?	1. አዎ 2. የለም		
ሐ	ላለፉት 12 ወራት በማንኛዉም ጊዜ ቆዳዎ ላይ መቅላት ኖሮበዎት ያዉቃል?	1. አዎ 2. የለም		
መ	ላለፉት 12 ወራት በማንኛዉም ጊዜ ቆዳዎ ላይ የማቃጠል ስሜት ኖሮብዎተ ያዉቃል?	ነ. አዎ 2. የለም		
303	ከላይ የተተቀሱት የቆዳ ችግር በዋነኝነት የሚያጠቃዉ የሰዉነት ክፍሎ የቱ ነዉ?	1. እጅ 2. እግር 3. ፊት 4. አንገት 5. ሌላ ይጠቀስ		
ከዚህበታችየተዘረዘሩትየጤናችግሮችሊሆፉት12 ወራት የተከሰቱትን ብቻነው፡፡ ሌሎች የጤናመታወክ ምልክቶች(Other health symptoms)				
304	ላለፉት 12 ወራት ወደ ስራ ሲሰማሩ የራስ ህመም (headache) ነበረብዎ?	1. አዎ 2. የለም		
305	ላለፉት 12 ወራት ወደ ስራ ሲሰማሩ የድካም ስሜት ነበረብዎ?	1. አዎ 2. የለም		
306	ላለፉት 12 ወራት የማቃጠል ስሜት ነበረብዎ?			
307ሀ	የአፍንጫ	1. አዎ 2. የለም		
307ለ	የአይን	1.አዎ 2. የለም		

307ሐ	የጉሮሮ	ነ. አዎ 2. የለም		
308	ላለፉት 12 ወራት እንቅልፍእንቅልፍ (sleepiness) የማለት ስሜት ነበረብዎ?	1.አዎ 2. የለም		
309	ላለፉት 12 ወራት የምግብ ፍላጎት ማጣት ወይንም መቀነሥ (loss apetite) በተደጋጋሚ ገጥሞዎታል?	1. አዎ 2. የለም		
310	ላለፉት 12 ወራት የጀርባ ህመም (backpain) በተደጋጋሚ ገጥሞዎታል?	1. አዎ 2. የለም		
311	የኩላሊ ችግር አለብዎ?	1. አዎ 2. የለም		
312	ላለፉት 12 ወራት የድብርት ስሜት በስራ ወቅት አጋጥሞዎታል?	1. አዎ 2. የለም		
313	ባልታሰበ ሁኔታ ስራ ቦታ መዉደቅ አጋጥሞታል?	1. አዎ 2. የለም		
314	ከላይ የተጠቀሱት ችግሮች ባጋጠምዎት ጊዜ ህክምና ቦታ ሄደዋል?	1. አዎ 2. የለም		
315	ሌላ ምን የጤና ችግር ገጥሞዎታል?			

ክፍል አራት :- ተዛማጅነት ያላቸው ጥያቄዎች፡ የህብረተሰቡን ስነ-ባሃሪ ላይ ሚያተኩሩ፡፡

	መጠይቅ	አማራጭ	
401	ሲጃራ ያጨሳሉ?	1. አዎ 2. የለም	
402	ለ **Q401 አዎ ከሆነ** በምን ያህል ጊዜ ልዩነት ነዉ የሚያጨሱት?		
402	ለ **Q401 መልሱ አዎ ከሆነ** በቀን በአማካኝ ምን ያህል ሲጃራ ነዉ የሚያጨሱት?		
403	መ ጠ ጥ ይጠጣሉ?	1. አዎ 2. የለም	
404	በቤ ትዎ ዉስጥ ምግብ የሚበስለዉ በዋናዉ ቤት ዉስጥ ነዉ?	1. አዎ 2. የለም	
405	የሚጠቀሙት የማገዶ አይነት **(ከከአንድ በላይ መልስ ይቻላል)**	1. እንጨት/ከሰል 2. ቡታጋዝ 3. ኤሌክትሪክ 4. ሌላ/ ይጠቀስ	
406	ሌላ ምን የጤና ችግር ገጥሞዎታል?		
407	በቤት ዉስጥ የሚጠቀሙት ፀረ ተባይ ወይም ፀረ ነፍሳት ኬሚካል ይጠቀማሉ?	1. አዎ 2. የለም	
408	ለ **Q407** ካለ የሚጠቀሙት ኬሚካል ምንድን ነዉ?		
409	ለ **Q407** የሚጠቀሙበት ለምን ተግባር ነዉ?		

Qualitative part data collection tool

III. Interviewee guide for Focus group discussion

1. What health problem that arises in your working area which may be due to your occupation?
2. What do you think the reason for these health problems?
3. What methods can you explain that will reduce the potential hazards that will rise in your working environment?
4. What type of personal protective equipment that workers use to reduce chemical hazards?
5. Do all workers use PPE?
6. If no why do you think the reason for not using PPE?
7. What type of safety measures do you expect from the employer?

IV. Interviewee guide for in-depth interviewee

1. Is there occupational health safety officer? If so what is its function?
2. How do workers keep their hygiene in work place?
3. In your experience what health problems have you observed? Most commonly encountered health problem in the farm?
4. Working hour per week?
5. How can you arrange your maternity leaves (only for woman) and sick leave?
6. Is there any arranged training considering new employment, equipment and other changes? If so what did the training focus on?
7. What do you think the major factors that expose workers for health problems?
8. How do workers try to prevent the possible health problems?

V. Work environment observation checklist

Hazards in working environment

1. Is there excessive heating in the work place? 1. Yes_____ 2.No_____

   yes requires if a worker is found sweating when naked or with light clothing if investigator feels as sudden heat wave when entering in to the industry.

2. Is there excessive dust in the work place? 1. Yes _____2.No_____

   yes requires if the investigator experiences sudden sneezing up on entering the industry or if the workers eye brows, hair, nostrils and cloths is observed by investigator to be covered with dust particles

3. Is there working sign and safety rule in the work place? 1. Yes _____2.No____

   Yes requires no lack of such management at inspection around.

4. Was there any preventive measure implemented for hazards in the working environment?

Yes requires specification of incident and preventive measure

5. Does the industry have copy of the most important safety and health regulation?

6. Does the farm follow written health and safety plan of action in the work place?

7. Does the working section have first aid equipment? 1. Yes_____ 2. No_____

8. Is there any health service near to the farm? 1. Yes 2 .No

Checklist to be filled by observing respondent at the time of data collection

Observe type of PPE and tick on the status of PPE according to your observation

PPE used	Status of PPE			perforated		Water proof		Other explanation needed	
	rubber	Leather	Not	yes	no	Yes	no		
Gloves									
Boots									
Facemask									
Goggles									
Coverall cloth									
Other PPE observed									

Declaration

I, the undersigned, declare this thesis is my original work in partial fulfillment of the requirement of the Degree of Master of Public Health and has not been presented in this or other University. All sources of materials used for this thesis have been acknowledged.

Name: Meaza Gezu

Signature _____

Place Addis Ababa Ethiopia

Date of Submission 23 May 2012

This thesis has been submitted for examination with my approval as the university advisor.

Name of the advisor Signature

Dr. Abera Kumie _____