JIMMA UNIVERSITY

INSTITUTE OF HEALTH, FACULTY OF PUBLIC HEALTH,

DEPARTMENT OF EPIDEMIOLOGY

PREVALENCE OF RESPIRATORY SYMPTOM AND ASSOCIATED FACTORS AMONG CLEANERS IN JIMMA UNIVERSITY, SOUTHWEST ETHIOPIA

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Prevalence of Respiratory Symptom and Associated Factors among Cleaners in Jimma University, Southwest Ethiopia

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Abstract

Background: Respiratory symptoms are manifestations of respiratory problems that are mainly developed as the result of occupational exposures. They are more prevalent in developing countries, where occupational health and safety issues are less emphasized. In Ethiopia there are very few studies conducted on the respiratory health problems of cleaners working in higher institutions.

Objective: The study was conducted to assess the prevalence of respiratory symptom and associated factors among cleaners in Jimma University.

Methods: Cross sectional study was conducted from April 01 to 15, 2018. Simple random sampling technique was used to select 426 study participants. Data was collected through interviewer administered structured questionnaire adopted from British Medical Research Council. Epi Data, SPSS and Microsoft Excel applications were used for data entry, analysis and result presentation. Bivariate regression analysis was computed to select candidate variables for multivariate logistic regression analysis. Multivariate logistic regression model was fitted by using variables that had association ($p < 0.25$) with the dependent variable in bivariate analysis.

Result: The prevalence of respiratory symptom among Cleaners in Jimma University was 36.3% (95% CI: (32%, 41%)). Multivariate analysis revealed that working in general service department than in student dormitory [AOR=1.75, 95% CI: (1.02, 3.04)], not using dust mask [AOR=2.34, 95% CI: (1.17, 4.69)], having no training on occupational health and safety [AOR=2.93, 95% CI: (1.41, 6.08)], sleeping problem [AOR=2.17, 95% CI: (1.05, 4.50)], past illness [AOR=2.84, 95% CI: (1.81, 4.45)], use of fuel gas than electricity [AOR=4.12, 95% CI: (1.47, 11.5] were significantly associated factors with the respiratory symptom.

Conclusion: Respiratory symptom among cleaners was high. The working department, use of dust mask, occupational health and safety training, sleeping problem, history of respiratory illness and energy used at home were major contributing factors for the respiratory symptom to occur. Therefore, wearing of dust mask among cleaners and provision of safety and health training, including induction training during enrollment, at work is highly recommended.

Key words: Cleaners, Respiratory symptom, Jimma University

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Abbreviations

AOR	Adjusted Odds Ratio
BMRC	British Medical Research Council
CAVM	College of Agriculture and Veterinary Medicine
CBE	College of Business and Economics
CI	Confidence Interval
COPD	Chronic Obstructive Pulmonary Disease
ILO	International Labor Organization
IRB	Institutional Review Board
JIT	Jimma Institute of Technology
JU	Jimma University
MSW	Municipal Solid Waste
ODTS	Organic Dust Toxic Syndrome
OHS	Occupational Health and Safety
PI	Principal Investigator
PPE	Personal Protective Equipment
URTI	Upper Respiratory Tract Infection
WHO	World Health Organization

1. Introduction

1.1 Background

Respiratory symptoms such as cough, phlegm, wheezing, shortness of breath, and chest pain are manifestations of respiratory problems that are mainly developed as the result of occupational exposures (1). Waste management activities namely, collection, transport, sorting, processing and disposal are carried out according to procedures that can have various negative effects on the environment and, potentially, on human health by posing risks resulting from the emissions or release of hazardous chemical agents and biological agents, from the types of exposure to these agents, and from the susceptibility of the populations exposed to them (2).

Waste management is one of the most important environmental aspects to be considered within educational institutions. Amount and type of waste produced in Universities depend on the number of students and staffs, site and infrastructures technical characteristics (including buildings) and the institutional management (3). In higher institutions the major sources of wastes are halls of residence, cafeterias, classrooms, social clubs and residential premises. The waste from these sources constitutes mainly dust particles, papers, plastics and organic waste including food leftovers (4).

In most public and private institutions wastes are collected by Cleaners who are employed for this purpose. These Cleaners face tremendous challenges while they are on duty. Lack of support and interest from their employers regarding health and protective measures put more load on them. Ways of disposal, isolation, separation, collection and disposal of the waste need to be addressed evaluated and managed properly by the institutions (5).

The majorities of waste collectors are ignorant in relation to Personal Protective Equipment (PPE) and not adhered to health and safety protocols. They suffered from different types of injuries, diseases and diseases like symptoms such as sore throat, cough, backache, diarrhea and bloody stool, shortness of breath, skin diseases, twisted ankle and a muscle tear (5). This occupation is physically strenuous, resulting in workers breathing through their mouths rather than their noses.

Individuals who breathe through their mouths have higher pulmonary ventilation rates than those who breathe through their noses (6) which aggravate the risk of respiratory problems. However the risk of allergenic response to organic dusts can be greatly reduced if workers wear respiratory masks (7). Thus this study was intended to assess respiratory symptom and its associated factors among Jimma University (JU) Cleaners.

1.2 Statement of the problem

In 2012 World Health Organization (WHO) reported that worldwide non-communicable diseases are the leading cause of mortality which accounts for 82 % of deaths and among those non-communicable diseases chronic respiratory diseases, asthma and chronic obstructive pulmonary diseases accounted for 4 million or 10.7 % deaths (8). Respiratory disease causes an immense worldwide health burden. It is estimated that 235 million people suffer from asthma, more than 200 million people have chronic obstructive pulmonary disease (COPD), and 65 million endure moderate-to-severe COPD (9). In 2011, International Labor Organization (ILO) revealed that occupational respiratory diseases represented up to 30% of all enrolled work related diseases and 10-20% of deaths were caused by respiratory conditions. Laborers in high hazard divisions, for example, mining, construction, and dust generating tasks have 50% prevalence of work related respiratory diseases (10).

Waste collectors are prone to a number of hazards such as pathogens (bacteria, fungi, viruses, parasites and cysts), toxic substances (endotoxins and beta-glucans), chemicals that come from the waste itself and from its decomposition, as well as vehicle exhaust fumes, noise, extreme temperatures, ultraviolet radiation, large amounts of household and commercial wastes, which are comprised of decomposable organic materials which may all contribute to respiratory problems (11). The prevalence of respiratory symptoms as well as impaired lung functional capacities was more common among garbage collectors than in their control counterparts. This is likely to be attributed to the occupational exposure of this group to workplace contaminants, particularly, bio aerosols (12). In some studies high atmospheric concentration of bio aerosols has been found in the breathing air of workers engaged in collection, disposal and recycling of waste site (13). Microbiological exposure associated with waste can occur indoors where the waste is stored (14) or outdoor during its collection and may be influenced by collecting, transferring and processing (15).

Compostable waste collectors have been shown to suffer from variety of health effects including mucous membrane irritation, rhinitis, asthma, bronchitis, conjunctivitis, hyper sensitivity, allergic bronco pulmonary mycosis, dermatitis and diarrhea (14). Moreover, waste collectors often lack training, tools and information in order to perform their work in the best healthy and

safe manner. In addition to these, routine medical checkup program for all waste collectors is mandatory to keep them safe and secure (16).

There is scanty of data and evidences on health problems related to occupational exposures in higher educational institutions in the country. Also there is minimum information about the respiratory problems related to institutional waste management. In Ethiopia institutional waste collectors has not been studied much due to various misconceptions that institutional wastes may not result in health problems. Most workers facing challenges from this job by full or partial exposed in high occupational hazards conditions, which later bring them adverse health effects and increases utilization of health services and poor quality of life. In most of the public institutions of the country waste is collected and transported manually which is accompanied with exposure to nuisance, particulate matters and bio aerosols. The waste awaiting collection is readily available to insect and rodents and other scavenger animals which are potential carriers of enteric pathogens. During the time of collection waste handlers may not use PPEs and follow safety measures.

2. Literature Review

2.1 Prevalence of work related Respiratory Symptoms

Respiratory diseases are one of the most common occupational health problems worldwide. Respiratory symptoms including cough, phlegm, wheezing, shortness of breath, and chest pain are manifestations of respiratory problems which are mainly evolved as the result of occupational exposures. The study conducted in United States on workers of different industry showed that the prevalence of work related asthma was 3.70% (95% confidence interval (95% CI) 2.88 to 4.52) and the prevalence of work related wheezing was 11.46% (95% CI 9.87 to 13.05) (17). Even if the magnitude differs, workers of different work industry face respiratory health challenges. Study conducted in Thailand on wood furniture manufacturers stated that 29.94% of wooden furniture factory workers ever had at least one respiratory problem. Respiratory symptoms were coughing (18.79%), followed by having sputum, stuffy nose, breathless, and wheezing (15.66%, 15.07%, 7.83% and 5.09%, respectively) (18). The study conducted on Cotton dust exposed workers in Arba Minch textile factory revealed that the percentage prevalence of cough, phlegm, wheeze, breathlessness and chest tightness was 64.7%, 55%, 39%, 41% and 43% for exposed respondents, respectively and 25.5%, 14%, 8%, 6% and 0% for control subjects, respectively (19). The study in Jimma town showed that cobblestone road paving workers who had exposure to occupational dust had significantly higher odds of respiratory symptoms, dry cough (p < 0.05), cough (p < 0.01) and sore throat (p < 0.001) compared to office workers (20). The study in North Shoa showed that the prevalence of respiratory symptoms was 66.2% in cement factory workers and 31.2% in Civil servants with a significant difference (p < 0.001) (21). Similarly the study conducted in Dejen cement factory reported that the prevalence of chronic respiratory symptoms among Dejen cement factory workers was 62.9 %, with prevalence of chronic cough 24.5 %, chronic wheezing 36.9 %, chronic phlegm 24.5 %, chronic shortness of breath 38.6 %, and chest pain 21.0 % (22).

2.1.1 Respiratory health among waste collecting workers

The standards and norms for handling waste in industrialized countries have reduced occupational health and environmental impacts substantially. Most waste collection in these countries involves vehicles with low loading heights and easy to lift plastic containers (6). In developing countries the waste collection activities are typically conducted in micro and small-

scale enterprise at municipal level or by permanent or temporary employed cleaners at institutional level, with old equipment and virtually no dust control or worker protection. So, collection workers have significantly direct contact with waste, and are also exposed to more potential particulates, toxic materials, and gases and infectious microorganisms.

Protection of worker form occupational respiratory hazards depend on availability and proper utilization of personal protective equipment, which in low and middle income countries is in short supply with very limited monitoring of their utilization (23). Moreover solid waste colection workers often lack training, tools and information in order to perform their work in the best healthy and safe manner (14). Workers in waste collection suffer from increased levels of respiratory disorders. This occupation is physically strenuous, resulting in workers breathing through their mouths rather than their noses. Individuals who breathe through their mouths have higher pulmonary ventilation rates than those who breathe through their noses (6). Because of the nature of their occupation, waste collectors are exposed to large amounts of household and commercial wastes, which are comprised of decomposable organic materials (11). The prevalence of respiratory symptoms as well as impaired lung functional capacities was more common among waste collectors than in their control counterparts. This is likely to be attributed to the occupational exposure of this group to workplace contaminants, particularly bio aerosols (12). In some studies high atmospheric concentration of bio aerosols has been found in the breathing air of workers engaged in collection, disposal and recycling of waste site (13).

Some studies concluded that direct contact with waste could induce dry cough with exercise induced dyspnea, asthma, and organic dust toxic syndrome (ODTS). A suggested hypothesis was that the level of exposure to microorganisms was responsible for these symptoms (24). An increased risk of self-reported cough, phlegm, wheezing, dyspnea, and chronic bronchitis was found among 533 waste collectors compared with 320 office workers of the same municipalities in Taiwan (25). Also, an increased prevalence of asthma, spasm, throat dryness, nasal discharge, and coughing symptoms was found among waste collectors in Istanbul than in drivers, but these differences were not statistically significant ($p > 0.05$) (26). According to the study conducted in Miami, Florida on solid waste collectors, illnesses reported by the collectors included: rash or skin disease (46.1%), asthma, chronic coughing, breathing trouble, sinus congestion (29.4%) (7).

In Palestine, 44.7% of domestic waste collectors have suffered from sore throat, cough, and high temperature, and 25% of them had suffered from shortness of breath in the last 12 months (27).

It has been reported that there was a higher prevalence of respiratory ailments among MSW collectors which were asthma, cold, cough, chronic bronchitis, bronchial asthma, and upper respiratory tract infection (URTI) (28). A Study in Egypt Mansoura revealed that the most frequent respiratory complaint among MSW collectors during the past 12 months was shortness of breath (21%) and the least frequent was nasal blockage (2.5%). A study in Tanzania more waste handlers reported nasal irritation than other workers 62% and 25.7% respectively. Coughing was significantly reported more among refuse handlers than other workers 63% and 23 % respectively with p = 0.00001 (29). The study conducted on municipal waste collectors in Addis Ababa,Yeka sub city revealed that the overall prevalence of respiratory symptoms among solid waste collectors in Addis Ababa, Yeka sub city was 40.7% with prevalence of cough 35.7%, wheezing 21.2%, phlegm 44%, chest illness 7.3% and breathlessness 29.2% (30).

2.1.3 Determinants of respiratory health symptoms among waste collectors

Personal protective equipment is used or worn by a person to minimize risk to the person's health or safety and include a wide range of clothing and safety equipment. Provision of personal protective measures during collection hours together with automatization of waste collection of refuse will ease the job for the workers and reduces the exposure to dust and the incidence of respiratory complaints (28). The acute respiratory health effects can presumably be reduced by proper dust control measures such as personal protective respirators, training and education and maintaining machines at the workplace (35). Study done in Addis Ababa showed that 43.6 % were using PPE while they are on duty. Out of these PPE users 22.5 % of them reported that they were not using it all the time they are on duty (25). Occupational exposures to dust, fumes, and gases are associated with increased prevalence of respiratory symptoms and impairment of lung function (38). This was found to have direct relationship with the dust concentration and duration of exposure (39). The higher prevalence of respiratory symptoms among MSW collectors could be attributed to the nature of their job.

The summary of relation between independent variables such as socio demographic factors, behavioral factors, and environmental condition and safety factors are expected to contribute to the prevalence of respiratory symptoms. And socio-demographic factors are expected to influence behavioral and environmental condition and safety factors directly and indirectly there by resulting in a great deal of respiratory health symptoms. Behavioral factors and environmental condition and safety factors are expected to affect each other. The brief summary is charted in the figure as conceptual frame work putting into consideration of factors, assumptions and relationships mentioned in literature review.

2.2 Conceptual Framework
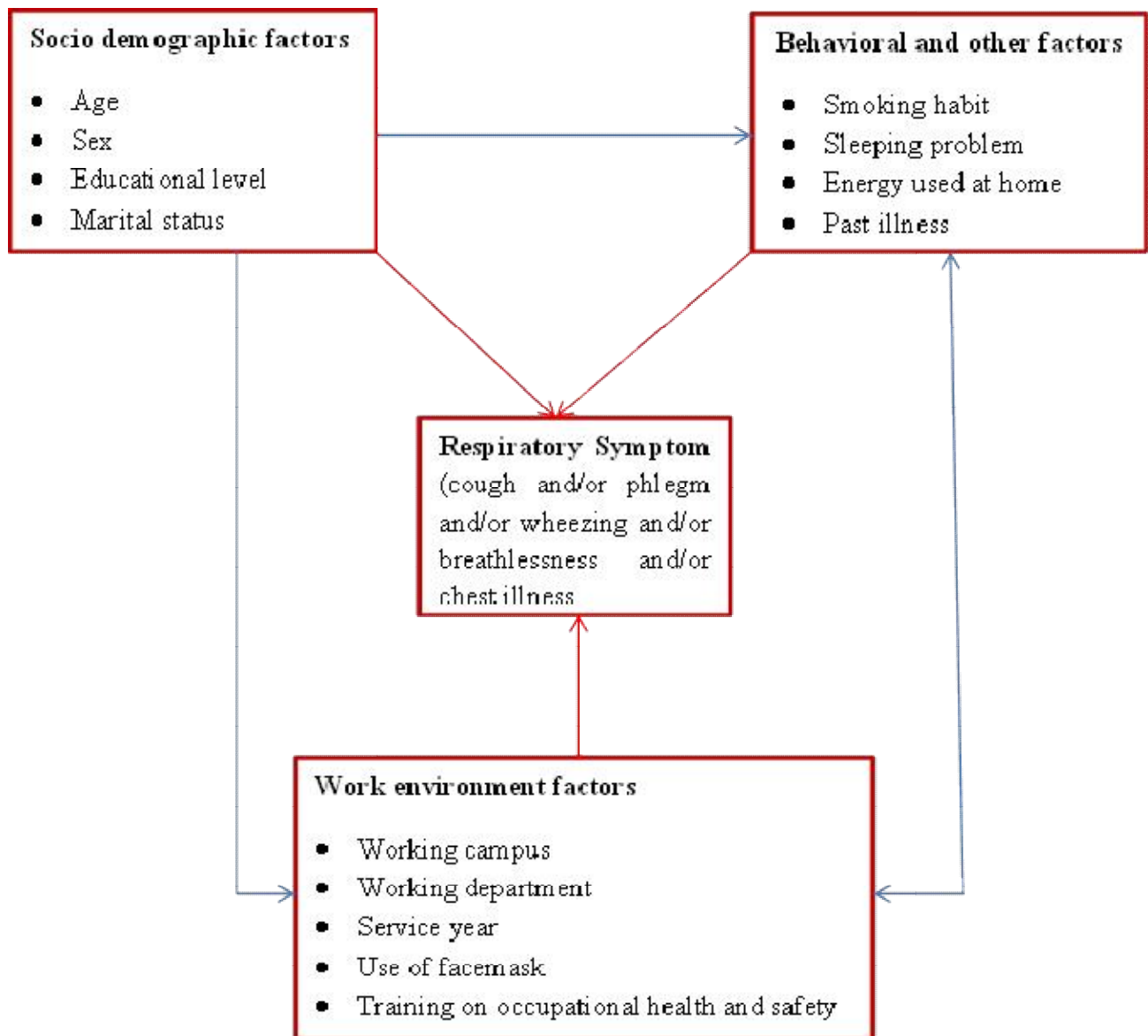
Figure 1 Conceptual framework to study prevalence of respiratory symptom and associated factors among Cleaners in JU, April 2018 (30).

2.3 Significance of the study

The finding of this study provides information on the magnitude of respiratory symptom, occupational and environmental factors associated with the problem. These can help JU, other higher education's and any public or private institutions to know the potential health risks and put safety measures in order to protect the health of their work force. The study also alarms the Cleaners to follow safety procedures and use PPE and enable them to know their work related hazards. Also, government, non-government, faiths based organizations, industries, municipal, contractors, agencies, authorities and policy makers may use the recommendation from the study. In addition, it paves away for further research.

3. Objectives

3.1 General Objectives

➢ The general objective of the study was to assess the prevalence of respiratory symptom and associated factors among cleaners in Jimma University, Southwest Ethiopia, 2018.

3.2 Specific Objectives

➢ The specific objectives of the study were:

✓ To determine the prevalence of respiratory symptom among cleaners in Jimma University.

✓ To identify factors associated with respiratory symptom among cleaners in Jimma University.

4. Methods and Materials

4.1 Study area and period

JU is found in Jimma town, which is situated around 352 kilometers Southwest of Addis Ababa. Its grounds cover some 167 hectares. It also has twelve research facilities, a modern hospital, a community school, an Information Communication Technology center, libraries and revenue generating enterprises. The University is operating on three campuses namely: Main campus, Jimma Institute of Technology (JIT) campus and College of Agriculture and Veterinary Medicine (CAVM) campus. Currently, the university educates more than 43,000 students in 56 undergraduate and 103 postgraduate programs in regular, summer and distance programs. Currently, there are a total of 1217 cleaners working in JU. The study was conducted in JU from April 01-15, 2018.

4.2 Study design

Institutional based cross-sectional study was conducted.

4.3   Population

4.3.1   Source population: The source population was all cleaners working in JU.

4.3.2   Study population: The study population was selected cleaners working in JU.

4.3.3   Inclusion criteria: Cleaners who had a minimum of one year work experience were included in the study.

4.3.4   Exclusion criteria: The study did not include the cleaners working in Jimma Medical Center. Again the cleaners who did not present during the time of data collection may be due to annual, maternity or sick leaves were excluded from the study.

4.4   Sample size determination

For the first specific objective, the study sample size was determined by employing single population proportion formula using 95% confidence level, 5% margin of error and prevalence of respiratory symptoms (p) from previous study which is 40.7% (41).

$$n = \frac{(Z\alpha/2)^2 * p(1-p)}{d^2}$$

Where

n = sample size to be determined

Zα/2 = the standard normal deviate corresponding to the confidence level of 95%, i.e., 1.96

p = proportion of respiratory symptoms

d = margin of error, i.e 0.05

$$n = \frac{1.96^2 * 0.407 * (1-0.407)}{0.05^2} = \underline{371}$$

For the second objective, the sample size was calculated by using Epi info sample size calculator for comparative cross-sectional studies by assuming two-sided confidence level of 95% and a Power of 80.

Table 1 Sample size determination for associated factors for respiratory symptom

No.	Variables	Proportion of population with respiratory symptoms	Odds Ratio	Sample size obtained
1	Utilization of dust mask on job (41)	28	1.84	406
2	Past illness (41)	27	5.00	62
3	Sleeping problem (41)	36	0.35	178
4	Training OHS (42)	51	0.18	66
5	Educational level (42)	31	0.15	92

The sample size calculated for utilization of facemask on job was larger than the sample size calculated for other associated factors and again larger than the sample size calculated for the first objective. Therefore, the sample size was taken as 406. Then by adding 5% for non-respondents, final sample size was found to be 426.

4.5 Sampling technique and procedure

The name list of the cleaners written on excel sheet was gained from the Central Human Resource office of JU. Then, simple random sampling technique was used and 426 study subjects were selected by using computer based random number generator.

4.6 Study variables

    4.6.1 Dependent variable:

- ✓ Respiratory symptom

    4.6.2 Independent variables:

- ✓ **Socio-demographic factors**: age, sex, educational level, marital status

- ✓ **Work environment factors:** working campus, working department, service year, use of facemask, training on occupational health and safety (OHS)

- ✓ **Behavioral and other factors:** smoking habit, sleeping problem, past illness, energy used at home

4.7 Operational definitions and definition of terms

Respiratory symptom: Respondent's report of the development of one or more of the symptom/s of cough, phlegm, breathlessness, wheezing, chest illness which last/s at least three months in one year (43).

Cough: Respondent's report of experience of coughs as much as 4-6 times per day occurring for most days of the week (≥4 days) for at least three months in one year.

Phlegm: Respondent's report of sputum expectoration as much as twice a day for most days of the week (≥ 4 days) for at least three months in one year.

Wheezing: Respondent's report of a condition of causing a wheezy or whistling sound during inspiration/expiration at least three months in a year; occasionally, apart from that caused by a cold or acute upper respiratory infection in the chest at any time in the last 12months.

Chest illness: Respondent's report of chest pain that kept off work with phlegm occurring any time during the work shift and on any work day which last/s at least three months in one year.

Breathlessness: It is divided into 5 grades with the following definitions:
- ✓ Grade 0: No breathlessness except with strenuous exercise.
- ✓ Grade 1: Breathlessness when hurrying on the level ground or walking up a slight hill at least three months in a year.

- ✓ Grade 2: Walking slower than people of the same age on the level because of breathlessness or need to stop for breath when walking at own pace or level at least three months in a year.
- ✓ Grade 3: Stopping for breath after walking about a certain distance or a few minutes on the level ground at least three months in a year.
- ✓ Grade 4: Too breathless to leave the house or breathless when dressing or undressing at least three months in a year. So, that the study reported dyspnea grade 2 or more as outcome as of American thoracic society (1976) (44).

Smoking habit: Classified in to three:
- ✓ Never smokers: workers who used no cigarette.
- ✓ Current smokers: workers who smoked at the time of the study or had stopped smoking less than one year before.
- ✓ Ex-smokers: workers who had quit at least 1 year before the survey.

Sleeping problem: If the worker have trouble getting to sleep or sleeping through the night; walk up too early or have hard time waking up at all then classified as sleeping problem.

Waste disposal method: is a means by which solid, liquid and gaseous wastes are disposed as end point in waste management.
- ✓ Incineration is a disposal method in which solid organic wastes are subjected to combustion so as to convert them into residue and gaseous products.
- ✓ Burying is disposal of waste underground.
- ✓ Recycle is the process of converting waste materials into new materials and objects.
- ✓ Reuse is using waste component again for the same purpose for which they were conceived.
- ✓ Municipal disposal is disposing waste along with other municipal wastes for further treatment and/or disposal.

Cleaner: is a person employed to perform cleaning of floors, walls, doors and roofs of the buildings; cleaning of materials and equipment in the buildings; collect, handle, store and dispose waste and dust particles in institution.
- ✓ **General Cleaners**- Cleaners who are responsible for cleaning of classroom and offices
- ✓ **Dormitory Cleaners**- Cleaners who are responsible for cleaning of student dormitories
- ✓ **Cafeteria Cleaners-** Cleaners who are responsible for cleaning of student cafeteria

4.8 Data collection tool and procedures

Data was collected by interviewer administered structured questionnaire. The questionnaire was adopted from British Medical Research Council's (BMRC) questionnaire on respiratory symptoms of 1986 (43) with required modification based on research objectives. The questionnaire was prepared in English and translated to both Amharic and Afan Oromo and translated back to English to ensure consistency. The questionnaire contains five major parts. Part one deals with socio-demographic characteristics of the respondents. Part two asks the questions related to working environments of the study participants. Part three contains the questions related to behavioral conditions. Part four contains other related factors. The last part contains questions which ask the presence of respiratory symptom. Pretest was conducted on 21 (5% of sample size) cleaners in Jimma Teachers Teaching College prior to actual data collection for validation of data collection tool. Four clinical nurses who can communicate with Amharic and Afan Oromo were recruited and collect the data.

4.9 Data quality control

To maintain the quality of the data, structured and pretested questionnaire was used to collect information. One day orientation was given to data collectors on the data collection procedure and content of the questionnaire. One supervisor who can communicate with Amharic and Afan Oromo and had bachelor degree in Nursing and above one year supervision experience was recruited to follow the data collection process. The collected information was checked on daily basis by the supervisor. Overall supervision was carried out by the principal investigator .The collected data was checked for completeness and consistency every day at the time of data collection. Any mistake or omission was corrected as on the same day of data collection

4.10 Data processing and analysis

Filled questionnaires were checked for completeness and any incomplete information was excluded from the entry. The variables were coded and entered into EpiData version 3.1 computer software packages. Cleaning was done to avoid missing values, outliers and other inconsistencies before analysis. Cleaned data was exported to SPSS version 20.0 software package for analysis. Descriptive statics such as frequencies, percentages, mean and medians were used to describe the variables of the study. Bivariate regression analysis was computed to identify candidate variable for multiple logistic regression.

Variables that had association ($p < 0.25$) with the dependent variable in bivariate analysis were used as candidate variable. Multicollinearity among the candidate variables was checked. All candidate variables showed variance inflation factor of less than 2. The variables were entered in to the model by using Enter method. Finally the variables which have significant association were identified on the basis of Adjusted Odds Ratio (AOR) with 95 % CI and $p < 0.05$ by fitting multiple logistic regressions. The fitness of the model was checked by using Hosmer and Lemeshow test.

4.11 Ethical consideration

Ethical clearance was obtained from Institutional Review Board of Institute of Health, JU. The study objective was communicated in words to each respondent and verbal consent was secured. Inconveniences for refusals were respected. Confidentiality was granted for the information collected from each study participants and privacy during interview was ensured.

4. 12 Plan for dissemination of result

The final report of the study is submitted and presented to department of Epidemiology, JU and communicated to all concerned bodies by different means. The concerned bodies may be JU, Ministry of Health, different public and private higher education institutions. Some means of dissemination are supply hard copies, present on different meetings and workshops, and publish on international peer reviewed journal.

5. Result

5.1 Socio-demographic Characteristics

The response rate of the study was 93%. Out of the total 397 respondents 391 (98.5%) were females and 241(60.7%) were married. The median age was 28 years ranging from 18 to 60 years. All the respondents attended at least elementary education. Mean monthly income of participants was 1262 Birr ranging from 390 to 2586 Birr (Table 2).

Table 2 Socio- demographic characteristics of Cleaners in JU (n=397), April 2018.

Variables	Number	Percent
Sex		
Female	391	98.5
Male	6	1.5
Age		
18-24	91	23.0
25-34	179	45.1
35-44	101	25.4
≥ 45	26	6.5
Educational level		
Primary (Grade1-8)	159	40.1
Secondary (Grade 9-12)	193	48.6
Above Grade 12	45	11.3
Marital status		
Married	241	60.7
Single	110	27.7
Divorced	14	3.5
Separated	19	4.8
Widowed	13	3.3
Monthly salary (in Birr)		
≤ 999	25	6.3
1000-1999	351	88.4

5.2 Work environment characteristics

The study indicated that 373 (94%) of respondents were employed as permanent worker and 234 (58.9%) were working in main campus (Table 3). The median work experience of participants was 5 years ranging from 1 to 23 years. According to respondent's report and observed during data collection, 297 (74.8%) used glove, 391 (98.5) used uniform on duty. Only 62 (15.6%) respondents used facemask when collecting dust particles out of which 61 (98.5%) used their own cloth as facemask. According to the study, 320 (80.6%) respondents did not use facemask due to lack of supply. Only 60 (15.1%) respondents trained on OHS out of which 59 (98.3%) were trained on job and 57 (95%) trainees were trained by the employer, JU. The study indicated that 392 (98.7%) respondents followed established safety rule where 106 (26.7%) and 283 (71.3%) respondents reported that there was positive and negative incentive to follow safety procedures, respectively. Recognition (90 (85%)) and documentation (205 (74.4%) were the main positive and negative incentives, respectively. They reported that 327 (82.4%) got occupational health and safety supervision, where 326 (82.1%) of them got the supervision from their immediate supervisors. Paper, Plastic and Dust particles were the major waste components in the working areas of the respondents (Figure 2). Regarding the waste management, 311 (78.3%) respondents disposed the waste in central disposal area in their respective campus out of which 255 (64.2%) of them used burning as final waste management method whereas 86 (21.7%) respondents stored the wastes for municipal disposal.

Table 3 Reported work environment characteristics of Cleaners in JU (n=397), April 2018.

Variables	Number	Percent
Type of employment		
Permanent	373	94.0
Temporary	24	6.0
Working campus		
Main	234	59.0
JIT	127	32.0
CAVM	36	9.0
Working department		
Dormitory	136	34.3
Cafeteria	135	34.0
General	126	31.7
Work experience in year		
1-5	214	53.9
> 5	183	46.1
Use of facemask		
Yes	62	15.6
No	335	84.4
OHS training		
Yes	60	15.1
No	337	84.9
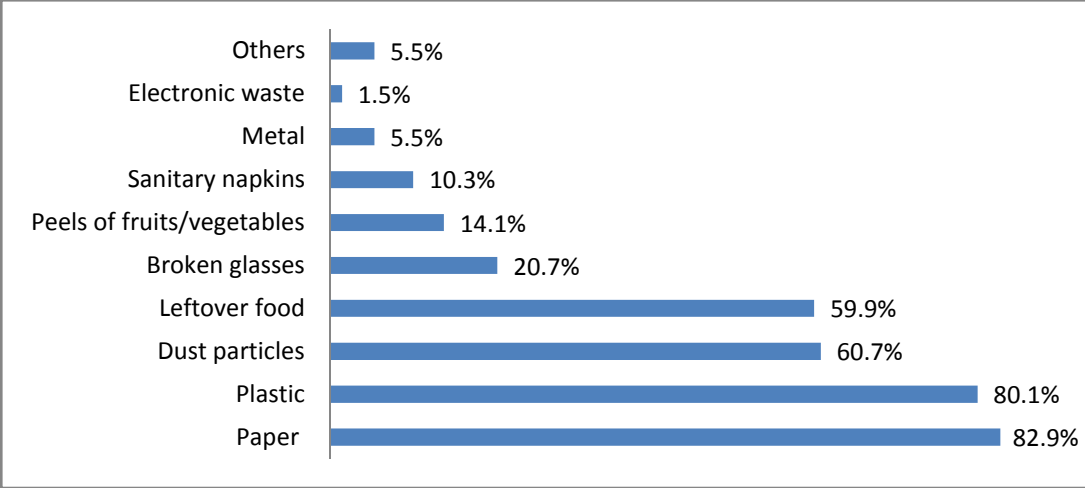
Figure 2 Major components of waste as of the response of cleaners in JU (n=397), April 2018

5.3 Behavioral and other Characteristics

The study indicated that 381 (96%) respondents had no smoking history, whereas 16 (4%) quitted smoking before one year of data collection (Table 4). According to respondent's report 42 (10.6%) of them had sleeping problem out of which 19 (47.5%) had developed the problem after they employed as cleaner. The study revealed that 267 (67.3%) respondents used biomass as primary energy source in their home, 275 (69.3%) were satisfied on their current work position and 113 (28.5%) had history of one or more respiratory illnesses (Table 4). Asthma was the most prevalent of all the past illnesses reported by the respondents (Figure 3).
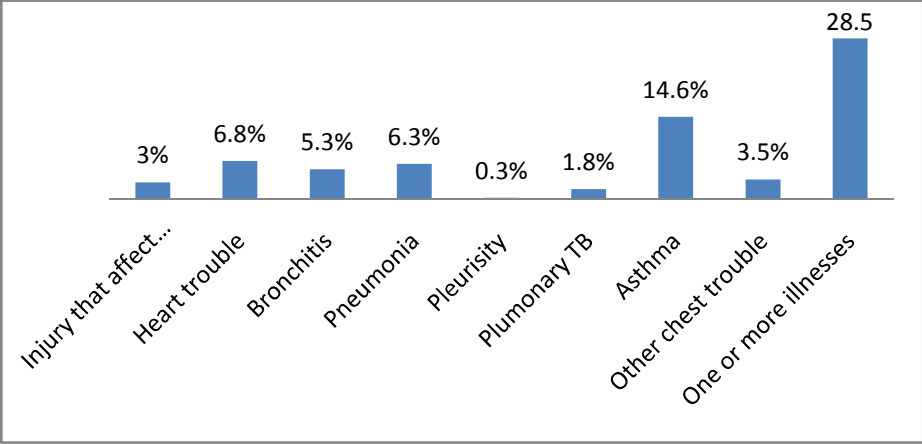
Figure 3 History of respiratory illness among Cleaners in JU (n=397), April 2018

Table 4 Behavioral and other characteristics of Cleaners in JU (n=397), April 2018.

Variables	Number	Percent
Past respiratory illness		
Yes	113	28.5
No	284	71.5
Smoking habit		
Ex-smoker	16	4.0
Never	381	96.0
Sleeping problem		
Yes	42	10.6
No	355	89.4
Source of energy at home		
Electric	109	27.5
Fuel gas	21	6.3
Biomass	267	67.3
Job satisfaction		
Yes	255	69.3
No	122	30.7

5.4 Prevalence of Respiratory Symptom

The respondents were assessed for the presence of one or more of respiratory symptoms: cough and/or phlegm and/or wheezing and/or chest illnesses and/or shortness of breath. The study indicates the prevalence of respiratory symptom was 36.3% (95% CI: (32%, 41%) and the prevalence of wheezing and breathlessness were higher than others (Figure 4).
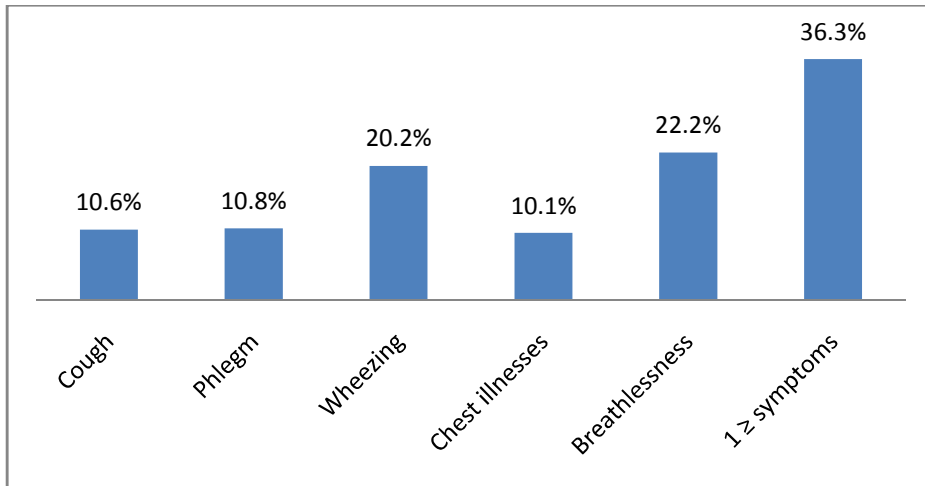
Figure 4 Distribution of respiratory symptom among Cleaners in JU (n=397), April 2018
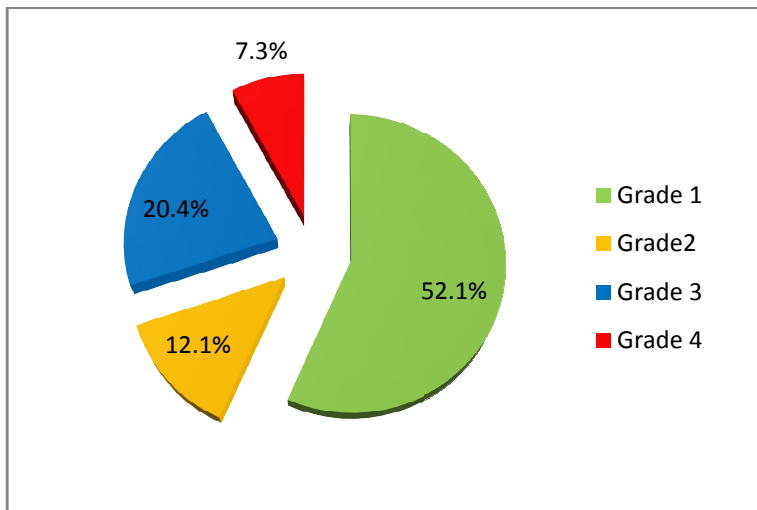
Figure 5 Level of breathlessness among Cleaners in JU (n=397), April 2018

5.5 Factors Associated with Respiratory Symptom

5.5.1 Bivariate Analysis

Bivariate logistic regression model was fitted to select candidate variables for multivariate logistic regression. Based on the bivariate analysis working department, using dust mask, OHS training, sleeping problem and past illnesses showed significant association with respiratory symptom (Table 5).

Table 5 Bivariate analyses of respiratory symptom and associated factors among Cleaners in JU (n=397), April 2018

Variable	Respiratory Symptom		COR (95% CI)	p -Value
Age				
18-24	32	59	1.00	
25-34	61	118	0.95 (0.56, 1.62)	0.859
35-44	39	62	1.16 (0.64, 2.08)	0.621
≥ 45	12	14	1.58 (0.65, 3.82)	0.310
Educational level				
Primary (Grade1-8)	51	108	1.00	
Secondary (Grade 9-12)	75	118	1.35 (0.87, 2.09)	0.187
Above Grade 12	18	27	1.41 (0.71, 2.79)	0.322
Marital status				
Married	81	160	1.00	
Single	46	64	1.42 (0.89, 2.26)	0.138
Divorced	4	10	0.79 (0.24, 2.60)	0.698
Widowed	4	9	0.89 (0.26, 2.94)	0.833
Separated	9	10	1.78 (0.69, 4.55)	0.230
Campus				
Main	83	151	1.00	
JIT	52	75	1.26 (0.81, 1.97)	0.305
CAVM	9	27	0.61 (0.27, 1.35)	1.350
Department				
Dormitory	40	96	1.00	
Cafeteria	50	85	1.41 (0.85, 2.35)	0.183
General	54	72	1. 80 (1.08, 2.99)	0.024[*]
Work experience				
1-5yrs	76	138	1.00	
> 5yrs	68	115	1.07 (0.71, 1.61)	0.734
Use of facemask on duty				

Yes	13	49	1.00	
No	131	204	2.42 (1.26, 4.63)	0.008[*]
OHS training				
Yes	12	48	1.00	
No	132	205	2.58 (1.32, 5.03)	0.006[*]
Sleeping problem				
Yes	24	18	2.61 (1.36, 4.99)	0.004[*]
No	120	235	1.00	
Past respiratory illnesses				
Yes	61	52	2.84 (1.81, 4.45)	0.000[*]
No	83	201	1.00	
Type of energy used at home				
Electric	38	71	1	
Fuel gas	12	9	2.49 (0.96, 6.44)	0.060
Biomass	94	173	1.02 (0.64, 1.62)	0.950

[*]$p < 0.05$

5.5.2 Multi-variable Analysis

Variables that showed significant association with respiratory symptom at $p < 0.25$ significance level in bivariate regression analysis were used as candidate variable to compute multivariate analysis. Based on the multivariate analysis working department, use of dust mask, OHS training, sleeping problem, past illness and energy used at home were remained significant at $p < 0.05$ after adjusting for other factors (Table 6).

Table 6 Multi-variable analysis of respiratory symptom and associated factors among Cleaners in JU (n=397), April 2018

Variable	Respiratory Symptom		COR (95%, CI)	AOR (95%, CI)
Educational level	**Yes**	**No**		
Elementary	51	108	1.00	1.00
Secondary	75	118	1.35 (0.87, 2.09)	1.29 (0.79, 2.14)
Above	18	27	1.41 (0.71, 2.79)	1.30 (0.58, 2.96)
Marital status				
Married	81	160	1.00	1.00
Single	46	64	1.42 (0.89, 2.26)	1.30 (0.75, 2.23)
Divorced	4	10	0.79 (0.24, 2.60)	0.60 (0.16, 2.22)
Widowed	4	9	0.88 (0.26, 2.94)	1.05 (0.26, 4.16)
Separated	9	10	1.78 (0.69, 4.55)	2.04 (0.74, 5.64)
Department				
Dormitory	40	96	1.00	1.00
Cafeteria	50	85	1.41 (0.85, 2.35)	1.45 (0.83, 2.56)
General	54	72	1. 80 (1.08, 2.99)	1.75 (1.02, 3.04)[*]
Use of Dust mask on duty				
Yes	13	49	1.00	1.00
No	131	204	2.42 (1.26, 4.63)	2.34 (1.17, 4.69)[*]
OHS training				
Yes	12	48	1.00	1.00
No	132	205	2.58 (1.32, 5.03)	2.93 (1.41, 6.08)[**]
Sleeping problem				
Yes	24	18	2.61 (1.36, 4.99)	2.17 (1.05, 4.50)[*]
No	120	235	1.00	1.00
Past respiratory illnesses				
Yes	61	52	2.84 (1.81, 4.45)	2.63 (1.61, 4.32)[***]

No	83	201	1.00	1.00
Type of energy used				
at home				
Electric	38	71	1.00	1.00
Fuel gas	12	9	2.49 (0.96, 6.44)	4.12 (1.47, 11.52)**
Biomass	94	173	1.01 (0.64, 1.62)	0.98 (0.59, 1.62)

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

6. Discussion

This study showed that the prevalence of respiratory symptom among cleaners in JU was 36.3%, which is lower than the report from Yeka sub city, Addis Ababa municipal waste collectors (30). The prevalence is found higher than that of study from Egypt, Mansoura among waste collectors (23) and Thailand among wood furniture manufacturers (18). This might be due to the type of industries and the advancement of safety practices used. More specifically, the prevalence of cough was 10.6% which is less than 63% in refuse handlers in Tanzania (29), 44.7% in domestic waste collectors in Palestine (22), 13.4% in coble stone workers in Jimma (20), 35.7 % in Yeka sub city waste collectors (30). The prevalence of Phlegm was 10.8%, which is less than 44% in Yeka sub city waste collectors (30). The prevalence of wheezing was 20.2%, which is less than 21.2% in Yeka sub city waste collectors (30). The prevalence was higher than that of cobble stone workers in Jimma town which is 6.2% (20). The prevalence of chest illness was 10.1%. It was higher than that of Yeka sub city waste collectors which is 7.3% (30). In this study the breathlessness higher or above grade 2 were considered. Based on this the prevalence of breathlessness was 22.2% which is less than 25% in domestic waste collectors in Palestine (22) and 29.2% in Yeka sub city waste collectors (30). The prevalence was higher than that of waste collectors in Egypt Mansoura which is 21% (23) and cobble stone workers in Jimma town which is 7% (20). The differences in respiratory symptoms might be due to different environmental study setups, variation in type and nature of wastes with different level of respiratory hazards and different level of awareness and access towards use of effective respiratory equipment.

Workers cleaning classroom and office had 1.75 times greater odds of respiratory health symptom than dormitory cleaners. This might be due to the difference in the component and amount of waste the cleaners faced. Cleaners who did not use dust mask on duty had about 2 times greater odds of respiratory symptom than dust mask users. This is consistent with the study conducted in Yeka subcity (30). About15.9% of the respondents uses their cloth as dust mask on duty. Consistent with this study, workers in Dejen cement factory use a piece of cloth as a respirator (22). In terms of the percentage of usage it is a little bit better than that of previous study on waste collectors in Addis Ababa (30). This indicates that the administration did not recognize the importance of PPE to reduce health risk. The cleaners who had not trained had

about 3 times greater odds of respiratory symptom than who trained on occupational health and safety. This is consistent with the study in North Shoa which revealed that having trained in occupational health and safety was protective for respiratory symptoms (21). Cleaners with sleeping problem had about 2 times greater odds of respiratory symptom than who had no sleeping problem. Consistent with this result, the study in Addis Ababa revealed that waste collectors with sleeping problem had about 4 higher respiratory health symptoms than those with no sleeping problem (30). This might be due to an interaction between sleep and respiratory symptoms resulting in permissive effect of sleep on respiratory failure. Similarly, there might be a negative effect of respiratory disease on sleep quality and continuity.

Cleaners with history of respiratory illnesses had about 2.5 times greater odds of respiratory symptom than cleaners of no respiratory illness history. The same thing was stated on Addis Ababa's study that states waste collectors with past illness had 4.8 times greater odds of respiratory health symptoms than solid waste collectors with non-past illness (30). The reason might be chronic past illness like bronchitis and asthma are well known cause of respiratory health symptoms. Cleaners who used fuel gases as energy source at home had about 4 times greater odds of respiratory symptom than that use electricity. This is inconsistent with the study in Dejen (22) and North Shoa (21) where type of energy source was insignificantly associated with respiratory symptom.

Strength of study

➢ The study used standardized tool to assess the respiratory symptom.

Limitations of the study

➢ The healthy workers effect affect the study since waste collecting is highly demanding physical activity, workers with respiratory problems will tend to leave the job and shift to other job where physical activity demand is lower. Therefore, the sick ones have already left the job or shifted to other job before the study and many healthy workers who were available during the data collection were enrolled in the study, which may contribute to underestimate the effect of interest of study.

➢ As it is self-reported of health problem, there might be under estimation of the magnitude of the problem due to recall bias.

➢ Shortage of literature on specific study population to compare the results.

7. Conclusion and Recommendation

Conclusion

This study found that respiratory symptom was prevalent among cleaners in JU. The working department, use of dust mask, OHS training, sleeping problem, history of respiratory illness and energy used at home was major contributing factors for respiratory symptom to occur. There was poor awareness on occupational health and safety among cleaners. Also there was lack of attention on the employer side to the cleaners' health and safety. This was manifested through non provision of facemask and training for cleaners and no work circulation across the departments. Working in student dormitory than class room and office; use of facemask; having trained on occupational safety, being free from sleeping problem and past respiratory illness and use of electric as energy source than using fuel gas were protective factors for respiratory symptom.

Recommendations

- ✓ Dust mask and occupational health and safety training should be provided by the University.
- ✓ There should be work circulation across the departments.
- ✓ Individuals who had history of past illness should get health information during enrollment.
- ✓ Risk assessment has to be done periodically to identify behavioral problems because sleeping problem was observed as the predictor.
- ✓ Use of fuel gases such as kerosene should be avoided since fuel gas was observed as the most predictor for respiratory symptom.
- ✓ Further researches are recommended to study the cause effect relationship and the role of chemical detergents on respiratory symptom.

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Annex

Questionnaire (English Version)

I.   Participant's Information Sheet

<u>Title of the research project:</u> Prevalence of respiratory symptom and associated factors among Cleaners in Jimma University, Southwest Ethiopia.

<u>Name of Principal Investigator</u>: Gemechu Beyene

<u>Name of the Organization:</u> Jimma University, Institute of Health, Faculty of Public Health, Department of Epidemiology.

<u>Introduction:</u> This information sheet and consent form is prepared with the aim of explaining the research project that you are asked to join. The aim of the research project is to assess prevalence of respiratory symptoms and associated factors among Cleaners in Jimma University.

<u>Risk or Discomfort:</u> By participating in this research project you may waste 20 minutes.

<u>Incentives/Payments for Participating:</u> You will not be provided any incentives or payment to take part in this project.

<u>Confidentiality:</u> The information collected for this research project will keep confidential and information about you that will be collected by this study will be coded with a number assigned to you without your name. And it will not be revealed to anyone except the research project team.

<u>Right to Refusal or Withdraw:</u> You have the full right to refuse from participating in this research project.

<u>Person to contact</u>: For any inconvenience, problem and more information you can contact the investigator through the following address. Gemechu Beyene, Mobile: 0913122807 / e-mail: gemebeyene@gmail.com

II.   Consent Form

Hello, my name is _____; I am conducting a research on the Cleaners in Jimma University. I would like to ask you a few questions about your socio demographic characteristics, work environment, behavioral status and respiratory illness symptoms. This will help us to know the prevalence of respiratory symptom and their associated factors so as to come with possible recommendation based on your answers to our questions. Your name will not be written in this form and will never be used in connection with any information you tell us, all information you given us will be kept strictly confidential. Your participation is voluntary and you are not obligated to answer any question you do not wish to answer. This interview will take 20 minutes. Could I get your permission to continue? 1. Yes   2. No

(If yes continue the interview)

(If No skip to the next participant with reason _____

Interviewer name _____ Signature _____

Date of Interview _____

Result of interview1. Completed 2. Refusal   3. Partially completed   4.Respondent not available

Checked by _____

III. Questionnaire

Jimma University, Institute of Health, Faculty of Public Health,

Department of Epidemiology

Organization _____ Code of Respondent _____ Date of Interview _____

Part 1: Socio-demographic data

Sr. No.	Question	Possible response
01.	Age	_____ years
02.	Sex	1. Male 2. Female
03.	Education level	1. Not able to read and write 2. Able to read & write only 3. Primary (1-8th) 4. Secondary (9-12th) 5. Above 12 grade
04.	Marital status	1. Married 2. Single 3. Divorced 4. Widowed 5. Separated
05.	Number of family members	_____
06.	Monthly salary	_____ ETB

Part 2: Work Environment Factors

07.	Type of employment	1. Permanent 2. Temporary
08.	Working campus	1. Main campus 2. JIT 3. CAVM
09.	Working department	1. Dormitory 2. Cafeteria

		3. General
10.	Work experience as cleaner	_____ year (s)
11.	What kind of PPE do you use on duty? (multiple answers possible)	1. Gloves 2. Boots 3. Uniform 4. Goggles 5. Back support 6. Others (specify) _____
12.	Do you use facemask when collecting dust particles?	1. Yes 2. No (if No skip to Q.15)
13.	Why you use facemask	1. for protection 2. for fulfillment of safety procedure 3. others (specify)_____
14.	What is the source of supply?	1. Supplied by JU 2. Supplied by NGO 3. Supply by my self 4. Others (specify) _____
15.	Why you don't use facemask?	1. Lack of supply 2. Don't know its importance 3. To reduce discomfort 4. Other (specify) _____
16.	Do you ever have occupational health and safety training?	1. Yes 2. No (if No skip to Q.19)
17.	What type of training was it?	1. Pre-employment training 2. On job training
18.	Who trained you?	1. JU 2. NGO 3. Other (specify) _____
19.	Do you usually follow established safety	1. Yes (if Yes skip to Q.21)

	procedures?	2. No
20.	Why you do not follow safety procedures?	1. Not aware of procedures
		2. Not aware of risks
		3. To save time
		4. To save discomfort
		5. Do not care
		6. Other (specify) _____
21.	Are there positive incentives for you to follow safety procedures?	1. Yes
		2. No (if No skip to Q.23)
22.	What kind of incentive?	1. Recognition
		2. Rewards of money
		3. Rewards of time
		4. Others (specify) _____
23.	Are there negative incentives for you to not follow safety procedures?	1. Yes
		2. No (if No skip to Q.25)
24.	What kind of incentive?	1. Enforced disciplinary action
		2. Documentation and follow up
		3. Others (specify)_____
25.	Do you ever been supervised at work place on Occupational safety issues?	1. Yes
		2. No (if No skip to Q. 27)
26.	Who supervise you on safety issues?	1. Immediate Supervisor
		2. Higher officials of JU
		3. NGOs
		4. Other (specify) _____
27.	What type of waste generated mostly in your working department? (multiple answers possible)	1. Plastic
		2. Paper or cardboard
		3. Garden waste
		4. Metal
		5. Glass (pottery, ceramic)
		6. Dusts/ash/soil particles
		7. Electronic wastes

		8. Food scrap/garbage
		9. Disposable diapers/napkins
		10. Others (specify)_____
28.	Where do you finally manage the wastes?	1. Municipally (if municipally skip to Q.30)
		2. Centrally in the campus
		3. At department level
		4. other (specify)_____
29.	How waste is managed finally?	1. Burning
		2. Burying
		3. Recycling
		4. Reuse
		5. Other (specify) _____

Part 3: Behavioral factors

30.	What is your smoking habit?	1. Active smoker
		2. Ex- smoker
		3. Never smoker
31.	Do you have any sleeping problem?	1. Yes
		2. No (if No skip to Q.33)
32.	When do you develop this problem?	1. Before start of this work
		2. After start of this work

Part 4: Other Factors

	Have you ever had, or been told that you have had:	
33.	An injury or operation affecting your chest	1. Yes 2. No
34.	Heart trouble	1. Yes 2. No
35.	Bronchitis	1. Yes 2. No
36.	Pneumonia	1. Yes 2. No
37.	Pleurisy	1. Yes 2. No
38.	Pulmonary tuberculosis	1. Yes 2. No

39.	Asthma	1. Yes 2. No
40.	Other chest trouble	1. Yes 2. No
41.	What type of energy source used in your home?	1. Electricity 2. Fuel gases 3. Biomass
42.	Do you ever satisfied with your job?	1. Yes (If Yes Skip to Q.44) 2. No
43.	Why you do not satisfy with your job? (Mention only one main reason)	(Specify) _____

Part 5: Respiratory symptom

	Cough	
44	Do you usually cough first thing in the morning?	1. Yes (if Yes ask Q.46) 2. No
45	Do you usually cough during the day or at night?	1. Yes (if yes ask Q.46) 2. No
46	Do you cough like this for as much as three months in a year?	1. Yes 2. No
	Phlegm	
47.	Do you usually bring up any phlegm from your chest first thing in the morning?	1. Yes (if Yes ask Q.49) 2. No
48.	Do you usually bring up any phlegm from your chest during the day or at night?	1. Yes (if Yes ask Q. 49) 2. No
49.	Do you bring up phlegm like this on most days for as much as three months in a year?	1. Yes 2. No
	Periods of Cough and Phlegm	
50.	In the past three years have you had a period of (increased) cough and phlegm lasting for three weeks or more?	1. Yes 2. No (if No skip to Q.52)
51.	Have you had more than one such period?	1. Yes 2. No

	Wheezing	
52.	Have you had attacks of wheezing or whistling in your chest at any time for as much as three months in a year?	1. Yes 2. No
53.	Have you ever had attacks of shortness of breath with wheezing?	1. Yes 2. No (if No skip to Q.55)
54.	Is/was your breathing absolutely normal between attacks?	1. Yes 2. No
55.	Have you at any time in the last 12 months been woken at night by an attack of shortness of breath?	1. Yes 2. No
	Chest illnesses	
56.	During the past three years have you had any chest illness which has kept you from your usual activities for as much as a week?	1. Yes 2. No (if No skip to Q. 59)
57.	Did you bring up more phlegm than usual in any of these illnesses?	1. Yes 2. No
58.	Have you had more than one illness like this in the past three years?	1. Yes 2. No
Breathlessness		
59.	Do you get breathless with strenuous exercise only	1. Yes 2. No
60.	Do you get short of breath when hurrying on the level or walking up a slight hill?	1. Yes 2. No
61.	Do you walk slower than people of the same age on the level because of breathlessness or have to stop for breath when walking at your own pace on the level?	1. Yes 2. No
62.	Do you stop for breath after walking about 100 yards or after a few minutes on the level?	1. Yes 2. No
63.	Do you get too breathless to leave the house or when dressing?	1. Yes 2. No

Thank you for your participation.

Questionnaire (Amharic Version)

ጅማ ዩኒቨርሲቲ፣ የጤና ኢንስቲትዮት፣ የህብረተሰብ ጤና ፋካልቲ፣ የኢፒዲሞሎጂ ትምህርት ክፍል

መጠይቁን መሙላት ከመጀመሩ በፊት ለተጠያቂዎች የሚሰጥ መረጃ ቅጽ

ሰላም ጤና ይስጥልን እኔ ----------------- እባላለው፡፡ የመጣሁት ከጅማ ዩኒቨርሲቲ ጤና ኢንስቲትዮት ሲሆን በዩኒቨርሲቲዉ ዉስጥ በዳተ ሥራ ላይ በተሰማሩ ስዎች ላይ ጥናት አየሰራሁ እገኛለው፡፡ በመሆኑም ይህ የእርስዎን ማህበራዊና ኢኮኖሚያዊ ገጽታ፣ ራስን የመከላከያ መሳሪያ አቅርቦትና አጠቃቀም ሁኔታ ፣ልማዳዊ ባህሪዎትና አተነፋፈስ ችግር ምልክቶችን ያካተተ ጥያቄዎችን ይዟል፡፡

የጥናቱርእስ፡- በጅማ ዩንቨርሲቲ በጽዳት ስራ ላይ በተሰማሩ ሰራተኞች ላይ የአተነፋፈስ ጤና ችግር ምልክቶችንና ተያያዥ መንስኤዎቻቸዉን መዳሰስ

የጥናቱ ዓላማ፡- በጅማ ዩንቨርሲቲ በጽዳት ስራ ላይ በተሰማሩ ሰራተኞች ላይ የአተነፋፈስ ጤና ችግር ምልከቶችን ና ተያያዥ መንስኤዎቻቸዉን መዳሰስ

ምስጥራዊነት፡- ስምዎት በቅጹ ላይ አይሞላም እንዲሁም የሚሰጡት መረጃ ሚስጥራዊና ለማንም ተላልፎ አይሰጥም፡፡

ጥቅም: ይህ ጥናት በቀጥታ ለተሳታፊዎች የሚሰጠዉ ጥቅም የለም ነገር ግን እርስዎ የሚሰጡት ምላሽ ለዚህ ጥናት ዉስጥ የአተነፋፈስ ችግር ምልከቶችንና ተያያዥ ምንጫቸው ለመለየት ከፍተኛ ጠቀሜታ አለዉ፡፡

ጉዳት፡-እዝህጥናትላይበመሳተፍምንም አይነትጉዳትአይደርስብዎትም፡፡

የፍቃደኝነት ማረጋጫ ቅፅ

ይህ ቃለ መጠይቅ በፍቃደኝነትዎ ላይ የተመሰረተ ሲሆን ያልተመቸዎት ነገር ካለ በማንኛዉ ሰዓት መጠይቁን የማቁረጥ መብት አልዎት፡፡

በአጠቃላይ መጠይቁ 40 ደቂቃ ያህል ይፈጃል፡፡ ስለዚህ ለመቀጠል ፍቃደኛነት? 1. አዎ   2. አይደለም

መልሳቸዉ አይደለም ከሆነ ምክንያት ጠቅሰው ወደሚቀጥለዉ ተሳታፊ ይለፉ

ምክንያት -----------------

የጠያቂዉ ስም-------------------------

የመጠይቁ ግምገማ 1. ተሟልቷል   2. እምቢ   3. በከፊል ተሟልቷል 4. ተጠያቂዉ አልተገኘም

ለማንኛዉም ችግር እና ግልጽ ላልሆነ ነገር ከታች ባለው አድራሻ ማነጋገር ይችላል፣ ገመቹ በየነ፣ ስልክ-09 13 12 28 07

የመላሽ መለያ ቁጥር _____   ቃለመጠይቁ የተካሄደበት ቀን_____

የድርጅቱ ስም _____   የካምፓሱ ስም _____   የስራ ክፍል _____

Part 1- Socio-demographic data

ተ. ቁጥር	ጥያቄ	መልስ
1.	ዕድሜ	_____ ዓመት
2.	ጾታ	1. ወንድ 2. ሴት
3.	የትምህርት ደረጃ	1. አንደኛ ደረጃ
		2. ሁለተኛ ደረጃ
		3. ኮሌጅ/ዩኒቨርሲቲ

4.	የጋብቻ ሁኔታ	6. ያገባ/ች
		7. ያላገባ/ች
		8. የፈታ/ች
		9. የሞተችበት/ባት
		10. የተለያዩ
5.	የቤተሰብ ብዛት	_____
6.	የወር ገቢ	_____ ብር

Part 2- Work Environment Factors

23.	የቅጥር ሁኔታ	1. ቋዋሚ
		2. ጊዜያዊ
24.	የሚሥሩበት ካምፓስ	1. ዋናዉ ጊቢ
		2. . ቴክኖሎጂካምፓስ
		3. ግብርናኮሌጅ
25.	የሚሰሩበት የሥራ ክፍል	1. የተማሪዎች መኝታ
		2. የተማሪዎች ምግብ ቤት
26.	በጽዳት ሥራተኛነት ስንት አመት ሰሩ?	_____ ዓመት
27.	በሳምንት ስንት ሰዓት ይሠራሉ?	_____ ሠዓት/ታት
28.	የሥራ አካባቢ ደህንነ ጤና ላይ ስልጠና ወስደዋል?	1. አዎን 2. አልወሰድኩም
29.	ለጥያቄ 28 መልስዎ አዎ ከሆነ ስልጠናዉ ምን አይነት ነዉ?	1. ቅድም ሥራ ሥልጠና
		2. በስራ ላይ ሥልጠና
30.	ለጥያቄ 28 መልስዎ አዎ ከሆነ ስልጠናዉን ማንነዉ የሰጠዉ?	1. ጅማ ዩኒቨርቲ
		2. መያድ
		3.ሌላ ካለ ይገለጽ
31.	በስራ ላይ የተቀመጠዉን የጥንቃቄ መመሪዎች ይከተላሉ?	1. አዎ 2. አይደለም
32.	ለጥያቄ 31 መልስዎ አይደለም ከሆነ ለምን?	1. መመሪያዉን አላዉቅም
		2. ጉዳቱን አላዉቅም
		3. ጊዜ ለመቆጠብ
		4. ምቾቴን ለመጠበቅ
		5. ግድ ስለ ሌለኝ
		6. ሌላ ካለ ይገለጽ_____
33.	በስራ ደህንነትና ጤና ጉዳዮች ላይ ከትትልና ድጋፍ ተደርጎሎት ያዉቃል?	1. አዎን 2. አያዉቅም
34.	ለጥያቄ 33 መልስዎ አዎ ከሆነ ድጋፉን ማን ነዉ የሰጠዉ?	5. የቅርብ የሥራ ሃላፊ

		6. የዩኒቨርሲቲዉ የበላይ ሃላፊዎች
		7. መያድ
		8. የዉጭ አካላት
		9. ሌላ ካለ ይገለጽ_____
35.	የጥንቃቄ መመሪያዎችን ባለማክበር የሚመጣ ቅጣት አለ?	1. አዎ 2. የለም
36.	ለጥያቄ 35 መልሰዎ አዎ ከሆነ ቅጣቱ ምንድነዉ?	1. ዲሲፕሊን ቅጣት
		2. መረጃ መያዝና ክትትል
		3. ሌላ ካለ ይገለጽ_____
37.	የጥንቃቄ መመሪያዎችን በማክበር የሚሰጥ ሽልማት አለ?	1. አዎ 2. የለም
38.	ለጥያቄ 37 መልሰዎ አዎ ከሆነ ሽልማቱ ምንድነዉ?	1. እዉቅና
		2. የገንዘብ ሽልማት
		3. የጊዜ ሽልማት/እረፍት
		4. ሌላ ካለ ይገለጽ_____
39.	በሚሠሩበት የሥራ ክፍል በአብዛኛዉ ምን አይነት ቆሻሻ ይመረታል?	1. ፕላስቲክ
		2. ወረቀት/ካርቶን
		3. የጉዋሮ ቆሻሻ
		4. ብረታብረት
		5. ብርጭቆ/ሴራሚክ/ሽክላ/
		6. አቡዋራ/ዲቃቅነገሮች/አመድ
		7. ኤሌክትሪክ መሳሪያዎች
		8. የምግብ ትራፊ
		9. የሴት/ህጻናት ንጽህና መጠበቂያ
40.	በመጨረሻም ቆሻሻዉን የት ያስወግዳሉ?	1. ከከተማዉ ቆሻሻ ጋር በጋራ
		2. ካምፓስ ዉስጥ አንድላይ
		3. በየክፍሉ
41.	ለጥያቄ 40 መልሰዎ 2 ወይም 3 ከሆነ እንዴት?	1. በማቃጠል
		2. በመቅበር
		3. ለእንዱስትሪ እንደግባት በመጠቀም
		4. መልሶ በመጠቀም
		5. ሌላ ካለ ይገለጽ_____
42.	ከቤታችሁ ዉስጥ ምን ዓይነት የኃይል ምነጭ ይጠቀማሉ	1. ኤሌክትሪክ
		2. ጋዝ/ኬሮሲን
		3. እንጨት/ፍሕም
43.	በሚሠሩት ሥራ ይረካሉ?	1l አዎ 2. የለም

| 44. | ለጥያቄ 43 መልሰዎ የለም ከሆነ ለምን? | (ጥቀስ/ሺ)_____ |

Part-4 Behavioral factors

7.	ሲጋራ ያጨሳሉ?	1. አሁን አጨሳለሁ
		2. አጨስ ነበር
		3. አጭሼ አላዉቅም
8.	የእንቅልፍ ማጣት ችግር አለብዎ?	1. አዎ 2. የለም
9.	ለ ጥያቄ ቁ.8 መልሰዎ አዎ ከሆነ መች ነው የጀመሮት?	1. ከዚህ ስራ በፊት
		2. ከዚህ ስራ በኋላ
10.	የፌት መሸፈኛ ያደርጋሉ?	1. አዎ 2. የለም
11.	ለ ጥያቄ ቁ.10 መልሰዎ አዎ ከሆነ መች መች ነዉ የሚጠቀሙት	1. ሁልጊዜ ስራ ላይ
		2. አንዳንድ ጊዜ ስራ ላይ
		3. በጣም ጥቂት ጊዜ
12	ለ ጥያቄ ቁ.10 መልሰዎ አዎ ከሆነ አቅርቦቱ ከማን ነዉ.	1. ከጅማ ዩኒቨርሲቲ
		2. ከመያድ
		3. ከራሴ
		4. ሌላ ካለ ይጠቀስ
13.	ለ ጥያቄ ቁ.10 መልሰዎ የለም ከሆነ ወይም ለጥያቄ ቁ.11 መልሰዎ 3 ከሆነ፣ ለምን? አይጠቀሙም	1. በአቅርቦት እጥረት
		2. ጠቃሚ መሆኑን ስለማላዉቅ
		3. ምቾት ስለሚነሳኝ
		4. ሌላ ካለ ይጠቀስ
14.	ሌላ የአደጋ መከላከያ መሳሪያ ምን ይጠቀማሉ	1. ጉዋንት
		2. ቦቲ ጫማ
		3. የደንብ ልብስ/ቱታ
		4. የዓይን መነጽር
		5. የጆሮ ድጋፍ
		6. ሌላ ካለ ይጠቀስ

	ከዚህ በፊት	
15.	ከደረትዎ ጋር የተያያዘ ቀዶ ጥገና ወይም ህክና ተደርጎዋሎት ያዉቃል?	1. አዎ 2. አይደለም
16.	የልብ ችግር ነበረብዎት በህክም የተረጋገጠ ወይም የሚሰማዎት?	1. አዎ 2. አይደለም
17.	የጉሮሮ ቁስለት ነበረዎት?	1. አዎ 2. አይደለም
18.	የሳንባ ምች ነበረዎት?	1. አዎ 2. አይደለም

19.	የሳንባአቃፊሀመምነበረዎት	1. አዎ 2. አይደለም
20.	የሳንባነቀርሳነበረዎት?	1. አዎ 2. አይደለም
21.	አስምነበረዎት?	1. አዎ 2. አይደለም
22.	ሌሎችየደረትአካባቢህመምቸግሮችነበረዎት?	1. አዎ 2. አይደለም

Part 5- Respiratory symptoms

45.	ብዙ ጊዜ ጠዋት ከመኝታዎ ሲነሱ ያስልዎታል?	1. አዎ 2. አይደለም
46.	ብዙጊዜ ቀን ወይም ማታ ላይ ያስልዎታል?	1. አዎን 2. አይደለም
47.	ለጥያቄ 45 እና 46 መልስዎ አዎ ከሆነ በዓመት ለ3 ወር ያክል ጊዜ ያስልዎታል?	1. አዎን 2. አይደለም
48.	ብዙጊዜ ከመኝታዎ ሲነሱ ከደረትዎ ላይ አክታ ነገር ያስተፋዎታል?	1. አዎ 2. አይደለም
49.	ብዙጊዜ አክታ መሰል ነገር ከደረትዎት ላይ ቀን ወይም ማታ ላይ ያስተፋዎታል?	1. አዎ 2. አይደለም
50.	ለጥያቄ 50 እና 51 መልስዎ አዎ ከሆነ በዓመት ለ3 ወር ያክል ጊዜ ያስተፋዎታል? 1	1. አዎ 2. አይደለም
51.	ባለፉት 3 ዓመታት ሳል ወይም አክታ ቢያንስ ለሶስት ሳምንት እና ከዛ በላይ አየጨመረ የሄደበት ወቅት አጋጥሞት ነበር?	1. አዎ 2. አይደለም
52.	ለጥያቄ 51 መልስዎ አዎ ከሆነ ከአንድ ወቅት በላይ አጋጥሞታል?	1. አዎ 2. አይደለም
53.	ባለፉት 12 ወራት ውስጥ በማንኛውም ጊዜ ደረትዎት አካባቢ የማ፣ቃተት ወይም የማቃሰት ስሜት ተሰምትዎት ያውቃል?	1. አዎ 2. አይደለም
54.	በማቃስት ስሜት ጋር አብሮት የትንፋሽ ማጠር ችግር ነበርዎት?	1. አዎ 2. አይደለም
55.	ለጥያቄ 54 መልስዎ አዎ ከሆነ በማቃስት ስሜት መካከል የአተነፋፈስ ስርዓትዎ ፍጹም ጤናማ ነበር?	1. አዎ 2. አይደለም
56.	ባለፉት 12 ወራት በማንኛውም ጊዜ በትንፋሽ እጥረት ምክንያት ማታ ከተኙበት ነቅተው ያውቃሉ?	1. አዎ 2. አይደለም
57.	ባለፉት ሶስት ዓመታት የደረት ላይ ህመም ተስምቶዎት በዚህም ምክንያት ለ ሳምንት ያክል መደበኛ ስራዎን እንዳያከናዉኑ አድረግዎት ነበር?	1. አዎ 2. አይደለም
58.	ለጥያቄ 57 መልስዎ አዎ ከሆነ ከተለመደው ውጭ በዚህ ህመም ጊዜ በብዛት አክታ ነበረዎት?	1. አዎ 2. አይደለም
59.	ለጥያቄ 57 መልስዎ አዎ ከሆነ ላለፉት ሶስት ዓመታት	1. አዎ 2. አይደለም

	ከአንድ ጊዜ በላይ አምዎት ያውቃል?		
60.	ትንፋሽ የሚያጥርህ ከባድ የአካል እንቅስቃሴ ስታደርግ ብቻ ነዉ?	1. አዎ	2. አይደለም
61.	ፈጠን ብለው ወይም አቀበት ላይ ሲሄዱ ትንፋሽ ማጠር ችግር ያጋጥሞታል?	1. አዎ	2. አይደለም
62.	በተስተካከለ መሬት ላይ ሲሄዱ ፍጥነትዎ በእድሜ እኩያዎ ከሆነ ሰዉ በታች ይሆናል ወይም አየሄዱ በትንፋሽ እጥረት ምክንያት ይቆማሉ?	1. አዎ	2. አይደለም
63.	በተስተካከለ መሬት ላይ ለትንሽ ደቂቃ እንደ ተጉዋዙ ትንፋሽዎ ይቆረጣል?	1. አዎ	2. አይደለም
64.	ከቤት ለመዉጣት ሲጣደፉ ወይም ልብስ ለመልበስ ትንፋሽ ያጥረዎታል?	1. አዎ	2. አይደለም