Addis Ababa University

College of Health science

School of public health

Assessment of respiratory symptoms and associated factors among solid waste collectors in Yeka sub city, Addis Ababa

By

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June, 2016

Addis Ababa, Ethiopia

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Abstract

Background: Respiratory disease symptoms are a public health challenge in both industrialized and developing countries. Respiratory symptoms are more prevalent in solid waste collectors of developing countries, where occupational health and safety issues are less emphasized.

This study was conducted to determine the prevalence and associated factors affecting respiratory symptoms among solid waste collectors in Yeka sub city.

Methods: cross sectional study was conducted among 518 study participants. Data were collected through interviewer administered structured questions derived from British Medical Research Council (BMRC) adult respiratory symptom assessment questions and observational check lists. Multivariable logistic regression model was used to identify predictor variables which have association with chronic respiratory symptoms and finally the variables which had significant association were identified on the basis of Adjusted Odds Ratio (AOR) with 95 % Confidence Interval (CI).

Results: The prevalence of chronic respiratory symptoms among solid waste collectors was 40.7 %, with Prevalence of cough 35.7%, wheezing 21.2 %, phlegm 44 %, breathlessness 29.2 %, wheezing 21.2 % and chest illness 7.3%. Respiratory symptoms were associated with use of respiratory facemask on duty [AOR=2; 95% CI :(1.1-4)], sleeping disorder [AOR=2.6; 95% CI :(1.5-4.42)] and past illness [AOR=4.8; 95%CI :(3.2-7.22)]

Conclusion:respiratory symptoms were prevalent among solid waste collectors in Yeka sub city, Addis Ababa. Use of respiratory equipment on duty, sleeping disorder and past illness were identified factors.

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Abbreviations and acronyms

MSW- municipal solid waste

USA- united states of America

ODTS- organic toxic syndrome

URTI- upper respiratory tract infection

PPE- personal protective equipment

MSE- micro and small enterprise

PI- principal investigator

DC- data collector

1.Introduction

1.1Background

Solid waste is comprised of materials that are a mixture of liquids, gases and solids that are no longer in use or it can be defined as the organic and inorganic waste materials produced by various human activities and which have lost their value to the first user(1). Municipal solid waste is the subset of non-hazardous and non-infections solid wastes generated from residential, commercial, institutional, construction and demolition, municipal service (2). Solid waste management isa discipline associated with the control of generation, storage, collection, transfer and transport, processing and disposal of solid wastes in a manner that is in accord with the best principle of public health, economics, engineering conservation, aesthetics and other environmental considerations (2).

Waste collectors refer to group of people who collects solid waste generated in various areas for disposal at designated locations. In developing countries such as Ethiopia the service is usually provided by responsible contractors (micro enterprises) assigned to respective areas. In advanced nations such as Europe and the USA, automated trucks are used in collection and disposal of waste using hydraulic lifts. The opposite is applied in developing countries such as Ethiopia. Solid waste collection service in Addis Ababa is divided in to two sub systems; primary and secondary collection .Primary collection is done by micro and small enterprises who are assigned to work on zonal based division of households. One zone constitutes 800-1000 households; secondary collection is by municipality transporting from garbage containers to dumping and the role of private sectors on transportation is limited (3).

Waste collectors 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 ways of solid waste disposal, isolation, separation, collection and disposal of the waste need to be addressed, evaluated, managed properly. The majority of waste collectors were ignorant in relation to personal protective measures (face mask, shoe covers, rubber boot or overall), and not adhered to health and safety protocols.Themajority of waste collectors have suffered from different types of injuries, diseases and diseases like symptoms such as suffering of sore throat, cough, high temperature, backache, diarrhea and bloody stool, shortness of breath, skin diseases, twisted ankle and a muscle tear (4). Most diseases have exposure pathways. Interrupting the pathways can reduce risks in solid waste management which can be achieved by making waste technologies more contained, changing working methods, reducing contaminant emission, and use of protective equipment. For example, risk of respiratory infection or allergenic response to organic dusts can be greatly reduced if workers wear respiratory masks (2).

1.2 Statement of the problem

Respiratory disease causes an immense worldwide health burden. It is estimated that 235 million people suffer from asthma (5), more than 200 million people have chronic obstructive pulmonary disease (COPD), and 65 million endure moderate-to-severe COPD (6). NIOSH, 2008, estimated that, deaths from work-related respiratory diseases and cancersaccount for about 70% of all occupational diseases death worldwide. 5-15% of new casesof asthma in working adults are caused by occupational exposure (7). ILO, Geneva2003 addresses diseases due to work related, cancer 32%, circulatory 23%, respiratory7% and accident and violence, 19% (8). ILO, Sept, 2000, working conditions tend to be unsafe for those who are directly handling the waste, they are exposed to dust and fume, speeding traffic and violence (9).

Solid waste collectors areprone 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(10, 14). 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, bioaerosols (11). In some studies high atmospheric concentration of bioaerosols has been found in the breathing air of workers engaged in collection, disposal and recycling of waste site (12). Microbiological exposure associated with waste can occur indoors where the waste is stored (13) or outdoor during its collection and may be influenced bycollecting, transferring and processing(14, 15).Compostable waste collectors have been shown to suffer from variety of health effects including mucous membrane irritation,,rhinitis,allergy,asthma,bronchitis,conjunctivitis,hyper sensitivity, allergicbroncho pulmonary mycosis, dermatitis and diarrhea(13,14,16,)

Moreover, solid 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 solid waste collectors is mandatory to keep them safe and secure (18, 20, 21).

In Ethiopia this group of workers has not been studied much due to various misconception that solid wastes may not result in respiratory illness. Most workers facing challenges from this job by full or partial exposed in high occupational hazardsconditions, which later bring them adverse health effects and increases utilization of health services and poor quality of life. Like many developing countries and cities solid waste in Yeka sub-city is collected home to home manually which is accompanied with exposure to nuisance, particulate maters and bioaerosols. 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 waste collection solid waste collectors may not use personal protective equipment, devices and follow safety measures .Therefore the cross sectional study is designed to answer the main research question ‘’what is the prevalence of respiratory health symptoms and associated factors among solid waste workers in Yeka sub city, Addis Ababa..

1.3Significance of the study

The findings of this study will help government and non-government organizations to create awareness among solid waste workers to know theirworking hazards, conditions, to know the importance of use and consequently demand of PPEs, how to protect themselves from other factors . Also government, non-government, faiths based organizations, industries, municipal, contractors, agency, authorities and policy makers may use the recommendation from this study in developing strategies and enforce legislation for further improvement. In addition it paves away for further research.

2.**Literature review**

2.1 Overview of solid waste collection

The standards and norms for handling solid 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 (16).

In developing countries the waste collection activities are typically conducted in micro and small-scale enterprise, with old equipment and virtually no dust control or worker protection. The waste collected is seldom stored in a plastic or metal container and covered with a lid .Sometimes the waste is placed on the ground directly, thus requiring being shoveled by hand, or it is left in an open carton or basket to be picked by hand. In either case, the waste awaiting collection is readily available to insects and rodent vectors and scavenging animals. So, collection workers have significantly direct contact with solid waste, and are also exposed to more potential particulates, toxic materials, and gases and infectious microorganisms. In low income countries, solid waste collectors have low socio-economic status such as poverty, lack of education, poor housing conditions and poor nutrition; furthermore this group of workers are directly exposed without adequate personal protection to municipal solid waste (MSW) which includes hazardous substances (14).

In Addis Ababa, Ethiopia most wastes are not segregated at household level, in addition manually loaded in to sacks, pushed or pulled through long distances to be loaded in to storage containers which is not in close proximity to where the residents are located (17).

2.2 Respiratory health among solid waste collectors

During refuse collection the worker must be relatively healthy. In this environment, the workers' health is his/her greatest asset and precondition for the sustainable generation of income. Protection of worker form occupational 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 (22).Moreover , refuse workers often lack training ,tools and information in order to perform their work in the best healthy and safe manner(13).

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 (16).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 (10). 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 bioaerosols(11).In some studies high atmospheric concentration of bioaerosols has been found in the breathing air of workers engaged in collection, disposal and recycling of waste site (12).

A study by Sigsgaard et al.(1990) 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 (23). 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 (24) .Also, an increased prevalenceof asthma, spasm, throat dryness, nasal discharge, andcoughing symptoms was found among waste collectors in Istanbul than in drivers, but these differences were not statistically significant (p >0.05) (25).

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, chroniccoughing, breathingtrouble, sinus congestion (29.4%) (2).In Palestine, 44.7% of domestic waste collectors have suffered from sore throat, cough, and high temperature, and in agreement with this results, 25% of them had suffered from shortness of breath in the last 12 months (26).

It has been reported thatthere 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) (27,28).

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%). There was statistically significant difference between the 2 groups regarding the shortness of breath (21% vs. 4.5%). There was a significantly higher prevalence of respiratory ailments among MSW collectors and the compared group of service workers (25% vs. 12.2%, respectively) (28). A studyin 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).

2.3 Determinants of respiratory health symptoms among waste collectors

2.3.1 Socio demographic factors and respiratory health symptoms

Education is a key determinant of lifestyle and status an individual enjoy in a society and Provide people with the skill and knowledge that can lead to a better quality of life (30). Also level of education influences the type of occupation and income which can determine the home living condition (31). It has strong effect in attitude and awareness related to family health and hygiene. The low awareness of health and safety would make more vulnerable to illness (32). Respiratory health symptoms of both conditions were more prevalent among persons above 40 years of age and those with low levels of schooling (28, 33).

2.3.2 Behavioral factors and respiratory health

A study done in Colombo revealed alcohol consumption was higher among solid wasteCollectors 72.3% and the prevalence of smoking was 63.8 %(34). The results of study Mansoura, Egypt revealed that about half of MSW collectors with impaired respiratory function measurements were cigarette smokers (28).

A study in AddisAbaba reported chat chewing, alcohol consumption, smoking and sleeping disorder were the main behavioral problems identified among the solid waste workers .Most workers admitted to starting these habits after joining the current line of work (17, 34).

2.3.3 Environmental condition and safety factors

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, 35). The acute respiratory health effects can presumably be reduced by proper dust control measures such as personal protective devices respirators, training and education and maintaining machines at the workplace (36). 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 (24)

Occupational exposures to dust, fumes, and gases are associated with increased prevalence of respiratory symptoms and impairment of lung function (37). This was found to have direct relationship with the dust concentration and duration of exposure (38).The higher prevalence of respiratory symptoms among MSW collectors could be attributed to the nature of their job, which involves exposure to dust and bio aerosols (28).

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.

Fig1 below shows the relationship between respiratory health symptoms and associated factors among solid waste collectors.

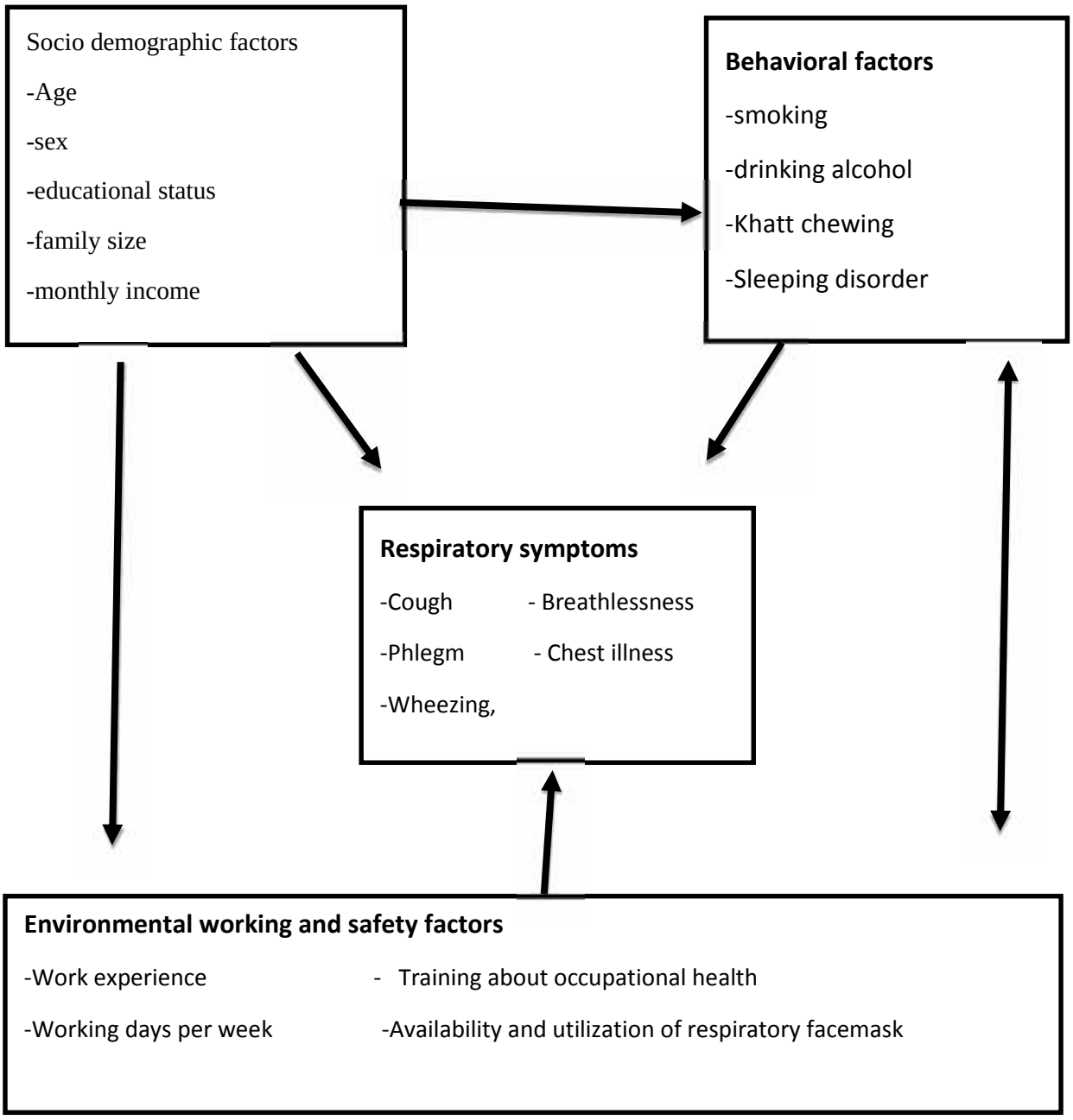

Fig 1.Conceptual frame work

3. Objective

3.1 GeneralObjective

To assess prevalence of respiratory symptoms and associated factorsamong solid waste workers in Yeka sub city, Addis Ababa

*3.2*Specific objectives:

1. Toassess prevalence of respiratory symptoms among solidwaste workers

2. To determine factors associated with respiratory symptoms among solid waste collectors

4. Methods

4.1Study design

A quantitative cross-sectional study was conducted to assess occupational respiratory

Symptoms and associated factors among the solid waste collectors.

4.2 Studyarea and study setting

The study was carried out in Yeka sub city, Addis Ababa. The sub city was 85.98 square kilometer with 404,336 total populations.

Yeka is one of the ten sub cities of Addis Ababa which is located north of Addis Ababa, and bounded north east of Oromiaregion, west of Arada and Gullele sub city ,south and south east for Bole sub city. It is also sub divided in to thirteen woredas. From the total waste generated in the sub city, 454 m3 of waste is collected and transported to disposal site per day and 165572 m3 per annual (39).

4.3 Source Population

All Yeka Sub City solid waste collectors were the source population for this study.

4.4 Study population

All selected workers in the sub city were study population.

4.5Inclusion and exclusion criteria

4.5.1 Inclusion criteria

All workers in the selected MSE who have a minimum of one year work experience was included in the study.

4.5.2. Exclusioncriteria

Workers with less than one year experience were excluded because they may not develop some of illness symptoms within short period of time (43).

4.6 Sample size determination

The study sample size was determined by employing single population proportion formula using 95% confidence interval. Magnitude of cough, breathing trouble=29.4% (2) There fore

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

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 among solid waste collectors = 0.294

d= margin of error, I .e 0.04

$$n = \frac{1.96^2 \times 0.294 \times (1-0.294)}{0.04^2} = 498$$

Considering the non-respondent rate, 10% is added as contingency

So the final sample size will be 498+50=548.

The sample size for the 2nd objective is calculated using double population proportion

Formula based on the following assumptions:Proportion of respiratory symptoms among PPE users is assumed to be 50%. Assuming odds of respiratory symptoms among non-users is 2 times higher than PPE users

$$n = \frac{(Z\alpha/2\sqrt{(1+1/r)\,p(1-p)} + z\beta\sqrt{p1(1-p1) + p2(1-p2)})^2}{(P1-p2)^2}$$

Where

P1=50 %(proportion of respiratory symptoms among PPE users)

P2=67 %(proportion of respiratory symptoms among non PPE users)

P=pooled proportion (p1+p2/1+r) =0.585

α=0.05 the probability of committing type one error =1.96

ß=20% of rejecting a true difference

r= 1 since the proportion of n1 to n2 is 1 to 1 n1=148; n2 148

By considering 10% none response rate n=326

Therefore the single population proportion yields the maximum sample size. The final Sample size was **548**.

4.7Sampling procedures

Yeka sub city was purposely selected being the interest of the investigator. All woredas under the sub city were purposely included in the study. Therewere about 75 micro and small enterprise solid waste collection unions with total of689members with minimum of 6 and maximum of 12 members in one micro and small enterprise union unit. The sub city has a total of 13 woredas.All woredas have different number of unions organized under small scale enterprises.Micro and small enterprise unions from allworedas were allocatedproportionally to the number of micro and small enterprise unions they had. Micro and small enterprise Unions allocated to each woreda were randomly selected from the list of total micro and small enterprise unions in that woreda. Finally all workers in the selected micro and small enterprise union wereinterviewed. If the sum of workers in the selected unions is below the final sample size, additionalMSE union that had large number of micro and small enterprise unions were selected.

Sampling procedure diagram

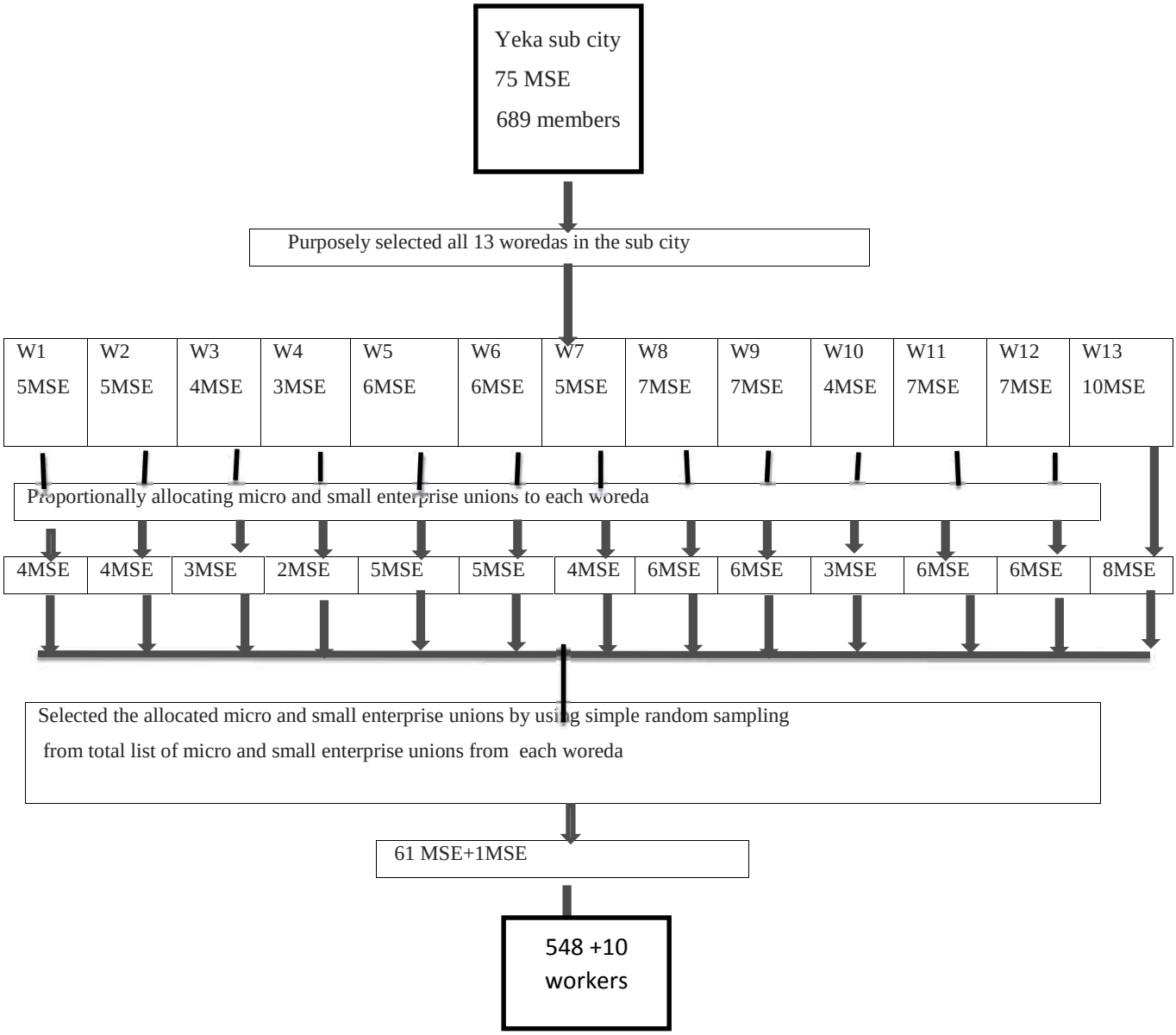

Fig 2 w-woreda, MSE-Micro and small enterprise union

4.8Data collection tool and procedures

Structured questionnaire was adopted from **British medical research council's questionnaire on respiratory symptoms** with required modification based on research objectives (40). The contents of questionnaire weresocio-demographic, occupationalsafety,behavioralconditions, occupational history, and respiratory illness symptoms. There wasalso observation checklist for Personal Protective Devices availability and utilization observed for each worker on duty (17). The questionnaire was prepared in English and translated to Amharic and translatedback to English. Pretest was conducted on 50 solid waste collectors15 days prior to actual data collection on one woreda of bole sub city which is out of the actual study area for validation of data collection tool. Four environmental health officers were collected the data from solid waste workers on duty during data collection period.

4.9 Operational definition

Respiratory symptoms:

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 (42).

Cough:

-Experience of cough on most days of the week (4 days) for at least three months in one year.

Phlegm:

-It is sputum expectoration on most days of the week (4 days) for at least three months in one year.

Breathlessness:

-Occurrence of shortness of breath when hurrying on level ground or walking up slight hill.

Wheezing:

- A condition of causing a wheezy or whistling sound in the chest at any time in the last 12 months.

Chest illness:

-In the past one year, chest pain that kept off work with phlegm.

Job satisfaction

It is a subjective response of study participants about their job as it is pleasurable for them (17).

Micro and Small Enterprise (MSE): Small scale unions that are organized by government toCollect waste from households to specific site that is accessiblefor transportation to final disposal site (17)

Smoking status: Workers are classified as current smokers, ex-smokers or non-smokers .If the worker started smoking before or after engaged to this job and smoking until the time of data collection of this study then they are classified as current smokers.

Sleeping disorder: 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 disorder

4.10 Study variables

Independent variables dependent variable

-Socio-demographic, - respiratory illness symptoms

- Occupational safety,

- Behavioral conditions,

- Occupational history

4.11 Data processing and management

Filled questionnaires were checked for completeness and any incomplete information was excluded from the entry. Coded data was entered into Epi info version 3.5.1 computer software package. After the entry of every questionnaire completed, the soft copy of every questionnaire was cross checked with its hard copy to see for the consistency. After the cross checking, 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 using stat transfer software package

4.12 Data analysis

Descriptive statics such as Frequencies, percentages,and medians were used to describe the variables of the study.

Crude Odds ratio with 95% CI in bivariate analysis was computed to see the presence of association between respiratory Symptomsand associated factors. Multivariate logistic regression analysis was used to observe independent effects of associated factors on the respiratory symptoms by controlling the effect of other factors.

4.13 Data quality assurance

To maintain the quality of the data, structured and pretest questionnaire checklist was used to collect information. One day orientation was given to all data collectors on the data collection procedure, the content of the questionnaire and checklist of the study. The collected information was checked on daily base by the supervisor. Overall supervision was carried out by principal investigator .Questionnaire was checked for completeness every day at the time of data collection .Feedbacks on previous day activities was given for data collectors and supervisors.

4.14Ethical Considerations

Ethical clearance was obtained from Institutional Review Board of College of Health Sciences, Addis Ababa University. Formal letter was written to city government of Addis Ababa Yeka sub city general manager Cleansing administrationOffice. This letter was distributed to all selected woreda of respective offices by principal investigator there by communicated the responsible body. The information Sheet and consent form was provided for respondents to read for those who can read and for those who cannot read, Interviewer read the paper. The right of the worker to participate or not in the study was explained to the study subject. The importance of the study was explained. Data confidentiality was assured (access to data will be limited to only the research team) and maintained by omitting respondents' name and personal identification, and the study had no harm to the study subjects. Each participating worker was interviewed to inquire about the socio-demographic and occupational profile and history of different respiratory complaints in the last 12 months. Based on the findings advice wasgiven, including use of appropriate personal protective equipment and workingcondition.

5. Results

5.1Socio-demographic characteristics of participants

Out of the total 518 respondents, 180(34.7 %) were males and 338(65.3%) were females with 94.5% response rate. The median age was 32 years ranging from18 to 70years. Four hundred and fifty three (87.5%) of participants were in the age group of 18–40, 205(39.6 %) of participants were illiterate and about 281(54.2 %) participants were married. About 271(52.3%) had 3-4 family size and mean monthly income of participants was 973 Ethiopian birr ranging from 400 to 2000 birr.

Table 1 Respondents by socio- demographic and working condition characteristics of Yeka sub city solid waste collectors (n=518) April 2016

Variables	Frequency	Percent
Sex		
Male	180	65.3
Female	338	34.7
Marital status		
Married	281	54.2
Single	128	24.7
Divorced/Separated	87	16.8
Widowed	22	4.2
Educational level		
Illiterate	205	39.6
Read and write	89	17.2
Primary school	184	35.5
Secondary school and above	40	7.7
Family size		
Two and less family	153	29.5
Three to four family	271	52.3
Five and above	94	18.1
Monthly income		
≤973	306	59.1
>973	212	40.9
Work experience		
≤5years	354	68.3
≥6 years	164	31.7

5.2Occupational safety factors

Three hundred and five (59%) of respondents used some kinds of personalprotective equipment such as glove, apron, boot and face mask. Out of these PPE users only 63(12.2%) use simple cloth made respiratory facemask out of which 53(10.2%) use it all the time. The majority of PPE users, 192 (63%) purchase PPEs for themselves and 111(36.4) were provided by NGOs and only few 2(0.7%) were provided by government .Two hundred and fifty eight (49.8 %) had training about occupational health and safety. Out of these 188 (72.9%) on job training and 53(20.5%) was first training and about 227(88%) of these workers were trained by government.

Findings from observation

Personal Protective equipment availability and utilization

On the time of data collection personal protective equipment such as glove, facemask were observed whether they are new or porous and tear out so that it allows dust and fluid to workers body. Those devices not porous and tear out are identified as new personal protective device. Out of 226 observed gloves on workers on duty, 67(25%), 213(80%), 106(40%) and 173(65%) were new, water proof, well dressed and perforated respectively. Out of the total 63 observed face mask 31 (49%) was perforated. Out of 233 overall clothing observed on workers on duty, 182 (78%) well dressed, 156 (67%) perforated, 78 (33.5%) new 37(7%) workers usedboot where as others used short shoes.

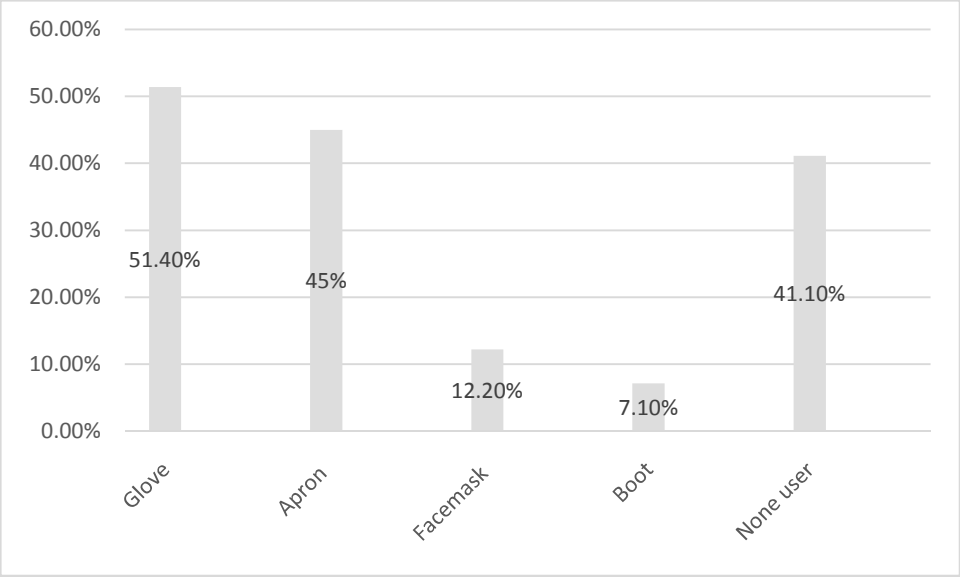

Fig 3 Types of personal protective equipment used by Yeka sub city solid waste collectors

5.3 Working condition and behavioral factors

Three hundred and fifty four (68.3%) had work experience of five years or less. Forty nine (9.5%) participants were cigarette smokers and around 71(13.7 %) drink alcohol, and 85(16.4%) had sleeping disorder. 86 (16.6%) of participants were not satisfied with the current job (Table 2).

Table 2 Utilization of PPE and behavioral status of Yeka sub city solid waste collectors April 2016,

Variables	Frequency (n = 518)	Percent
Use of respiratory facemask on duty		
Yes	63	12.2
No	455	87.8
Time facemask used		
All the time	53	10.2
Sometime	10	1.9
First training		
Yes	70	13.5
No	448	86.5
On job training		
Yes	188	36.3
No	330	63.7
Smoking cigarette		
Yes	49	9.5
No	469	90.5
Drinking alcohol		
Yes	71	13.7
No	447	86.3
Chewing chat		
Yes	31	6
No	487	94
Sleeping disorder		
Yes	85	16.4
No	433	83.6
Job satisfaction		
Yes	432	83.4
No	86	16.6
Work experience		
≤5years	354	68.3
≥6 years	164	31.7
No of working days per week		
≤4 days	38	7.3
5-7 days	480	92.7

.**First training** means whether the study participants were trained about safety issues first when they engaged in the current line of job or not.

5.4Past illnesses

Participants were reported to have 10.2% bronchitis and asthma, 10.6% other chest trouble before they were employed to this job industry. Few workers reported the presence heart trouble 6.6% ,pneumonia 5.4% ,1.5% pulmonary TB and operation affecting chest, felt by respondents or identified by physicians before and after being employed in solid waste collection.

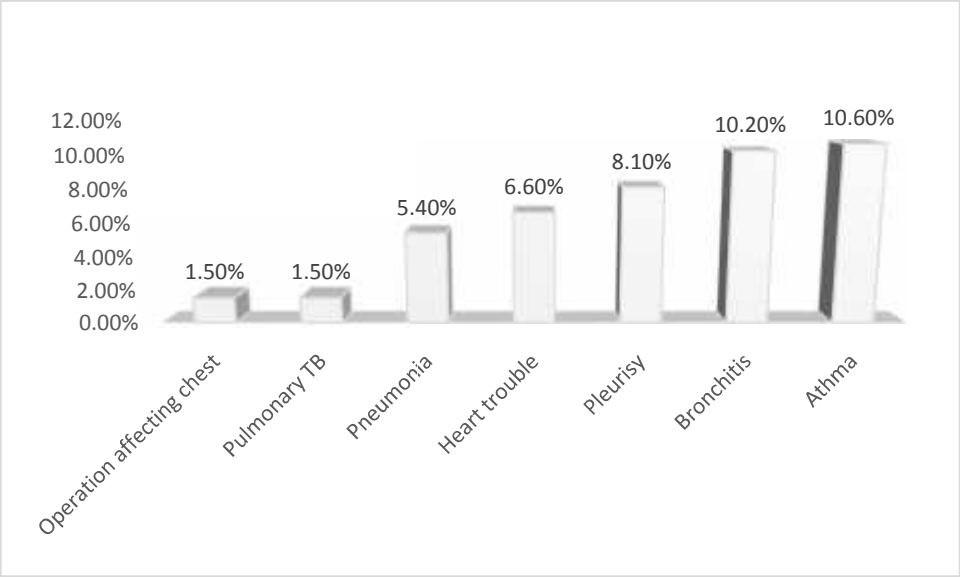

Fig 4 distribution of past illness

Distribution of respiratory symptoms

The prevalence of respiratory symptoms among solid waste collectors in 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% (Fig 5 below).

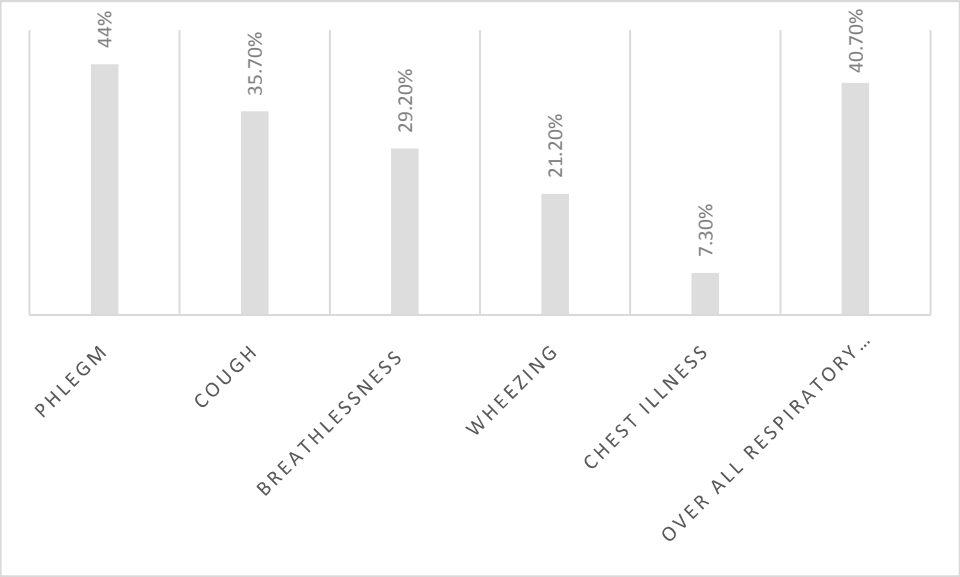

Fig 5.Distribution of respiratory symptom

Bivariate analysis

The association between socio-demographic, occupationalsafety, working condition and behavioral variables with respiratory health symptoms were computed. On job occupational safety training[COR=0.7, 95% CI: (0.477-0.975)] and use of respiratory facemasks on duty [COR=1.842, 95%CI (1.034-3.281)]were statically significant variables of occupational safety factors. Sleeping disorder [COR = 0.347, 95% CI :(0.215-0.561)] from behavioral variables were significant to respiratory health symptoms. Similarly, Past illness [COR=5, 95% CI: (3.45-7.5)] was also significant variable associated with respiratory health symptoms at bivariate level in this study.

Table 3 Associated factors and respiratory symptoms among solid waste collectors in Yeka subcity,Addis Ababa 2015(n = 518) April 2016

Variable	respiratory symptoms		COR (95 % CI)	p-value
	Yes	No		
Sex				
Male	65	115	**1**	
Female	146	192	0.743[0.512-1.079]	0.119
Age				
18-35	140	201	1	
36-50	60	99	0.87[0.591-1.281]	0.481
>=45	11	7	2.256[0.854-5.963]	0.1
Working days per week				
<=4	20	18	1	
5-7	191	289	0.6[0.3-1.2]	0.124
On job occupational safety training				
Yes	95	110	1	
No	116	197	0.682[0.477-0.975]	0.036**
Use of facemask on job				
Yes	18	45	1	
No	193	262	1.842[1.034-3.281]	0.038**
Sleeping disorder				
No	158	275	1	
Yes	53	32	0.347[0.215-0.561]	0.00**
Past illness				
No	91	244		
Yes	120	63	5[3.45-7.5]	0.00**

Multivariate analysis

In the first step, the effects of selected socio-demographic, behavioral, occupational safety and working condition variables on respiratory health symptoms were assessed. In the second step of the analysis all variables that were significant at bivariate level and other socio-demographic, behavioral, working conditions and occupational safety variables that had p value < 0.3 were added.From all variables entered in multivariate analysis, only use of facemask on job, sleeping disorder and past illness were remained significant after adjusting for othersocio-demographic, occupational safety and behavioralfactors.

Table 4 Summary of logistic regression of relative effects of Associated factors and respiratory symptoms among solid waste collectors in Yeka sub city, Addis Ababa 2015(n = 518)April 2016

Variable	respiratory symptoms		COR (95 % CI)	AOR
	Yes	No		
Sex				
Male	65	115	**1**	
Female	146	192	0.743[0.512-1.079]	0.7[0.44-1.1]
Age				
18-35	140	201	1	
36-45	60	99	0.87[0.591-1.281]	0.89[0.6-1.4]
>45	11	7	2.256[0.854-5.963]	2.5[0.82-7.4]
Working days per week				
<=4	20	18	1	
5-7	191	289	0.59[0.307-1.154]	0.75[0.36-1.6]
On job occupational safety training				
Yes	95	110	1	
No	116	197	0.682[0.477-0.975]	0.75[0.5-1.1]
Use of facemask on job				
Yes	18	45	1	
No	193	262	1.842[1.034-3.281]	2[1.1-4] *****
Sleeping disorder				
No	158	275	1	
Yes	53	32	0.347[0.215-0.561]	2.6[1.5-4.42] *****
Past illness				
No	91	244	1	
Yes	120	63	5[3.45-7.5]	4.8[3.2-7.22] *****

Discussion

Out of the total 518 respondents, 180(34.7 %) were males and 338(65.3%) were females with 94.5% response rate which is a little bit less than previous study in Addis Ababa on the same participants 97.9 % (17). Number of female workers was higher as compared with some other studies those either with no or small number of female workers. The main reason for large number of female's workers in this study might be this work sector is an emerging and leveled as one of small scale enterprises in the country in which females are actively involved in the sector.

The prevalence of respiratory symptoms among solid waste collectors in 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%. This result has much or less discrepancies when compared with otherstudies. Florida, Miami the prevalence of cough and breathing trouble (29.4%) is less than this study. Similarly a study done in labotse, Botswana which had prevalence of cough 34.4%, chest illness 17.2% and breathlessness 24.1 % (44) and astudy in NewDelhi cough 34.3%, wheezing 12.5%, chest illness 41.7 % and breathlessness 39.6 %(45). Only cough is comparable 34.4% Botswana and 34.3 % New Delhi and 35.7% in this study. The differences in other 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.

Factors associated with chronic respiratory symptoms

Absence of face mask on duty, sleeping disorder and past illnesses weremajor contributing factors for respiratory symptoms to occur in this study.

The majority of MSW collectors were less adherent to health and safety measures. Provision of personal protective measures during collection hours together with automatization of waste collection of waste will ease the job for the workers and reduces the exposure to dust and the incidence of respiratory complaints (28).Those who were not using facemask on duty had 2 times higher odds of respiratory symptoms than those who use respiratory facemask after some variables were adjusted. This result is consistent with a study done in Gambia on respiratory symptoms among solid waste collectors in which none use of respiratory protective device was significant with prevalence of respiratory symptoms ($P<0.05$) (47).

Solid waste collectors with past illness had 4.8 times greater odds of respiratory health symptoms than solid waste collectors with non-past illness. The main reason might be Chronic Past illness like bronchitis and asthma are well known cause of respiratory health symptoms. This finding is inconsistent with a study done in the municipality of Keratsini, a suburb in the port city of Piraeus, Greece (10) in which past illness was not significant. The difference might be small no of participants compared with this study

Chat chewing, alcohol consumption, smoking and sleeping disorder were the main psycho-social problems assessed among the workers in this study. Only sleeping disorder was significant with respiratory symptoms. Solid waste collectors with sleeping disorder had 4.2 higher respiratory health symptoms than those with no sleeping disorder. 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.

The difference between MSW collectors with normal and those of protecting themselves from respiratory symptoms among all educational categorywith impaired pulmonary function tests was statistically significant regarding age, and duration ofEmployment (28).In this study age, work experience and educational status was not statically significant. Major problem here might be a problem of selection bias in an occupational cross-sectional study, especially the 'healthy worker' effect in this study. Those of elder age with greater work experience tend to leave this high demanding job and replaced with new healthy workers.

Strengths and limitations of the study

Strength of study

-This sector involves large number of people with various socio-economic composition. Therefore this study is useful to aware decision makers to come up with possible solutions to minimize and control Factors associated with health problems in this study.

-Even though there were limitations in this studies, the findings of this study paves away for further research

Limitations of the study

-Since the study is cross sectional, which could not establish causal relationship.

-The healthy workers effect like in most of other occupational studies might affect the study since solid waste collection 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, already sick ones have already left the job before the study and replaced with new healthy worker who are not eligible for 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 over or under estimation of the magnitude of the problem and there might be recall bias

Conclusion

This study found that respiratory symptoms were prevalent among solid waste collector in Yeka sub city. This is may be due to the nature of their occupation that solid waste collectors are exposed to large amount of household and commercial waste of diverse nature. None use of respiratory mask, sleeping disorder and chronic past illness were identified as contributing factors for respiratory symptoms in this study.

Recommendations.

-Initiatives are needed to encourage the use of safe waste management techniques and the appropriate use of personal protective equipment.

- Risk assessment has to be done periodically to identify behavioral problems because sleeping

disorder was observed as the most predictor for respiratory symptoms outcomes.

-Other studies like comparative cross sectional and cohort studies should be done to avoid cross sectional study draw backs

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7. Annexes

Assurance of principal investigator

I the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project. I will provide timely progress report to my advisor and seek the necessary advice and approval from my primary advisor in the course of the research. I will communicate timely to my advisors all stakeholders involved in the study including any source of funding for this research

Name of the students: _____

Signature: _____

Date: _____

Approval of the primary advisor

Name of the advisor: _____

Signature: _____

Date: _____

Participant's information sheet

Information sheet and Consent form was prepared for solid waste collectors who participated in this Research.

Title of the research Project

Assessment of prevalence of respiratory symptoms and their associated factors among solid waste collectors in Yeka sub-city, Addis Ababa.

Name of Principal Investigator: Zerihun Emiru

Name of the Organization: Addis Ababa University, College of Health Sciences, School of Public Health.

Name of the Sponsor: Addis Ababa University

Introduction

This information sheet and consent form was prepared with the aim of explaining theresearch project that you are asked to join by the group of research investigators. Themain aim of the research project was to assess prevalence of respiratory symptoms and their associated factors among solid waste collectors in Yeka sub-city.

Risk or Discomfort

By participating in this research project you may feel that it has some discomfort Especially on wasting your time

Incentives/Payments for Participating

You will not be provided any incentives or payment to take part in this project.

Confidentiality

The information collected for this research project will kept 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.

Right to Refusal or Withdraw

You have the full right to refuse from participating in this research project.

Person to contact

This research project will be reviewed and approved by the ethical committee of theAddis Ababa University. For any inconvenience, problem and more information you can contact the committee through the address below.

1. Zerihun Emiru, Mobile: 0913731167 / e-mail: Emiruzerihun@gmail.com
2. **Written Consent Form**

Addis Ababa University College of health science

Questionnaire for the Assessment of prevalence of respiratory Symptoms among municipal solid waste collectors in Yeka Sub city, Addis Ababa

Hello, I am _____, I am working a research on solid waste collectors and came from Addis Ababa University College of health science. I would like to ask you a few questions about your socio demographic characteristics, the use of personal protective equipment, behavioral status and respiratory illness symptoms. This will help us to know the prevalence of respiratory symptoms and their associated factors among solid waste collectors 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 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 _____ minutes.

Could I have your permission to continue?

1. If yes proceed the interview 1, Yes 2, No
2. If No skip to the next participant with reason _____

Interviewer name _____ Signature

Date of Interview _____

Result of interview 1. Completed 2. Refusal 3. Partially completed 4.respondent not available

Checked by _____

For any convenience and problem you can contact the principal investigator, phone no 09 13 73 11 67

English Version Questionnaire

Assessment of occupational Respiratory Symptoms among municipal solid waste collectors in Yeka sub city Addis Ababa University College of health Science, School of Public Health

Woreda _____Name of enterprise ___Questionnaire no _____

Part 1- <u>Socio-demographic data</u>

S.No	***Question***	***Possible Response***
1	Age	_____ Years
2	Sex	1. Male 2.Female
3	Educational Status	1. Illiterate 2.Can read & write 3.Education grade……..
4	Marital Status	1. Single 2.Married 3.Divorced 4.Separated 5.Widowed
5	Work Experience as Waste Collector	_____ Year(s)
6	Working days per week	_____ Day(s)
7	Number of family members	_____
8	Monthly in come	_____ birr
9	Religion	1. Orthodox 2.Muslim 3.Protestant 4. Other Specify
10	Ethnicity	1. Oromo 2.Amhara 3.Tigre 4.SNNPRS

Part 2-Availability and Utilization of Personal Protective Equipment (PPE)

S.No	***Questions***	***Possible Responses***
11	Do you have PPE ?	1. Yes 2.No

12	If yes to Question 11 what kind of PPE do you use?	1.Glove 2.Face mask 3.Boot 4.Apron 5.All 6.Others specify....
13	When do you use PPE?	1. Use PPE on duty only some times 2. Use PPE on duty all the time 3. Not use at all because specify…….
14	From where do you get PPE?	1.Supplied by gov't 2.Supplied by NGO 3..Supplied by our union 4.Other – Specify
15	Do you ever had occupational health and safety training?	1. Yes 2.No
16	If yes to question 15 what type of training was it ?	1. First training 2.On Job training
17	Do you ever been supervised at work place on occupational safety issues?	1. Yes 2. No
18	If the answer is yes for question 15 who trained you?	1. Our union 2.Government 3.NGO

Part-3**Behavioral Status**

S.NO	**Questions**	**Possible answers**
19	Do you smoke cigar rete?	1. Yes 2.No
20	If the answer is yes when do you began to smoke	1. Before I started this work 2. After I started this work
21	Do you drink alcohol?	1. Yes 2.No
22	If yes to question 21 as, when did you start?	1. Before I engaged to this work 2. After I engaged to this work
23	Do you chew khat?	1. Yes 2.No
24	If yes for question 23 when did you begin to chew?	1. Before I engaged to this work 2. After I engaged to this work
25	Do you any sleeping problem?	1. Yes 2.No
26	If your answer for q 25 is yes, when do you develop this problem?	1.Before I engaged to thiswork 2.After I engaged to this work
Occupational history		
27	Do you ever satisfied with your job	1. Yes 2.No --- why--

28	How many years did you spent as a solid waste collector	---------Years

Part 4- Respiratory symptoms

S.NO	Questions	Possible answers
Cough		
29	Do you usually cough first thing in the morning?	1. Yes 2.No
30	Do you usually cough during the day or at night?	1. Yes 2.No
31	If yes to 29 or 30 do you cough like this for as much as three months a year?	1. Yes 2.No
32	Do you usually bring up phlegm from your chest first thing in the morning?	1. Yes 2.No
33	Do you usually bring up any phlegm from your chest during the day or at night?	1. Yes 2.No
34	If yes to 32 or 33 Do you bring up phlegm like this on most days for as much as three months each year?	1. Yes 2. No
35	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
	Periods of cough and plegm	
36	If yes to 35 have you had more than one such period?	
	If subject is disabled from walking by any condition other than heart or lung disease, omit question	

	35 – 37 enter 1 here	
37	Are you troubled by shortness of breath when hurrying on level ground or walking up slight hill?	1. Yes 2. No
38	If yes to 37Do you get shortness of breath walking with other people of your own age on level ground?	1.Yes 2.No
39	If yes to 38Do you have to stop for breath when walking at your own pace on level ground?	1.Yes 2.No
40	Have you had attacks of wheezing or whistling in your chest at any time in the last 12 months?	1.Yes 2.No
41	Have you ever had attacks of shortness of breath with wheezing?	1.Yes 2.No
42	If yes to 41Is/was your breathing absolutely normal between attacks?	1.Yes 2.No
43	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
44	During the past three years have you had any chest illness which has kept you from your usually activities for as much as a week?	1. Yes 2. No
45	If yes to 44Did you bring up more phlegm than usual in any of these illnesses?	1.Yes 2.No
46	if yes to 45 Have you had more than one illness like this in the past three years?	1Yes 2.No
Past illness Have ever had ,or been told		
47	An injury or operation affecting your chest?	1.Yes 2.No
48	Heart trouble?	1.Yes 2.No
49	Bronchitis	1.Yes 2.No
50	Pneumonia	1. Yes 2. No
51	Pleurisy	1. Yes 2. No
52	Pulmonary tuberculosis	1. Yes 2. No

53	Asthma	1. Yes 2. No
54	Other chest trouble	1. Yes 2. No

Observational Check list

I. Personal protective equipment related questions

1. Glove1.1 New a.yesb. no

1.2 Water proof/rubber a.yesb.no

1.3 Perforated a.yesb.no

1.4 Well-dressed a.yesb.no

2. Face Mask 2.1 New a .yes b no

2.2 Perforateda.yes b.no

2.3Well-dresseda.yesb.no

3. Boot (Shoe)3.1Newa.yes b.no

3.2 Perforated a.yes b.no

3.3 Well-dressed a.yes b.no

4. Working material Status

4.1.Trolley/Push cart a.Wood b.metal

4.2. Waste collective sack a.New b.old

a.perforateb.Not perforated

a.easilyliftableb.Not

<u>የአማርኛመጠይቅ</u>

የመጠይቅመለያቁጥር…….ወረዳ ……..የማህበሩመለያስም……..

መጠይቁንመሙላትከመጀመሩበፊትለተጨያቅዎችየሚሰጥማረጋገጫቅጽ

ሰላምጤናይስጥልንእኔ_____
_____እባላለው፡፡የመጣሁትከአዲስአበባዩኒቨርሲቲከጤናሳይንስኮሌጅሲሆንበደረቅቆሻሻመሰብሰብሥራላይበተሰማሩስዎች ላይጥናትእየሰራውእገኛለው።በመሆኑምይህየእርስዎንማህበራዊናህዝባዊገጽታ,
ራስንየመከላከልመሳሪያአቅርቦትናአጠቃቀምሁኔታ, ልማዳዊባህሪዎትናአተነፋፈስችግርምልክቶችንያካተተጥያቄዎችንይዟል፡፡

የጥናቱርእስ፡-.በአዲሰአባባየካከ/ከተማደረቅቆሻሻንበመሰብሰብስራላይበተሰማሩሰራተኞችላይየአተነፋፈስጠናችግርምልክቶችን ናተያያዥምነጫቸውንመዳሰስ

የጥናቱዓላማ፡-.በአዲሰአባባየካከ/ከተማደረቅቆሻሻንበመሰብሰብስራላይበተሰማሩሰራተኞችላይየአተነፋፈስጠናችግርምልክቶች ንስርጭትናተያያዥምነጫቸውንመዳሰስ።

ምስጥራዊነት፡-ስምዎትበቅጹላይአይሞላምእንዲሁምየሚሰጡትመረጃሚስጥራዊናለማንምተላልፎአይሰጥም፡፡

ጥቅምይህጥናትበቀጥታለተሳታፊዎችየምሰጠዉጥቅምየለምነገርግንእርስዎየሚሰጡትምላሽለዚህጥናትውስጥየአተነፋፈስችግር ምልክቶችንናተያያዥምንጫቸውለመለየትከፍተኛጠቀሜታአለው።

ጉዳት፡-እዝህጥናትላይበመሳተፍምንምአይነትጉዳትአይደርስብዎትም።

የፍቃደኝነትማረጋገጫቅፅ

ይህቃለመጠይቅበፍቃደኝነትዎላይየተመሰረተሲሆንያልተመቸዎትነገርካለበማንኛውሰዓትመጠይቁንየማቋረጥመብትአልዎት፡፡
በአጠቃላይመጠይቁያህል…… ደቂቃይፈጃል፡፡ስለዚህለመቀጠልፍቃደኛነዎት?1. አዎ…2. አይደለሁም……መልስዎአይደለሁምከሆነምክንያትጠቅሰውወደሚቀጥለውተሳታፊይለፉበ_____
_____ምክንያት

የጠያቂውስም_____

የመጠይቁግምገማ 1. ተሟልቷል 2. እምቢ3. በከፍልተሟልቷል

4.ተጠያቅዉአልተገኘምለማንኛውምችግርእናግልጽላልሆነነገርከታችባለውአድራሻማነጋገርይችላልስልክ-09 13 73 11 67

Socio – demographic data

ተ.ቁ	ጥያቄዎች	
1	እድሜ	_____
2	ፆታ	1. ወንድ 2.ሴት
3	የት/ትደረጃ	1. ያልተማረች 2.ማንበብናመፃፍመቻል 3.ት/ትደረጃበከፍል……
4	የጋብቻሁኔታ	ነ.ያላገባ(ች) 2.ያገባ(ች) 3.የፈታ(ች) 4.የተለየ(ች) 5.የሞተበት(ባት)
5	በዚህስራላይያለህ(ሽ) ቆይታ	_____ ዓመት
6	በሳምንትየሚሰሩባቸውቀናትብዛት	_____ ቀን
7	የቤተሰብዎትአባላትብዛት	-
8	የወርገቢዎትስንትነው	
9	ሀይማኖት	1. አርቶዶክስ 2..ሙስሊም 3.ፕሮቴስታንስ 4.ሌላ (ይገለጽ)….
10	ብሔር	ነ.ኦሮሞ 2አማራ 3.ትግሬ 4.ደቡብ

Availability and utilization of personal protective equipment

ተ.ቁ	ጥያቄዎች	
11	በስራላየአደጋመከላከያመሳሪያአለዎትወይ?	1. አዎ 2.የለኝም
12	ቁጥር 11 መልስዎአዎከሆነምንዓይነት (ከአንድበላይመልስይችላል)?	ነ.ጉዋንት 2.የፊትመሸፈኛ 3..ቡቲጫማ 4. ሁሉምዓይነት 5የሥራቱታ 6.ሌላካለይጠቀስ

13	መችመችነውመሳሪያዎችንይጠቀማሉ?	1. አልፎአልፎበስራላይ 2.ሁልጊዜበስራላይ 2. ምንምአልጠቀምምምክንያቱም…….
14	መሳሪያዎችንከየትነውያገኘኸው(ው)?	ነ.መንግሎትሰ 2.የእርዳታድርጅቶች 3.ማህበራትንሰቶን 4.ሌላካለይገለጽ
Training and supervision about occupational safty		
15	የሥራደህንነትስልጠናወስደዋል?	1. አዎን 2.አልወሰድኩም
16	ቁጥር 15 አዎንከሆነመልስዎስልጠናውምንዓይነትነው?	ነ.ሥራውንከመጀመርአስቀድሞ 2.ሥራውንከጀመርኩበኋላ
17	በስራደህንነትጤናጉዳዮችላይከትትልናድጋፍተደርጎሎትያውቃል?	1. አዎን 2.አያቅም
18	ቁጥር 15 አዎንከሆነመልስዎስልጠናውንማንነውየሰጠው?	ነ.ማህበራችን 2.መንግስት 3.መያድ 4.ለላካለይገለጽ……

Behavioral Status

ተ.ቁ	*ጥያቄዎች*	
19	ሲጋራያጨሳሉ?	1. አዎን 2.የለም
20	ቁ.19 አዎከሆነመልስምማጨስየጀመሩትመችነው?	1. ከዚህስራበፊት 2.እኔንስራከጀመርኩበኋላ
21	የአልኮልመጠጥ (አረቄ፣ጠጅ---) ይጠጣሉ?	1. አዎን 2.የለም
22	ቁ.21 አዎከሆነመልሶዎመችነውየጀመሩት?	1. ከዚህስራበፊት 2.ስራከጀመርኩበኋላ
23	ጫትይቅማሉ Chat?	1. አዎን 2.የለም
24	ቁ.23 አዎንከሆነመልሶዎመችነውየጀመሩት ?	1. ከዚህስራበፊት 2.ስራከጀመርኩበኋላ
25	የእንቅልፍማጣትችግርአለብዎ?	1.አዎን 2..የለም
26	ቁ.25 አዎከሆነመልሶዎመችነውየጀመሮት?	1.ከዚህስራበፊት2.ስራከጀመርኩበኋላ
27	ለምሰሩትስራደስተኞኖት?	1. አዎን 2.የለምምክንያቱም
28	በዚህስራላይምንያህልዓመትቆይተዋል?	_____ ዓመት

Respiratory Symptoms

	Cough	
29	ጠዋትከመኝታዎሲነሱያስልዎታል?	ነ.አዎ 2.አይደለም
30	ሁልጊዜቀንወይምማታላይያስልዎታል (አልፎአልፎከሆነይታለፍ)?	ነ.አዎን 2አይደለም
31	ቁ 29ምወይም 30 መልስዎአዎከሆነበዓመትቢበዛእስከ 3 ወርያስልዎታል?	ነአዎ2.አይደለም

	Phlegm	
32	ሁልጊዜከመኝዎታዎትሲነሱከደረትዎላይአክታነገርያስተፋዎታል?	ነአዎ 2.አይደለም
33	ሁልጊዜአክታመሰልነገርከደረትዎትላይቀንወይምማታላይያስተፋዎታል (ሁለትጊዜወይምከዝያበላይ)?	ነአዎ2.አይደለም
34	ቁ. 32 ወይንም 33 አዎከሆነመልስዎይህአክታበአብዛኛውቀናትቢበዛበሶስትወርበየአመቱያስተፋዎታል?	ነ.አዎ.2አይደለም
	Periods Of Cough and Phlegm	
35	ባለፉት 3 ዓመታትቢያንስለሶስትሳምንትእናባላይእየጨመረየሄደሳልወይምአክታነበሮት ?	ነ.አዎን 2.አይደለም
36	ቁ. 35 አዎከሆነመልስዎለስንትጊዜነውይህአክታወይምሳልየነበረዎት?	_____ ዓመት

Breathlessness

	ከልብወይምከሳንባህመምውጭበሌላችግርምክንያትየመራመድችግርካለብዎት	1. አዎ 2.አይደለም
37	ፈጠንበለውወይምአቀበትላይሲሄዱትንፋሽማጠርችግርአጋጥሞትያውቃል?	1. አዎ 2.አይደለም
38	ቁ. 37 አዎንከሆነመልስዎቀጥባለመንገድላይከሰዎችጋርሲሄዱትንፋሽያጥሮዎታል?	1. አዎ2.አይደለም
39	ቁ. 38 አዎንከሆነመልስዎአቀበትባልሆነመንገድስገዙየትንፋሽማቆምችግርነበረዎት?	1. አዎ 2.አይደለም
40	ባለፉት 12 ወራትውስጥበማንኛውምጊዜደረትዎትአካባቢየማቃተትወይምየማቃሰትስሜትተሰምቶዎትያውቃል?	1. አዎ 2.አይደለም
41	በማቃሰትስሜትጋርአብሮትየትንፋሽማጠርችግርነበርዎት?	1. አዎ 2.አይደለም
42	ቁጥር 41 አዎከሆነመልስዎበማቃሰትስሜትመካከልየአተነፋፈስስርዓትዎፍጹምጤናማነበር?	1. አዎ 2.አይደለም
43	ባለፉት 12 ወራትበማንኛውምጊዜበትንፋሽእጥረትምክያትማታከተኙበትነቅተውያውቃሉ?	1. አዎ 2.አይደለም
44	ባለፉትሶስትዓመታትየደረትላይህመምተስምቶዎትያውቃል?	1. አዎነ2.አይደለም
45	ቁ. 44 አዎንከሆነመልስዎከተለመደውውጭበዚህህመምጊዜበብዛትአክታነበረዎት?	1. አዎ2.አይደለም
46	ቁ. 45 አዎንከሆነመልስዎላለፉትሶስትዓመታትከአንድጊዜበላይአምዎትያውቃል ?	1. አዎ2.አይደለም
	Past illness ከዚህበፊት	
47	ከደረትዎጋርየተያያዘቀዶጥገናወይምህክናተደርጎዎሎትያውቃል?	1. አዎ 2.አይደለም

48	የልብችግርነበረብዎትበህክምየተረጋገጠወይምየሚሰማዎት ?	1. አዎ2.አይደለም
49	የጉሮሮረቁስለትነበረዎት?	1. አዎ 2.አይደለም
50	የሳንባምችነበረዎት?	1. አዎ2.አይደለም
51	የሳንባአቃፊህመምነበረዎት	1. አዎ 2.አይደለም
52	የሳንባነቀርሳነበረዎት?	1. አዎ 2.አይደለም
53	አስምነበረዎት?	1. አዎ2.አይደለም
54	ሌሎችየደረትአካባቢህመምችግሮችነበረዎት?	1. አዎ 2.አይደለም