

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDY

ASSESSMENT OF OCCUPATIONAL SKIN DISEASES AND ASSOCIATED FACTORSAMONG TANNERY WORKERS, OF SELECTED TANNERIES, ADDIS ABABA ETHIOPIA

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II. Acronyms

AJPH: American Journals of Public Health

AOR: Adjusted Odds Ratio

CI: Confidence Intervals

COR: Crude Odds Ratio

EIA: Ethiopian Investment Agency

IDRC: International Development Research Center

IDI: In-Depth Interview

ILO: International Labor Organization

IRB: International Review Board

KII: Key Informant Interview

PI: Principal Investigator

PPE: Personal Protective Equipment

SPSS: Statistical Package for Social Sciences

WHO: World Health Organization

III.Abstract

Background: More than 500,000 people are working in tanneries around the world. Work related accidents and diseases continue to have series consequence, with an estimated 2.3 million fatalities per year and economic losses of 4% of global gross domestic product. The modern tanning industry in Ethiopia was started in 1920s. There are 26 tanneries and together they employ 4577 persons in the country. Employment in tannery industries has been associated with various diseases caused by biological, toxicological, and carcinogenic agents.

Objectives: The objective of this study was assessing prevalence of occupational skin diseases and its associated factor among tannery workers of selected tanneries of Addis Ababa.

Methods: An institutional based cross sectional study was done from October 2013 to May 2014 to assess prevalence of occupational skin diseases symptoms of tannery workers. Random samples of 311 workers were drawn from different section of 3 selected tanneries for health survey. Data was collected through structured questionnaire, and observational check lists. Data was collected through structured questionnaire and observational check lists. Data was entered into Epi Info version 3.5.4 and exported to SPSS version 21 for analysis. Bivariate analysis was done by logistic regression model then variables which showed statistically significant association at $P<0.05$ were run for multiple logistic regressions to see the relative effect of independent variables by controlling for potential confounders. Difference was considered to be significant, at p-value less than 0.05 ($p<0.05$).

Result Male workers take the majority (70.1%) of employees of tannery industries. Nearly 34% (n=103) of leather tanners reported dermatological diseases symptoms such as eczema, rashes, and burning sensation along with complaints of itching. Among workers who had reported occupational skin diseases 32.57% were affected on their hands and 21.4% were affected on their face. Reported occupational skin diseases were high among beam house workers i.e.odds ratio of reporting skin disease is 88.5% lower among Crust room workers and 87.2% lower among finishing room workers compared to beam house workers. Odds of developing skin disease problems are twice more among workers who got safety training than who didn't (OR= 2.442: 95%, CI (1.33-4.45)).

Conclusion: It can be concluded that the prevalence of occupational skin diseases is high in this population of tannery workers. Workers Working in Beam house and Retanning & Dying section are affected more than others. This high prevalence of occupational skin diseases could result from: lack of occupational safety training, and poor concepts on utilization of personal protective devices in working environment.

1. Introduction

1.1 Background

Occupational health is an area concerned with protecting the safety, health and welfare of people engaged in work. It is about the effect of work on health. It plays a vital role in helping employers care and understand the need of their employees to create enabling businesses with reduced sickness, absence level and optimized staff performance and productivity. Occupational health remains neglected in developing countries because of competing social, economic, and political challenges, (1).

The modern tanning industry in Ethiopia was started in 1920s. It is the second largest component of Ethiopia's export earnings after coffee, representing 14% of total earnings. There are 26 tanneries and together they employ **4577** persons in the country. Ethio-leather tannery, Dire tannery, Waliya tannery, Batu factory, Addis Ababa tannery and Cristal tannery are tanneries found in Addis Ababa with a total employee 2333 person, (11). These tanneries produce largely semi-processed and some finished hides and skins. With respect the degree of tanning these tanneries are largely limited to semi-processing activities and currently only 14% of total production is finished leather (2).

Leather is exclusively vast, multi-dimensional and mutually dependent material all over the world. Currently more than 5000,000 people are working in this sector and the number of workers is increasing from day to day all over the world.. The food and agriculture organization (FAO) shows that world trade of commodities such as sugar, coffee, cotton, rubber, rice, and tea is not bigger than hides and skins trade. The growth rate of tanning materials is increasing in developing countries (1).

Leather production uses raw material in the form of cow and buffalo hides, skins of goats and sheep which are locally collected and a number of important chemicals. Hundred and Thirty different type chemicals are used in leather manufacturing which ranges from common salt (sodium chloride) to very expensive chrome Sulphate. Leather manufacturing

involves major steps like pre-processing, pre-tanning process, tanning process; wet finishing process, dry finishing and finishing process (3).

The chemical used in the leather industry can be divided in to three broad categories: pre-tanning chemicals, tanning chemicals, and finishing chemicals. Pre-tanning chemicals are used to clean and prepare skin for tanning process and they are mostly washed away with waste water. Chrome Sulphate is the basic tanning chemical which is expensive and also series pollutant. Finishing chemicals are used to impart certain properties of leather like softness, color, appearance etc. like tanning chemicals finishing chemicals also get discharged in to waste water (3, 7).

Trivalent chromium is released from chrome tanning process. This is much less toxic than hexavalent Chromium. The toxicity of chromium is variable for plants and animals, algae have been shown very sensitive to chromium levels. Suspended solids also reduce light penetration and thus photosynthesis in the water. Apart from Sulphate and natural these salts natural salt is also found in the wastewater from tanneries this can affect fresh water aquatic life if their concentration becomes too high (5).

1.2 Statement of the Problems

Work related accidents and diseases continue to have serious consequences with an estimated 2.3 million fatalities per year and economic losses of 4% of global GDP. (8) Employment in the tannery and leather manufacturing product industry has been associated with various diseases caused by biological, toxicological, and carcinogenic agents. The specific diseases associated with exposure in the tannery industry depend upon the extent to which the work is exposed to the agents which is in turn dependent upon the job category of workers within the industry (5).

During tanning process, infection can occur due to contact hazard, since the hide serves as a medium for numerous micro-organisms. Yeasts, tetanus, anthrax, leptospirosis, epizootic aphtha, Q fever and brucellosis are example of diseases that workers could contract during the tanning process due to infected hides. Skin disorder or contact (allergic) dermatitis has been diagnosed among leather tanners exposed to the preservatives applied to the hides. The leather tanning and finishing process has been shown to have the highest incidence of dermatitis of any working group in the United States. Irritation of mucous membrane of the throat and nose and perforation of the nasal septum may also occur after inhaling chromic acid fumes liberated during the chrome tanning process, (7).

The chemical used in leather production are intended to alter the structure of animal hides and it may have the same effect on worker's skin. Many of these chemicals are considered to be potential sensitizers. Tannery workers who are frequently exposed to these chemicals for prolonged period are at considerable risk of developing occupational contact dermatitis. (17)

In UK, skin diseases account for 22% of occupation diseases, and is the second commonest caused after musculoskeletal disorders. Eighty percent (80%) of occupational skin disease is due to contact dermatitis (22). Occupational skin diseases can occurs at any working age and its occurrence varies from one occupation to another and between the sexes. The incidence in females is greater at young age, whereas the incidence in men increases with age. The hands are more often affected (18)

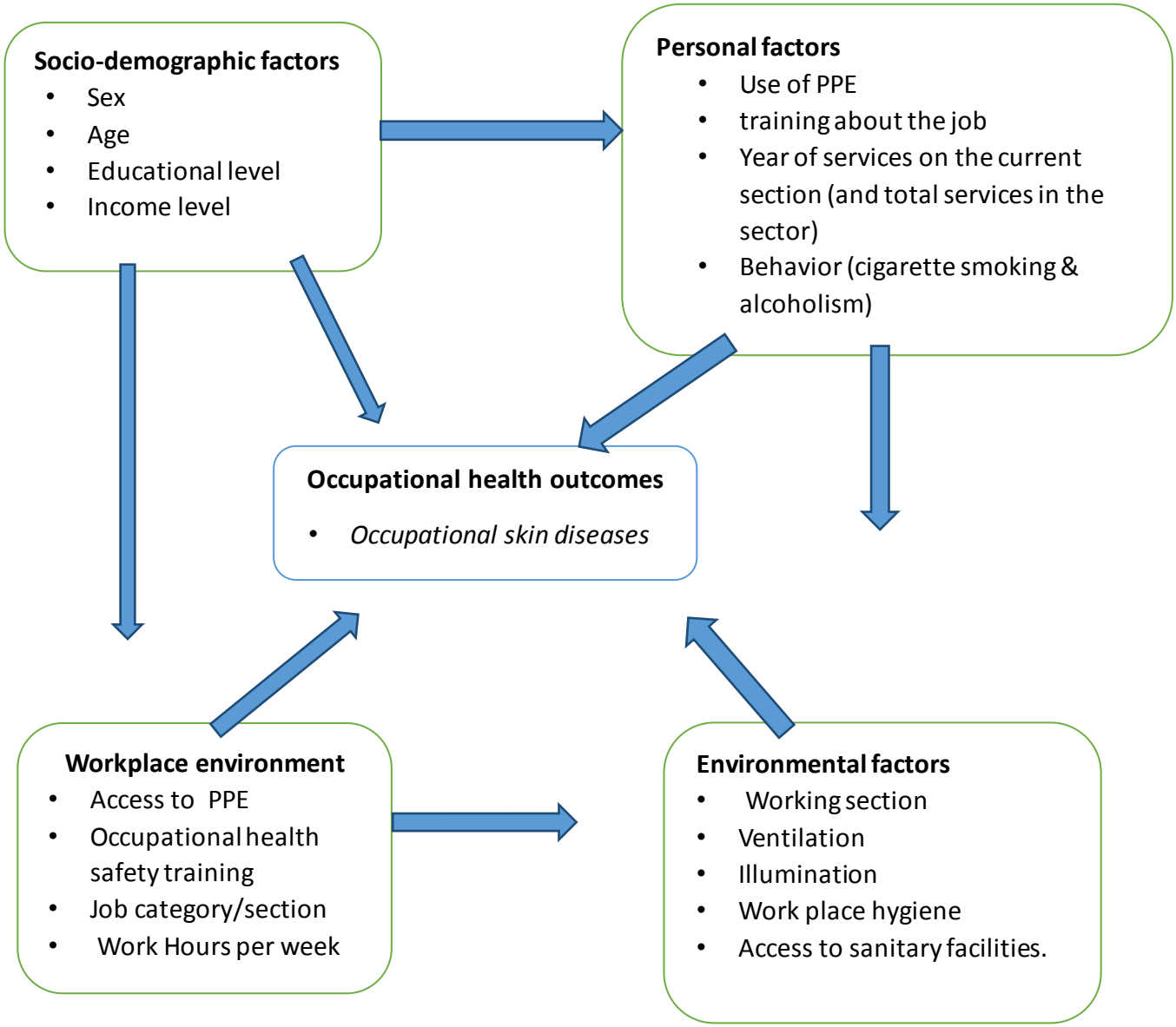
The tanning industry has two opposite aspects; it brings economic prosperity and also it causes health problems for workers. Moreover it has detrimental effect on surrounding environment as well. Workers health has relationship with surrounding areas, equipment, workplace floor, chemicals, and ways of dealing with machine, and all activities performed determine the workers' health (1). Tannery workers may be expose to chemical hazard during loading handling, mixing of chemicals, washing and disposing of chemical containers, during management and disposal of chemical waste and effluent (6).

Health impact from tannery disposal waste is increased probability of death due to sufferings by illness including skin diseases, fever, headaches. Studies by FAO/1993 have found that metal concentration are high and increasing consumption of these vegetables; health problems for consumers in future are inevitable. Sever effect include reduced growth and development, cancer, organ damage, nervous system damage, and in extreme cases death. Rome 4000 people are working in the 35 industries in Bangladesh; most of workers are suffering from different diseases. About 35% of tannery workers are suffering from gastrointestinal diseases, 25% from dermatological diseases, and 10% from headache, hypertension and lethargy. Most of workers expressed that they have experienced skin problems because of their frequent contact with chemicals. The skin lesion on their bodies, particularly on hands fingers and legs were observed on workers. The symptom of skin condition includes a rash, boil and irritation (3).

Skin disease has increased in tannery area. Beside the workers, farmers, children and fisher man are mainly affected as they work in the polluted water. The pollutants from tannery are responsible for it. Gastrointestinal diseases have been identified as a common health for workers in the area, including tannery workers, (4).

There is no any published research done in Ethiopia on occupational skin diseases among tannery workers. This study will provide base line information to understand sanitation status of tannery and prevalence of occupational skin diseases among tannery workers.

1.3 Conceptual Frame Work



1.4 Significance of the Study

Currently tanneries are booming sector in Ethiopia; nevertheless there is a serious health issues that comes in contradiction with its expansion. The workers' health conditions produced by tannery factories under major artificial conditions endanger the workers involved.

Study on occupational health effect among workers in tanneries is useful in the development of occupational epidemiology. This study provided statistical evidences and it will serve as base line information to undertake studies on similar setting. Since it is on expansion and one of the country's economic area information on occupational health and safety is helpful in raising awareness at all levels and making the problems of occupational health problems more visible to policy maker and managers.

2. Literature Review

A) Occupational safety and health:

Occupational Health is the promotion and maintenance of the highest degree of physical, mental and social well- being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs (12), It is also across-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational health and safety programs is to foster work environment. As a secondary effect, it may also protect co-workers, family members, employers, customers, suppliers, nearby communities, and other members of the public who are impacted by the workplace environment (12). The safety of work varies enormously between countries, economic sectors and social groups (3). Deaths and injuries take a particularly heavy to in developing nations, where large numbers of people are engaged in hazardous activities such as agriculture, construction, logging, fishing and mining. Throughout the world, the poorest and least protected- often women, children and migrants are among the most affected (5).

B) Burden of Disease from Occupational Exposures:

In the developing world, workers often face unregulated and unprotected exposure to known hazards. Decades ago, these minerals were the source of problems commonly faced by millions of workers in the developed world. However, the difference now is that developing country workers are being exposed when widespread knowledge is available about the risks and effective preventive measures. (11)

Dramatic changes are occurring in the global labor force, as globalization and population growth continue to shape the world economy. In Latin America and the Caribbean, the labor force is one of the fastest growing in the world: 217 million workers in 2000 are projected to reach 270 million in 2010. (6, 12)

Although the data are incomplete, the International Labor Organization (1LO) estimates that among the world's 2.7 billion workers, at least 2 million deaths per year are attributable to occupational diseases and injuries. However, this ILO estimate is really just

the tip of the iceberg, because data for estimating nonfatal illness and injury are not available in most developing countries.(12)

According to a recent comparative risk assessment of a handful of occupational hazards conducted by World Health Organization, the leading occupational causes of death were chronic obstructive pulmonary disease (COPD), followed by unintentional injuries and lung cancer. Although the WHO assessment only accounts for 40 percent (800,000) of the ILO-estimated 2 million deaths, findings showed that unintentional injuries caused 312,000 deaths globally per year for the world's 2.7 billion workers. Occupational injuries alone account for more than 10 million Disability-Adjusted LifeYears (DALYs) lost, or healthy years of life lost whether to disability or premature death, and 8 percent of unintentional injuries worldwide. With regard to disability, WHO found that back pain accounts for the largest portion of non-fatal conditions: 37 percent of all back pain worldwide is attributable to work, resulting in an estimated 800,000 DALYs lost, a significant loss of time from work, at a high economic cost, (11).

C) Occupational Injury:

Poor perception regarding to working conditions and safety environment had a significant influence on injury occurrence. Most researchers emphasize that work place injuries are caused by poor person environment which leads to increased job stress and, therefore, increases occupational injury risk. Most studies in different countries revealed that sleeping disorder, job stress and job dissatisfaction are the major risk factors for the occurrence of occupational injuries among industrial workers (13).

These studies done in Addis Ababa Ethiopia on causes of occupational injury indicated that being hit by or against objects and falling were the commonest causes of work-related injuries. Findings of a study done among textile factory workers in Addis Ababa demonstrated that the most frequent causes of occupational injury were machinery 42 (29.4%), and being hit by or against objects 29 (20.3%). Department of Environmental Health in Ministry of Health in Ethiopia reported that striking (25.5%), falling (12.8%), and flying objects from machines (8.5%) were the major causes of occupational injury. In

most studies, abrasions, cuts, burns, puncture, and fracture were the common injury types among manufacturing industrial workers. The common affected body parts among eleven industrial workers in Addis Ababa were fingers (37.3%) and hands (11.6%), (5, 8).

D) Occupational health risks among leather and tanneries workers:

Leather production includes many operations with different exposures, which can be harmful for the health of the workers, and particularly be carcinogenic. Some compounds in the tanning process are considered as probably being carcinogenic to humans (some benzene-based dyes and formaldehyde). An important health risk factor for the tannery workers is occupational exposure to chromium, mainly in the organic Cr (III) form or in the protein bound-form (leather dust). Chromium may enter the body by inhalation, ingestion and by direct cutaneous contact. Professional exposure to Cr (III) increases the risk of dermatitis, ulcers and perforation of the nasal septum and respiratory illnesses as well as increased lung and nasal cancers. Study done in India among tannery workers show that the overall prevalence of morbidity was found to be significantly higher among the tanners in contrast to that found in the controls (40.1% vs. 19.6%) ($P< 0.01$). In the case of the exposed group, it is the respiratory (16.7%), followed by ocular illnesses (14.7%) that afflicted the tanners, whereas gastrointestinal tract problems were predominant in the control groups (9.4%) (9).

Among the leather tanners, a group of 10 subjects (5.07%) reported redness in the conjunctiva with prominent bulbar vessels, seven subjects (3.55%) reported congestion of the nasal mucosa. Nearly 9% (n = 17) of the leather tanners reported dermatological diseases such as rashes and papules along with complaints of itching. The burning sensation was reported by 15 subjects (7.6%) in the exposed workers The prevalence of respiratory impairment was found to be significantly higher among the leather tanners in contrast to that observed in the control group (30.9% vs. 16.2%) ($P< 0.001$). Bronchial obstruction followed by lung restriction was the main abnormality found in the exposed group, (8).

E) Occupational Contact Dermatitis

Work-related skin disease may be defined as any disorder of the skin which is caused by or made worse by work or workplace activity (28). The terms dermatitis and eczema are interchangeable and refer to a particular type of inflammatory reaction of the skin which may be triggered by internal or external factors. Occupational contact dermatitis is an exogenous eczema caused by the interaction of the skin with chemical, biological or physical agents found in the work environment (27).

Contact dermatitis accounts for 90% of all occupational dermatoses and in 80% of the cases, it will impair a worker's most important tool, the hands. Direct contact with the offending agent is the usual mode of production of the dermatitis, but other mechanisms may be involved. Particulate matter such as dust or smoke, or vapours from volatile substances, may give rise to airborne contact dermatitis (27).

A study done in Korea on occupational skin diseases revealed that contact dermatitis 74.1% was most common among occupational skin diseases, followed by pigment disorders 7.3%, nail disorders 6.7%, and burns 4.3%) (12).

The same study indicated that characteristics of contact dermatitis, 64.5% workers were chronic cases with repeated healing and relapse. In addition, 72.5% workers answered that colleagues had similar skin diseases, which indicated clustered incidence. In the aspect of controlling, 64.9% workers answered that personal protective equipment (PPE) was not effective, accounting for the larger number compared with workers who answered that PPE was effective.

Contact eczematous dermatitis can be caused by hundreds of irritant and sensitizing chemicals, plants and photo reactive agents. Symptoms include itch, burning and general discomfort. The back of the hands, the inner wrists and the forearms are the usual sites of attack, but acute contact dermatitis can occur anywhere on the skin. If the dermatosis occurs on the forehead, the eyelids, the ear s, the face or the neck, it is logical to suspect that a dust or a vapour may be involved in the reaction (30).

F) Personal protective devices

Occupational contact dermatosis can be prevented by applying a hierarchy of occupational control measures [i.e. hazard elimination, substitution, engineering controls, safe work practices and, where this is not possible, personal protective equipment (PPE)] Where adequate control of exposure cannot be achieved by other means, suitable personal protective equipment should be provided in combination with other measures. The use of gloves must take into account appropriate selection and training on glove usage, including the provision of cotton liners (29).

Personal protective equipment offers protection only when selected and stored correctly, worn properly, removed safely and either replaced or maintained regularly. Limiting gloves to only use where necessary helps to prevent these additional complications (12, 17).

3. Objectives

3.1 General Objective

- To assess the prevalence of occupational skin diseases and its associated factors among workers of tannery industry found in Addis Ababa.

3.2 Specific Objectives

- ✓ To assess prevalence of the occupational skin diseases
- ✓ To assess factors associated with occupational skin diseases

4. Methods and Materials

4.1 Study Area:

The study was conducted from February 1, 2014 – March 30, 2014 in tannery factories found in Addis Ababa city. Data found from leather industries development institute (LIDI) showed that there are six tanneries employees in Addis Ababa having 2333. From a total sampled 311 workers, 7 refused to participate that made the response rate of 97.8%.

Work process of tanning factories involves three steps:

1. ***Beam house:*** The aim of beam house process is to put the hide into a proper chemical and physical condition for the subsequent removal of unwanted substance in the finished leather. Liming is done to remove hair and appendices. Hides are put in drums filled with lime, metam sodium and sodium Sulphate to achieve the alkaline condition. Hair and skin appendices are also removed manually with fleshing knives. Finally the hides/skin is transformed in to an acidic condition (pickling) using formic acid sulphuric acid sodium chloride formate and sodium metabisulphite, these chemical may dehydrate the worker's skin.
2. ***Tanning stage***: tanning is the chemical process to convert the hide/skin into tanned leather by stabilizing the collagen structure, protecting the leather from enzymatic and microbial degradation and enhancing the strength and increasing its resistance to heat, hydrolysis. Trivalent chromium Sulphate is widely used as tanning agent to form cross linking collagen. Workers do it with bare hands; chromium, sulfur, manganese, lead, copper compounds and others are used to tan.
3. ***Finishing stage***: in re-tanning processes, semi-finished leather undergoes dyeing fat liquoring and coating to create elasticity, softness, impermeability and brightness of tanned leather. Leather is then stretched and pulled on metal frame (toggling) and undergoes a trimming process to remove the unwanted part of the hide/skin. The last stage in finishing is the application of a protective and decorative coating, the dyeing is applied. In finishing stage a huge amount of dyes, pigments and chemicals used again.

4.2 Study Design and Period:

An institutional-based cross sectional study was done to assess occupational skin diseases of selected tannery workers of Addis Ababa from February 1, 2014 – March 30, 2014. Random samples of 311 workers drawn from different sections of three leather tanneries of Addis Ababa for the health survey.

4.3 Study Population:

Selected tanneries workers from tanneries found in Addis Ababa Ethiopia

4.4 Sampling methods and sample size determination:

To determine the sample size, the formula for single population proportion was used. Based on the reported health effects during tanning process the prevalence of 30% occupational dermatitis of tannery workers was used (9). With 5% degree of permission was used and none response rate 10% was added. Then the study subjects were selected by systematic random sampling from their salary rosters.

$N = z\ (a/2)^2 * p\ (1-p)/d^2$ finite population correction $n' = n/(1+n/N)$

- $N = z(a/2)^2 * p(1-p)/d^2$

N = sample size

Z a/2 = standard score corresponding to 95% CI

P = 30% prevalence

d = 5% margined of error

$N = z\ (a/2)^2 * p\ (1-p)/d^2$

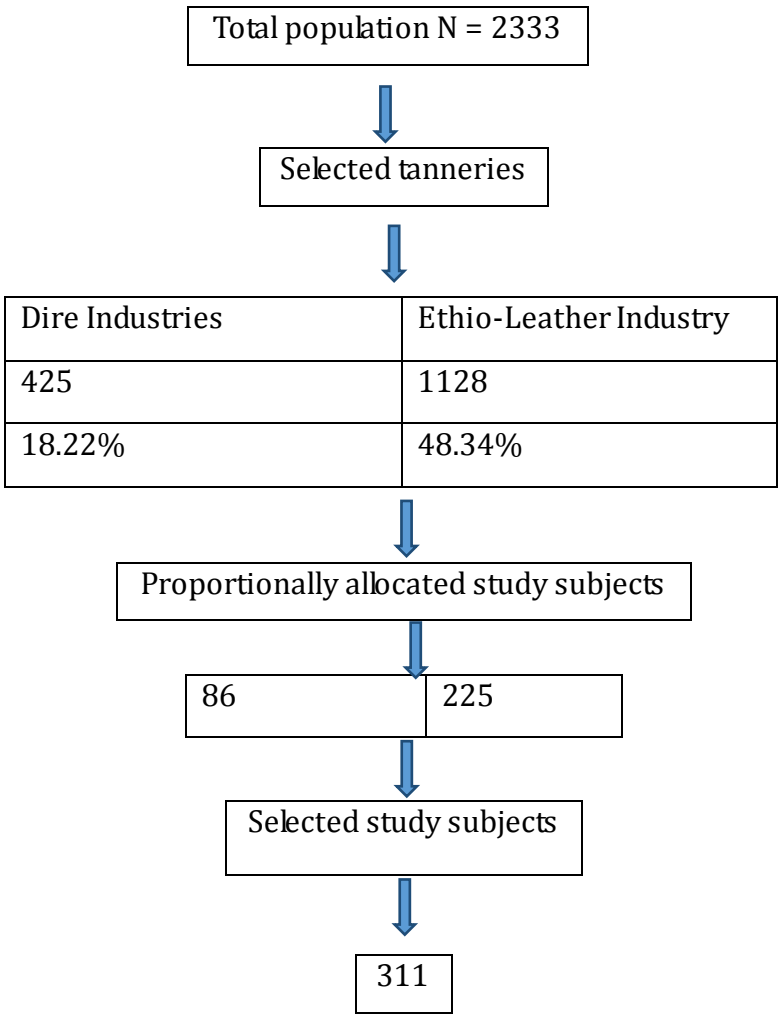
N = 323,

$n' = n/(1+n/N) = 284$

4.5 Sampling procedure:

The 3 tanneries found in Addis Ababa city and surrounding areas giving a total sample size of 311whichwasallocated proportion ally with respect to the number of each tannery staff. The study units were selected by systematic random sampling starting point from the workers roster to capture sample sizes in the given specific industry.

Sampling procedure



4.6 Data Collection procedures:

Data was collected using pretested and structured Amharic version questionnaire adopted form Nordic Occupational Skin Questionnaire and interviewed via face to face of the study participants (23). The questionnaires were administered by three data collectors who were trained for two days. First questionnaires were written in English and then translated to Amharic and then back translated to English by other person to check the consistency of translation. Five percent of the questionnaires were pre-tested on workers which were not selected, to identify potential problem areas, an anticipated interpretation and cultural objections to any of questions.

4.7 Operational definition

- Respiratory illness symptoms: is an illness feeling participants have answered subjectively having at least one of respiratory illness symptom in the 12 months prior to the study.
- Hazard: anything that potentially cause harm on workers in the industry.
- Tannery: is place for tanning hides or building or factory where animal skins and hides tanned.
- Skin disorder symptoms: is an ill feeling participants have answered subjectively having at least one of skin disorder such as eczema, rashes, boil, itching, redness, and burning, in the 12 months prior to the study.
- Excessive heat: if workers found sweeting or wear light clothes when naked. If the investigator feels sudden heat when entering in to workplace.
- Excessive dust: if investigator experiences sudden sneezing upon entering the industry or if workers eyebrows, hair, nostrils and clothes are observed covered with dust particles.

4.8 Study Variables:

The personal history included details of personal characteristics, age, smoking history, alcohol socioeconomic status and living conditions were included

Dependent Variables

- Occupational skin diseases are the outcome variable

Independent Variables

- Socio demographic factors: sex, age, religion, ethnicity, marital status, level of education, monthly salary, employment condition, work experience.
- Work environment determinants: health and safety information, health and safety training, workplace supervision, work section, PPD utilization, ventilation, illumination.

4.9 Data processing and Analysis:

Quantitative data was entered by EPI Info version 3.5.4 then exported to SPSS version 21 statistical packages for cleaning and analysis. Frequency count and percentage were used to clean and check the accuracy of data entry. Data was analyzed to determine the overall prevalence of occupational diseases and injuries. Statistical association was checked among dependent and independent variables. Cross tabulation, and odds ratio (OR) using 95% confidence interval (95%CI) was done on SPSS. First bivariate analysis was done by logistic regression model then variable which shows statistically significant were used as covariates to see the relative effects of independent variable on dependent variables by controlling for potential confounders. Differences was considered to be significant, when P-Value was less than 0.05($P < 0.05$).

4.10 Data quality management

Two days training on data collection procedures, how to keep the quality, its completeness and timely recording of data was given for data collectors. Pre-testing for questionnaire was done on 20 workers to assure the quality of the data and for improvement of data collection tools. Supervision during data collection was done to understand how the data collectors are handling the questionnaire and each filled questionnaire was checked for its completeness, accuracy, clarity, and consistency on daily basis/ finally it was analyzed by principal investigator.

4.11 Dissemination and utilization of the result

The result of this study will be presented to Addis Ababa University School of Public Health, it will also be communicated to Ethiopian leather industry development institute, and with respective tannery industries where was data collected. The result will also be availed by publication.

4.12 Ethical consideration

Ethical clearance was obtained from the Research and Publication Committee, School of Public Health Addis Ababa University. Official letters were written from the School of Public Health to the respective tanneries. The purpose of study was explained to the study subjects.. Study subjects were told that the information they provided kept confidential and that their identities would not be revealed in association with the information they provided. Informed consent was secured from each participant. Cases were advised to visit the nearby health services regarding health problems they encounter. For bad Working environment assessment findings feedback will be given to all tanneries involved in the study. There is a plan to give copy of the result to the respective study tanneries.

5. Result

A) Socio demographic information:

Almost all study population was living in the city, Addis Ababa. Majority, 213 (70.1%) of study participants were males. The age of study subjects ranged from 18 to 65 years old with a mean age of 39.66. The age group 31-50 years with a total of 220 (72.37%) study subjects constitute majority of respondents. Among the study population, majority of the study subjects were married 214 (70.4%). Followed by single and divorced/widowed respectively the 55 (18.1%) and 35(11.5%).

The mean (SD) monthly income of respondents was 1,663 (± 488) ETB birr/month; 819 and 3400 were the minimum and maximum monthly salary of the study participants, respectively. The majority (76.6%) of respondent have monthly salary between 819 and 2006 birr/month. (See table 1) Table 1 shows the result of analysis of Socio demographic information of the study population.

Table 1 Socio-demographic characteristics of selected Tannery workers of Addis Ababa, Ethiopia, May 2014

Characteristics		**Number**	**%**
Gender	Male	213	70.1
	Female	91	29.9
Age	18-30	53	17
	31-40	108	35.5
	41-50	112	36.8
	51-65	31	10.2
Marital status	Married	214	70.4
	Single	55	18
	Divorce/ widowed	35	11.5
Educational status	No formal education	27	8.9
	Primary education	123	40.5
	Secondary and above	154	50.7
Monthly income (ETB)	800-1500	131	43.1
	1501-200	101	33.2
	2001-2500	59	19.4
	2501-3500	13	4.3
Work service (in year)	1-10	118	38.8
	11-20	75	24.7
	Above 21	111	36.5

B) Work environment factors

Nearly all workers 297(97.7%) worn Gowon and put on boot shoes, while 105 (34.5%) had glove and only few (3%), had mask. Although some of the workers had a pair of eye glass, they complained it is not suitable/combatable to use it all the time. Four major work sections/categories are available in the Tanneries, 115 (37.8%) were working in the Crust room, 87 (28.6%) were working in Beam House, and 65 (21.4%) were working in Retanning and Dying room while 37 (7.9%) work finishing room (See figure 1).

Almost all workers included in this survey were permanent workers, because the time at which data collection started, there were no contract workers, as they were requited only for some duration of time, and hired periodically. Majority, 185 (60.9%) of respondents did not have any occupational health and safety training, while 247 (81.3%) of the respondents had perceived health risk involved due to working in tannery.

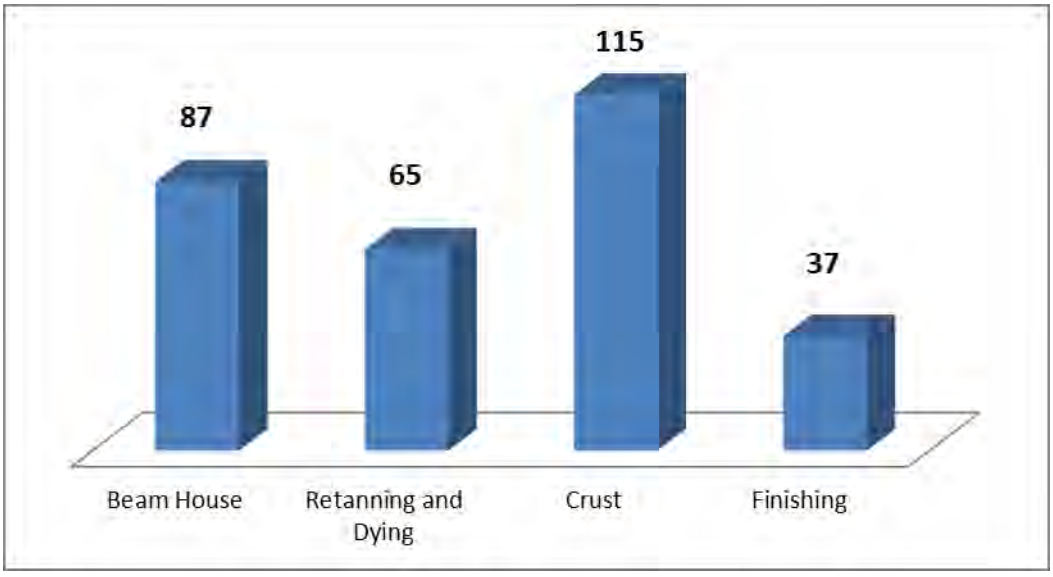


Figure 1 Work Sections/Work Categories Found in selected Tanneries of Addis Ababa, Ethiopia May 2014.

The average (SD) work experience in the tannery was 15 +/- 9.2 years. Half of the workers had experience from 1 to 14 years and 7% of the workers had 1 to 3 years' experience. One hundred thirty four (44%) of the workers are not satisfied by their current job. Table 2 depicts the description of selected Work environment factors, see it.

Table 2 Work environment factors of selected Tannery workers of Addis Ababa, Ethiopia, May 2014.

Characteristics		Number	%
Safety training	Yes	119	39.1
	No	185	60.9
Access of PPD (gown, boot/shoes)	Yes	297	97.7
	No	7	2.3
Risk awareness	Yes	247	81.3
	No	57	18.8

C) Behavioral characteristics

Almost all participants did not smoke cigarette nor chew khat whereas 61 (20.1%) drink alcohol occasionally (with special events or it intended for use as needed). Almost all workers reported that they had visited the clinics when they got signs or symptoms for any health problems at work place, the medical cost was covered by the organization/tanneries, with some limited ranges of money, and sick leave is also given.

D) Skin disease:

Nearly 34% (n=103) of leather tanners reported one of dermatological symptoms such as eczema, rashes, burning sensation, papules along with complaints of itching. They had at least one sign and symptoms of skin problems in the past 12 months prior to data collection period. Of 103 respondents who reported having skin disease, Seventy three (29.1%) were females and 73 (70.9%) were males. Among workers having skin diseases 30-40 age group 49 (45.4%), and 40-50 age group 34 (30.4%) had skin problems in the past 12 months prior to data collection period (See Table 3 below).

Table 3 Distribution of Occupational Skin Diseases by Age Category of Tanneries workers of Addis Ababa, Ethiopia June 2014.

Characteristics	Occupational skin diseases		Total
	No#%	Yes#%	
Age category			
18-30	41(77.4%)	12(22.6%)	53
31-40	59(54.6%)	4(45.4%)	108
41-50	78(69.6%)	34(30.4%)	112
51-65	23(74.2%)	8(25.8%)	31
Total	201(66.1%)	103(33.9%)	304

Workers working in beam houses 42 (48.30%) and working in Retanning and Dying 24 (37%) had occupational skin diseases; and about males 73 (24%) and 30 (9.8%) females reported that they had occupational skin diseases; see Figure 2 that depicts distribution of occupation skin among tannery work section.

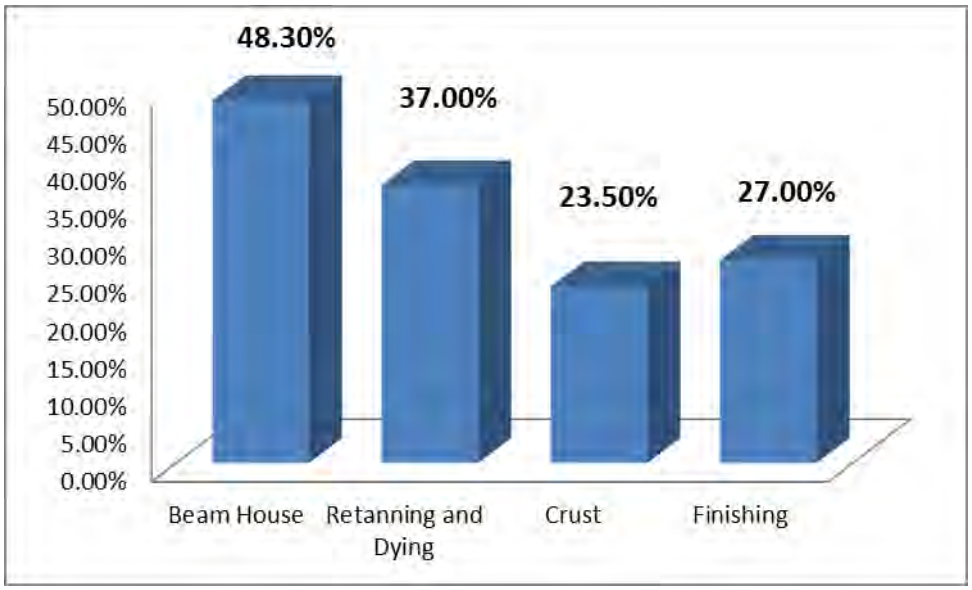


Figure 2 Distributions of Occupational Skin Diseases by Work Sections of Tanneries workers of Addis Ababa, Ethiopia May 2014.

About 25(8.2%), of workers reported that they got occupational skin diseases only once and followed by 54 (17.8%), and 24 (7.9%) more than once, and nearly all the times respectively. Out of workers that report had occupational skin diseases 46 (44.6%) of workers noticed that their skin diseases worsen by contact with materials or chemicals during work time. And the same number of workers had skin diseases improvement on skin diseases when away from work section during weekend or vacation (See table 4 below).

About 46 (15%) of workers reported that they noticed occupational skin diseases Worsen by contact with materials/chemicals. And equal number of respondent 46 (15%) of workers reported that thy noticed that improvement of their skin diseases when they were away from work. One hundred (33%) of workers reported that they had as diagnosed for the skin diseases.

As Figure 3 below indicates; most commonly affected body part by occupational skin diseases were 99 (32.5%) the hands, and followed by 66 (21.7%) and 20 (6.6%) respectively.

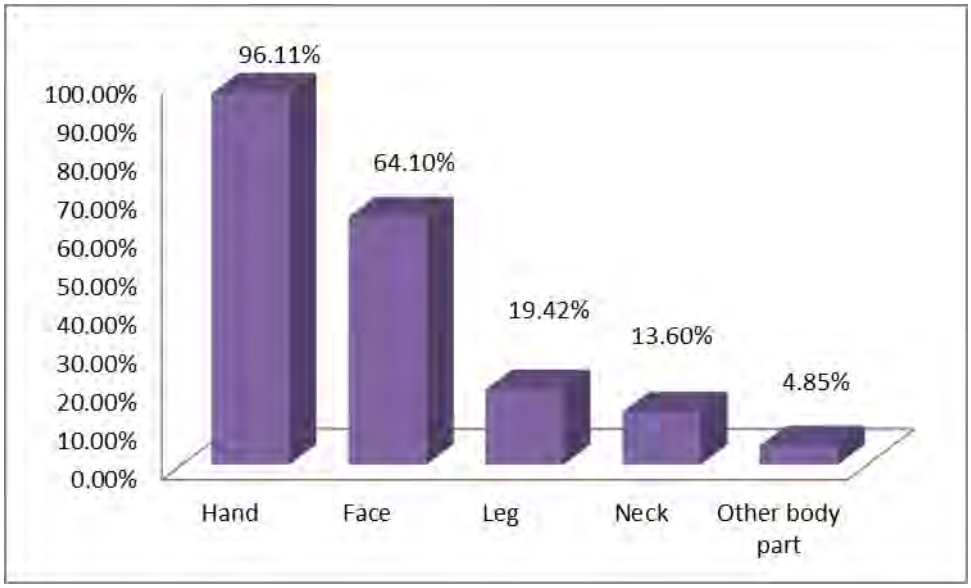


Figure 3 Distribution of Occupational Skin Diseases on some body parts of Tanneries workers of Addis Ababa, Ethiopia May 2014.

E) Observation:

A thorough observation was done in all three tanneries namely Awash tannery, Abyssinia tannery and Dire tannery. The observation mainly focused on system of the worker handling use of procedures, personal protective equipment, precautions and availability of sanitation.

A) Work safety standards and the use of personal protective devices: occupational skin diseases risk in tanneries is mainly related to the frequent and prolonged exposure of the workers skin to chemical substances, to hot and humid environmental conditions and to machinery equipment. Workers exposed to hazardous chemicals through skin absorption, inhalation and ingestion.

Workers at beam house and tanning area exposed to chemicals during the whole process including cleaning and disposing chemical wastes as these rooms are humid, had no ventilation system and had high temperature. Some of the workers perform their tasks in acid solution at pickling stage without wearing musk, gloves, and apron.

Personal protective equipment required by the workers in this area is gown, glove, apron, boots, goggles and respirator. Only some workers wore a thin plastic apron that did not cover all the part of their body exposed to chemicals. They also wore plastic boot that covered the lower legs and the feet. Some workers used synthetic rubber gloves that covered their hands and lower arms. Some workers work with bare hands. Despite this observation I noticed that some reluctance against the use of personal protective devices.

B) Hygiene and Sanitation facilities:

The house covered by high walls which have not proper ventilation system, the air inside the factories is with fume and heat; Very bad smells are also emitted. The majority of workers practiced basic behavioral principles in personal protection; they washed the exposed skin area after handling chemicals. Bathroom and dressing room were available at observed tanneries.

F) Determinants for the occurrence of skin diseases

We used binary logistic regression model to explain the relationship between skin problems and selected socio demographic variables with different factors/variables: work section, safety training, income and having some other diseases were significantly associated with occurrence of skin diseases. No statistically significant difference was found in the occurrence of skin diseases by sex of the study population. Similarly marital status, ethnicity, educational status, and religion did not show any statistically significant association with occurrence of skin diseases.

The odds ratio of skin diseases of age group, 31-40 is 2.8 times higher than that of age group of 18-30 (OR= 2.838, 95% CI (1.345-5.986)), and of those age group between 41-50 had chance of developing skin diseases is 49% compared with age group of 18-30 (OR= 1.489, 95% CI, (0.697-3.181)), odds ratio of respondents of 51-65 age group is 18%more likely (OR= 1.18, 95% CI (0.427- 3.3.9)) time more likely to have skin diseases than age group of 18-30

Workers who had glove 67.5% (OR=0.325 95% CI (0.180-0.588)) less likely to develop skin diseases compared to those did not had glove. Worker those did not got safety training had twice (OR= 2.414 95% CI (1.34 - 4.34)) odds of skin diseases compare to those got training. Having awareness on health risk working in Tannery did not have significant association in getting the skin diseases.

Table 7 Result of Logistic regression and determinant factors occupational skin diseases of Tanneries workers of Addis Ababa, Ethiopia May 2014.

Characteristics	Occupational skin diseases		OR 95% CI	Adjusted OR 95% CI
	No # (%)	Yes # (%)		
Age				
18-30	41(77.4%)	12(22.6%)	**1**	
31-40	59(54.6%)	49(45.4%)	**2.838 (1.345-5.986)***	
41-50	78(69.6%)	34(30.4%)	1.489 (0.697-3.181)	
51-65	23(74.2%)	8(25.8%)	1.188 (0.424-3.329)	
Work section				
Beam House	45(51.7%)	42(48.3%)	**1**	**1**
Crust	88(76.5%)	27(23.5%)	**0.329(0.180-0.600)***	**0.115 (0.053- 0.252)***
Finishing	27(73.0%)	10(27.0%)	**0.397(0.172-0.918)***	**0.128 (0.047 - 0.348)***
Retanning and Dying	41(63.1%)	24(36.9%)	0.627(0.325-1.209)	0.475 (0.220 - 1.026)
Income /salary				
800-1500	95 (72.5%)	36 (27.5%)	1	
1501-2000	61 (60.4%)	40 (39.6%)	1.730 (0.995-3.009)	**1.905 (1.03- 3.517)***
2001-2500	39 (66.1%)	20 (33.9%)	1.353(0.698-2.623)	1.974 (0.85- 4.55)
2501-3500	6 (46.2%)	7 (53.8%)	3.079(0.969-9.781)	**4.527 (1.21- 16.81)***
Safety training				
No	133 (61.0%)	85 (39.0%)	**2.414(1.343-4.340)***	**2.442(1.33-4.45)***
Yes	68 (79.1%)	18 (20.9%)	1	1
Glove				
No	125 (59.2%)	86 (40.8%)	1	
Yes	76 (81.7%)	17 (18.3%)	**0.325 (0.180-0.588)***	**0.126 (0.06- 0.26)***

6. Discussion

Occupational skin diseases include allergic contact dermatitis, irritant contact dermatitis, contact urticaria, infectious diseases and skin cancers. This Study was conducted primary to assess occupational induced skin diseases among tannery workers of selected Addis Ababa tanneries. It provides also valuable information about general condition of workers in the tanneries.

Nearly 34% (n=103) of leather tanners reported dermatological diseases such as eczema, rashes, burning sensation, papules along with complaints of itching. Studies done in Turkey, India, UK and Bangladesh on tannery workers 29.3%, 23%, 22% and 31% respectively showed that workers had Slightly less occupational skin diseases, (9, 20, 21, 22). The difference could be due to sample size and the working area conditions that might not expose the workers to different determinant factors.

This survey depicts occupational skin diseases were high among beam house workers **i.e.** odds ratio for Crust room workers **(AOR=0.115, 95% CI (0.053- 0.252))** is88.5% less likely to develop disease and also for finishing room workers **(AOR=0.128, 95% CI (0.047 - 0.348))** is 87.2% less likely to develop disease compared with Beam house workers. A study done in India among tannery workers in dictated there was clear association that beam house workers had 2.6 times more developing occupational skin diseases. The sulfuric acid is strongly corrosive which may cause permanent damage to skin if any workers worked bare hand in acid solution. This reflects during beam house activities there were direct contact with wet hides and manual handling of hides, (24).

Workers who had glove 87.4% **(OR=0.126 95% CI (0.06 - 0.26))** less likely to develop skin diseases compared to those did not had glove. Worker those did not get safety training had twice **(OR= 2.442 95% CI (1.34 - 4.45))** odds of developing skin diseases compare to those got training. Having awareness on health risk working in Tannery did not have significant association in getting the skin diseases.

In this study the hands of 99 (32.56%) and the face 66 (21.7%) of workers were the most common part of the body affected by occupational skin diseases. However a study done in Indonesia on tannery workers depicted that occupational skin disease affected the trunk, lower extremities, and face/ neck >50% of the workers (25). A possible explanation for those typical diseases location is inappropriate use of personal protective devices: working without glove, splashing of chemical on face, using wet or contaminated aprons or boots. In this study there was no significant difference for occurrence of symptoms of diseases with respect to age.

Strength and limitation of the study

Strength

- The study covers larger tanneries found in the Addis Ababa
- The response rate was 97.75%
- The study utilized pre-tested structured questionnaire and trained data collectors
- Quality control during data collection, data entry and analysis
- This study can serve as baseline data for further studies of occupational health problems on tannery workers

Limitation

- since the study used cross-sectional study design it could not explain cause and effect relationship
- Qualitative design was not used to substantiate the quantitative findings.
- There could be biases, like recall, social desirability.

7. Conclusion

It can be concluded that the prevalence of occupational skin diseases is 34% in this population of tannery workers to be high. The study reveals that having no safety training, no awareness on safety measures and failing to use personal protective equipment had shown a significant association with an increased prevalence of skin disease. Workers Working in Beam house followed by Retanning and Dying section had shown increased association of reporting skin disease.

Recommendation

- Each tannery management/ administration should provide full personal protective devices and enforce its usage.
- The tannery should arrange periodic occupational health and safety training and full annual health checkup.
- Comparative or longitudinal studies are recommended to examine the real cause and effect relationship of the determinants.

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9. Annexes

6.1 Questionnaires

Questionnaire for the assessment of health risk of occupational exposure among tannery workers in Addis Ababa, Ethiopia

Identification

Identification number ---------- Name of enterprise ----------

Introduction and consent form

Hello my name is----------, I am here on behalf of the research team of the Addis Ababa University, School of Public Health. We would like to assess the health problems encountered here, and also we would like to know the prevalence of occupational induced health problems and what causes the health problems. To get this information, we are caring out interview in this tannery. The result from this project will be used to help policy makers and other responsible bodies to improve occupational safety and health service in this organization. I will ask you a few questions about the health symptom and out comes encountered within the last years since you came here. The questions about occupational health problem that I would like to ask will take about 20 minutes of your time. What you tell me will be kept strictly confidential, your name will not be registered and your information will never be transferred, to another party or interpreted wrongly. Your participation is volunteerand you are not obliged to answer any question; if you do not wish to answer you are free to stop the interview at any point.

So, may I continue?

1. Yes 2. NO

Informed consent certified by

Interviewer Name_____ signature_____

Date of interview_____ Time started_____ Time completed_____

Result of interview - 1. Completed _____ 2. Respondent not available_____

3. Refused_____4. Incomplete_____

Checked by Supervisor_____ Signature _____Date _____

For any convenience and problem you can contact the principal investigator

Phone -09 10 39 36 92 E-mails- dejenesm26@yahoo.co

No	Question	Possible answers	skip	Code
Part I Socio demographic characteristics				
1.	Residence	1.Urban 2.Rural		
2.	Sex	1.Male 2.Female		
3.	Age	---------years		
4.	Marital status	1.Married 2.Single 3.Divorced/separated		
5.	Ethnicity	1. Oromo 2. Amhara 4.Tigrai 4. other specify_____		
6.	Educational level	1. Illiterate 2. Read & write 3. education grade _____		
7.	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Other specify		
8.	What is your present occupation?			
9.	Where is your work section			
10.	Pattern of employment	1.Permananent 2.Temporary		
11.	Monthly salary	Birr		
12.	Have you signed work agreement			
13.	Total services year in the tannery	Months/years		
14.	Service duration in the same job	Months/years		
15.	Are you satisfied by your current job	1.Yes2.No		
16.	Do you have full personalProtective equipment?	1.Yes2.No		
17.	If the answer for Question number13 is" yes " list them	1.Yes2.NO		
18.	If the answer for question number 13 is "No" why not use it Properly?	1.Not provided by the organization 2.Not comfortable for work		
19.	Have you taken anyOccupational safety training?	1.Yesb 2.No		
20.	If yes for how long?			
21.	Do you think that working in the Tannery can expose to different health problems?	1.Yes2.No		
22.	If the answer for question number 17 is "Yes" please list some Health problems?			
23.	If the answer for question number17 is "Yes" please list some Health problems?			
24.	**Part II Respiratory Health problems related questions**			
24.1	Do you usually cough during working time (excluding clearing throat or single	1.Yes2.No		

	cough)			
24.2				
24.3	Are you ever troubled by shortness of breath?	1.Yes2.No		
24.4	Does your Chest ever feel tighter & Your breathing becomes difficult?	1.yes2.No		
24.5	Have you ever had **wheezing** or whistle at any time in thepast?	1.Yesb 2.No		
24.5	Have you ever had diagnosed asthma?	1.Yes 2.No		
24.5	The above sign and symptoms manifested	1. Before join thework 2. After join the work		
25.	**Occupational Skin disorders related questions**			
25.1	Have you ever had eczemawhich was coming and going for at leastsix months in the last 12 months?	1.Yes2.No		
25.2	Have you had itchy rash at any time in the last12months?	1.Yes 2.No		
25.3	Have you had this itchy rash at any time in the last12months?	1.Yes2.No		
25.4	Have you had burning at any time in the last 12months?	1-Yes2-No		
25.5	The above skin disorders Major attack at any of the following body parts?	1. Hand2. Face 3. Leg4. Neck 5. Additional		
25.6	The above sign and symptoms manifested	1. Before join thework 2. After join the work		
25.7	How often have you had skin disease on your hands, wrists or forearms?	1. only once 2. more than once 3. (nearly) all the time		
25.8	When did you first get skin diseases on your hands, wrists or forearms?	1. below 6 years of age 2. between 6 and 14 years of age 3. between 15 and 18 years of age 4. above 18 years of age		
25.9	What do you think was the cause of the skin diseases?			
25.10	Have you noticed that contact with certain materials, chemicals or anything else in your work makes your skin diseases worse?	1. Yes 2. No		
25.11	Do your skin diseasesimprove when you are away from your normal work?	1. Yes 2. No		
25.12	Has your skin diseases affected your daily activities in your occupation in	1. Yes 2. No		

	any way?			
25.13	Has your skin diseases had a negative influence on your financial situation?	1. Yes 2. No		
25.14	Has a doctor ever diagnosed you with skin allergy?	1. Yes 2. No		
26.	**Part III Others health symptoms**			
26.1	In the past12 months, have you had a problem with **headache**When you came in to the workplace?	1.yes 2.No		
26.2	In the past 12months have you had frequent problem with**Back pain**?	1. Yes 2. No		
26.3	Have you had **Kidney problem**?	1. Yes 2. No		
26.4	In the past 12 months have you had a problem with **Dizziness**When you were at work?	1. Yes 2. No		
26.5	Have you ever **Faint** in the tannery during working hours?	1. Yes 2. No		
27.	The above sign and symptoms manifested	1. Before join thework 2. After join the work		
28.	Did you visit health facility following disease symptoms?	1.Yes 2.No		
29.	If "yes" for Question number 28 Who would cover medicalcost?	1.The staffs 2.The farm		
30.	Have you ever had sick leave for medical process?	1.Yes 2.No		
31.	If "yes" for question number 30 for how long?	1.Till recovery 2. Work while on medication. 3.Other option		
32.	If "no" for Question number 28 what was the reason?	1. The firm has nohealth facility 2. Lack of break 3. Lack of money 4. Other		
	Part I V: Related questions (worker's behavior information)Tobacco smoking			
33.	Do you smoke cigarette	1. Yes 2.No		
34.	If "Yes" to question 33, how often?	1.Everyday 2.Occationaly 3.1-3days/week		
35.	Do you drinkalcohol?	1.Yes 2.No		
36.	If "Yes" to question 33, how often?	1.Everyday 2.Occationaly 3.1-3days/week		1.
37.	Please list if you face other health problems during your stay in the tannery?			

መጠይቅ

ቆዳፋብሪካዎችላይተቀጥረውበሚሰሩሰራተኞችላይከስራቸውጋርበተያያዘየሚደርስባቸውንየጤናችግ
ርለማጥናትየተዘጋጀመጠይቅ፤

መለያቁ□ር_____ድርጅቱስም_____

መጠይቁንለመሙላትከመጀመሩበፊትየተሳታፊውንፈቃደኝነትመጠየቂያቅጽ፤

ሰላምእንደምንአለህእኔ
_____እባላለሁ፡፡እዚህየመጣሁትይህንጥናትከሚያካሂደውአዲስአበባዩኒቨርሲቲየህብረሰብጤናትም
ህርትክፍልነው፡፡

ከስራጋርበተያያዘበዚህድርጅትውስጥምንአይነትየጤናችግርእንዳለ፣መጠኑስምንያህልእንደሆነእናበ
ምንምክንያትሊከሰትእንደሚችልለመረዳትእንፈልጋለን፡፡በመሆኑምይህንመረጃለማግኘትበዚህድርጅ
ትውስጥይህንመጠይቅበማካሄድላይእገኛለሁ፡፡የዚህጥናትውጤትበሀገራችንናበዚህድርጅትውስጥየ
ሚደረገውንየሙያደህንነትጤንነትአገልግሎትለማሻሻልከፍተኛእገዛይኖረዋል፡፡ስለሆነምከስራዎጋርበ
ተያያዘላለፉትአመታትእዚህከመጡጀምሮየተከሰተየጤናችግሮችንበተመለከተየተወሰኑጥያቄዎችንለ
ማንሳትእወዳለሁ፡፡በአጠቃላይመጠይደቁከ 15-20
ደቂቃያህልይፈጃልየሚሰጡትመረጃምለማምተላልፎአይሰጥምበተጨማሪምበተቃራኒመልኩፈጸሞአ
ይተረጎምምስምዎመመዝገብአያስፈልገኝም፡፡ተሳትፎዎሙሉበሙሉበፈቃደኝነትላይየተመሰረተእደ
መሆኑመጠንእንዲመልሱብለንበምንምአይትመልኩአንገፋፋዎትምመመለስበማይፈልጉበትሰዓትመ
ጠይቁንየማቋረጥመብትአለዎት፡፡

ስለዚህለመቀጠልፍቃደኛነዎት፡ 1. አዎ ☐ 2. አይደለሁም ☐

የጠያቂውስም_____ፊርማ_____

መጠይቁየተሞላበትቀን_____የተጀመረበትሰዓት_____የተጠናቀቀበትሰዓት

የመጠይቁግምገማ1.ተሟልቷል 2.ተቃውመዋል

3. ተጠያቂውአልተገኙም 4. በከፊል

የአረጋገጠውሱፐርቫይዘርስም_____ቀን_____ፊርማ_

ለማንኛውምችግርእናግልጽላልሆነነገርከታችባለውአድራሻማነጋገርይችላሉ፡፡

ዋናየጥናቱተጠሪ፤ደጀኔስዩም

ስለክ፤ 0910393692e-mail: dejenesm26@yahoo.com

የተጠያቂው ሀሳብብቻይከበብ

ተ.ቁ	ጥያቄ	አማራጭመልስ	(ይለፍ)	ኮድ
ክፍልአንድ፡-ማህበራዊናስነ-ሕዝባዊገጽታዎችንበተመለከተ (socio demographic information)				
1	የመኖሪያቦታ	1. ከተማ 2. ገጠር		
2	ጾታ	1. ወንድ 2. ሴት		
3	እድሜ			
4	የጋብቻሁኔታ	1. ያገባ/ች 2. ያላገባ/ች 3.ፈታ/ች 4. የሞተበት/ባት		
5	ብሔር	1. ኦሮሞ 2. አማራ 3.ትግሬ 4. ጉራጌ 5. ሌላይጥቀሱ…		
6	የትምህርትደረጃ	1. ያልተማረ/ች 2. ማንበብናመጻፍ 3. የትምህርትክፍል ----------		
7	ሐይማኖት	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ሌላይጥቀሱ…		
8	የስራድርሻ/ክፍል			
9	□ስራ መ□ብ/work section/			
10	የቅጥርሁኔታ	1. ቋሚ 2. ኮንትራት		
11	መጀመሪያስትቀጠር/ሪየስራውልፈርመሃል/ሻል?	1. አዎ 2. የለም		
12	የወርደመወዝ			
13	በድርጅቱየቆይታጊዜ (በወራት/በአመት)			
14	በዚህስራየቆይታጊዜ (በወራት/በአመት)			
15	በስራህደስተኛነህ/ነሽ?	1. አዎ 2. የለም		
16	የተሟላየሰውነትመከላከያመሳሪያትጠቀማለህ/ ትጠቀሚያለሽ?	1. የለም አልጠቀምም 2. አዎ አንዳንዴ 3. አዎ ሁሌም እ□ቀማለሁ		
17	የትኞቹን የሰውነትመከላከያመሳሪያትጠቀማለህ/ትጠቀሚያለ ሽ?	1. ጋውን/ Gowon 2. □ላቭ/Glove 3. ቦት ጫማ/Boot 4. አፍንጫ ና አፍ መሸፈኛ/Mask		
18	የተሟላየሰውነትመከላከያመሳሪያየማትጠቀም/ሚከ ሆነለምን?	1. ድርጅቱአያቀርብም 2. ለስራአይመችም		
19	የስራአካባቢደህንነትስልጠናወስደሀል/ሻል?	1. አዎ 2. የለም		
20	ከወሰድክ/ሽ ለምንያህልጊዜ?	1. መ□ሪ□/ማብራሪ□/Orientation 2. ለሶስትቀናት 3. ላንድ ሳመነት/ 4. ለሁለትሳምንትና ከዛ በላይ/		

21	ቆዳፋብሪካውስጥመስራትለአደጋያጋልጣልብለህታምናለህ/ሽ?	1. አዎ 2. የለም		
22	ለተራቁጥር21 መልሱአዎከሆነምንምንየጤናችግሮችያጋልጣል?			
23	ለተራቁጥር 21 መልሱአዎከሆነበድርጅቱውስጥለዚህየጤናችግርየሚያጋልጡነገሮችምንምንናቸው?			

(24) ከዚህበታችየተዘረዘሩትየጤናችግሮችላለፉት 12 ወራትለተከሰቱበትብቻነው። **ክፍልሁለት፡- የመተንፈሻአካልየጤናችግሮችላይየሚያተኩርጥያቄ**					
24.1	በስራወቅትበተደጋጋሚየማሳልስሜትአለብህ/ሽ?	1. አዎ 2. የለም	1. ከመግባትህ/ሽበፊት 2. ከገባህ/ሽበኋላ		
24.2	በትንፋሽማጠርተቸግረህታውቃለህ/ቂያለሽ?	1. አዎ 2. የለም	1. ከመግባትህ/ሽበፊት 2. ከገባህ/ሽበኋላ		
24.3	ደረትክብድክብድወይምየአተነፋፈስችግርገጥሞህ/ህ ያውቃል?	1. አዎ 2. የለም	1. ከመግባትህ/ሽበፊት 2. ከገባህ/ሽበኋላ		
24.4	ደረትላይሲጥሲጥየማለትችግርገጥሞህ/ህ ያውቃል?	1. አዎ 2. የለም	1. ከመግባትህ/ሽበፊት 2. ከገባህ/ሽበኋላ		
24.5	በሃኪም የተረጋገጠአስምአለብህ/ሽ?	1. አዎ 2. □ለም	1. ከመግባትህ/ሽበፊት 2. ከገባህ/ሽበኋላ		
25	□ቆዳላይችግሮችሽፍታ				
25.1	የቆዳመቆጣትወይምመቁሰልገጥሞትያውቃል?	1. አዎ 2. የለም			
	ላለፉት 12 ወራትሄድመጣእያለየሚያስቸግርሽፍታነበረብህ/ሽ?	1. አዎ 2. የለም			
25.2	ላለፉት 12 ወራትበማንኛውምጊዜቆዳህላይማሳከክኖሮብህያውቃል?	1. አዎ 2. የለም			
25.3	ላፉት 12 ወራትበማንኛምጊዜቆዳህላይመቅላትኖሮብህያውቃል?	1. አዎ 2. የለም			
25.4	የቆዳላይችግርበዋናነትየሚጠቃውየሰውነትህ/ሽአካልህ/ሽ የቱ ነው?	1. እጅ 2. ፊት 3. እግር 4. እንገት 5. ተጨማሪካለ			
25.5	የቆዳላይችግርለምንያሂልጊዜነውየግጠሞት?	1. አንድጊዜብቻ			

		2. ካአንድጊዜበላይ 3. ሁሌም		
25.6	ለመጀመርያጊዜየቆዳመቆታትወይምመቁሰልየገጠሞትመ ችነበር?	1. የ 6 አምትልጅሳለሁ 2. ከ 6-14 ዓመትሳልሁ 3. ከ 15-18 ዓመትሳልሁ 4. ከ 18 ዓመትብላይሳልሁ		
25.7	የቆዳመቆጣትወይምመቁሰልመንስኤውምንድነውይላሉ?			
25.8	ለቆዳመቆጣትወይምመቁሰልእቃዎችንናኬሚካሎችንመነካ ካትአባብሶትእንደሆንአሰተዉለዋል?	1. አዎ 2. የለም		
25.9	ከሚሰሩትስራሲርቁየቆዳመቆጣቱወይምመቁሰሉሻልይል ሎታል (በረፍትቀናት)?	1. አዎ 2. የለም		
25.10	የቆዳዎመቆጣትወይምመቁሰልየቀንተቀንተግባሮንያውኮታ ል?	1. አዎ 2. የለም		
25.11	የቆዳዎመቆጣትወይምመቁሰልገቢዎላይተዕኖአለው(የህክ ምናውጪ፣ከስራመቅረት፣የስራአቅምንበመቀነስ)?	1. አዎ 2. የለም		
25.12	ሃኪምያረጋገጠው□ቆ□ አለርጂ (an allergy) አለቦት?	1. አዎ 2. የለም		
(26) ከዚህበታችየተዘረዘሩትየጤናችግሮችላለፉት 12 ወራትለተከሰቱበትብቻነው።። ክፍልሦስት፡- ላላቸውየጤናመታወክምልክቶች				
26.1	ላፉት 12 ወራትየራስህመም (headache)አለበዎት?	1.አዎ 2. የለም		
26.2	ላለፉት 12 ወራትየጀርባህመም (Back pain) አለበዎት?	1. አዎ 2. የለም		
26.3	የኩላሊትችግር (Kidney problem)አለብህ/ሽ?	1. አዎ 2. የለም		
26.4	ላለፉት 12 ወራትየድብርትስሜት (Dizziness)	1. አዎ 2. የለም		
26.5	ባልታሰበሁኔታስራቦታመውደቀውታውቃለህ/ሽ?	1. አዎ 2. የለም		
27	ከላይየጠቀስናቸውየጤናምልክቶችየትጀመረህ/ሽ?	1. እዚህከመግባትህበፊት 2. እዚህከገባህበኋላ		
28	ከላይየጠቀስናቸውንየጤናእክሎችባጋጠመህ/ሽጊዜወደህክ ምናቦታሄደሃል/ሻል?	1. አዎ 2. የለም		
29	ለተራቁጥር 28መልሱአዎከሆነየህክምናውንወጪየሚሸፈነውበማንነ ው?	1. በሰራተኛው 2. በድርጅቱ		
30	ህክምናውንበምታደርግበትጊዜእረፍትይሰጥሀል/ሻል?	1. አዎ 2. የለም		
31	ለተራቁጥር 30 መልሱአዎከሆነለምንያህልጊዜ?	1. ህክምናውንተከታትለህእስከ ምትጨርስ		

		2. ህክምናእ□ተከታተልክ		
32	ለተራቁጥር28መልሱየለምከሆነላለመታከምህ/ህ ምክንትህ/ሽምንነበር?	1. ድርጅቱህክምናአገልግልሎ ትስለሌለው 2. ድርጅቱለህክምናእረፍትስለ ማይሰጥ		
ክፍልአራት፡- ተዛማጅነትያላቸውጥቄዎችሰራተኛውስነ-ባህሪላይ				
33	ሲ.ጋራታጨሳለህ?	1. አዎ 2. የለም		
34	ለተራቁጥር 33 መልሱአዎከሆነለምንያህልጊዜ?	1. ለአንዳንድጊዜ 2. ሁልጊዜ 3. 1-3 ቀንበሳምንት		
35	መጠጥትጠጣለህ/ሽ?	1. አዎ 2. የለም		
36	ለተራቁጥር 35መልሱአዎከሆነለምንያህልጊዜ?	1. አንዳንድጊዜ 2. ሁልጊዜ 3. 1-3 ቀንበሳምንት		
37	ጫት·ትቅማለህ/ሽ?	2. አዎ 2. የለም		
38	ለተራቁጥር 36 መልሱአዎከሆነለምንያህልጊዜ?	1. አንዳንድጊዜ 2. ሁልጊዜ 3. 1-3 ቀንበሳምንት		
39	ስለጤናዎከርሶዕድሜእኩዮችጋርበማነፃፀርምንይላሉ?	1. እጅግበጣምጥሩነው 2. በጣምትሩነው 3. ጥረነው 4. መካከልኛነው 5. ዝቅተኛነው		
ጥያቄዎቹን ጨርሻለሁ።ጥያቄዎቹን ለመመለስ ላደረጉልኝ □ገዛናጊ□- ሰ□·ተ□·ስለተባበሩኝ አመሰግናለሁ።። ተጨማሪ የሚሰጡት አስተያየት ወይንም ጥያቄ ካሎት ቢገልፁልኝ? በትጋሚከልብአመሰግናለሁ።።				

Working environment observation check list

Hazard in working environment

ii. Is there excessive heating in the work place? 1. Yes ---------- 2. No ---------- a yes requires that a worker is found sweating when naked or with light clothing if investigator feels as sudden heat wave when entering in to the industry.

iii. Is there excessive dust in the work place? 1. Yes ---------- 2. No ---------- a yes requires if the investigator experience sudden sneezing up on entering the industry or if the workers eyebrows, hair, nostrils, and clothes is observed by investigator to be covered with dust particles.

iv. Is there working sing and safety rules in the work place? 1. Yes ---------- 2. No ---------- a yes require no lack?

v. Do the employees use the necessary personal protective equipment? 1. Yes --------- 2. No -----

vi. Was there any preventive measures implemented for hazards in the working environment? 1. Yes ---------- 2. No ---------- a yes requires specification of and preventive measures

vii. Does the industry have copy of most important health regulation?

viii. Does the industry follow writer safety and health plan of action in the workplaces?

ix. Does the working section have first aid equipment? 1. Yes ------- 2. No ------

x. Is there any health service near to the industry?