

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH



UNDER-NUTRITION AND ITS DETERMINANTS AMONG
COBBLESTONE WORKERS IN COBBLESTONE PROJECT, YEKA
SUB CITY, ADDIS ABABA, ETHIOPIA.

BY: GETENEH MOGES (BSc)

ADVISORS: SOLOMON SHIFERAW (MD, MPH)

ROBEL YIRGU (BSc, MPH)

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES ADDIS
ABABA UNIVERSITY IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER IN PUBLIC HEALTH

JUNE 2015

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School of Public Health, College of Health Sciences

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ABSTRACT

Background: Under-nutrition is one of the most important public health problems, affecting more than 900 million people around the World. It is an important underlying cause of illness and death in Africa and imposes a huge cost both in human and economic terms worldwide. In Ethiopia, although under-nutrition costs as high as 16.5% of its GDP, there is limited research evidence on its magnitude among the growing population of daily laborers.

Objective: To assess the level of under-nutrition and its determinants among cobblestone workers in cobblestone project, Yeka Sub City, Addis Ababa Ethiopia.

Methods: The study was community based cross sectional involving 423 cobblestone workers from February 20 to April 1, 2015. Systematic random sampling method was employed (with proportional allocation) for Qatsila, Gewasa and Tafo Cobblestone sites. Anthropometric measurements (weight, height) were recorded. Dietary intakes were estimated by 24 hrs recall using Household Dietary Diversity Score Questionnaire. Two days training was given to supervisors and data collectors. The data entered, cleaned and analyzed by using Epi info 3.5.3 and SPSS 20 version software respectively. Multiple binary logistic analysis was performed to examine the effect of independent variables on under-nutrition as defined by BMI<18.5.

Results: Overall, 423[300 males (71%)] respondents participated in this study making the response rate at 100 percent. The prevalence of underweight (BMI<18.5) were 141(33.3%; 95%CI: 28.8- 38.0). Males were significantly more likely to have the conditions of under-weight 112(37.3%) versus 29(23.6%) [95% CI; 31.8-43.1] compared to their female counterparts. Lower educational status, bigger family size (greater or equal to 3), lower monthly income (<1500 ETB) and smoking, remained significant in multivariate analysis. Study participants who had no education were significantly more likely to be undernourished [OR = 7.83; 95% CI (3.78, 16.22)] compared to $\geq$ secondary level education. Daily laborers who had low monthly income (<1500) were significantly more likely to be undernourished [OR= 9.77; 95%CI (4.92, 19.39)] compared to high income ($\geq$ 2500ETB).

Conclusion: The study revealed that substantial segments of cobblestone workers were undernourished. Significant determinant of under-nutrition include; lower educational level, bigger family size, lower monthly income and smoking. Based on the findings of the study it is important to prioritize such groups of cobblestone workers for targeted nutrition programs to reduce the burden of under-nutrition and contribute to their productivity.

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List of Abbreviations

A.A	Addis Ababa
AAU	Addis Ababa University
BMI	Body Mass Index
EDHS	Ethiopian Demographic and Health Survey
FAO	Food and Agriculture Organization
GDP	Growth Domestic Product
HDDS	Household Dietary Diversity Score
ILO	International Labor Organization
MDG	Millennium Development Goals
NNP	National Nutrition Program
SPSS	Statistical Package for Social Science
WHO	World Health Organization

1. ITRODUCTION

1.1 Background

Under-nutrition occurs when people do not eat (or absorb) enough nutrients to cover their needs for energy and growth, or to maintain a healthy immune system [1]. Under-nutrition is one of the most important public health problems, affecting more than 900 million individuals around the World [2]. Under-nutrition is an important underlying cause of illness and death in Africa[1]. Economy is also affected by under-nutrition directly, a loss of productivity due to poor physical condition, and indirectly, poor cognitive function and learning abilities. Furthermore, under-nutrition increases health expenses [3].

Low Body Mass Index (BMI) people are physically disadvantaged and they are imposed a greater stress to carryout work requiring body mass such as carrying loads, digging earth or coal, stone splitting [4]. Furthermore, the life cycle of under-nutrition persists for generations [5].

In resource-poor environments across the globe, low quality monotonous diets are the norm and the risk of micronutrient deficiencies [6]. As the world's population becomes increasingly urbanized the proportion of persons living in poverty cities increases. For many countries, the current rate of expansion of urban agglomerations has brought about severe challenges to food and nutrition security. There is a need to focus on the factors specific to life in urban environments, which affect level of under-nutrition urban populations. The nutritional status of adults is vital, considering their role in the economic support system [7].

1.2 statement of the problem

Under-nutrition imposes a huge cost both in human and economic terms worldwide; loss of billions of dollars in forgone productivity and avoidable health care spending [8]. The economic burden of under-nutrition has reached global proportions. Every year, US\$ 1.4-2.1 trillion (2-3 percent of global Growth Domestic Product (GDP) is lost due to under-nutrition. In Ethiopia, the cost of under-nutrition is up to 16.5% of GDP, primarily the poor who experience these losses. Avoid under-nutrition means putting more money in poor people's pockets [5].

Good nutrition has a better chance of reaching full intellectual capacity, economic productivity and enjoying an adequate quality of life. Yet despite this knowledge, under-nutrition remain among the most devastating problems facing the world's poor [9]. There still exists a lack of knowledge about the connection between good nutrition for people and economic productivity and growth [10].

Under-nutrition of children, pregnant and lactating mothers typically the focus of investigators, while under-nutrition of daily laborers in developing countries is poorly addressed [11]. There is little data to identify how socioeconomic factors affect nutritional status of adult populations. studies also shows that various socioeconomic factors are linked to under nutrition [12, 13]. Studies shows that daily laborers are more likely higher alcohol consumer and to miss breakfast[14]. More often daily laborers have Job stress and long working hours, which cause individuals to seek out convenience food like Street food vending; less healthy than food prepared at home [15].

Migration to Addis Ababa constitute large share of city's population (37%), for purpose of job opportunities. Substantial segment of migrants were involve in daily laborers and they are disadvantaged, vulnerable, face reduce quality of life and few opportunity to overcome the challenges [16]. Cobblestone project is one of the emerging enterprises that involve large number of daily laborers with various socio-demographic characteristics.

1.3 significance of the study

Information on trends with respect to daily laborers' under-nutrition level provides some insights on how policy actions can intervene for promoting the potential benefits of laborers. Migrants come for jobs are likely to contribute substantially to the growth of economy in Addis Ababa. However, there is paucity of data on level of under-nutrition of daily laborers in Ethiopia. To best of the investigator knowledge, there is no research report on level of under-nutrition of daily laborers working in cobblestone projects of Ethiopia.

The paucity of data on level of under-nutrition of daily laborers has limited the development of designing and initiating intervention strategies aims at improving the nutritional status of daily laborers. This study aimed to assess the level of under-nutrition and its determinants among daily laborers working in cobblestone project, Yeka Sub City, Addis Ababa. Findings from this study will provide baseline data and hope to elicit support and promote cooperation among different stakeholders towards the initiation of a sustainable nutrition program in cobblestone project.

2. LITERATURE REVIEW

2.1 Under-nutrition

Under-nutrition is an indicator of national development. Nutrition has both an input and an output of the development process [17]. Study conducted in Indian factory shows BMI (57%) of the workers are BMI < 20, which is Food and Agriculture Organization (FAO) predicts that there will be increased risk of work performance reduction. Chronic energy under-nutrition (BMI < 18.5) was 20% of the workers. Education and income have positive influence on nutritional status of factory workers[18].

Body Mass Index (BMI) is the most commonly used tool to assess one's nutritional status. BMI based on a weight -to-height ratio that considered a good index of body fat and protein stores. Body stores reflect the stores needed to cope with physiological stress due to reduced intake and increased demands in increased activity and diseases. Body Mass Index (BMI) = weight/ (height)² [19]. Nutritional status of Addis Ababa population(EDHS2011), 14.4.0 percent of women were thin or undernourished (BMI less than 18.5 kg/m² whereas 22.0 percent of men were thin or undernourished (BMI less than 18.5 kg/m² [20].

Adequate nutrition is the key stone of survival, health and development for current and next generations. Under-nutrition is the largest single underlying cause of death worldwide and a silent killer that are under reported, under addressed and, as result, under prioritized [21]. Decreased energy intakes contribute to impairments of a number of human functions such as disease response, work output and activity. The cyclical pattern of undernourishment leads to low productivity and low productivity generated low wages, which in turn lead to undernourishment [10].

Study conducted in Gondar town population shows that a large proportion of the subjects consumed fish, fruits and vegetables less frequently or never at all and oil and butter were eaten daily by most of the participants [22]. Study conducted in Jimma, attainment of higher education and increase monthly income were related to higher BMI and adolescent from food insecurity, the number of days that the adolescent had to work per week was independent predictors of school absenteeism [23].

2.2 Factors affecting level of under-nutrition

Food at work inextricably linked to the pillars of the ILO's decent work agenda. Adequate nourishment can raise national productivity levels by 20 percent. A 1 percent kilocalorie (kcal) increase results in a 2.27 percent increase in general labor productivity. In India, the cost of lost productivity, illness and death due to malnutrition is US\$10–28 billion, or 3–9 percent of gross domestic product (GDP). Iron deficiency accounts for up to a 30 percent impairment of physical work capacity and performance [24].

Most of the time daily laborer is energy demanding process; it creates a sort of psycho-physiological stress on the body for eight hours. which increases the rate of basal metabolism thus enhances the body's energy requirements. dietary protein important for wear-and -tear rate of body muscle, to repair and regenerate the muscular structure and ligaments[25].

Unstable employees more likely to suffer from an unhealthy lifestyle, sickness and causing a decreased quality of life. Studies in Japan shows that leaner population (BMI<18.5) was greater among fixed-term workers compared with permanent workers (8.3% versus 4.0%) [26, 27].

Many health impairments associated with shift work have been reported [28]. Under nutrition is largely preventable and is essential to meeting the Millennium Development Goals (MDGs) and equally contributing to agreed human rights for health and freedom from hunger and Falling hardest on the very poor [29].

The National Nutrition Program (NNP) targets the most vulnerable groups and also gives priority to the rural population while recognizing that significant under-nutrition exists in low income urban areas [30]. Lower education, lower social class and renting were independently associated with lower fruit and vegetable variety. Greater financial hardship was also independently associated with lower variety, with differences stronger for fruits and vegetables and under-nutrition [13, 31].

Studies show that right hand dominant laborers have lesser mean handgrip strength than their sedentary counterparts do. Despite the higher level of physical activity, female laborers had both lower handgrip strength and lower values of nutritional indices than their sedentary counterparts due to poor nutritional status [32].

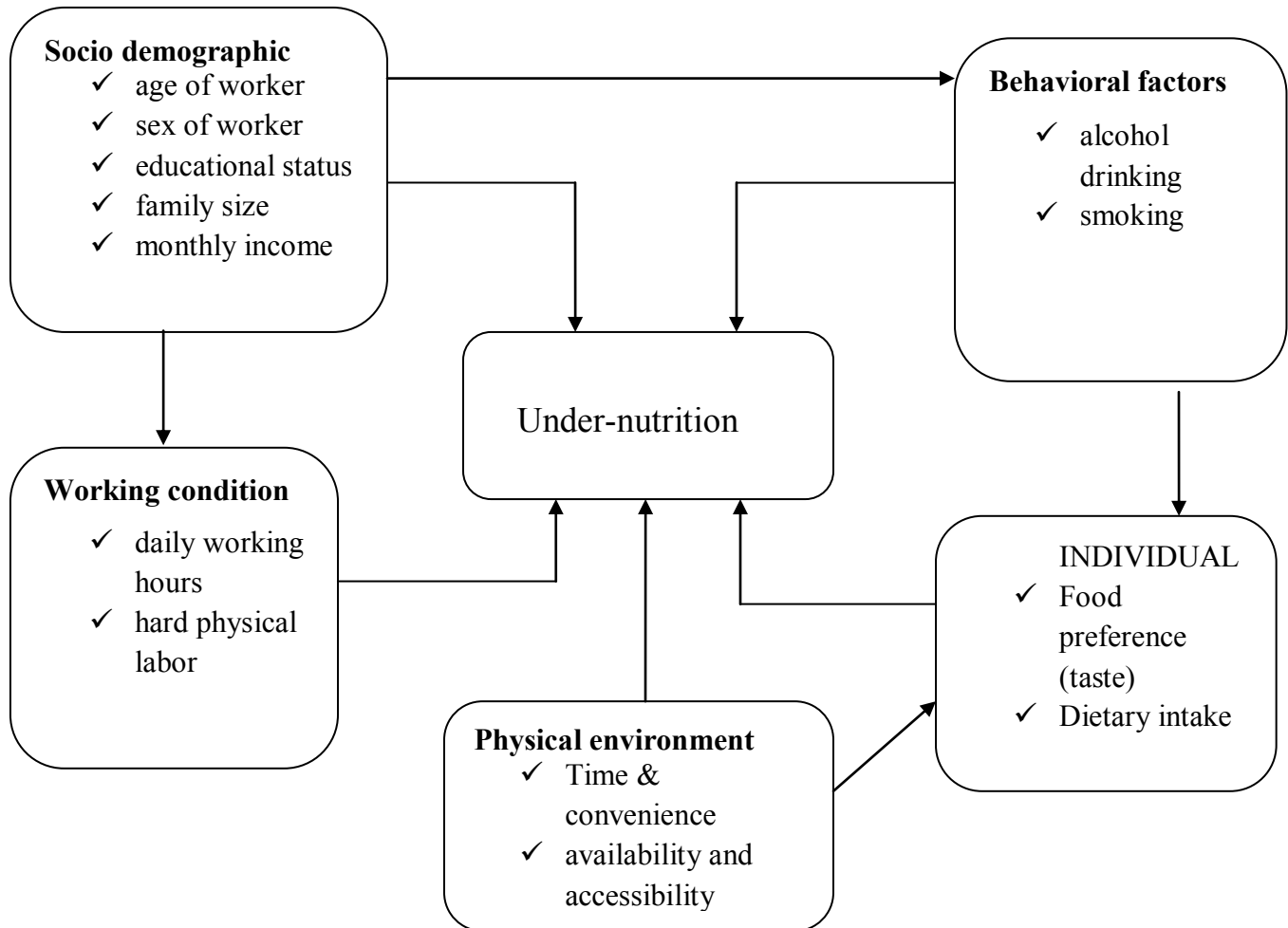
Logistic regression models shows that the statistically significant correlates of work were age, work status and fruit and vegetable intake in women, and age, education, work status, marital

status and BMI in men. Gender-stratified linear regression models found that the statistically significant correlates of sitting time were age, work status and BMI in women and education in men[33].

Greater educational attainment was significantly associated with higher BMI. BMI positively correlated with variables in both sexes: education, occupation, quality of housing conditions, household assets, and subjective social status[34, 35]. Studies suggest that future studies should look more closely at stressors in the environment as well as culturally acceptable versus ideal notions of weight and corpulence[36]. The term-limited researchers work longer hours, drink alcohol more frequently and eat breakfast less regularly and more stress[37]. Study in Egypt indicates that Cigarette smoking exhibits an inverse association with body weight or BMI[38].

2.3 CONCEPTUAL FRAMEWORK

Conceptual framework- shows relationship between different determinants and under-nutrition with emphasis in cobblestone project.



Source: Adapted based on literature review

3. OBJECTIVES

3.1 General objectives

- To assess the level of under-nutrition and its determinants among cobblestone workers in cobblestone project, Yeka Sub City, Addis Ababa.

3.2 Specific objectives

- ✓ To determine the level of under-nutrition among cobblestone workers in cobblestone project,
- ✓ To identify factors associated with under-nutrition among cobblestone workers in cobblestone project.

4. METHODS

4.1 Study Area and Period

Class Room and onsite Training Cobblestones technology was introduced by the mayor of Dire Dawa following a visit to France. More than 20 towns in Ethiopia, including Addis Ababa, have now institutionalized cobblestone-paving construction [6]. With an urbanization rate of approximately 4% per annum, Ethiopia has one of the fastest growing urban populations in Africa. Estimated that 12 million people are residing in urban areas and young population makes the highest proportion of unemployed, the cobblestone initiative can make a difference [6].

This study was conducted in cobblestone project (Qatsila, Gewasa and Tafo sites) yeka sub city, Addis Ababa. Cobblestone Project found around Summit and Taffo, border to Oromiya region. Six thousand six hundred fifteen workers (6,615) were found in cobblestone project registered as cobblestone workers. The study was conducted from February 20 to April 1, 2015.

4.2 Study design

Institution based cross sectional study was employed.

4.3 Populations

4.3.1 Source population

Cobblestone workers who work in cobblestone project,

4.3.2 Study population

Cobblestone workers who systematically selected from Qatsila, Gewasa and Tafo cobblestone sites and participated during data collection time,

4.4 Inclusion and Exclusion criteria

4.4.1 Inclusion criteria

- ✓ Age ≥ 18 years (both sex)
- ✓ Work experience as cobblestone worker ≥ 6 months

4.4.2 Exclusion criteria

- ✓ Cobblestone workers who cannot speak or listen (if any)
- ✓ Cobblestone workers with mental illness and acutely ill at the time of data collection
- ✓ Cobblestone workers diagnosed for chronic illness before being cobblestone worker.

- ✓ Cobblestone workers who is lactating or pregnant

4.5 Sample size calculation

The study sample size is determined for the 1st objective calculated using single population proportion formula. Since there are no studies on this area, to calculate sample size for this study, the 50% proportion (50% of the respondents have BMI <18.5) is used at 95% confidence level and 5% margin of error, the sample size is calculated below.

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

Where:-

n= sample size

p= 0.5 expected estimates BMI < 18.5

Z_{α/2}= 1.96 (Z=score corresponds to 95% confidence level)

d= 0.05 (Margin of error)

The proportion of 50% considered for this study is in order to maximize the sample size.

$$n = \frac{(1.96)^2 * 0.5 * 0.5}{(0.05)^2} = 384$$

Ten percent (10%) of the total sample size added as an attrition rate for any drop out of the study subjects during the study period.

$$n = 384 + (384 \times 10\%) = \mathbf{423 \text{ respondents}}$$

The sample size for 2nd objective is calculated using double population proportion formula based on the following assumptions:

- ✓ Percent of controls to expose in daily laborers (for smoker) assumed 50%.
- ✓ Detecting OR = 2.00 (to have large sample size)
- ✓ α = 0.05 (the probability of committing type one error =1.96)
- ✓ β = 20% (the probability of rejecting a true difference)
- ✓ Power = 80%
- ✓ Ratio of controls to cases = 1
- ✓ None response rate =10%

N.B 50% selected because of lack of data on this study area.

Then it is calculated by epi info version 7 software and obtained =**326**

Since the single population proportion yields the maximum sample size, the final sample size is 423.

4.6 Sampling procedures

Systematic random sampling was carried out and within the study sites; daily laborer was selected for interview using the formula N/n

That is $\frac{N}{n} = \frac{6,615}{423} = 15.6$

Therefore, the sample individual was taken every 15th and 16th individual after selecting the first individual by lottery method. List of cobblestone workers were obtained in cobblestone project office.

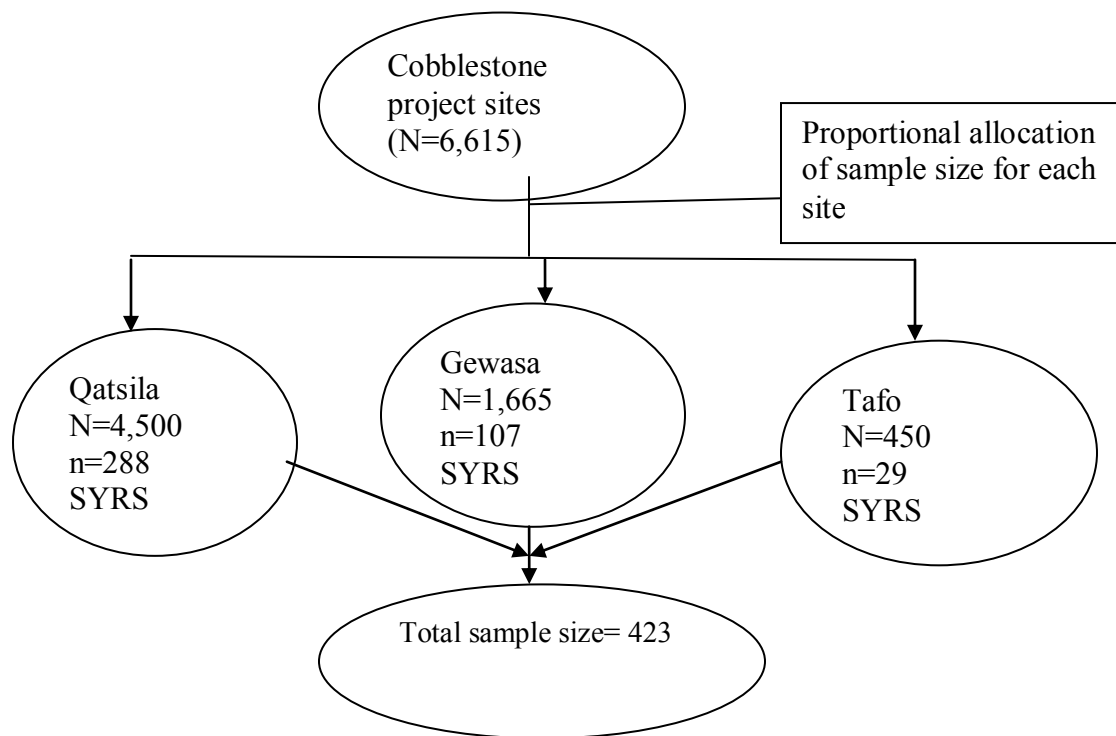


Figure 1: schematic presentation of the sampling procedure

4.7 Data collection; and Tools

Study participants were interviewed before they start work by trained interviewers (grade 12 and above completed) using structured questionnaire. Anthropometric measurements (weight, and height) were recorded. Dietary intakes of respondents were estimated by 24-hours recall using Household Dietary Diversity Scores (HDDS) Questionnaire. Stadiometres with a sliding headpiece, and portable mechanical analog scales obtained from AAU and used to measure height and weight, respectively. Each subject weighted with minimum clothing and no footwear.

The scale was carefully handled and periodically calibrated by placing standard calibrate weights of 2 kg iron bars on the scale to ascertain in accuracy. If the scale weight did not match with the calibrated weight, the scale calibrated by adjusting its calibration screw until the calibration weight is on the scale. The questionnaire first written in English and was translated into Amharic, and it was translated back into English by both English and Amharic speaker person.

4.8 Operational definitions

Cobblestone workers: daily laborer who work in cobblestone project as grinder and digging

Under-nutrition: Daily laborers who measures $BMI < 18.5 \text{ kg/m}^2$

Available: Food is present at work area throughout the day.

Accessible: Food obtained with minimum perceived distance and time from work place

Dietary diversity: is the number of reported different foods and food groups consumed by daily laborers within 24 hours.

Low diversity: ate less than the mean dietary diversity score.

High diversity: ate greater than or equal to the mean diversity score.

4.9 Study variables

4.9.1 Dependent variables

Under-nutrition (Yes, No)

4.9.2 Independent variables

- ✓ Socio demographic characteristics such as age(years),sex, educational status, family size, and income(birr)

- ✓ Working conditions like daily working hours, hard physical labor,
- ✓ Dietary intake,
- ✓ Behavioral factors such as smoking, alcohol drinking, khat chewing,
- ✓ Availability and accessibility of food,

4.10 Data quality control methods

To maintain the quality of the data structure pretested and standardized questionnaire was used. Two days training on the contents of the questionnaire, data collection techniques, and ethical conduct of human research provided to research interviewers and supervisors prior to the commencement of the study.

Pretest (5%) was conducted in Akaki/Kality Sub City (Gelan Gura) for validation of questionnaire 15 days prior to actual data collection and some adjustment was made to fit the study objectives. The collected information checked frequently in the field by the supervisor (BSc qualification). The overall coordination made by the principal investigator. The questionnaire was checked for completeness every night after data collection. Feedback on previous day activities was given for both supervisors and data collectors before the next day data collection.

4.11 Data management

Data was checked for completeness and if there is, any incomplete information it was excluded from entry. Coded data was entered into Epi info version 3.5.3 computer software package. After the entry of every questionnaire completed, soft copy checked with its hard copy to see the consistency. After cross checking, cleaning was made to avoid missing values, outliers and inconsistencies before analysis. Cleaned data was exported to SSPS version 20.0 software package for analysis using stata transfer 9 software package.

4.12 Data analysis

Percentages, Odds ratios, Tables and Chart were used to summarize and present the results as appropriate. Anthropometric measurements were converted to Body Mass Index (BMI) and mean dietary intake score were computed using appropriate measures. Multiple binary logistic analyses were performed to identify independent predictors of under-nutrition.

4.13 Ethical considerations

Ethical clearance was obtained from the Institutional Review Board of Addis Ababa University, College of Health Sciences. Formal letter was written to Cobblestone Project Office and this official letter was distributed to Qatsila, Gewasa and Tafo sites. The principal investigator was communicated these sites. Information sheet and consent form provided for respondents to read for those who can read and the interviewer read the paper for those respondents who cannot read. Finally, the respondent asked the agreement to participant in the study. Confidentiality was maintained by omitting their names and personal identifiers; it was not revealed to anyone except the principal investigator and assistants. Privacy was maintained by arranging a quiet place for interviewer and study participant to protect them exposing other parties.

4.14 Dissemination of results

The result of this study will be submitted to Addis Ababa University, School of Public Health, College of Health Sciences and the copies will be given to Yeka Sub City Cobblestone Project Office. The findings will also be disseminated through publishing on national or international journal and presentations on scientific conferences.

5. RESULTS

Four hundred twenty three cobblestone workers were included in this study with response rate of 100%. The majority of respondents were males 300(70.9%) and the median age of respondents were 24 years with 18 and 58 years minimum and maximum ages respectively. More than half 247(58.4%) were between 18-24 ages. Among study participants 280(66.2%) were non-married and three fourth 319(75.4%) of them have family size between one and two. Most of the study participants attain primary 175(41.7%) and $\geq$ secondary 91(38%) school. Mean and median income of the respondents was 2079 ETB and 2000 ETB respectively.

Table 1. Socio-demographic characteristics of cobblestone workers in Cobblestone Project, Yeka Sub City, February 2015, Addis Ababa, Ethiopia.

Variables	Frequency (n=423)	Percent (%)
Sex		
Male	300	70.9
Female	123	29.1
Age		
18-24	247	58.4
25-34	157	37.1
≥ 35	19	4.5
Marital status		
Married	143	33.8
Non married	280	66.2
Educational status		
No education	87	20.6
Primary	175	41.7
$\geq$ Secondary	161	38
Family size		
≥ 3	104	24.6
1-2	319	75.4
Monthly income (ETB)		
≤ 1500	154	36.4
1500- 2499	124	29.3
≥ 2500	145	34.2

Majority of the respondents 311(73.5%) were work between 6-17 months in cobblestone project. From Four hundred twenty three cobblestone workers 141(33.3%) were underweight (BMI<18.50), 282(66.7%) were (BMI $\geq$ 18.5). From 66.7% of daily laborers 7(1.7%) were BMI >25.

Table 2. Working conditions and Anthropometric measurement of cobblestone workers in Cobblestone Project, Yeka Sub City, February 2015, Addis Ababa, Ethiopia.

Variables	Frequency (n=423)	Percent (%)
Work experience (in months)		
6-17	311	73.5
18-29	74	17.5
≥ 30	38	9.0
Work day per week (days)		
3-5	51	12.1
6-7	372	87.9
work hour per day (hours)		
5-7	12	2.8
8-10	411	97.2
BMI(kg/m²)		
<18.50	141	33.3
$\geq$ 18.50	282	66.7

From total participants, 133(31.4%) of cobblestone workers were eaten their breakfast less or equal to two days per week. 410(96.9%) and 401(94.8%) of daily laborers were eaten their lunch and dinner respectively. From study participants, 266 (62.9%) and 370(87.4%) daily laborers were eaten snacks and fast foods ≤ 2 times per week respectively. (Table3).

Table 3. Individual diet habits of cobblestone workers for the last six months in Cobblestone Project, Yeka Sub City, February 2015, Addis Ababa, Ethiopia.

Variables	Frequency (n=423)	Percent (%)
Average meal per day		
1 meal	3	0.7
2 meals	58	13.7
3 meals	357	84.4
> 3 meals	5	1.2
Breakfast per week		
≤ 2 times	133	31.4
3-4 times	68	16.1
Daily	222	52.5
Lunch per week		
≤ 2 times	3	0.7
3-4 times	10	2.4
Daily	410	96.9
Snacks per week		
≤ 2 times	266	62.9
3-4 times	112	26.5
Daily	45	10.6
Dinner per week		
≤ 2 times	8	1.9
3-4 times	14	3.3
Daily	401	94.8
Fast foods per week		
≤ 2 times	370	87.40
3-4 times	32	7.6
Daily	21	5.0

From the total number of reported different foods and food groups consumed by daily laborers within 24 hours; cereals, fruits, oils and fats and miscellaneous were eaten on regular bases.

A large proportion of the subjects were consumed fish and seafoods, meat and poultry, eggs and vegetables less frequently.

The mean dietary diversity score is 5.86 and 206 (48.7%) of daily laborers were below mean dietary diversity score.

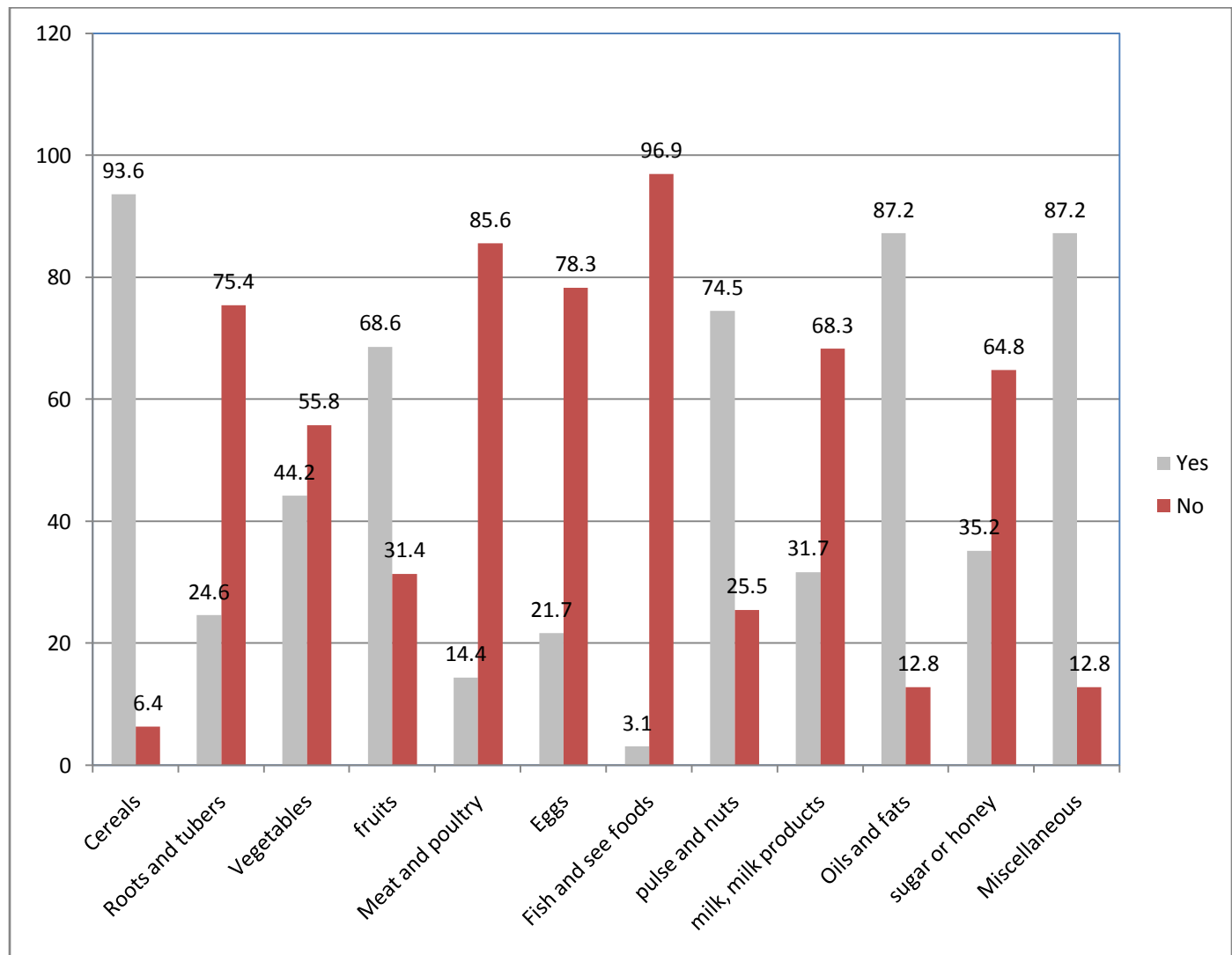


Figure1. Shows dietary intake of cobblestone workers during the previous 24-hours period (yesterday day and night) working in Cobblestone Project, Yeka Sub City, February 2015, Addis Ababa.

From study participants, 20.1%, 56.7% and 21.3% of the respondents were smoker, alcohol consumer and khat chewer respectively. Among study participants, 43.7% were obtained their food outside home.

Table 4. Behavioral related factors and food sources of cobblestone workers in Cobblestone Project, Yeka Sub City February 2015, Addis Ababa, Ethiopia.

Variables	Frequency (n=423)	Percent (%)
Smoking cigarette		
Yes	84	19.9
No	339	80.1
Smoking per day		
1-5	38	45.2
6-10	38	45.2
More than 10	8	9.5
Alcohol drinking		
Yes	240	56.7
No	183	43.3
Alcohol drinking per day		
Sometimes	153	63.8
Once a day	79	32.9
More than one a day	8	3.3
Khat chewing		
Yes	90	21.3
No	333	78.7
Khat chewing per day		
Sometimes	57	63.3
Once a day	27	30.0
More than one a day	6	6.7
Source of food		
At home	238	56.3
Outside home	185	43.7
Available		
Yes	29	15.7
No	156	84.3
Accessible		
Yes	53	28.6
No	132	71.4

Bivariate and Multivariate analysis

The multivariate analysis was done by considering the conceptual framework to assess the relative effect of explanatory factors on the outcome variable (under-nutrition). Multivariate analysis of this study revealed that lower educational status, bigger family size, low monthly income and smoking found statistically significant.

Cobblestone workers who had no education were eight times [OR= 7.83; 95%CI ;(3.78, 16.22)] and primary school were two times [OR=2.26; 95%CI ;(1.25, 4.08)] more likely to be undernourished compared to secondary and above education level. Cobblestone workers who had bigger family size (≥ 3) three times [AOR=2.88; 95%CI; 1.54-5.40] more likely to be undernourished compared to low family size (≤ 2). Cobblestone workers who had monthly income <1500 ETB ten times [OR= 9.77; 95%CI; (4.92, 19.39)] and 1500-2499ETB two times [OR= 2.16; 95% CI;(1.08, 4.34)] more likely undernourished compared to monthly income ≥ 2500 ETB. Sex, alcohol drinking and chat chewing were statistically significant to had under-nutrition in bivariate analysis. Table 5

Table 5. Bivariate and multivariate analysis to observe the relative effect of determinants for under-nutrition among cobblestone workers in Cobblestone Project, Yeka Sub City, February 2015 Addis Ababa. (n=423)

Characteristics	Under-nutrition		Crude OR (95% CI)	Adjusted OR (AOR)
	Yes	No		
Sex				
Male	112(37.3%)	188(62.7)	1.93(1.19-3.11) *	1.16(0.62-2.17)
Female	29(23.6%)	94(76.4%)	1	1
Educational status				
No education	50(57.5%)	37(42.5%)	6.41(3.56-11.56) *	7.83(3.78-16.22) *
Primary	63(36.0%)	112(64.0%)	2.67(1.60-4.45)	2.26(1.25-4.08) *
≥ Secondary	28(17.4%)	133(82.6%)	1	1
Family size				
≥3	50(48.1%)	54(51.9%)	2.31(1.47-3.65)*	2.88(1.54-5.40) *
1-2	91(28.5%)	228(71.8%)	1	1
Monthly income (ETB)				
<1500	83(53.9%)	71(46.1%)	5.35(3.15-9.08)*	9.77(4.92-19.39) *
1500-2499	32(25.8%)	92(74.2%)	1.59(0.88-2.85)	2.16(1.08-4.34) *
≥2500	26(17.9%)	119(82.1%)	1	1
Dietary diversity				
< Mean	89(43.2%)	117(56.8%)	2.41(1.59-3.65) *	1.82(1.07-3.08) *
≥ Mean score	52(24.0%)	165(76.0%)	1	1
Smoking				
Yes	50 (59.5%)	34(40.5%)	4.00(2.43-6.59) *	2.02(1.06-3.87) *
No	91(26.8%)	248(73.2%)	1	1
Alcohol drinking				
Yes	108(45.0%)	132(55.0%)	3.71(2.36-5.86) *	3.32(0.80-6.11)
No	33(18.0%)	150(82.0%)	1	1
Khat chewing				
Yes	43(47.8%)	47(52.2%)	2.19(1.36-3.53) *	1.69(0.90-3.17)
No	98(29.4%)	235(70.6%)	1	1

6. DISCUSSION

This study illustrated that one-third of cobblestone workers (33.3%; 95%CI: 28.8-38.0) were undernourished (BMI<18.5). This is higher comparing to studies in Indian factory workers (33.3% versus 20.0%) [18] Which indicate cobblestone workers in Addis Ababa were more likely to be disadvantaged [16, 21]. The national nutrition program gives priority to the rural population but this study shows significant under-nutrition exists in daily laborers in urban area [30].

Males were significantly more likely to have the conditions of under-weight 112(37.3%) versus 29(23.6%) [95% CI; (31.8, 43.1)] compared to their female counterparts. The numbers of underweight cobblestone workers were higher for both male and female comparing to Ethiopian Demographic and Health Survey of Addis Ababa population (EDHS2011) (37.3% versus 22.0% and 23.6%versus 14.4%) [20]. Comparing to study in Gondar town population higher number of cobblestone workers were underweight (33.3% versus 12.9%) [22]. this might be cobblestone workers were disadvantaged and energy demanding work processes. It is also similar to studies in Japan fixed-term workers and Indian laborers [14, 32].

From reported different foods and food groups consumed by cobblestone workers within 24 hours; cereals, fruits, oils and fats and miscellaneous were eaten on regular bases. Roots and tubers, vegetables, meat and poultry, egg, fish and sea foods, milk and milk products were the lowest or not taken at all on regular bases, this is similar to studies in Gondar, India, England [22, 32, 31]. This indicate study participants were eaten low dietary protein, which is important for wear-and -tear rate of body muscles, to repair and regenerate the muscular structure and ligaments [25].

A large portion of cobblestone workers had eaten low dietary diversity score. Study participants had eaten low dietary diversity score were significantly more likely to be undernourished [OR = 1.82; 95% CI (1.07, 3.08)] compared to high dietary diversity counterparts. Higher number of cobblestone workers (43.7%) obtained food from outside home; this may be less healthy than prepared at home [15].

Majority of the study participants (56.7) were alcohol drinkers. This is similar to studies in Japan term limited and tenure tracking employees [14, 15]. cobblestone workers eat breakfast less regularly (47.5%), which is comparable to studies in Japan and Brazil [14, 28].

Study participants who had no education were significantly more likely to be undernourished [OR = 7.83; 95% CI (3.78, 16.22)] compared to $\geq$ secondary education level. cobblestone workers who had low monthly income (<1500 ETB) were significantly more likely to be undernourished [OR; 9.77; 95%CI ;(4.92, 19.39)] compared to monthly income ≥ 2500 ETB; it is also true in studies of Jimma and Mexican adults [23, 34, 35]. cobblestone workers with bigger family size (≥ 3) were significantly more likely to be undernourished compared to low family size. Smokers were significantly more likely to be undernourished [OR=2.02; 95%CI (1.06, 3.87)] compared to non- smokers. This is similar to studies in Egypt smoke bans at university [38]. In this study the factors; adjusted regression model shows lower educational status, bigger family size (>2), lower monthly income (<1500 ETB), low dietary diversity and smoking came out significant factors to have under-nutrition.

Health education program will be given for the study participants at the end of thesis presentation by principal investigator. Cluster coordinators for each site will organize the schedule and communicate the program.

7. STRENGTH AND LIMITATIONS OF THE STUDY

7.1 Strength of the study

- ✓ This study tried to assess level of under-nutrition and associated factors, which were not studied previously in cobblestone project. Therefore, the result of this study will serve as a baseline data for further studies.
- ✓ Cobblestone project is an emerging enterprise that involves large number of people with various socio-demographic characteristics. Therefore, this study is an operational study, which will be helpful for policy and decision makers to prevent nutritional deficiency in this sector.

7.2 Limitations of the study

- The data were collected on self-report of study participants and may be subjected to recall bias and social desirability bias.
- This study includes single 24 hours dietary recall, thereby providing a less precise measure of dietary intake. Energy intake was not assessed
- Due to lack of similar studies done on level of under-nutrition and associated factors particularly in Ethiopia, make discussion of result difficult. Baseline data were not assessed for this study.
- Cobblestone paving-construction cobblestone workers were not addressed in this study.

8. CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

- From this study finding, substantial segments of cobblestone workers were undernourished.
- Significant determinant of under-nutrition include; lower educational level, bigger family size, lower monthly income, smoking and low dietary diversity.
- Cobblestone workers who had no education and low monthly income were more undernourished
- Cobblestone workers with bigger family size had more undernourished compared to low family sizes.
- Smoker cobblestone workers were more undernourished compared to no-smokers.
- Cobblestone workers with low dietary diversity score were more undernourished compared to high dietary diversity.

8.2 Recommendations

- ✓ It is important that nutrition programs consider expanding their focus to the growing population of cobblestone workers in urban dwellers (cobblestone project). This can be an interim strategy until the majority are empowered through better education and earn sufficient income to feed themselves.
- ✓ For those who can afford, it is important to emphasize the importance of improving their dietary diversity and eating habits in improving their nutritional status.
- ✓ Cobblestone workers should be empowered through behavior change education to reduce the burden of smoking on under-nutrition.
- ✓ It is recommended that further research to be undertaken for better understanding of under-nutrition level in cobblestone projects including migration status.

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Annex – 1: Participant’s Information Sheet

Title of the Research Project

Under-nutrition and its determinants among daily laborers working in Cobblestone Project Yeka Sub City, Addis Ababa.

Name of Principal Investigator: Geteneh Moges

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

Name of the Sponsor: Addis Ababa University

Information sheet and Consent form prepared for daily laborers working in cobblestone who were participated in this Research.

Introduction

This information sheet and consent form is prepared with the aim of explaining the research project that you asked to join by the group of research investigators. The main aim of the research project is to assess under-nutrition and its determinants among daily laborers in cobblestone project, Yeka Sub City, Addis Ababa. There is no benefit for the study participants, can get in terms of money or items but they can get benefit in the future if there is a change of policy and strategies by considering this study. There is no risk to study participants because of this study other than taking their time for interview not more than 45 minutes.

Risk and /or Discomfort

By participating in this research project, you may feel that it has some discomfort especially on wasting your time (a minimum of 45 minutes). This may not be too much as you are one of the members of the community. so your response will help as an important input to show the gap and means to improve nutritional status and dietary intake. There is no risk in participating in this research project.

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 by this study will be stored in a file, without your name, but a code number assigned to you.

In addition, it will not be revealed to anyone except the principal investigator and assistants will be kept locked with key.

Right to Refusal or Withdraw

You have the full right to refuse from participating in this research. (You can choose not to response some or all the questions) and this will not affect you from getting any service. You have also the full right to withdraw from this study at any time you wish, without losing any of your right.

Person to contact

This research project was reviewed and approved by the ethical committee of the Addis Ababa University. If you want to know more information, you can contact the committee through the address below. If you have any question you can contact any of the following individuals and you may ask at any time you want.

1. Geteneh Moges (BSc)

Mobile: +251 913 141 467 / e-mail: gtnhph2001@gmail.com

2. Solomon Shiferaw, (MD,MPH): Addis Ababa University

E-mail; solomonshiferaw@gmail.com

3. Robel Yirgu (B.Sc, MPH)

E-mail; yirgurob@yahoo.com

የመረጃና የስምምነት ውል ቅፅ

የምርምር/የጥናቱ ርዕስ

በየካ ክ/ከተማ በኮብል ስቶን በቀን ሰራተኝነት ላይ የተሰማሩ ሰራተኞች የስነ ምግብ ሁኔታቸውን እና አመጋገባቸውን የሚወስኑ ዕርሰ ጉዳዮች ላይ ምን ይመስላል የሚለውን ርዕስ ጉዳይ ለማጥናት ነው፡፡

የዋና ተመራማሪው ስም:- ጌጤነህ ሞገስ

የድርጅቱ ስም:- በአዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ ት/ቤት

ወጪውን የሚሸፍነው:- አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ ት/ቤት

በቀን ሰራ በየካ ክ/ከተማ በኮብል ስቶን በቀን ሰራተኝነት ላይ የተሰማሩ ሰራተኞች የስነ ምግብ ሁኔታቸውን እና አመጋገባቸውን የሚወስኑ ዕርሰ ጉዳዮች ላይ ምን ይመስላል የሚለውን ርዕስ ጉዳይ የተዘጋጀ የመረጃ ቅፅ፡፡

መግቢያ

ይህ የመረጃና የስምምነት ውል ቅፅ የተዘጋጀው እርስዎ ተሳታፊ እንዲሆኑ ስለተጋበዙበት በምርምር ቡድኑ የሚካሄደውን ጥናት በተመለከተ መግለጫ ለመስጠት ነው፡፡ የምርምር ፕሮጀክት ዋና ዓላማ በየካ ክ/ከተማ በኮብል ስቶን በቀን ሰራተኝነት ላይ የተሰማሩ ሰራተኞች የስነ ምግብ ሁኔታቸውን እና አመጋገባቸውን የሚወስኑ ዕርሰ ጉዳዮች ላይ ምን ይመስላል የሚለውን ርዕስ ጉዳይ ለማጥናት ነው፡፡

ሊገጥም የሚችል ችግርና/ወይም አለመመቻቸት

በዚህ ጥናት ላይ እርስዎ ተሳታፊ በመሆኖ አንዳንድ አለመመቻቸት ይኖራሉ ብለው ሊያስቡ ይችላሉ በተለይም ደግሞ ጊዜዎትን በመሻማታችን (40ደቂቃ በትንሹ) ነገርግን እርስዎ እንደሚያስቡበት በጣም ብዙ ጊዜ አንሻማዎትም፡፡ እንዲሁም ደግሞ እርስዎ የሚሰጡን መልስ ችግሩን ለመለየት እና እንዴት መቅረፍ እንዳለብን እንደ ጠቃሚ ግብዓት ያገለግላል፡፡ በዚህ ጥናት ላይ መሳተፍ ምንም አይነት ጉዳት አይደርስብዎም፡፡

ጥቅሞች

እርስዎ በዚህ ጥናት ተሳታፊ በመሆኖ በቀጥታ ሊያገኙ የሚችሉት ጥቅም ላይኖር ይችላል ነገር ግን የእርስዎ በዚህ ጥናት መሳተፍ በቀን ሰራ ላይ የተሰማሩ ሰራተኞች የስነ ምግብ እና አመጋገባቸውን ሁኔታቸውን የሚወስኑ ጉዳዮች ለማሻሻል ይጠቅማል፡፡

ለመሳተፍ ጥቅማጥቅሞች

እርስዎ በዚህ ጥናት ተሳታፊ በመሆኖ ምንም ዓይነት ማበረታቻ ወይም ክፍያ አይሰጥዎትም፡፡

ምስጢራዊነት

ለዚህ የጥናት ፕሮጀክት የሚሰበሰብ ማንኛውም አይነት መረጃ በምስጢራዊነት የሚጠበቅ ሲሆን እርስዎን በተመለከተ የሚሰበሰበው መረጃ የእርስዎ ስም ሳይፃፍበት ነገር ግን ምስጢራዊ ቁጥር ተሰጥቶት በፋይል ውስጥ የሚቀመጥ ይሆናል፡፡ እንዲሁም መረጃው ከጥናቱ ዋና ተመራማሪ እና ረዳቶች በስተቀር ሌላ ለማንኛውም አይነት ሰው ግልፅ አይሆንም፡፡

ከጥናቱ ያለመሳተፍ ወይም የማቋረጥ መብት

በዚህ ጥናት ያለመሳተፍ ሙሉ በሙሉ የተጠበቀ መብት አለዎት፡፡ (ለጥያቄዎቹ በሙሉም ሆነ በከፊል መልስ አለመስጠት መምረጥ ይችላሉ) ይህ ደግሞ ማንኛውም የጤና አገልግሎት ከማግኘት የሚያግድዎት አይሆንም፡፡ እንዲሁም በማንኛውም በፈለጉት ሰዓት ማንኛውንም መብትዎን ሳያጡ የማቋረጥ ሙሉ መብት አለዎት፡፡

ሊገናኙዎቸው የሚችሉ ሰዎች

ይህ የምርምር ፕሮጀክት በአዲስ አበባ ዩኒቨርሲቲ የስነ ምግባር ኮሚቴ ተከልሶ የሚፀድቅ ይሆናል፡፡ የበለጠ መረጃ ማግኘት የሚፈልጉ ከሆነ ኮሚቴውን በሚከተለው አድራሻ ማግኘት ይችላሉ፡፡ የትኛውም ዓይነት ጥያቄ ቢኖርዎት ከዚህ ቀጥሎ የተጠቀሱትን ግለሰቦች ማግኘትና በማንኛውም ጊዜ መጠይቅ ይችላሉ፡፡

1. ጌጤነህ ሞገስ፡

የሞባይል ስልክ ቁጥር፡+251 913 141 467/ +251 943 320 538

E-mail: gtnhph2001@gmail.com

2. ዶ/ር ሰሎሞን ሽፈራዉ ፡- አዲስ አበባ ዩኒቨርሲቲ

E-mail: solomonshiferaw@gmail.com

3. ሮቤል ይርጉ፡- አዲስ አበባ ዩኒቨርሲቲ

E-mail; yirgurob@yahoo.com

Annex - 2: Consent Form

Hello! My name isI am here on behalf of Geteneh Moges, student of the School of Public Health in the Addis Ababa University . He is conducting a research for the partial fulfillment of second degree on “Assessment of under-nutrition and its determinants among daily laborers in Cobblestone Project, Yeka Sub City, Addis Ababa.”. He has received permission from school of public health at Addis Ababa University, to conduct this study. The objective of this study is to assess level of under-nutrition and its determinants among daily laborers in Cobblestone Project, Yeka Sub City, Addis Ababa. You are selected for this study because you are working as a daily laborer and with the hope that you will cooperate with us. We are kindly requesting you to answer the questions that we have prepared for you. We assure all information gathered during the course of the study will be kept completely confidential. All the information that you are going to deliver to us will be coded for anonymity. Only the principal investigator and the research assistants collecting the data will have access to the data.

Would you be to participate? Yes1 No2

Having been well explained and informed of the intentions and benefits of the study, I voluntarily consent to participate in the study.

Respondent	Sign.	Date
	_____	_____
Interviewer name	Sign.	Date
_____	_____	_____

የስምምነት ዉል ቅፅ

ጤና ይስጥልኝረ ስሜ _____ ይባላል፡፡ የመጣሁት በአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና አጠባበቅ ትምህርት ተማሪ የሆኑት አቶ ጌጤነህ ሞገስ ወክሎ ነዉ፡፡ እርሳቸዉ በየካ ክ/ከተማ በኮብል ስቶን በቀን ሰራተኝነት ላይ የተሰማሩ ሰራተኞች የስነ ምግብ ሁኔታቸዉን እና አመጋገባቸዉን የሚወስኑ ዕርሰ ጉዳዮች ላይ ምን ጥናት/ምርምር እያካሄደ ይገኛል፡፡ ለዚህም ምርምር የሚሆን ፈቃድ ከአዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና አጠባበቅ ትምህርት ቤት አግኝተዋል፡፡

የምርምሩ/ጥናቱ ዋና አላማ በየካ ክ/ከተማ በኮብል ስቶን በቀን ሰራተኝነት ላይ የተሰማሩ ሰራተኞች የስነ ምግብ ሁኔታቸዉን እና አመጋገባቸዉን የሚወስኑ ዕርሰ ጉዳዮች ላይ ምን ይመስላል የሚለዉን ርዕሰ ጉዳይ ለማወቅ ነዉ፡፡ እርሶ ለዚህ ጥናት የተመረጡት በቀን ሰራተኝነት ስራ ላይ ስለተሰማሩና በጥናቱ ላይ ይተባበሩናል ብለን ስላመንን ነዉ፡፡ እኛ ለዚህ ጥናት የሚሆን ጥያቄዎች አዘጋጅተናል፤ ለምናነሳቸዉ ጥያቄዎች መልስ በመስጠት ይተባበሩን ዘንድ በአክብሮት እንጠይቃለን፡፡

በዚህ ጥናት ሂደት ዉስጥ የሚሰበሰበዉ ማንኛዉም ዓይነት መረጃ ሙሉ በሙሉ በሚስጢር የሚጠበቅ መሆኑን ልናረጋግጥልዎ እንወዳለን፡፡ እንዲሁም የሰበሰብነዉ መረጃ ሌላ ሰዉ ሊያዉቀዉ በማይችል መንገድ በሚስጢራዊ ቁጥር የተቀመጠ/የተመዘገበ ይሆናል፡፡ ከዋናዉ ተመራማሪ እና ከጥናቱ ረዳቶች በስተቀር ሌላ ማንኛዉም ሰዉ ሊያገኘዉ መረጃ ፈቃድ አይኖረዉም፡፡

በዚህ ጥናት እርሶ ለመሳተፍ ፈቃድ ነዎት?

አዎ-----1 አይደለሁም-----2

የጥናቱ ዓላማና ጥቅም በደንብ ተገንዝቤና አዉቄ በዚህ ጥናት ለመሳተፍ በፍቃደኝነት ተስማምቻለሁ፡፡

ተሳታፊ	ፊርማ	ቀን
_____	_____	_____
ቃለ መጠይቅ ጠያቂ	ፊርማ	ቀን
_____	_____	_____

Annex -3 English versions Questionnaire:

Addis Ababa University College of Health sciences School of Public Health
Questionnaires for assessment of level of under-nutrition and its determinants among daily laborers in Cobblestone Project, Yeka Sub City, February 2015, Addis Ababa.

Association Name, -----

1. How many months do you work?

<6 months ☐ ≥ 6 months ☐

✓ If <6 months, escape the study participants.

2. Did you diagnosed for chronic illness before being daily laborer [Diabetes, hypertension, TB, Malaria, (HIV/AIDS if he/she disclosure him/herself)]

Yes ☐ No ☐

✓ If yes, escape the study participants.

✓ 3. If the study participant is pregnant or lactating, escape the study participants.

Part 1 Socio-demographic information of daily laborers

S.no	Question	Possible response	Skip
101	Age	-----Years	
102	Sex	1.Male 2.Female	
103	Educational status	1.Illiterate 2.Can read write 3.Grade 1-4 4.Grade 5-8 5.Grade 9-12 6.Above 12	
104	Marital status	1.Single 2.Married 3.Divorced 4.Separated 5.Widowed	
105	Number of family members	-----	
106	Monthly income	-----birr	
107	Are you receiving any money or support from any resource?	1.Yes → Go to Q108 2.No 99. Do not know	
108	If yes, what amount(money) support do you get in birr	Birr	

Part 2 working conditions of daily labourers

S. no	Question	Possible response	Skip
-------	----------	-------------------	------

201	Work experience as daily labourer	-----months	
202	Working days per week	-----day(s)	
203	Working hours per day	-----hours	
204	Have you ever work in daily work jobs before this cobblestone project?	1.Yes → Go to Q205 2.No 99. Do not know	
205	If yes, how many months do you work?	-----months	

Part 3 Anthropometric measurements of daily laborers

S.no	Question	Measurement results	Skip
301	Weight (kg)		
302	Height (cm)		

Part 4 Question on individual dieting habit of daily laborers

S.no	Question	Possible response	Skip
401	How many times you commonly eat per day for the last six years?	1. <1 meal a day 2. 1 meal a day 3. 2 meals a day 4. 3 meals a day 5. > 3 meals a day	
402	How often do you eat breakfast per week?	1. Daily 2. Three or four times per week 3. twice per week 4. Rarely	
403	How often do you eat lunch per week?	1. Daily 2. Three or four times per week 3. twice per week 4. Rarely	
404	How often do you eat snack per week? (between breakfast and lunch)	1. Daily 2. Three or four times per week 3. twice per week 4. Rarely	
405	How often do you eat dinner per week?	1. Daily 2. Three or four times per week 3. twice per week	

		4.Rarely	
406	How often do you eat fast foods per week?(between lunch and dinner)	1.Daily 2.Three or four times per week 3. twice per week 4.Rarely	
407	During the previous 24-hours periods (yesterday day and night), did you consume?		
407A	Bread, Ambasha, biscuits cookies enjera or any other foods made from millet, sorghum, maize rice wheat barley teff?	1.Yes 2.No 99. Don't know	
407B	Any pumpkin carrots squash or sweet potatoes that are yellow or orange inside?	1.Yes 2.No 99. Don't know	
407C	Any potatoes adenguare or any other foods made from roots or tubers?	1.Yes 2.No 99. Don't know	
407D	Any dark green leafy vegetables such as tomato, pepper other vegetables?	1.Yes 2.No 99. Don't know	
407E	Any other vegetables(e.g tomato, onion)	1.Yes 2.No 99. Don't know	
407F	Any ripe mangoes avocado banana pineapple ripe papayas or orange?	1.Yes 2.No 99. Don't know	
407G	Any other fruits?	1.Yes 2.No 99. Don't know	
407H	Any beef pork lamb goat chicken liver kidney heart or other organ meats?	1.Yes 2.No 99. Don't know	
407I	Any eggs?	1.Yes 2.No 99. Don't know	
407J	Any fresh or dried fish or shellfish?	1.Yes 2.No 99. Don't know	

407K	Any foods made from beans, peas lentil or nuts?	1.Yes 2.No 99. Don't know	
407L	Any cheese yogurt milk or other milk products?	1.Yes 2.No 99. Don't know	
407M	Any foods made with oil fat or butter?	1.Yes 2.No 99. Don't know	
407N	Any sugar or honey?	1.Yes 2.No 99. Don't know	
407O	Any other foods such as condiments soft drinks coffee or tea?	1.Yes 2.No 99. Don't know	
407P	Did you eat anything (meal, or snacks) outside of the home?	1.Yes 2.No 99. Don't know	

Part 5 Behavioral related factor questions

S.no	Question	Possible response	Skip
501	Do you smoke cigarette?	1. yes→Go to Q502 2. no	
502	If yes, how many cigarettes do you smoke per day?	1 1-5 2.6-10 3. more than 10	
503	Do you drink alcohol?	1. yes→Go to Q504 2. no	
504	If yes, how many times do you drink per day?	1.sometimes 2.once a day 3. more than one	
505	Do you chew chat?	1. yes→Go to Q108 2. no	
506	If yes, how many times do you chew per day	1.sometimes 2.once a day 3. more than one	

Part 6 Accessibility and availability of food

S.no	Question	Possible response	Skip
601	Where do you get food mostly?	1. at home 2.outside home → Go to Q602&Q603	
602	If outside, is it available for you?	1.Yes 2.No 99. Don't know	
603	If outside, is it accessible for you?	1.Yes 2.No 99. Don't know	

የአማርኛ ትርጉም መጠይቅ

አዲስ አበባ ዩኒቨርሲቲ የህብረተሰብ ጤና ሳይንስ ኮሌጅ

ይህ መጠይቅ በአዲስ አበባ ከተማ አስተዳደር በየካ ክ/ከተማ በኮብል ስቶን በቀን ሰራተኝነት ላይ የተሰማሩ ሰራተኞች የስነ ምግብ ሁኔታቸውን እና አመጋገባቸውን የሚወስኑ ርዕሰ ጉዳዮች ላይ ምን ይመስላል የሚለውን ርዕሰ ጉዳይ እና ተያያዥ ጉዳዮች ለማጥናት የተዘጋጀ ነው፡፡

የማህበሩ ስም እና አድራሻ፡ _____

1. ለስንት ወር ሰራህ/ሽ? < 6 ወር ≥6 ወር

✓ ከ 6 ወር በታች ከሆነ በጥናቱ አይካተትም

2. በኮብል ስቶን ከመስራትህ/ሽ በፊት ለቆየ የጤና ችግር ታክመህ/ሽ ተወቃለህ/ሽ አዎ አልታከምኩም

✓ የታከሙ ከሆነ በጥናቱ አይካተቱም

3. የጥናቱ ተሳታፊ ነፍሱ-ጡር ወይም አጥቢ ከሆኑ በጥናቱ አይካተቱም.

ክፍል 1: ማህበራዊ እና ስነ-ህዝባዊ ገጽታዎችን በተመለከተ

ተ.ቁ	ጥያቄዎች	የሚጠበቅ መልስ	ዝለል
101	እድሜ	-----ዓመት	
102	ፆታ	1 ወንድ 2 ሴት	
103	የትምህርት ደረጃ	1. ያልተማረ/ች 2. ማንበብና መጻፍ 3. 1-4 ክፍል 4. 5-8 ክፍል 5. 9-12 ክፍል 6 ዲፕሎማና በላይ	
104	የጋብቻ ሁኔታ	1 ያላገባ/ች 2 ያገባ/ች 3 የፈታ/ች 4 የተለያየ/ች 5 የሞተበት/ባት	
105	የቤተሰብዎት ብዛት	-----	
106	የወር ገቢዎት ስንት ነው?	-----ብር	
107	ተጨማሪ የገቢ ምንጭ ለህ/ሽ?	1. አዎ 2.የለም 99. አላወቅም	
108	ተ.ቁ 107 መልሱ አዎ ከሆነ ምን ያህል ገቢ ታገኛለህ/ሽ?	----- ብር	

ክፍል 2 የቀን ሰራተኞች የስራ ሁኔታ

ተ.ቁ	ጥያቄዎች	የሚጠበቅ መልስ	ዝለል
201	በዚህ ስራ ላይ ለስንት ጊዜ ቆየህ/ሽ	----- ወር	
202	በሳምንት የሚሰሩባቸው ቀናት ብዛት?	----- ቀን	

203	በቀን ውስጥ በስራ የሚያሳልፉበት ሰዓት ብዛት	----- ሰዓት	
204	ከዚህ ስራ ውጭ በቀን ስራ ላይ ሰርተህ/ሽ ታወቃለህ/ሽ?	1. አዎ 2.የለም 99. አላወቅም	
205	አዎ ከሆነ ለስንት ወር?	----- ወር	

ክፍል 3 የስነ ምግብ ሁኔታ መለኪያ

ተ.ቁ	ጥያቄዎች	የሚጠበቅ መልስ	ዝላል
301	ክብደት በኪሎ ግራም		
302	ቁመት በሴንቲ ሜትር		

ክፍል 4. ቀጣዩ መጠይቅ የቀን ሰራተኞች የአመጋገብ ልምድን ዓይነትን ይመለከታል

ተ.ቁ	ጥያቄዎች	የሚጠበቅ መልስ	ዝላል
401	በቀን በመደበኛ ስንት ጊዜ ትመገባለህ?	1. <1 በታች 2.1 ጊዜ 3. 2 ጊዜ 4.3 ጊዜ 5. ከ3 በላይ	
402	ቁርስ በሳምንት ስንት ጊዜ ትመገባለህ/ሽ?	1. በየቀኑ 2. ከ3-4 ጊዜ በሳምንት 3. 2 ጊዜ በሳምንት 4. ተመግቤ አላወቅም	
403	ምሳ በሳምንት ስንት ጊዜ ትመገባለህ/ሽ?	1. በየቀኑ 2. ከ3-4 ጊዜ በሳምንት 3. 2 ጊዜ በሳምንት 4. ተመግቤ አላወቅም	
404	ስናክ(መክሰስ) በሳምንት ስንት ጊዜ ትመገባለህ/ሽ?	1. በየቀኑ 2. ከ3-4 ጊዜ በሳምንት 3. 2 ጊዜ በሳምንት 4. ተመግቤ አላወቅም	
405	እራት በሳምንት ስንት ጊዜ ትመገባለህ/ሽ?	1. በየቀኑ 2. ከ3-4 ጊዜ በሳምንት 3. 2 ጊዜ በሳምንት 4. ተመግቤ አላወቅም	
406	ፋስት ፎድስ በሳምንት ስንት ጊዜ ትመገባለህ/ሽ?	1. በየቀኑ 2. ከ3-4 ጊዜ በሳምንት 3. 2 ጊዜ በሳምንት 4. ተመግቤ አላወቅም	
407	ባለፈው 24 ሰዓት ውስጥ (ትናንት ቀን እና ማታ), የተመገብካቸው/ሻቸው ምግቦች?		
407A	ዳቦ አምባሻ ሩዝ ብስኩት ኩኪስ እንጀራ ወይም ማንኛውንም ዓይነት ምግብ ከበቆሎ ከሩዝ ገብስ ስንዴ ጤፍ ማሽላ የተዘጋጀ?	1. አዎ 2.የለም 99. አላወቅም	

407B	ማንኛውንም ዓይነት ወሰጣቸው ቢጫ ወይም ኦሬንጅ ከለር ያላቸው ዱባ ካሮት ጣፋጭ ድንች?	1. አዎ 2.የለም 99. አላወቅም	
407C	ማንኛውንም ዓይነት ድንች አደንጓሪ ስራስር?	1. አዎ 2.የለም 99. አላወቅም	
407D	ማንኛውንም ዓይነት አረንጓዴ ቅጠላቅጠል ቲማቲም ቃረ?	1. አዎ 2.የለም 99. አላወቅም	
407E	ማንኛውንም ዓይነት ቲማቲም ነጭ ሽንኩርት ስራስር?	1. አዎ 2.የለም 99. አላወቅም	
407F	ማንኛውንም ዓይነት ማንኛ አሾካዶ ሙዝ አፕል ፓፓያ ብርቱካን?	1. አዎ 2.የለም 99. አላወቅም	
407G	ማንኛውንም ዓይነት አትክልት?	1. አዎ 2.የለም 99. አላወቅም	
407H	ማንኛውንም ዓይነት ስጋ ጉበት ኩላሊት?	1. አዎ 2.የለም 99. አላወቅም	
407I	ማንኛውንም ዓይነት እንቁላል?	1. አዎ 2.የለም 99. አላወቅም	
407J	ማንኛውንም ዓይነት የአሳ ወጤቶች?	1. አዎ 2.የለም 99. አላወቅም	
407K	ማንኛውንም ዓይነት ምግብ ከአተር ባቄላ እና ለወዝ የተዘጋጀ?	1. አዎ 2.የለም 99. አላወቅም	
407L	ማንኛውንም ዓይነት አሬራ እርጎ እና የወተት ወጤቶች ምግብ?	1. አዎ 2.የለም 99. አላወቅም	
407M	ማንኛውንም ዓይነት ምግብ ከዘይት ከቅባት እና ቅቤ የተዘጋጀ?	1. አዎ 2.የለም 99. አላወቅም	
407N	ማንኛውንም ዓይነት ስኳር እና ማር?	1. አዎ 2.የለም 99. አላወቅም	
407O	ማንኛውንም ዓይነት ምግብ ቅመማ ቅመም ለስላሳ ቡና ሻይ?	1. አዎ 2.የለም 99. አላወቅም	
407P	ከቤት ውጭ (ምግብ ወይም ስናክ)?	1. አዎ 2.የለም 99. አላወቅም	

ክፍል 5 ከሱሰኝነት ጋር በተያያዘ ያላቸው ባህሪን በተመለከተ

ተ.ቁ	ጥያቄዎች	የሚጠበቅ መልስ	ዝላል
501	ሲጋራ ታጨሳለህ/ሽ?	1. አዎ 2. አላጨሰም	
502	አዎ ከሆነ በቀን ስንት ጊዜ ሲጋራ ታጨሳለህ/ሽ?	1 ከ1-5 2.ከ6-10 3. ከ 10 በላይ	
503	አልኮል ትጠጣለህ/ሽ?	1. አዎ 2. አልጠጣም	
504	አዎ ከሆነ በቀን ስንት ጊዜ ትጠጣለህ/ሽ?	1.አልፎ አልፎ 2. አንድ ጊዜ 3. ከአንድ ጊዜ በላይ	
505	ጫት ትቅማለህ/ሚያለሽ?	1. አዎ 2. አልቅምም	
506	አዎ ከሆነ በቀን ስንት ጊዜ ትቅማለህ/ሽ?	1.አልፎ አልፎ 2. አንድ ጊዜ 3. ከአንድ ጊዜ በላይ	
506	በቂ እንቅልፍ ትተኛለህ/ኝያለሽ?ከ5 ሰዓት በላይ በየቀኑ የሚተኛ/የምተኛ ከሆነች	1. ብዙ ጊዜ አልተኛም 2. መካከለኛ 3. ብዙ ጊዜ እተኛለሁ 4. ሁልጊዜ እተኛለሁ	

ክፍል 6 ምግብ በቅርብ እና በፈለጉት ሰዓት ማግኘታቸውን በተመለከተ

ተ.ቁ	ጥያቄዎች	የሚጠበቅ መልስ	ዝላል
601	ምግብ በአብዛኛው የምታገኘው/ኚው የት ነው?	1. ከቤት 2. ከቤት ውጭ	
602	ከዉጭ ከሆነ በማንኛውም ሰዓት ማግኘት ይቻላል?	1. አዎ 2. አይደለም 3. አላዉቀውም	
603	ከዉጭ ከሆነ በቀላሉ ማግኘት ይቻላል?	1. አዎ 2. አይደለም 3. አላዉቀውም	

Annex- 5, Declaration:

I, the under signed, declared that this is my original work and has not presented in this or any other University and all sources of materials used for this thesis have been duly acknowledged.

Name: Geteneh Moges (BSc)

Signature: _____

Date: _____

Place: Addis Ababa University, school of public health

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

Name: Solomon Shiferaw (MD, MPH)

Signature: _____

Date: _____

Name: Robel Yirgu (BSc, MPH)

Signature: _____

Date: _____

Place: Addis Ababa University, school of public health

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress report as pre terms and conditions of the Research Publications Office in effect at the time of Grant is forward as the result of this application.

Name of the Student

Date. _____Signature

Approval of the primary Advisor

Name of Primary Advisor

Date _____Signatur

Name of Secondary Advisor

Date _____Signature