HARAMAYA UNIVERSITY

POSTGRADUATE DIRECTORATE

NUTRITIONAL LITERACY AMONG HEALTH PROFESSIONALS WORKING IN PUBLIC HOSPITALS OF BALE ZONE, SOUTH EASTERN ETHIOPIA

MPH THESIS

By

MUHAMMED JEMAL (BSc)

DECEMBER, 2022

HARAR, ETHIOPIA

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NUTRITIONAL LITERACY AMONG HEALTH PROFESSIONALS WORKING IN PUBLIC HOSPITALS OF BALE ZONE, SOUTH EASTERN ETHIOPIA

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH NUTRITION

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BIOGRAPHICAL SKETCH

The author I, Muhammed Jemal Abdurebi, was born in Bale Zone, Agarfa Woreda, Ali Town, Oromia Regional State, Ethiopia on December 30/1992 GC. I have attended my primary and secondary schools grade 1-8, 9-10 and 11-12 in Ali Elementary, Ali Beha Biftu High School and Robe Preparatory schools respectively. Following the university entrance examination, I was placed at Hawassa University in October 2011GC and graduated from the department of Human Nutrition on 7, July 2013GC with Great Distinction. After graduation, I was employed at Bule Hora University and served as assistant lecturer and other administrative positions until I left for study leave at Haramaya University for post graduate study in a Master of Public Health specialization by public health nutrition in September 2019/2020GC.

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ABBREVIATIONS AND ACRONYMS

CINS	Comprehensive Integrated Nutrition Services
EMDHS	Ethiopia Mini Demographic and Health Survey
FL	Food Literacy
FSQ	Food Service Quality
GMP	Child Growth Monitoring and Promotion
GrandNL	Grand Nutritional Literacy Scale
HL	Health Literacy
IMCI	Integrated Management of Childhood Illnesses
IYCN	Infant and Young Children Nutrition
NCQ	Nutritional Care Quality
NL	Nutritional Literacy
NLS	Nutritional Literacy Scale
NNS	National Nutrition Strategy
NSDA	Nutrition Service Delivery Assessment
NVS	New Vital Sign Scale
OTC	Outpatient Therapeutic Care
PSNP	Productive Safety Net Program
SBCC	Social Behavioral Change Communication
SFLQ	Short Food Literacy Questionnaire
SHNS	School Health and Nutrition Strategy

ABSTRACT

Background: Nutrition literacy is the degree to which individuals have the capacity to get, process, and understand nutrition information and skills needed to make right nutrition decisions. It is the capacity to get, process, and understand basic nutrition information and nutrition services needed to make right health decisions. There is distinct paucity of literature and no study has been done in Ethiopia to determine the level of nutritional literacy among health professionals.

Objective: To assess nutritional literacy status of health professionals in Government Hospitals of Bale Zone; South Eastern Ethiopia, from December 6-31, 2021.

Methods: An institution based cross-sectional study was employed. From the five Hospitals in Bale Zone, 316 health professionals were selected by systematic random sampling and all Hospitals Food and Nutritional Service coordinators were included for interview. Nutritional literacy instrument and other self-administered questionnaires were used to assess nutritional literacy, nutritional status, quality of nutritional care and other related variables. Data were entered into Epi data version 3.1 and exported to Statistical Package for Social Science version 21 for analysis. Descriptive analysis was displayed and the results were presented by tables and graphs. Binary logistic regression was used to identify factors associated with nutritional literacy status among health professionals. Accordingly, AOR with 95% confidence interval was computed and p value <0.05 was used to declare statistical significance.

Result: The overall magnitude of adequate nutritional literacy was 34.5% (95% CI (29.7-40.2). The magnitude of nutritional literacy of the five domains, nutrition and health, micronutrient, household food measurement, food label and numeracy, and food group were 68.4%, 56.4%, 8.5, 38.3% and 44.6%, respectively. All the hospitals were on substantial food and nutritional care quality. Being females [(AOR=0.47; 95% CI: (0.25, 0.86)], working in General hospital [(AOR=2.2; 95% CI: (1.20, 4.28)], and being Doctor [(AOR=3.3; 95% CI: (1.34, 8.14)] were significantly associated with nutritional literacy.

Conclusion: The magnitude of adequate nutritional literacy was poor in relative to similar studies. Since most subjects had non nutrition academic degrees, so they had a bit nutrition course which can justify their poor nutritional literacy level. Factors including gender, type of hospital and study field were positively associated with nutritional literacy.

Key words: Health literacy, Nutritional literacy scale, Nutritional literacy

1. INTRODUCTION

1.1. Background

Nutrition literacy is the degree to which individuals have the capacity to get, process, and understand nutrition information and skills needed to make right nutrition decisions. It is the capacity to get, process, and understand basic nutrition information and nutrition services needed to make right health decisions (Silk et al., 2008). Inadequate Nutritional Literacy hinders healthy eating (Gibbs *et al.,* 2018), which is associated with the high prevalence of chronic diseases (Who and Consultation, 2003).

Human nutrition starts with the physiological and biochemical use process involved in nourishment, how nutrients in a food provide energy or convert into tissue body, and the disease that result from insufficient or access essential nutrients (Oyewole and Atinmo, 2008). Nutrition is widely recognized as an integral part of overall health care and disease management. Life style, environmental factors and nutrition is considered as the major malleable and powerful factor in promoting health, preventing and treating disease, and improving quality of life (Jessica C Fanzo *et al.*, 2015). Nutrition literacy requires knowledge of nutrition principles and skill in food-related tasks (Gibbs and Chapman-novakofski, 2012).

Nutrition services are the backbones that keep healthcare organizations steadily providing patients with warm, healthy service during their stay. In principle all patients have the right to nutritional care and, whenever able to eat, to choose what they want to eat and when and with whom. What we eat and drink affects our health and wellbeing and reflects our culture and beliefs. Nutritional disorders are the main causes of morbidity and mortality (FDRE, 2008).

Providing nutrition care through early and appropriate nutrition screening, assessment, and intervention can improve outcomes in hospitalized patients (Tappenden et al., 2013), including increased morbidity and mortality, length of stay, complications, and readmission rates and decreased patient quality of life (Agarwal *et al.*, 2013) and hospitalization costs (Dan. L *et al.*, 2017).

Given the breadth of findings among studies that look at nutritional literacy and associated factors in Ethiopia, there is no study yet done and there are distinct paucity of literature on

health professionals' nutritional literacy and associated factors. Therefore, the purpose of this paper is to assess nutritional literacy of health professionals in public hospitals of Bale Zone, South Eastern Ethiopia, from December 6-31, 2021.

1.2. Problem Statement

Worldwide, numbers of studies have done on nutritional literacy, food and nutritional literacy and health and nutritional literacy including factors related to literacy, with most leading countries turkey and Iran, the only study in Africa is in Uganda. Among employees the range of inadequate nutritional literacy on adults employees 4.7% in Turkey, 68.4% in Brazil and at 60% in Uganda.

Child undernutrition can be reduced if health workers with adequate nutrition knowledge provide correct, adequate, and frequent nutrition advice to caregivers (Imdad A, Yakoob MY and Bhutta ZA, 2011). Across the globe, the quality of health workers' nutrition knowledge and, their counseling skills has been a concern (Mowe *et al.*, 2008; Calderon, 2001). Historically, medical training has lacked adequate and updated nutrition training that is in keeping with the situation and needs on the ground (Lindell *et al.*, 2006). As a result, health workers produced from teaching institutions have lacked adequate nutrition knowledge (Mogre *et al.*, 2017). Such health workers may also lack the competence and skills to provide basic nutrition advice to their clients (Fletcher and Carey, 2011). This incompetence, in turn, may be a factor deterring health workers from providing nutrition advice and management to their clients (Leslie and Thomas, 2009).

Poor health literacy affects all levels of the health care experience. It impedes provider-patient communications, and affects the ability to access and navigate the health service system (Nielsen-Bohlman L et al., 2004). If this disparity is not addressed, providers will be unable to respond adequately to growing global health concerns such as obesity, diabetes, heart disease, and cancer (Carmona, 2006). Understanding the importance of nutrition and healthful dietary behaviors is critical to the prevention and management of each of these global health concerns. Literacy is a key factor accounting for differences in dietary habits, with more-healthful eating practices positively associated with higher nutrition literacy skills. Nutrition illiteracy may be contributing to the disease burden of poor communities and countries and reinforcing the already existing health and economic inequalities (Silk *et al.*, 2008).

A society's low level of nutrition literacy may lead to problems in understanding, evaluating and implementing nutrition information and ultimately to an increase in nutrition-related diseases. Today, it is a well known fact that eating habits play an important role in the development of health problems such as cardiovascular diseases, many cancers, obesity, hypertension, diabetes, allergic diseases, osteoporosis, anemia etc. (Lindsay H. Allen and Stuart R. Gillespie, 2001). Health literacy appears to be associated with nutrition behaviors. Those with limited health literacy less often consult food labels (EunSeok Cha *et al.*, 2014), (Miller and Cassady, 2015) and have greater difficulty in interpreting food labels as well as estimating appropriate food portions (Norazmir *et al.*, 2012).

Nutrition and related lifestyle factors greatly impact wellbeing in health and disease. Despite the profound impact good nutrition has on health and wellness, the science of nutrition and its application to health care are not fully integrated in most health professions training programs. This gap is further compounded by the fact that patients and the public remain confused about the correct nutritional advice to follow given the widespread media interest attracted by diet and the disparity in nutrition related health messages that are in circulation. All health care professionals need to be knowledgeable and competent in nutrition as it applies to health promotion and prevention, as well as treating acute and chronic diseases. There is little doubt that health professionals can be more effective in their daily practice when they draw on current nutrition knowledge and effective clinical skills ('National Research Council (US) Committee on Nutrition in Medical Education, 1985)

No study has been done in Ethiopia to determine the level of nutritional literacy among health professionals and associated factors. However, one study indicated that factors that influence development of competence in nurses include both personal attributes and external factors such as the learning environment (Tabari and Kiger, 2006), another two studies one is exploratory study done by (Sileshi Demelash *et al.*, 2019) on Brief Assessment of Nutrition Service at Selected Government Hospital, Ethiopia, 2018"and (Yimer, 2017), Nutrition Competence Assessment of Nurses and Midwives in Ethiopia, 2017. Therefore, it is better to evaluate existing nutritional literacy status of health professionals in public hospitals.

1.3. Significance of the Study

Primarily, the findings of this study will help Hospitals in Bale Zone, to train their health professionals, take correction on their services quality and change their services delivery systems. Secondly, the findings will help local health offices to take measures on their health work force and plan for better quality health services. Thirdly, the finding will also used as an input for other stakeholders in the health care system including Regional Health bureau and Ministry of Health. Finally, this study finding will also used as baseline and reference for scientific community for further research conducting in the same areas in Bale Zone and will serve as a partial fulfillment of the requirements for the Master of Public Health Nutrition.

1.4. Objective of the Study

1.4.1. General Objective

- To assess magnitude of nutritional literacy among health professionals working in public hospitals of Bale Zone, South Eastern Ethiopia, from December 6-31, 2021.

1.4.2. Specific Objectives

- To determine magnitude of nutritional literacy status among health professionals working in public hospitals of Bale Zone, South Eastern Ethiopia, from December 6-31, 2021.
- To identify factors associated with nutritional literacy among health professionals working in public hospitals of Bale Zone, South Eastern Ethiopia, from December 6-31, 2021.

2. LITERATURE REVIEW

2.1. Prevalence of Nutritional Literacy

The prevalence of nutritional literacy and food and nutritional literacy done across the world in different target groups and associations also made with different variables. Ashoori et al., 2021 and Ahmad et al., 2018 identified the level of food and nutritional literacy in Iranian high school students by using Food and Nutrition Literacy Assessment Tool (FNLAT) and found inadequate nutritional literacy status of low and 60.5% respectively (Ashoori *et al.*, 2021), (Mehri *et al.*, 2020). Another study done in turkey in Denizli province, on level of nutritional literacy of adolescents in 9^{th} grade identified the mean (S D) Adolescent Nutrition Literacy Scale score of 67·6 (Ayer and Ergin, 2021)and similar study in Kampala District in Uganda found moderate levels of total nutritional literacy scale (Nicholas, 2021).

A cross sectional study done on adults in Sivas province, Turkey by using Evaluation Instrument of Nutrition Literacy on Adults (EINLA), result in 79.8% of adult population was inadequate mean score from the domain (Cesur and Sumer, 2017) and similar study in Lower Mississippi Delta found by using Newest Vital Sign indicated that 24% of participants had a high likelihood of limited nutrition literacy, 28% had a possibility of limited nutrition literacy, and 48% had adequate nutrition literacy (Zoellner *et al.*, 2009).

The study done in New Zealand on Nursing Students found mean literacy score of 56.7% ± 13.2% (Gael J. Mearns et al., 2016) and similar study done in Yasuj University of Medical Sciences in Iran by using a localized questionnaire based on the Evaluation Instrument of Nutrition literacy on Adults (EINLA), result in, 1% of students were dealt with the problem of inadequate nutritional literacy and 50.9% and 48.12% of students had borderline nutritional literacy and adequate nutritional literacy, respectively (Bahramfard *et al.*, 2020). Another study in Turkey university students using the Turkish version of Adolescent Nutrition Literacy Scale (ANLS) found Total nutritional literacy scores of 69.72 ± 8.59 (Kalkan, 2019)and (Hoseini and Hoseini, 2019) investigate Nutritional Literacy of Male University Students Athletes Contributed in 2018 Iran University Games and found that 42.44%, 32.17% and 25.39% of students had poor, moderate and good nutritional literacy, respectively (Kalkan, 2019; Hoseini and Hoseini, 2019).

Gülperi DEMİR, 2020 on turkey academicians, M Hemati on Elementary School Teachers in Yasuj, Iran and Sampaio, H. A. C.1 in a Brazilian health employees found the inadequate nutritional literacy scale of 4.7% with 50% poor score on domains, 22.7% and 68.4% respectively ((Demir, 2020; M Hemati et al., 2018).

The Nutrition Literacy Assessment Instrument used was a 40-item survey that includes five nutrition literacy domains. The domains are Nutrition and Health, micronutrient, household food measurement, food label and numeracy and food knowledge. Nutrition and Health domain addresses the ability to link intake of nutrients with health-related outcomes. Macronutrient knowledge attempts to identify understanding of foods containing carbohydrate, fat, and protein. Household Food Measurement skill are able to measure or estimate portions of food, which might be necessary for a carbohydrate controlled diet or for a weight loss diet, for example. The picture food with portion amount presented and the reader must choose from three answer options whether the amount is a recommended portion or not. The Food Label and Numeracy skills are able to find information about nutrients on food labels, which might be necessary for a carbohydrate controlled diet, a low-fat diet, or a sodium-restricted diet. Food Group knowledge is relevant as it able to group foods by nutritional category as taught through the USDA food guide (MyPlate)

2.2 Factors Affecting Nutritional Literacy

Nutritional literacy is affected by number of factors which is also different for different class of populations and living standards. Among the major factors affecting nutritional literacy number of studies identify factors like socio-demographic characteristics such as age, gender, level of education, income and mother education level and lifestyle factors like physical activity, presence of chronic disease and media use, nutritional status like level of body mass index and other biomarkers, and nutritional knowledge and health literacy are among the major ones. Based on these, the most factors among high school students are stream students attending, school performance, mothers education level, life style and nutritional knowledge, among university students was physical activity, year of study of higher semester and other lifestyle factors was investigated and the factors among employees was age, marital status, income level of education, media, weight, experience, presence of chronic disease and health literacy takes large portion.

2.2.1. Socio-Demographic Factors

Çağla Ayer and Ahmet Ergin done study on adolescents in semi-rural area in Turkey and identified Nutrition literacy status was related to mothers' education level (p 0.021); health perceptions(p 0.008); positive body perception (p 0.032); unhealthy food consumption status (p 0.017); information barriers (p 0.026), and trust in nutrition (p 0.001) (Ayer and Ergin, 2021).

G.Yilmazel, and S.Bozdoğan indentified nutritional literacy scale was affected by socio-demographic characteristics and health behaviors of adolescents, such as age, gender, education level of the mother, regular sports and BMI ($p<0.05$) (Yilmazel and Bozdogan, 2021).

Another study done in higher education graduate academicians in Turkey identify Nutritional literacy scores of women were found to be higher than men ($p<0.05$), decreased with increasing age ($p>0.05$), and those who were single, those with better income, those with chronic diseases and those with normal weight were closer to each other (Demir, 2020).

The cross-sectional study done in Sivas province in Turkey, associates nutrition literacy of adults living in the city center by using Evaluation Instrument of Nutrition Literacy on Adults (EINLA) and quality of life had found inadequate mean score from the domain which was negatively associated with their quality of life in physical, psychological and social domains and no statistically significant relationship was determined with individuals' monthly income levels ($p<0.05$) (Cesur and Sumer, 2017)**.**

2.2.2. Level of Education

Ashoori et al., 2021 investigated nutrition literacy status and its correlates in Iranian senior high-school students and found probability of high FNL knowledge score was significantly higher among students who majored in Natural Sciences (OR = 1.73, CI = 1.09–2.75), had better school performance (OR = 1.13,CI = 1.06–1.20) and higher socio-economic status score (OR = 1.20, CI = 1.01–1.44) (Ashoori *et al.*, 2021). (Bahramfard *et al.*, 2020) also done similar study on Yasuj University of Medical Sciences and revealed that higher semester students had more nutritional literacy than other students and nutritional literacy was

significantly correlated with the semester, field of study, students' residence and body mass index ($p<0.05$) (Bahramfard *et al.*, 2020).

The nutritional literacy study done on male athletes in Iran University revealed factors like Students with more sports precedent and higher education had a higher level of nutritional literacy ($r = 0.71$, $P = 0.028$, $r = 0.83$, $P = 0.011$, respectively) (Hoseini and Hoseini, 2019). Çağla Ayer and Ahmet Ergin done similar study on adolescents in semi-rural area in Turkey and identified Nutrition literacy status was related to mothers' education level; health perceptions; positive body perception; unhealthy food consumption status; information barriers (undecided about effort for information gathering, undecided about the difficulty of understanding information and thinking it is difficult to understand, trust in nutrition, diet information sources (nutrition and diet expert, dietitian trusting (according to others), nutrition and diet expert, dietitian neutral to trust (compared with others) and trust in textbooks)) (Ayer and Ergin, 2021). Study done on Elementary School Teachers in Turkey indentify factors affecting nutritional literacy, and found Teachers with fewer years of work and higher education had a higher level of nutritional literacy ($p<0.05$) (M Hemati et al., 2018).

Another study revealed that, as the level of education increases, nutritional literacy levels also increase (OR= 5.85, %95 CI: 3.12-10.97) ((Demir Özdenk and Özcebe, 2018; Aihara and Minai, 2011)) and similar study produce low education level and low health literacy had been associated with negative health and nutritional behaviors (Michou *et al.*, 2019; González-Chica *et al.*, 2016; Aaby *et al.*, 2017).

The role of media was also indentified as source of nutrition information. A research done on adults in the Lower Mississippi Delta by (Zoellner *et al.*, 2009), Controlling for income and education level revealed that, nutrition literacy was significantly associated with media use for general purposes ($F = 2.79$, $P = .005$), media use for nutrition information ($F = 2.30$, $P= .04$), and level of trust from nutrition sources (Zoellner *et al.*, 2009).

2.2.3. Experience

Study done on Elementary School Teachers in Turkey indentify factors affecting nutritional literacy, and found Teachers with fewer years of work and higher education had a higher level of nutritional literacy (M Hemati et al., 2018).

2.2.4. Nutritional Status

Another arena of studies reported on the association between nutrition and health literacy and study in New Zealand on undergraduate Nursing students indentify nutritional literacy score was inversely associated with anthropometry measures and total cholesterol/high-density lipoprotein cholesterol ratio and positively associated with high-density lipoprotein cholesterol (Gael J. Mearns et al., 2016). The relationship between Health and nutrition literacy levels in Greek adults with chronic disease by using European Health Literacy Questionnaire (HLS_EU_Q47) and the Greek version of the Nutrition Literacy Scale (NLS-Gr) indentified that, controlling for gender, age and education, chronic disease was negatively associated with lower NL (b ± SE: -0.736 ± 0.341, p=0.031) but was not associated with HL levels (b ± SE: -0.741 ± 0.609, p=0.224) (Michou *et al.*, 2019).

Another study in Turkey assess impact of nutrition literacy on the food habits on young by using Turkish version of Adolescent Nutrition Literacy Scale (ANLS) and found better literacy score on females which drives the food habits of female participants were better than males; in accordance with their nutrition literacy status (Kalkan, 2019).

2.3. Conceptual Framework

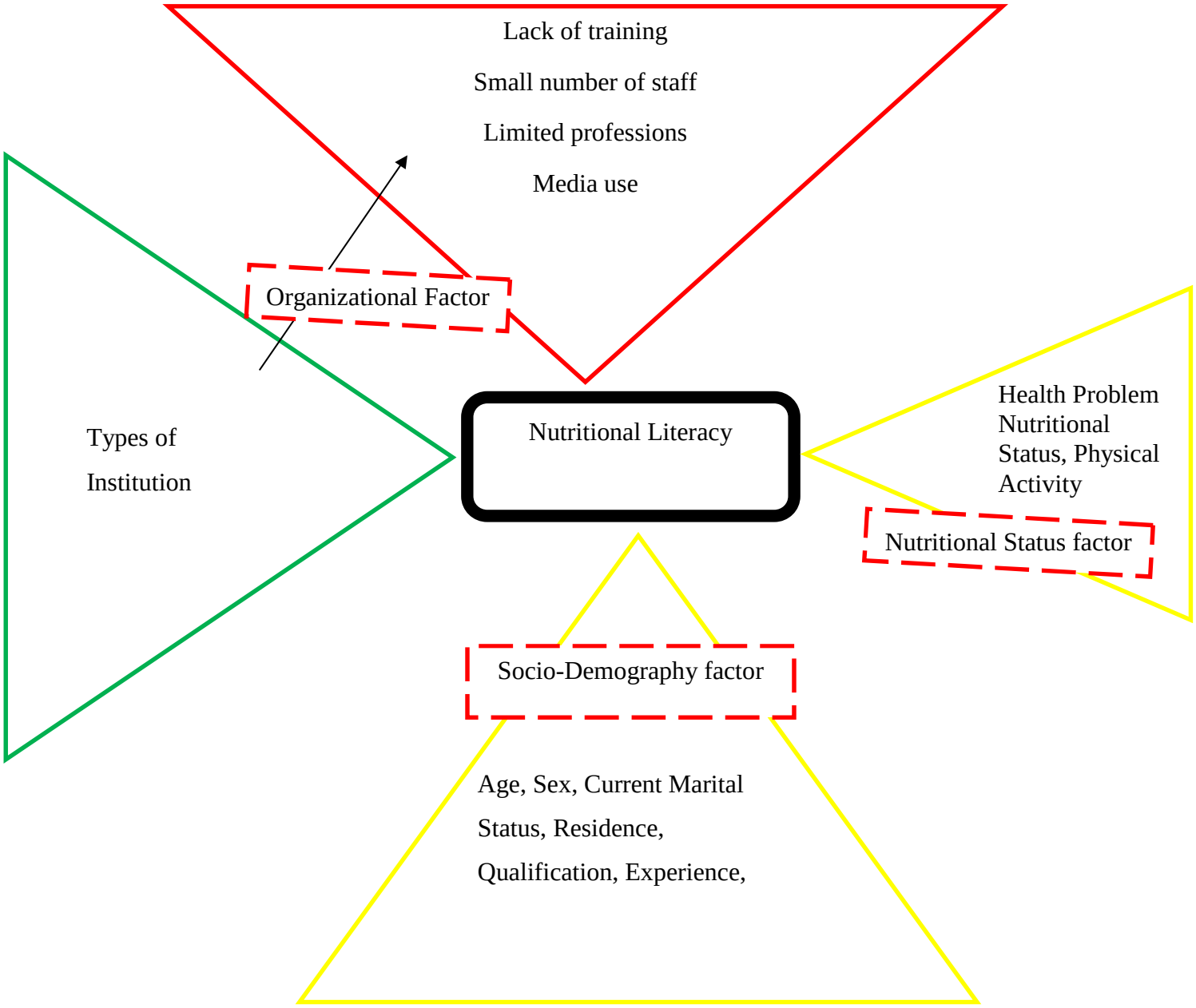

Figure 1 Conceptual framework on nutritional literacy status developed by principal investigator from different literatures.

3. METHODOLOGY

3.1. Study Area and Period

The study was conducted in five public hospitals in Bale Zone, South Eastern Ethiopia from December 6-31, 2021. Bale zone is among twenty-one administrative zones of Oromia regional state. It is located in the Southeastern part of Oromia and is situated between 5°11´03´´N to 8°09´27´´North latitudes and 38°12´04´´E to 42°12´47´´East longitudes with an altitude ranges from 300 to 4377 meters above sea level. Bale is bordered by Somali Region on the South and Guji zone on the West, West Arsi Zone on the North, Arsi Zone on the Northeast, West Hararghe and East Hararghe on the East. Robe, the capital of the zone is situated at 430km from Addis Ababa. Bale zone have 18 districts and two city administrations. About five hospitals, 383 health posts, 83 health centers, 179 private clinic, 1 NGO clinic, 4 other public clinic, 95 pharmacy/drug shop, 1 NGO drug shop and 4 medical drug store are found in the zone. The total population projected for 2019 was 1,963,416. The hospitals deliver health services in many specialty areas including gynecology and obstetrics, surgery, pediatrics and child health, internal medicine, ophthalmology, psychiatry, and dentistry. The five hospitals are Madda Walabu University Goba Referral Hospital, Robe general hospital, Dallo Manna general hospital, Goro primary hospital and Madda Walabu primary hospital (Bale Zone Report. Socio Demographic and Socio Economic Profile of Bale Zone, southeast Ethiopia. 2013).

Madda Walabu University Goba Referral Hospital (MWU GRH) first established as a small clinic in a resident house in 1955 and is located 446 km Southeast of Addis Ababa. The hospital has more than 120 beds offering different specialized services and serves more than 1.5 million peoples which come from catchment area and different district of the Bale zone in four wards by more than 519 clinical staffs. The hospital also serves as a training center for Madda Walabu University and provides clinical services to students, prisoners, and students of private and public colleges in the town. There are also services like, major and minor operations, neonatal intensive care, maternal and child health, ART (Anti-Retroviral Therapy) service, physiotherapy, radiology and dermatology services, out-patient department, psychiatry, emergency room, laboratory, pharmacy, dental and eye clinic, X-ray, card room, kitchen, and laundry room (Goba Hospital Report. Goba Referral Hospital, Bale Zone, Southeast Ethiopia. 2014).

Robe General Hospital is found in Robe town of the zone, Oromia National Regional State, and located at 435 km southeast from the capital city, Addis Ababa, Ethiopia. Robe hospital was started as health center from 1978- April 2011. Then it becomes hospital comprising four wards with a total of 56 beds and more than 219 clinical staffs (Unpublished Robe Hospital Report. Bale Robe District Hospital, Bale Zone, Southeast Ethiopia, 2014).

Goro Hospital is in Goro Woreda, 60km from Robe Town. Goro primary hospital is the new hospital with only MCH single ward with 75 clinical staffs. Dallo Mana general hospital is in Delo Menna town which is one of the woredas in the Oromia Region of Ethiopia. The hospitals provide nearly all types of obstetric care with more than 150 clinical staffs. Madda Walabu primary hospital is Madda Walabu Woreda, one among the nine pastoralist districts of the Bale Zone. It is located 630 Km from Addis Ababa and have a total population of 127,682 according to Bale Zone health office 2016/ 2017 population projection. The hospital has four wards including ART with more than 198 clinical staffs (Unpublished Bale Zone Report. Socio Demographic and Socio Economic Profile of Bale Zone, southeast Ethiopia, 2013).

3.2. Study Design

An institution based cross-sectional study design was employed.

3.3. Population

3.3.1. Source Population

All the health professionals working in all public hospitals of Bale Zone were source population and all the Hospital Food and Nutritional Service coordinators of each hospital.

3.3.2. Study Population

All the health professionals working the public hospitals and fulfill the inclusion criteria during the study period and all the assigned or representative Hospital Food and Nutritional Service coordinators were included.

3.4. Inclusion and Exclusion Criteria

3.4.1. Inclusion Criteria

All the health professionals served at least six months and above and those willing to participate were included in the study.

3.4.2. Exclusion Criteria

The health professionals on probation period were excluded from the study.

3.5. Sample Size Determination

The sample size was calculated by using Epi Info population survey for the total population of 1155 at 95 % confidence level and 5% margin of error for all specific objectives and the largest was used as a representative sample for the study. The expected frequency for nutritional literacy was 47% (Ketelo, 2020), with representative sample size of 287. Therefore, the final sample size by adding 10% non-response rate, was 316.

For the second objective the sample size was calculated using Epi Info at 95% confidence level and power of 80% from considered factors as displayed in the table1.

Table 1 Summary of sample size calculation for associated factors of nutritional literacy to assess nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

Considered factors	**Power**	**Ratio (exposed : non exposed**	**Odds ratio**	**Outcome in exposed group**	**Outcome in unexposed group**	**Total sample required**
Chronic disease (Michou *et al.*, 2019).	80	1	0.26	7.6	24	178
Level of education (Demir, 2020).			5.85	86.6	52.1	66
Gender (Ashoori et al., 2021)			0.45	32.9	52.1	226

3.6. Sampling Technique

Health professionals were selected by using systematic random sampling technique with proportional allocation. Accordingly sample size was allocated for all five Hospitals based on numbers of health professionals they have. The skipping interval (K) was calculated for each hospital by dividing total number health professionals of each Hospital to allocated sample size. Accordingly, skipping interval was 4 for all hospitals and the first respondents for each Hospital was selected by lottery method from their pay roll and then, every 4^{th} health professionals were included (Figure2).

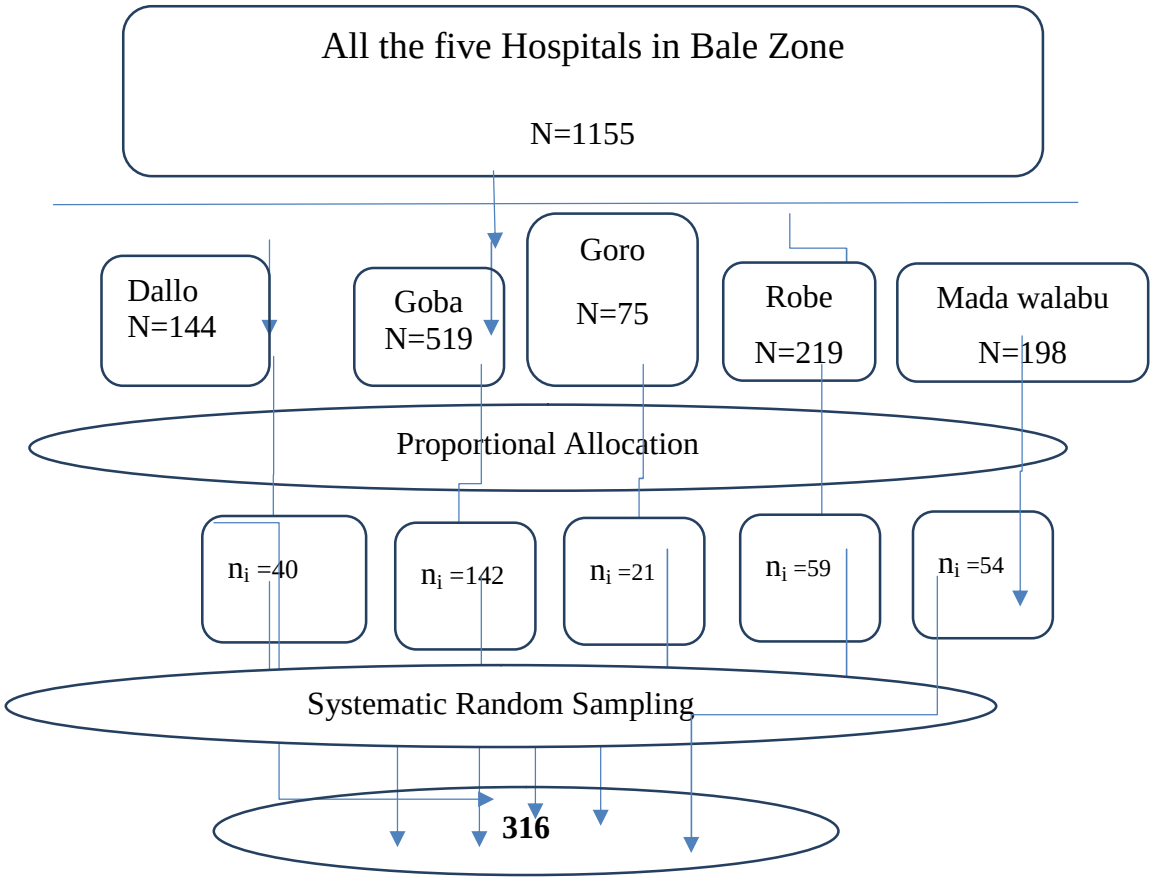

Figure 2 Diagrammatic representation of sampling technique to assess nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

3.7. Data Collection Method

The research assessed level of nutritional literacy among health professionals working in selected government hospitals. Several variables were recorded in a questionnaire form including socio-demographic characteristics, Nutritional literacy and related factors both separately and in combination.

The Nutritional literacy status data was collected by using nutritional literacy instrument with 40 items that was developed and modified from literature (Gibbs *et al.*, 2018). The nutritional literacy domains were nutrition and health, micronutrients, Household Food Measurement, Food Label and Numeracy and Food groups**.** Each correct and incorrect answer was scored as 1and 0, respectively. Based on the achieved scores, participants were categorized as having

inadequate nutrition literacy (less than 25 score), and having adequate nutrition literacy (greater than or equal to 25 score) (Gibbs *et al.*, 2018).

Anthropometric measurement was carried out to determine the nutritional status of the study participants' by using Body Mass Index (BMI). The weight of the study subjects were measured using a beam balance to the nearest 0.1Kg. The height of the respondents were measured using a vertical height scale (stadio meter) to the nearest 0.5 cm. Body Mass Index was computed by dividing weight in kg by the square of the height in meters (kg/m^2) and study participants were classified as underweight, normal, overweight and obese based on their BMI (WHO, 1995).

Dietary data was assessed by using standardized individual Dietary Diversity score (IDDS) tool with the 24-h food recall method. The questionnaire was adapted from Food and Nutrition Technical Assistance (FANTA)/Food and Agriculture Organization (FAO) and by reviewing the literature (FAO, 2010)

Nutritional service quality data was collected by Instrument for Evaluation of Food and Nutritional Care questionnaire from Hospital Food and Nutritional Service coordinators of each hospital (Diez-Garcia *et al.*, 2013).

The Instrument for Evaluation of Food and Nutritional Care designated into Nutritional Care Quality (NCQ) and Food Service Quality (FSQ). Each category comprised four indicators with lists of 3 to 6 criteria, and was measured as percentage of existence of that group of actions in selected institutions. Each indicator corresponded to 25% of the total Nutritional Care Quality and Food Service Quality value. Food and Nutritional Care Quality in Hospital was determined as the mean percentage that each institution complied with the NCQ and FSQ indicators. Differences in the criteria between hospitals were considered as substantial, moderate and small when the score were equal to 30%, Less than 30% to 15%, and less than 15%, respectively. All the necessary changes were done on tools before data collection (Diez-Garcia *et al.*, 2013).

3.8. Data Collectors

The data were collected by twelve nurses and six midwives who were working closely to the respective hospitals and four Health officers and two nutritionists were assigned as supervisors.

3.9. Data Collection Procedure

Data collections were carried out on job site within respected hospitals. The selected participants were informed by data collectors (nurses/midwives) to enroll in the study if they were willing, and written informed consent was taken from each respondent prior to data collection.

3.10. Variables

3.10.1. Dependent Variable

- Nutritional literacy among health professionals (YES/NO)

3.10.2. Independent Variable

- Socio-Demographic characteristics

Age, gender, level of education, income, marital status and types of institution

- Level of Education

Field of study, year of experience, media use

- Nutritional Status

Body mass index and nutritional knowledge and health literacy, physical activity and presence of chronic disease

3.11. Operational Definition

Nutrition literacy: Nutrition literacy is a literacy level collected by using nutritional literacy instrument from its five domains (nutrition and health, micronutrients, Household Food Measurement, Food Label and Numeracy and Food groups) used to get, process, and understand nutrition information and skills needed to make right nutrition decisions (Gibbs *et al.*, 2018).

Inadequate nutrition literacy: A nutritional literacy level collected by using nutritional literacy instrument from its five domains (nutrition and health, micronutrients, Household Food Measurement, Food Label and Numeracy and Food groups) and with score of less than 25 from 40 items (Gibbs *et al.*, 2018).

Adequate nutrition literacy: A nutritional literacy level collected by using nutritional literacy instrument from its five domains (nutrition and health, micronutrients, Household Food Measurement, Food Label and Numeracy and Food groups) and with score of 25 or more from 40 items (Gibbs *et al.*, 2018).

Small Food and Nutritional Care Quality: a level given by Instrument for Evaluation of Food and Nutritional care Quality and Food Service Quality and measured as percentage that each institution complied with the NCQ and FSQ indicators with score of less than 15% (Diez-Garcia *et al.*, 2013).

Moderate Food and Nutritional Care Quality: a level given by Instrument for Evaluation of Food and Nutritional care Quality and Food Service Quality and measured as percentage that each institution complied with the NCQ and FSQ indicators with score of Less than 30% to 15% (Diez-Garcia *et al.*, 2013).

Substantial Food and Nutritional Care Quality: a level given by Instrument for Evaluation of Food and Nutritional care Quality and Food Service Quality and measured as percentage that each institution complied with the NCQ and FSQ indicators with score of greater than or equal to 30% (Diez-Garcia *et al.*, 2013).

3.12. Data Quality Control

Data collectors and supervisors were trained for two days about research objective, type of data to be collected, ways of obtaining consent, keeping confidentiality and quality of data collection. Pre-test was done before actual data collection in Melka Oda General Hospital, West Arsi, Shashemanne town which was different from actual study area to decrease information contamination. Every day after data collection, questionnaires was reviewed and checked for completeness, consistency, and clarity by the supervisors and overall supervision was done by principal investigator. Finally, double data entry was done by two data clerks and consistency of data was checked by comparing the two separately entered data.

3.13. Methods of Data Analysis

Data were entered into Epi data version 3.1 and exported to SPSS version 21 for analysis. Descriptive analysis (frequencies, percentage and mean) was displayed and the results were presented by tables and graphs. Collinearity was checked by scatter matrix plot. Model fitness was tested by Hosmer and Lemshow and its P-value was 0.118. Initially bivariate logistic regression was performed to select candidate variables for multivariable analysis at p-value of <0.25. Then multivariable logistic regression was done to identify factors significantly associated with nutritional literacy. Accordingly adjusted odds ratio with 95% confidence interval was computed and p-value less than 0.05 were used to declare significance.

3.14. Ethical Consideration

This research was approved by Haramaya University College of Health and Medical Sciences Institutional Health Research Ethical Review Committee (IHRERC) and obtained letter of clearance.

An official letter of cooperation was written from Haramaya University College of Health and Medical Science to respected hospitals. Prior to administering the questionnaires, objective of the study was clearly explained to the heads of health institutions and participants informed voluntary written and signed consent were obtained. Confidentiality was ensured throughout execution of the study. Participants were informed that their participation on the study was voluntary and that they could withdraw from the study at any time if they wish to do so. All standard safety measures were implemented during the data collection process to protect data collectors and participants from COVID-19.

4 RESULTS

4.1 Socio-Demographic Characteristic

A total of 316 health professionals were participated in the study with response rate of 100% and 209 (66%), were males and 193 (61%) were married. Regarding educational level the largest portion 225 (71%) were degree holders. From the total respondents, nursing department was the largest portion, 117 (37%). Internet was the most preferred and trusted media for seeking information about nutrition, food and diet 183 (58% and 121 (38%) respectively (Table2).

Table 2 Socio-demographic characteristics of respondents on assessment of nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021.

Variable Characteristics and Category	Frequency	Percentage
Gender		
Male	209	66
Female	107	34
Current marital status		
Single	123	39
Married	193	61
Level of education		
Diploma	49	16
Degree	225	71
Masters	7	2
Medical doctor/specialist	35	11
Study field		
Nursing	117	37
Midwifery	59	19
Pharmacy	47	15
Medical doctor/specialist	35	11
Others (MLS, PH, Radiology, Anesthesia, Environmental, psychiatry)	58	18
Presence of any kind of chronic disease		
Yes	20	6
No	296	94
Engaged in any kinds of physical activity		
Yes	200	63
No	116	37
Media used for seeking information about nutrition, food, or diet in the past 12 months		
Television and Radio	102	32
Internet	183	58
Newspaper	31	10
Other		
Trust of nutrition, food, or diet information sources		
Other health care provider	63	20
Television and radio	86	27
Internet	121	38
Other	46	15
Confidence in getting information about nutrition, food, or diet		
Confident	255	81
Not confident	36	11
I don't know	25	8
Barriers to seeking information about nutrition, food, or diet		
It took a lot of effort to get the information you needed	86	27
You felt frustrated during your search	50	16
You were concerned about the quality	90	29
The information you found was too hard to understand	39	12
Others	51	16

4.2. Nutritional Status of Respondents

4.2.1. Body Mass index of respondents

In this study the mean body mass index was 23.3±3.1kg/m^2. The magnitude of undernutrition (BMI<18.5 kg/m2) was 18 (6%). In the finding normal nutritional status was 212 (67%), while the magnitude of overweight and obesity was 73 (23%) and 13 (4%) respectively (Table3).

Table 3 Nutritional status of health professionals on assessment of nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

Variable	Classification	N (%)
BMI	<18.5	18 (6%)
	18.5-24.9	212 (67%)
	25-29.9	73 (23%)
	>30	13 (4%)

4.2.2. Dietary Diversity Score of Respondents

The result from the individual dietary diversity score indicated that, the mean dietary diversity score was 5.15±2.09 with a minimum score of 1 and maximum 9. Based on standard dietary diversity score status classification of nine food groups 234 (77%), meet the score and the rest 73 (23%) consumed below 4 food group and they had poor dietary diversity score (Figure3)

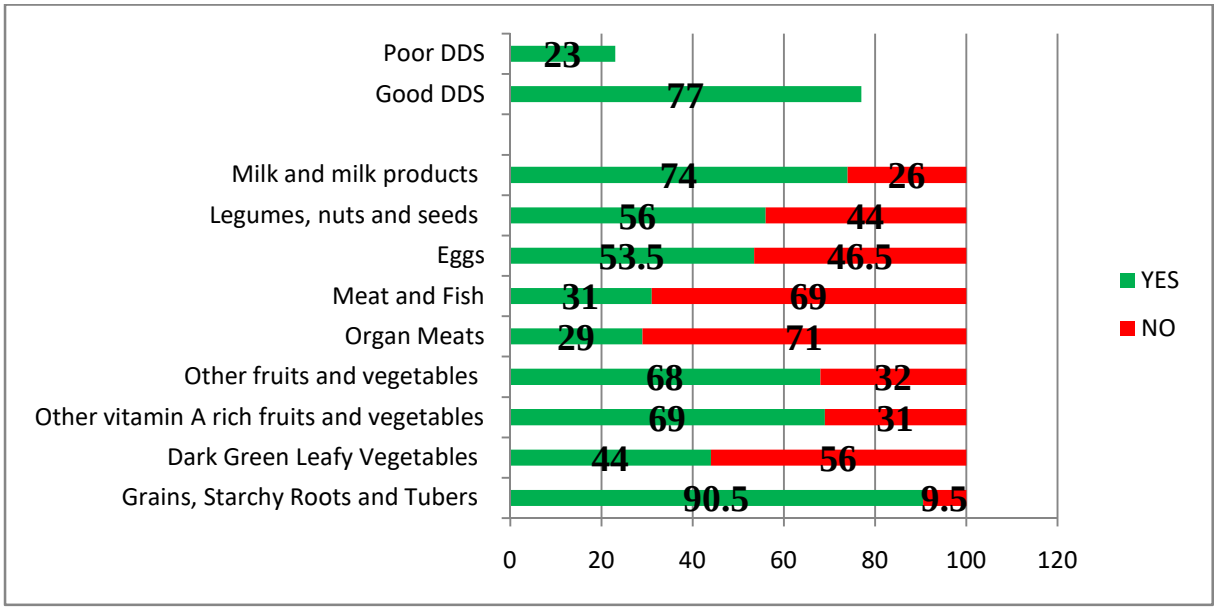

Figure 3 Individual Dietary Diversity Score of Respondents on assessment of nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

4.4 Nutritional Literacy Status of Respondents

The magnitude of adequate nutritional literacy was 34.5% (95%CI, 29.7-40.2). The magnitude of adequate nutritional literacy from the domains was 68.4%, 56.6%, 8.5%, 38.3% and 44.6% of the domains nutrition and health, micronutrient, household food measurement, food label and numeracy and food group respectively (Figure5).

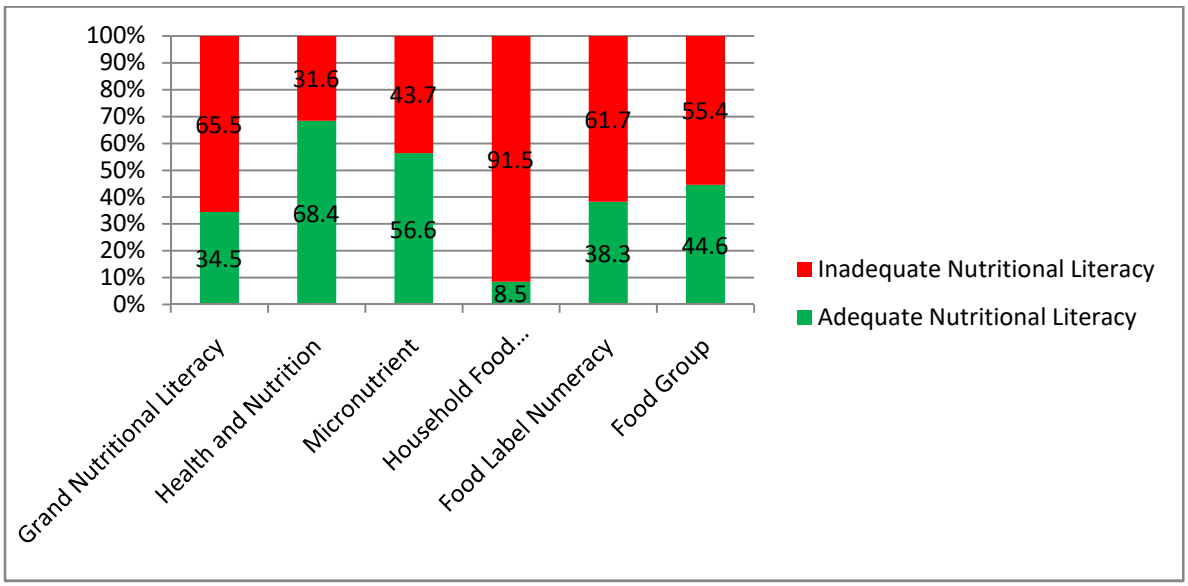

Figure 4 Nutritional literacy by its domains on assessment of nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

Mean grand nutritional literacy was 21.5±5.76 and the domains mean score was 4±1.43 nutrition and health, 3.64±1.43 micronutrient, 1.69±1.26 household food measurement, 3±1.45 food label and numeracy and 9±3.6 food groups. (Table4).

Table 4 Grand Nutritional Literacy Status and Its Domains of Respondents on assessment of nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

Nutritional Literacy Domains	N	Minimum	Maximum	Mean	Std. Deviation
Nutrition and health domain	316	0.0	6.0	4.0	1.44
Micronutrients domains	316	0.0	6.0	3.6	1.43
Household food measurement domains	316	0.0	6.0	1.7	1.26
Food label and numeracy domains	316	0.0	6.0	3.0	1.45
Food groups domains	316	0.0	16.0	9.1	3.61
Grand nutritional literacy	316	8.0	35.0	21.4	5.76

Grand nutritional literacy status was evaluated in combination with different variables. In this study the magnitude of adequate nutritional literacy of males was greater than females. The magnitude of adequate nutritional literacy status by level of education as diploma, degree and masters and medicine was 29%, 30% and 64% respectively. Using different study fields, the highest magnitude of adequate nutritional literacy score was among Medicine/ Specialist 69%. The magnitude of adequate nutritional literacy among others study fields, Nursing, Pharmacy and Midwifery was 40%, 32%, 28%, and 19% respectively (table5).

Based on nutritional status, the highest magnitudes of adequate nutritional literacy was among overweight and obese 37%. The magnitudes of adequate nutritional literacy among normal and underweight nutritional status groups were 34% and 28%, respectively. Nutritional literacy status was also evaluated using hospitals and its type. Accordingly, the adequate nutritional literacy among Hospitals was, 52% in Goro Primary Hospital, 49% in Robe General Hospital, 45% in Dallo Manna General Hospital, 30% in MWU Goba Referral Hospital and 17% in Madda Walabu Primary Hospital. The adequate nutritional literacy was 27%, 47% and 30% among primary, general and referral hospitals respectively (Table5).

Table 5 Nutritional literacy status by different variables on assessment of nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

Variable	Nutritional Literacy		X^2	P-Value
	Yes N (%)	No N (%)		
Gender			13.9(1)	0.001
Male	87 (42)	112(58)		
Female	22 (21)	85 (79)		
Hospital Type			10.9(2)	0.004
Referral	42 (30)	100 (70)		
General	47 (47)	52 (53)		
Primary	20 (27)	55 (73)		
Level of education: **Diploma**	14 (29)	35 (71)	19.1(2)	0.001
Degree	68 (30)	157 (70)		
Masters/Medicine	27 (64)	15 (36)		
Study Field			26.4(4)	0.001
Nursing	38 (32)	79 (68)		
Midwifery	11 (19)	48 (81)		
Pharmacy	13 (28)	34 (72)		
MD/Specialist	24 (69)	11 (31)		
Others	23 (40)	35 (60)		
Nutritional status **Underweight**	5 (28)	13 (72)	0.67(2)	0.717
Normal	72 (34)	140 (66)		
Overweight and Obese	32 (37)	54 (63)		
Hospitals **MWU Goba RH**	42 (30)	100 (70)	19.6(4)	0.001
Robe GH	29 (49)	30 (51)		
Goro PH	11 (25)	10 (48)		
Madda Walabu PH	9 (17)	45 (83)		
Dallo Manna GH	18 (45)	22 (55)		

4.5 Food and Nutritional Care Quality of Hospitals

The nutritional care quality and food service quality status of all the hospitals was measured with standardized interview questionnaires that were presented to each hospital food service head. Accordingly, the highest mean score of both nutritional care quality and food service quality was MWU Goba Referral Hospital with a mean score of food and nutritional care quality of 84.5% and the lowest score was Madda Walabu Primary Hospital with a mean score of 60% food and nutritional care quality. From all the selected hospitals, Goro Primary Hospital was not included in data due that, there was no any kind of food and nutritional care services at the time of study (Table6).

Table 6 Mean FSQ and NCQ on assessment of nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

Food and Nutritional Services	Mean
Mean percentage of FSQ in Robe General Hospital	55.70
Mean percentage of FSQ in Dallo Manna General Hospital	60.00
Mean percentage of FSQ in Madda Walabu Primary Hospital	62.00
Mean percentage of FSQ in Mwu Goba Referal Hospital	86.60
Mean percentage of NCQ in Madda Walabu Primary Hospital	58.00
Mean percentage of NCQ in Dallo Manna General Hospital	63.65
Mean percentage of NCQ in Robe General Hospital	74.10
Mean percentage of NCQ in Mwu Goba Referal Hospital	82.40

The hospitals level of food and nutritional care quality was developed from the individual score food service quality and nutritional care quality. Based on level of food and nutritional care quality measurement reference levels, all the hospitals were on substantial food and nutritional care quality (Figure10).

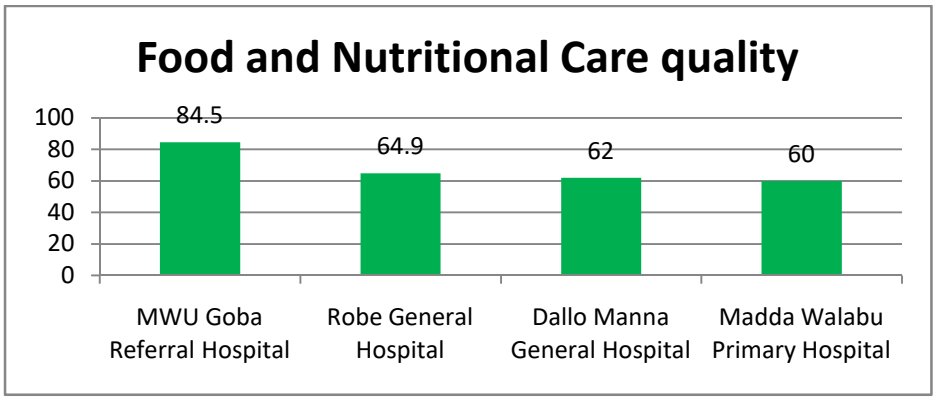

Figure 5 Level of Food and Nutritional Care Quality on assessment of nutritional literacy among health professionals in government hospitals, South Eastern Ethiopia, 2021

4.7 Factors Associated with Nutritional Literacy

In the bivariate logistic regression analysis, seven factors; gender, age, type of Hospital, study Field, level of trust of nutrition, food and diet information source, level confident in seeking information about nutrition, food and diet, and barriers to seeking information about nutrition, food and diet were associated with outcome variable at p-value less than 0.25 and selected as a candidate variable for multivariable logistic regression analysis.

In final multivariable binary logistic regression three variables were remained as factors significantly associated with nutritional literacy status. Accordingly, being female, being in General hospital, and being in Medicine/Specialist field of study were the factors that were statistically significant and associated with level of nutritional literacy status. Health professionals that were females were 53% less [(AOR=0.47; 95% CI: (0.25, 0.86)] adequate nutritional literacy status when compared to males. Working in General hospital was about 2.2 times more [(AOR=2.2; 95% CI: (1.20, 4.28)] adequate nutritional literacy when compared to being in referral hospital. Doctors were about 3.3 times more [(AOR=3.3; 95% CI: (1.34, 8.14)] adequate nutritional literacy status when compared to nursing professionals (Table7).

Table 7 Factors associated with Nutritional literacy in Bivariate and Multivariable Logistic Regression

Variable	Nutritional Literacy Status		COR with 95% CI	AOR with 95 % CI
	Yes	No		
Gender				
Male	87	112	1	1
Female	22	85	0.36(0.21, 0.62)	0.47(0.25, 0.86)
Hospital Type				
Referral	42	100	1	1
General	47	52	2.15(1.26, 3.67)	2.2(1.20, 4.28)
Primary	20	55	0.87(0.46, 1.62)	1.1(0.53, 2.34)
Study Field				
Nursing	38	79	1	1
Midwifery	11	48	0.48(0.22, 1.02)	0.54(0.23, 1.23)
Pharmacy	13	34	0.80(0.38, 1.68)	0.71(0.30, 1.66)
MD/Specialist	24	11	4.5(2.01, 10.21)	3.3(1.34, 8.14)
Others	23	35	1.4(0.71, 2.62)	1.3(0.63, 2.74)
Level of Trust				
Other health provider	18	45	1	1
TV and Radio	34	52	1.64(0.81, 3.30)	1.5(0.69, 3.36)
Internet	44	73	1.50(0.78, 2.90)	1.15(0.53, 2.50)
Others	13	37	0.88(0.38, 2.03)	1.3(0.32, 2.20)
Confidence in Getting Information				
Confident	95	160	1	1
Not confident	6	30	0.34(0.14, 0.84)	0.46(0.16, 1.32)
I don't know	8	17	0.79(0.33, 1.90)	1.4(0.52, 3.84)
Age Category				
<=25	13	40	1	1
26-30	59	96	1.89(0.94, 3.83)	1.5(0.69, 3.24)
31-35	29	47	1.89(0.87, 4.13)	1.1(0.44, 2.63)
>-36	8	24	1.03(0.37, 2.83)	0.71(0.22, 2.25)
Barriers in Seeking Information				
It took a lot effort	33	53	1	
You felt frustrated	9	41	0.35(0.15, 0.82)	0.57(0.22, 1.45)
You concerned quality	31	59	0.84(0.46, 1.60)	0.89(0.44, 1.80)
Too hard to understand	16	23	1.12(0.52, 2.42)	1.7(0.70, 4.10)
Others	20	31	1.04(0.51,2.11)	1.4(0.60, 3.26)

5 DISCUSSION

The present study was conducted among health professionals in public hospitals and it was the first of its types in Ethiopia. This study found magnitude of adequate nutritional literacy to be 34.5% (95% CI, 29.7-40.2). Health professionals, who were females, in General hospital and those studies Medicine/ Specialist were the factors affecting nutritional literacy and were statistically significant.

This study found magnitude of adequate nutritional literacy to be 34.5% (95% CI, 29.7-40.2). This finding was in line with two studies done in Iran which reported magnitude of adequate nutritional literacy of 39.5% (95% CI, 35.2-43.76) (Mehri *et al.*, 2020), and 25.39% (95% CI, 20.7, 30) (Hoseini and Hoseini, 2019) respectively. The other studies conducted in Brazil and Japan also found consistent with present results which reported magnitude of adequate nutritional literacy to be 31.6% (95% CI, 16.8, 46.3) (Sampaio, et al., 2014), and 30% (95% CI, 26.5-33.4) (Aihara and Minai, 2011) respectively.

But the finding from current study on magnitude of adequate nutritional literacy was lower than the findings from the studies done; in Lower Mississippi Delta using Newest Vital Sign which found that 48% (95% CI, 40.6, 55.3) of respondents had adequate nutrition literacy (Zoellner *et al.*, 2009)**,** Yasuj University of Medical Sciences in Iran using a localized questionnaire based on the Evaluation Instrument of Nutrition literacy on Adults (EINLA), result in 48.12% (95% CI, 43.7, 53) of students had adequate nutritional literacy (Bahramfard *et al.*, 2020), New Zealand on nursing students which found the adequate nutritional literacy score of 56.7% (95% CI, 46.7, 65.8) (Gael J. Mearns et al., 2016), Iran by M Hemati on Elementary School Teachers in Yasuj, found the adequate nutritional literacy scale of 77.3% (95% CI, 69.4, 85.1)(M Hemati et al., 2018), Brazil using nutritional literacy scale on health employees found the adequate nutritional literacy scale of 94.7% (95% CI, 87.6, 99.9) (Sampaio, H. A. C.), in Turkey in Sivas province on adults by using Evaluation Instrument of Nutrition Literacy on Adults (EINLA) found that 79.8% (95% CI, 75.8, 83.7) of adult population had adequate nutritional literacy (Cesur and Sumer, 2017)**,** and Turkey university on Turkey academicians found an adequate nutritional literacy scale of 96.3% (95% CI, 94.2, 98.3) (Demir, 2020).

The reasons for these discrepancies might be due to the difference in study period, because majority of previous studies were conducted five years before current study. The other possible explanation for this difference might be the target population used. Since current study was conducted among health professional and previous studies used different target population like students, community, elderly and academicians. The difference in tools used in this study and the former studies might also be source of discrepancy with the present finding. Finally there could be sociodemographic and socioeconomic differences between different populations used by this study and the formers. The finding from the present study suggests the need for further intervention through training and continuous professional development of health professionals for improvement of level of nutritional literacy.

Regarding factors associated with nutritional literacy, three factors were found to be significantly associated with nutritional literacy among health professionals. Health professionals who were females had 53% less likelihood of having adequate nutritional literacy when compared to males [(AOR=0.47; 95% CI: (0.25, 0.86)]. Health professionals working in General hospital had about 2.2 more likelihood of having adequate nutritional literacy when compared to those in referral hospital [(AOR=2.2; 95% CI: (1.20, 4.28)]. Health professionals studying Medicine/Specialist were about 3.3 more odds of having adequate nutritional literacy status when compared to nursing professionals [(AOR=3.3; 95% CI: (1.34, 8.14)].

In this study health professionals that were females had 53% less adequate nutritional literacy status when compared to males [(AOR=0.47; 95% CI: (0.25, 0.86)]. This finding was in agreement with the results of the studies done in Iran, which identified significantly lower score for food label reading in girls (OR = 0.45, CI = 0.31–0.67) (Ashoori, et al., 2021), and the other study from the same country which found low nutritional literacy among women with [(AOR=0.60; 95% CI: (0.24, 0.72)] (Mehri *et al.*, 2020). But this finding was different from the result conducted in Japan that revealed limited nutritional literacy more on men [(OR=0.58; 95% CI: (0.42, 0.81)] (Aihara and Minai, 2011), and Turkey which was done on higher education graduate academicians that identified Nutritional literacy scores of women to be higher than men ($p<0.05$), (Demir, 2020).

The reasons for this disagreement might be due to the difference in study population because the current study was among health professional but the formers were among elderly population and academician. The other possible source of difference might be the study setting. The current study was conducted in Ethiopia where females have a lot of additional responsibility than men; while this was not the case in Japan and Turkey. This finding implies the need to continuously develop nutritional literacy of women.

Health professionals working in General hospital had about 2.2 more likelihood of adequate nutritional literacy when compared to those in referral hospital [(AOR=2.2; 95% CI: (1.20, 4.28)]. This might be because health professionals working in general hospitals could have more training opportunities than those working in primary hospitals. Also they might be a merit of free time for reading and likelihood of getting training compared to those working in referral hospitals, as those working in referral hospital might be busy with additional academicals responsibilities. The numbers of health professionals working in general hospitals could be less than those working in referral hospital which in turn could create more chance of getting timely training for those working in general hospitals.

Health professionals studying Medicine/Specialist were about 3.3 more odds of having adequate nutritional literacy status when compared to nursing professionals [(AOR=3.3; 95% CI: (1.34, 8.14)]. This finding was in line with the studies conducted at Yasuj University of Medical Sciences revealing that mean nutritional literacy scores of students' were 25.41, 24.90 and 27.47 in general medicine, dentistry and nutrition sciences students, respectively. It also found that nutrition science students had highest score of nutritional literacy than operating room students (p=0.001). Students those attend tertiary education for higher numbers of semester had more nutritional literacy than other students and nutritional literacy was significantly correlated with the semester and field of study ($p<0.05$) (Bahramfard *et al.*, 2020). This similarity could be due to the fact that medicine students have longer duration of practical attachments on nutritional management which in turn will help them to read more about nutrition. This might increase their nutritional literacy compared to others field of studies.

5.1. Strength and Limitation of the Study

The present study is the first of its type study done in Ethiopia and it also targeted the neglected area by addressing health professionals' nutritional literacy in public hospitals in Bale Zone. The scope of the study was also large enough, which included all the public hospitals in the Bale Zone in which the hospitals are far apart geographically at the edge of the country.

The study have the following limitations: it was targeted only health professionals in public hospitals. Hence, it didn't include other health care institutions due to the absence of food services in other institutions. The study also did not include health posts, both private and public, due to resources and time constraints. Other limitation is, there was limited evidence on this area which could have affected the detail discussion of the findings.

6 CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

The study findings point out that the magnitude of adequate nutritional literacy was poor among health professionals in the studied hospitals when compared to other similar studies. Since most subjects had non nutrition academic degrees, so they had a bit nutrition course which can justify their poor nutritional literacy level. The finding also shows health professionals need intervention on nutrition knowledge and practice areas as nutrition literacy is a key element to promoting healthy dietary habits as well as promoting general health. Factors including gender, type of hospital and study field were significantly associated with nutritional literacy.

6.2. Recommendations

For Hospitals and Zonal Health Offices

Prepare professional development training on nutrition related areas, encourage and support females employee on professional development, allocate training opportunities for all hospitals proportionally support wards by availing infrastructure and equipment used for nutrition services, supply nutritional services assistance equipment and communicate with stakeholders, allocate budget specifically for food services and nutrition related activities, and strength the follow-up and mentorship of wards related to nutrition.

For Researchers:

Conduct similar studies on nutritional literacy by changing study target, area and methodology by adding more parameters and by including private institutions to report the findings for all stakeholders.

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8. ANNEXES

8.1. Participant Information Sheet and Informed Voluntary Consent Form (English Version) for the Head of the Hospitals

1 Introduction

My name is Muhammed Jemal. I am studying Masters of Public Health at Haramaya University, College of Health and Medical Sciences. I am working as a principal investigator for the study being conducted in this hospital. I kindly request you to lend me your attention to explain you about the study and your institution being selected as the study setting.

2 The study title: Nutritional Literacy Status among health professionals in Selected Public hospitals in South Eastern Ethiopia, from December 6-31, 2021.

3 Purpose of the study: The aim of this study is to write a thesis as a partial requirement for the fulfillment of a master's degree in Public Health Nutrition for the principal investigator.

The finding of this study has paramount importance for Health professionals, Hospitals and other concerned bodies on the level of Nutritional Literacy Status of health professionals and associated factors; those will use study finding as in put for planning, implementing and evaluating program components and services delivered.

4 Procedure and duration: I will provide questionnaire to the health professionals to give me pertinent information that is needed for the study. The questionnaire contains three sections and it will take about 15 minutes to complete.

5 Risks and benefits: The risk of being participant in this study is minimal, but only taking few minutes from the participants time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information on Nutritional Literacy Status of health professionals and associated factors among public Hospitals for planner.

6 Confidentiality: The information that is provided is kept confidential. There is no information that will identify the participants in particular. The finding of the study is general for the study community and will not reflect anything particular of individual person. The

questionnaire is coded to exclude showing names. No reference is made in oral or written reports that could link participants to the research.

7 Rights: Participation in this study is fully voluntary. The participants have the right to declare to participate or not in this study. If they decide to participate, they have the right to withdraw from the study at any time and this will not label them for any loss of benefit which they otherwise are entitled. They do not have to answer any question that they do not want to answer.

8 Contact address: If there are any questions or enquires any time about the study or procedures, please contact on this addresses.

The Principal Investigator: Muhammed Jemal:
Mobile phone: +251-9220-639-03/+251-9161-633-10
Email address: jemalmuhammed522@gmail.com

Institutional Health Research Ethics Review Committee (IHRERC):
Office phone: +251254662011, P.O.B: 235, Harari.

9 Declaration of informed voluntary consent:

I have read the participant information sheet. I have clearly understood the purpose of the research, and the procedures. The risks and benefits, issues of confidentiality, the rights of participating and the contact address for any queries. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that participants have the right to withdraw from the study at any time or not to answer any question that they do not want. I am also informed that the University has the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the Universities premises. Therefore, I declare my voluntary consent on behalf of Hospital management to allow this study to be conducted in this Hospital with my initials (signature) as indicated below.

Name and signature of head of the institution _____Date_____
Name and Signiture of data collector _____ Date_____

Thank you for your cooperation!!

8.2. Participant Information Sheet and Informed Voluntary Consent Form (English Version)

1 Introduction

My Name is----------. I am working as a data collector for the study being conducted in this Hospital by Muhammed Jemal on the assessment of Nutritional Literacy Status of health professionals and associated factors who is studying for his Master's degree at Haramaya University, Collage of Health and Medical Sciences**.** I kindly request you to lend me your attention to explain you about the study and study participant.

2 The study title: Nutritional Literacy Status among health professionals in Selected Public hospitals in South Eastern Ethiopia, from December 6-31, 2021.

3 Purpose of the study: The aim of this study is to write a thesis as a partial requirement for the fulfillment of a master's degree in Public Health Nutrition for the principal investigator. The finding of this study has paramount importance for Health professionals, Hospitals and other concerned bodies on the level of Nutritional Literacy Status of health professionals and associated factors; those will use study finding as in put for planning, implementing and evaluating program components and services delivered.

4 Procedure and duration: I will provide you a questionnaire to give me pertinent information that is needed by the study. The questionnaire contains three sections and it will take about 15 minutes to complete.

5 Risks and benefits: The risk of being participant in this study is minimal, but only taking few minutes from your time. There would not be any direct payment for participating in this study. But the findings from this research may reveal important information on Nutritional Literacy Status of health professionals and associated factors among public Hospitals for planner.

6 Confidentiality: The information that is provided is kept confidential. There is no information that will identify the participants in particular. The finding of the study is general for the study community and will not reflect anything particular of individual person. The questionnaire is coded to exclude showing names. No reference is made in oral or written reports that could link participants to the research.

7 Rights: Participation in this study is fully voluntary. The participants have the right to declare to participate or not in this study. If they decide to participate, they have the right to withdraw from the study at any time and this will not label them for any loss of benefit which they otherwise are entitled. They do not have to answer any question that they do not want to answer.

8 Contact address: If there are any questions or enquires any time about the study or procedures, please contact on this addresses.

The Principal Investigator: Muhammed Jemal:
Mobile phone: +251-9220-639-03/+251-9161-633-10
Email address: jemalmuhammed522@gmail.com

Institutional Health Research Ethics Review Committee (IHRERC):
Office phone: +251254662011, P.O.B: 235, Harari.

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Name and Signiture of the participant _____ Date_____
Name and Signiture of data collector _____ Date_____

Thank you for your cooperation!!

8.3. English Version of Self Administered Questionnaire Form

Name of data collector _____signature ————————date ————————

Name of supervisor ———————————— signature ————————date ————————

Questionnaire code ————————Hospital—----------

Self -administered questionnaire for health professionals

	Section I **Socio-demographic characteristics**	Responses	Code
01	Age	In years ……..	
02	Gender	Male ……..1 Female……2	
03	Current Marital status	Single ……....1 Married……..2 Divorced……3 Widowed ……...4	
04	Educational status	Diploma ……..1 Degree……..2 Masters and above…3	
05	Field of study	……..	
06	Experience	In years …….	
07	Types of Hospital	Primary hospital……1 General hospital…....2 Specialized hospital..3	
08	Presence of chronic disease	Yes ……..1 No …….2	
09	Physical activity	Yes ……..1 No …….2	

Section II Dietary Diversity Score (Tick YES/NO for the food consumed or NOT consumed for the last 24hrs)

	Food group	Examples	YES=1	NO=0
1	Grains or other starchy roots and tubers	Corn/maize, rice, wheat, sorghum, millet (e.g. Bread, noodles, porridge) white potatoes, white yam, white cassava,		
2	Dark green leafy vegetables	Amaranth, cassava leaves, kale, spinach**,** broccoli		
3	Other vitamin A rich fruits and vegetables2	Pumpkin, carrot, squash, sweet potato, ripe mango, papaya, cantaloupe, apricot, dried peach, and *other*		
4	Other fruits and vegetables 3	Tomato, onion, eggplant**,** wild fruits and 100% fruit juice made from these		
5	Organ meat	Liver, kidney, heart or other organ meats or blood-based foods		
6	Meat and fish 4	Beef, lamb, goat, rabbit, chicken, duck, or dried fish or shellfish		
7	Eggs	Eggs from chicken, duck, guinea fowl or any other egg		
8	Legumes, nuts and seeds	Dried beans, dried peas, lentils, nuts, seeds or foods made from these (eg. Hummus, peanut butter)		
9	Milk and milk products	Milk, cheese, yogurt or other milk products		

Anthropometric Data

Weight (Kg) …….

Height (Meter) …….

BMI……..

Section III **Nutritional Literacy**

Directions: Please read the text below and answer the questions that follow.

Eating well and staying fit are important to health. Good nutrition allows healthy growth and development for children and teens. A healthy diet may prevent long-term diseases such as heart disease, high blood pressure, type 2 diabetes, some cancers, malnutrition, osteoporosis, and others. It may also increase your chances for a longer life.

Good nutrition can also help maintain a healthy weight. When we eat food and drink beverages, we consume calories along with other nutrients. Calories are a vital source of energy for the body, but it is important to take in the right amount. Taking in too few can lead to weight loss, while taking in too many may lead to weight gain.

Some foods are high in calories and low in other nutrients. These foods are considered energy dense. You could eat a few energy dense foods and meet your calorie needs, but not get enough vitamins, minerals, and other important nutrients. A better idea would be to eat a variety of foods that are nutrient-dense, or foods that provide many vitamins, minerals, and other needed nutrients, but are low in calories, such as fruits and vegetables.

According to the 2005 Dietary Guidelines for Americans a healthy diet emphasizes fruits, vegetables, whole grains, low-fat dairy products, lean meats, poultry, fish, beans, eggs, and nuts. A healthy diet is also low in some nutrients, such as saturated fat, trans fat, cholesterol, sodium, and added sugars.

1. To lose _____, a person may need to eat fewer calories.
A) Weight B) cancer C) fruits D) fitness
2. Good _____ may prevent chronic diseases like high blood pressure.

A) Eggs B) diabetes C) nutrition D) chicken

3. A person who eats too few nutrients may develop _____.

A) Fat B) malnutrition C) suicide D) vitamins
4. Some nutrients, like _____ should be limited in a healthy diet.

A) Fruits B) vegetables C) niacin D) cholesterol

5. An example of an energy-dense food is _____.
A. chocolate ice cream (290 calories per 1 cup) B. air-popped popcorn (15 calories per 1

cup)
C. sliced fresh strawberries (50 calories per 1 cup) D. raw carrot sticks (50 calories per 1 cup)

6. Nutrient-dense foods such as _____ should be consumed most often.
A. chocolate ice cream (290 calories per 1 cup) B. French fries (152 calories per 1 cup)
C. sliced fresh strawberries (50 calories per 1 cup) D. root beer (100 calories per 1 cup)

Macronutrients **Code:_____**

1. The starch in a slice of bread is a type of _____.
A) Fat B) vitamin C) carbohydrate D) protein
2. Foods like oil and butter are often a source of _____.
A. vitamin C B. carbohydrate C. iron D. fat

3. The _____ found in orange juice is a type of carbohydrate.
A. sugar B. calcium C. protein D. folate

4. A good source of _____ is found in foods like eggs, chicken and fish.
A. starch B. protein C. fiber D. sugar

5. Butter, lard, and cheddar cheese all provide high amounts of _____ fat.
A. polyunsaturated B. saturated C. monounsaturated *D. trans* saturated
6. Because they are a good source of _____, vegetarians might eat kidney beans.
A. vitamin D B. vitamin B-12 C. fat D. protein

Household Food Measurement

Sometimes we eat food in the right amounts and sometimes we choose smaller or larger portions. For each food pictured, choose what you think is the right portion size.

1. Pictured is an 8 (eight) ounce glass of milk. Is this

a. More than one (1) portion?

b. Less than one (1) portion?

c. About right for one (1) portion?

2. Pictured is a 6 (six) ounce hamburger. Is this

a. More than one (1) portion?

b. less than one (1) portion?

c. about right for one (1) portion?

3. There is ½ cup of rice on this plate, pictured at left. Is this

a. more than one (1) portion?

b. less than one (1) portion?

c. about right for one (1) portion?

4. Pictured is one (1) grapefruit. Is this

a. more than one (1) portion?

b. less than one (1) portion?

c. about right for one (1) portion?

5. There are 2 (two) cups of spaghetti on the plate at left. Is this

a. more than one (1) portion?

b. less than one (1) portion?

c. about right for one (1) portion?

6. Pictured is 8 (eight) ounces of steak on the plate at left. Is this

a. more than one (1) portion?

b. less than one (1) portion?

c. about right for one (1) portion?

Food Label and Numeracy Food groups **Code:_____**

This is a list of foods. Using the chart below, write the name of each food in the food group in which it belongs.

apple	cheese	pork chop	Tomato
milk	potato	onions	Banana
noodles	bread	butter	Rice
orange juice	Chicken	hamburger patty	salad dressing

Grains	Vegetables	Fruits	Meat, Poultry, Fish and Beans	Dairy	Fats & Oils

Food Label and Numeracy **Code:_____**

Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving	
Calories 250	Calories from Fat 110
	% Daily Value*
Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 1.5g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

The food label at left is taken from the back of a container of macaroni and cheese.

1. How many calories will you eat if you eat the whole container?
    a. 250 calories
    b. 500 calories
    c. 700 calories
    d. 750 calories

2. If you are trying to eat fewer than 500 mg of sodium per meal, how many cups of this macaroni and cheese can you eat if you eat nothing else?
    a. 1 cup
    b. 2 cups
    c. 3 cups
    d. 4 cups

3. If your doctor has asked you to limit your fat intake to 60 grams per day, what percentage of your day's intake have you eaten in one serving of macaroni and cheese?
    a. 10%
    b. 20%
    c. 30%
    d. 40%

4. How many grams of carbohydrate would you eat in 2 cups of macaroni and cheese?
    a. 31 grams
    b. 45 grams
    c. 62 grams
    d. 75 grams

5. Which of the following nutrients is not found on this food label?
    a. total fat
    b. sodium
    c. thiamin
    d. sugars

6. If you are advised to increase your fiber intake, is this food a good choice?
    a. yes
    b. no

Section IV

Self -administered questionnaire for Hospital Food and Nutritional Service coordinator

Section III Nutritional Care Quality (NCQ) (100%)			
INDICATORS	**CRITERIA**	**Yes**	**No**
Inpatient dietary coverage actions (A) (25%)	A1.Duty shift system in the area of clinical nutrition A2.Supervision of meal distribution in the ward A3.Routine visits to patients		
Evaluation and monitoring of nutritional status actions (B) (25%)	B1.Nutritional status evaluation (complete) B2.Nutritional status monitoring B3.Entry of nutritional care information in the medical record B4.Filling in forms about nutritional care B5.Nutritional guidance at discharge B6.Assistance protocols		
Actions on integration of nutritional assistance activities within the team (C) (25%)	C1. Diet prescription in the medical records C2. Interconsultation on nutritional care C3. Team visits to patients C4. Participation in activities outside the HFNS C5. Nutritional support team		
Actions supporting diet therapy (D) (25%)	D1.Diet manual D2.Information about energy supply D3.Selection of nutritional supplements D4.Mechanisms for patients to require changes to the diet		
B Food Service Quality (FSQ)			
Mediation actions with users and other hospital sectors (A) (25%)	A1. Duty shift in the area of meal production A2. Formal evaluation of the HFNS regarding user satisfaction A3. Planning and goal-setting for the HFNS A4. HFNS participation in other hospital sectors		
Autonomy and management control actions (B) (25%)	B1. HFNS responsibility for purchases B2. Budget autonomy B3. Control of cost/meal or cost/daily produced food B4. Statistical control by the HFNS B5. Statistical control of the produced diets		
Meal production qualification actions (C) (25%)	C1. Standard prescription form C2. Dietetic kitchen C3. Routine tasting of diets C4. Good practice manual C5. Diet manual (*) C6. Production of nutritional supplements		
Staff qualification actions (D) (25%)	D1. Staff evaluation D2. Instrument for staff evaluation D3. Periodic training program		

7.4. Curriculum Vitae of Principal Investigator

europass

Europass Curriculum vitae

Personal information

Surname(s) / First name(s)	**ABDUREBI, MUHAMMED JEMAL**
Address(es)	Baha Biftu, 03, Bale Robe, Ethiopia
Telephone(s)	Mobile: **+251 922063903**
E-mail	Jemalmuhammed522@gmail.com
Nationality	Ethiopian
Date of birth	December, 30, 1992
Gender	Male

Work experience

Dates	08, September, 2018
Occupation or position held	Assistant Lecturer at Bule Hora University
Main activities and responsibilities	▪ To teach and examine courses ▪ To plan and review own teaching approach ▪ To plan, design and co-ordinate broad research activities and programmes ▪ To contribute to the development of research strategies for the School ▪ To provide expert advice to colleagues, students and external bodies, eg, government bodies
Name and address of employer	Bule Hora University, Bule Hora, Ethiopia
Type of business or sector	Higher Education

Education and training

Dates	30 October 2008 - 11 July 2013
Title of qualification awarded	Bachelor of Science Degree in Human Nutrition
Principal subjects/occupational skills covered	• program is organized to equip the students with knowledge, skills and attitudes of: ▪ Basic Sciences ▪ Microbiology and Food Hygiene ▪ Nutrition ▪ nutritional assessment ▪ Nutrition in emergency ▪ Public Health
Name and type of organisation providing education and training	Hawassa University P.O.Box: 05, Hawassa, Ethiopia.

Personal skills and competences

Mother tongue(s): **Afan Oromo**

Other language(s) Self-assessment	Understanding		Speaking	Writing
	Listening	Reading		
English	4	4	4	4
Amharic Language	4	4	4	4

4: fluently/mother tongue 3: good 2: sufficient 1: basic

Social skills and competences
- I have ability to communicate in difficult situation, Problem solving skills, ethical behaviour, sociable in interpersonal situation, have strong sense of multiculturalism, self management & professionalism.

Organisational skills and competences
- Able to work independently including planning & executing activities with minimum supervision
- Able to organize tasks in a team situation and able to motivate colleagues & meet deadlines.
- Various small skills that i can share with people in group
- I have also the humility to learn new knowledge from everyone in an organization

Technical skills and competences
- Able to Work and/or to cooperate in research (food/agro-industries and other related institutions) and development work in the field of Nutrition and Public Health
- Able to monitor & evaluate project activities

Computer skills and competences
- Able to converse with various software & computer programs...word, excel, Access, power point, Adobe, internet facilities, web designing, systems design, database management
- I have also various formal University trainings on the same field

Artistic skills and competences
- Writing articles is my favourite
- Reading & sharing
- Sports (Soccer, tennis, volleyball)

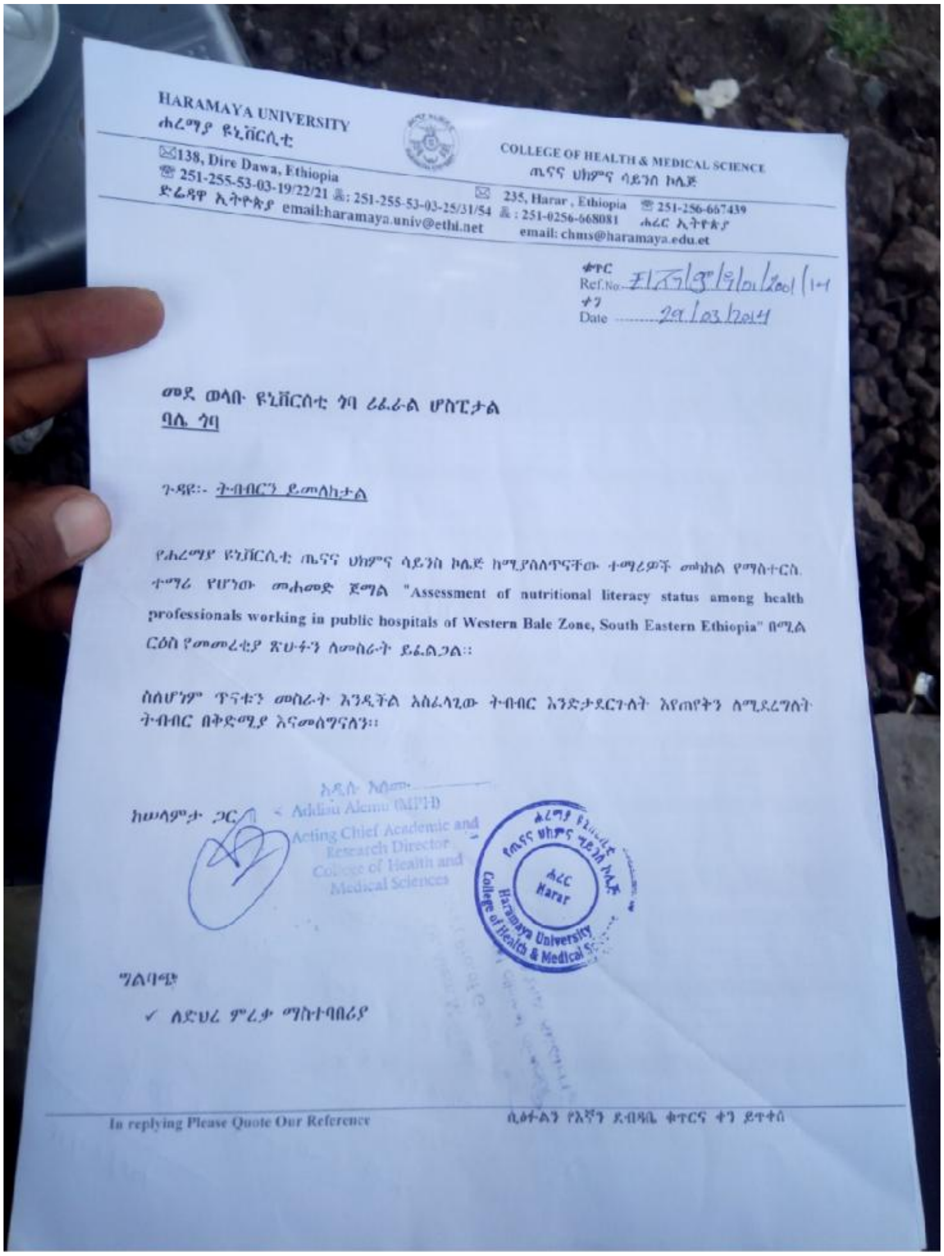
Other skills and competences: There are other activities that I have performed in addition to activities indicated.

Additional information

I certify that the statements made by me are true, complete and correct. I also certify that any documents provided in support of my application are authentic and accurate. I understand that any false or misleading statement or withholding relevant information may provide grounds for the withdrawal of any offer of appointment or the termination of employment.

Annexes

8.5. **Ethical Clearance and Supportive Letters**



HARAMAYA UNIVERSITY
ሐረማያ ዩኒቨርሲቲ

COLLEGE OF HEALTH & MEDICAL SCIENCE
ጤናና ህክምና ሳይንስ ኮሌጅ

138, Dire Dawa, Ethiopia
251-255-53-03-19/22/21 : 251-255-53-03-25/31/54
ድሬዳዋ ኢትዮጵያ email:haramaya.univ@ethi.net

235, Harar, Ethiopia 251-256-667439
: 251-0256-668081 ሐረር ኢትዮጵያ
email: chms@haramaya.edu.et

ቁጥር Ref.No.
ቀን Date 29/03/2014

መደ ወላቡ ዩኒቨርስቲ ጎባ ሪፈራል ሆስፒታል
ባሌ ጎባ

ጉዳዩ:- ትብብርን ይመለከታል

የሐረማያ ዩኒቨርሲቲ ጤናና ህክምና ሳይንስ ኮሌጅ ከሚያስለጥናቸው ተማሪዎች መካከል የማስተርስ ተማሪ የሆነው መሐመድ ጀማል "Assessment of nutritional literacy status among health professionals working in public hospitals of Western Bale Zone, South Eastern Ethiopia" በሚል ርዕስ የመመረቂያ ጽሁፉን ለመስራት ይፈልጋል።

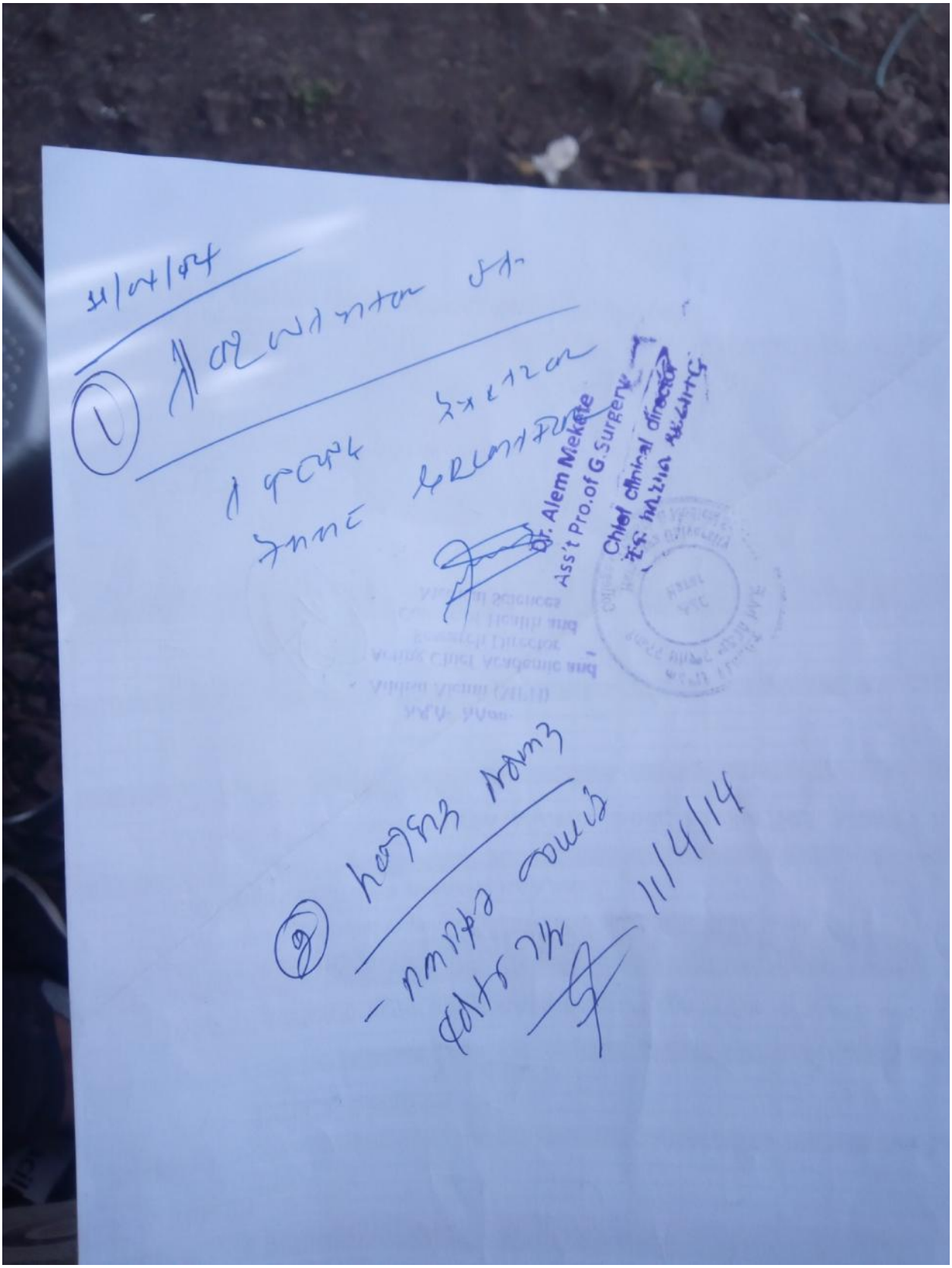
ስለሆነም ጥናቱን መስራት እንዲችል አስፈላጊው ትብብር እንድታደርጉለት እየጠየቅን ለሚደረግለት ትብብር በቅድሚያ እናመሰግናለን።

ከሠላምታ ጋር

አዲሱ አለሙ
Addisu Alemu (MPH)
Acting Chief Academic and Research Director
College of Health and Medical Sciences

ግልባጭ
✓ ለድህረ ምረቃ ማስተባበሪያ

In replying Please Quote Our Reference
ሲፅፉልን የእኛን ደብዳቤ ቁጥርና ቀን ይጥቀሱ


Dr. Alem Mekete
Ass't Pro.of G.Surgery
Chief clinical director

HARAMAYA UNIVERSITY
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COLLEGE OF HEALTH & MEDICAL SCIENCE
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Ref.No. [illegible]
ቀን
Date 29/03/2014

ለምዕራብ ባሌ ዞን ጤና ቢሮ
ባሌ ሮቤ

ጉዳዩ፡- ትብብርን ይመለከታል

የሐረማያ ዩኒቨርሲቲ ጤናና ህክምና ሳይንስ ኮሌጅ ከሚያስለጥናቸው ተማሪዎች መካከል የማስተርስ ተማሪ የሆነው መሐመድ ጀማል "Assessment of nutritional literacy status among health professionals working in public hospitals of Western Bale Zone, South Eastern Ethiopia" በሚል ርዕስ የመመረቂያ ጽሁፉን ለመስራት ይፈልጋል፡፡

ስለሆነም ጥናቱን መስራት እንዲችል አስፈላጊው ትብብር እንድታደርጉለት እየጠየቅን ለሚደረግለት ትብብር በቅድሚያ እናመሰግናለን፡፡

ከሠላምታ ጋር

አዲሱ አለሙ
Addisu Alemu (MPH)
Acting Chief Academic and Research Director
College of Health and Medical Sciences

ሐረማያ ዩኒቨርሲቲ ጤናና ህክምና ሳይንስ ኮሌጅ
ሐረር Harar
Haramaya University College of Health & Medical Sciences

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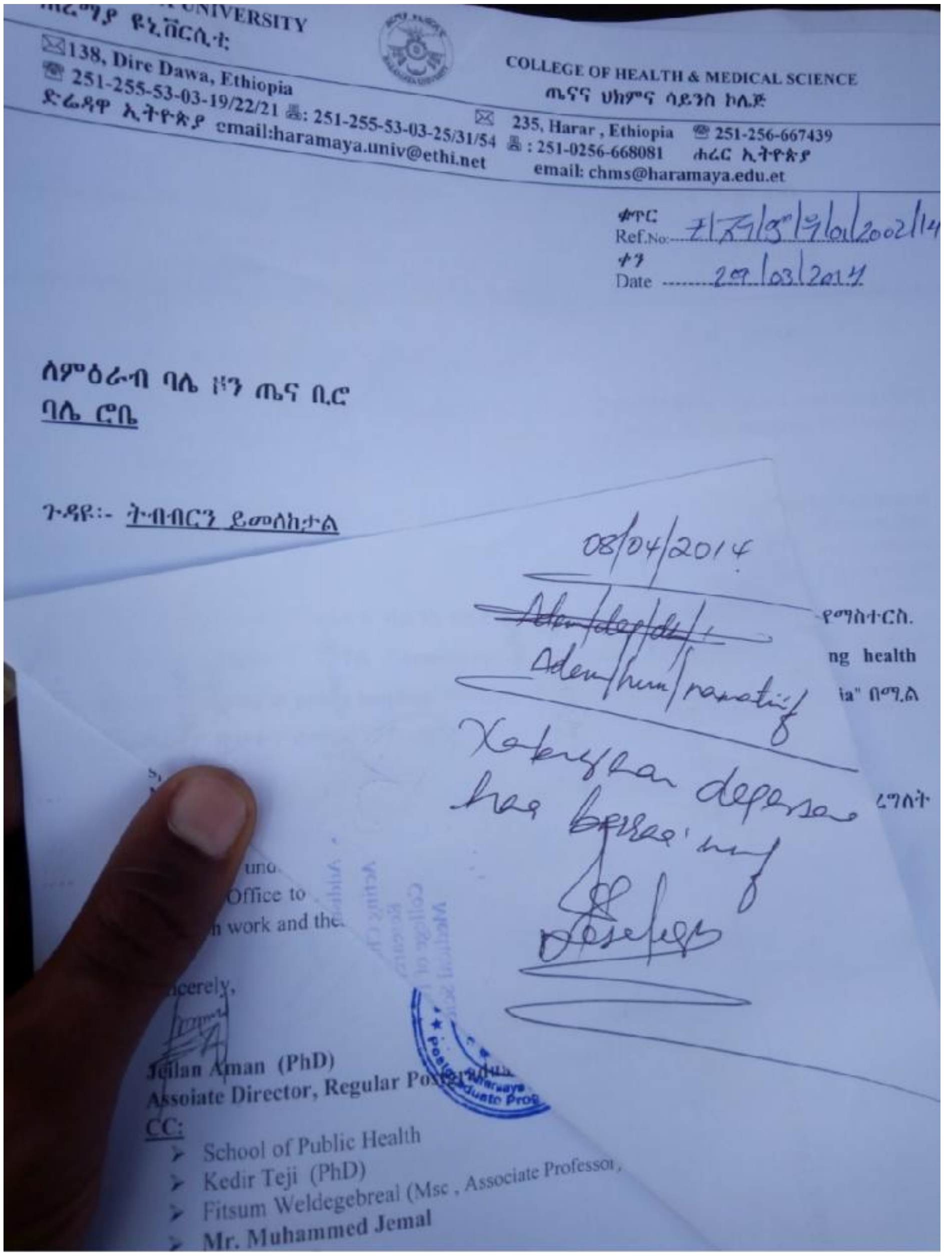
- ✓ ለድህረ ምረቃ ማስተባበሪያ

In replying Please Quote Our Reference   ሲጽፉልን የእኛን ደብዳቤ ቁጥርና ቀን ይጥቀሱ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ባሌ ሮቤ

ጉዳዩ:- ትብብርን ይመለከታል

08/04/2014

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...ng health
...ia" በሚ.ል
...ረግለት

...Office to
...work and the...

...cerely,

Jeilan Aman (PhD)
Assoiate Director, Regular Po...

CC:
- School of Public Health
- Kedir Teji (PhD)
- Fitsum Weldegebreal (Msc, Associate Professor,
- Mr. Muhammed Jemal

8.6. Approval Sheet

HARAMAYA UNIVERSITY

POST GRADUATE PROGRAM DIRECTORATE

Nutritional Literacy Status among Health Professionals in Government Hospitals of Western Bale Zone, South Eastern Ethiopia

Submitted by

_____	_____	_____
Name of Student	Signature	Date

Approved by

1 _____	_____	_____
Major Advisor	Signature	Date
2 _____	_____	_____
Co-Advisor	Signature	Date
3 _____	_____	_____
Research Thematic Area Leader	Signature	Date
4 _____	_____	_____
Chairman, DGC/SGC	Signature	Date
5 _____	_____	_____
PGPD	Signature	Date