COLLEGE OF MEDICINE AND HEALTH SCIENCE

DEPARTMENT OF HUMAN NUTRITION

UNDER NUTRITION AND ASSOCIATED FACTORS AMONG ELDERLY PEOPLE IN DEBRE MARKOS TOWN, EAST GOJJAM ZONE, NORTH-WEST ETHIOPIA, 2024

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Under nutrition and associated factors among elder peoples in the Debre Markos town, east gojjam zone, North West Ethiopia, 2024

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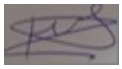
3 Habtamu Temesigen  Jan 13, 2025

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LIST OF ACRONYMS AND ABBREVIATIONS

AOR	Adjusted Odds Ratio
BMI	Body Mass Index
CI	Confidence Interval
COR	Crude Odds Ratio
CSA	Central Statistical Agency
CBE	Community Based Education
DMT	Debre Markos Town
E.C	Ethiopian Calendar
ETB	Ethiopian Birr
HH	Households
HP	Health Post
MNA	Min Nutritional Assessment
NGO	Non-Governmental Organization
USD	United States Dollar
WHO	World Health Organization

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ABSTRACT

Introduction: - A nutritional problem, especially under nutrition is one of the common public health problems in elders causing greater mortality and economic loss in developing countries. However, it was often poorly recognized and under diagnosed. Under nutrition among elderly was not well studied in Ethiopia, particularly in the study area. .

Objective: To assess prevalence of under nutrition and associated factors among elderly population in Debre Markos town east Gojjam zone northwest Ethiopia, 2024.

Methods: A community-based cross-sectional study design was conducted at Debre Markos town from July 7/08/2024 to November 1/ 2024. A multistage simple random sampling method used to select 446 elderly and proportional sample size allocation was used to address study subjects at kebele level. The collected data were coded and entered into Epidata version 3.1 and then exported to SPSS version 20 for further analysis. Binary logistic regression was used to assess the association between outcome and explanatory variables. Variables with a p-value<0.25 in a bivariable analysis were fitted into the multivariable analysis to show the independent relationship between dependent and independent variables. Multivariable analysis a p-value of≤ 0.05 was used to determine if the association was statistically significant. Both the COR and AOR with the corresponding 95% confidence interval (CI) were calculated to show the strength of the association.

Result: The prevalence of under nutrition among study participants was 17.9%. Being females [AOR 1.95:95%CI (1.12, 3.40)], monthly income of ≤1000 birr [AOR=3.45; 95% CI: 1.46, 8.13] and meal frequency <3 times a day [AOR=1.94; 95% CI: 1.04, 3.61] were significantly associated with undernutrition among elders.

Conclusion and recommendation: The study revealed that the prevalence of under nutrition in Debre Markos town among elderly individuals was high as most studies carried out in Ethiopia; however. The factors including sex, average monthly household income and meal frequency were significantly associated with under nutrition. It needs great concern by the government and should be an issue for the health sector and other organizations working on elderly nutrition.

Kay words: Debre Markos Town, Elderly, MNA-SF, under nutrition

1. INTRODUCTION.

1.1 Background

The term 'elderly' or older age has different meanings in different countries; it is mainly explained to chronological age, functional age, as well as retirement age (1, 2).

According to a factsheet released by the WHO, around 12% of the global population (900million people) was aged 60 years or over in 2015, with forecasts that this number will nearly double to 22% (2 billion people) by 2050(3) Furthermore, the older adult population in developing countries is expanding at a faster rate than in developed countries.(3) Older adults are expected to become the largest demographic group in many countries in the next few decades. The increasing number of this group gives an insight into the global community to reconsider the suitability of health infrastructure. Eleven percent of the world population (11%) and 5.0% of the Ethiopian population were categorized as older adults when aged 60 years or older(4)

Elderly people's functional capacity and overall health are significantly influenced by their nutritional condition (5). Although malnutrition is more prevalent in this age group, diagnostic and treatment processes tend to underestimate its effects (6).

Malnutrition in this age group is defined as "the cellular imbalance between the supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions". It may be caused by the lack of one or more nutrients (under nutrition), or an excess of nutrients (over nutrition)(7). Numerous aging-related physiological, psychological, and pharmacological factors can affect dietary practices and the uptake and utilization of nutrients, which may lead to particular deficiencies (8-10).

The elderly population is experiencing malnutrition more frequently, which is most likely the result of consuming inadequate amounts of energy and nutrients (11, 12). Many physiological, psychological, and pharmacological aspects of aging may influence dietary habits and the absorption and use of nutrients, thereby resulting in certain deficiency states (13). It worsens when dietary issues affect between 30% and 80% of

older people living in institutions, having an adverse effect on their health as a result (9, 14).

Under nutrition in the elderly is inadequate food intake or low nutritional status. Under nutrition is commonly associated with a number of health problems, including pain, anxiety, and hopelessness (15). However, the elderly are more vulnerable to malnutrition because of things like limited access to social and health services, decreased mobility, psychological distress, widowhood, illiteracy, and trouble feeding (16).MNA is an excellent tool for the research setting. MNA is also a reliable and valid nutritional assessment method for identifying malnutrition and being at risk of malnutrition among community-dwelling elderly in Ethiopia. It is recommended and fits the Ethiopian elderly population with its established cut-off points (17).

1.2 Statement of problem

Elderly age is an irreversible biological process and ends with death, not a disease in and of itself (18). However, it becomes an issue when they become incapable of performing their own fundamental tasks due to the apparent mental and physical changes brought on by aging (13). Consequently, compared to adults, they are more susceptible to dietary shocks (19).

There is uncertainty over the exact prevalence of malnutrition worldwide, partly because there is no agreement on what constitutes malnutrition in older adults (20). Even though, an international pooled dataset from different settings reported a 23% overall prevalence of malnutrition, the exact prevalence of malnutrition worldwide is not known (21). Nonetheless, there is a lack of information regarding the prevalence of under-nutrition among the elderly in developing countries. In Ethiopia, different studies showed that the prevalence of under nutrition among elders was between 14.1% and 22.7% (22, 23).

Elders are at risk of under nutrition due to, physical, cognitive, as well as functional decline due to aging. The potential risk factors of under nutrition are multiple: reduced food intake due to loss of appetite, episodes of fasting, poor dentition, swallowing difficulties, inability to eat independently, digestive disorders, chronic diseases and depression. Moreover, under nutrition can have a significant impact on individuals and

communities as well as the social, political, and economic conditions of the population (15, 24, 25) .

Furthermore, the social, political, and economic conditions of the population, as well as the individual and society, can all be significantly impacted by malnutrition (26). Many detrimental effects, including elevated morbidity, reduced quality of life, higher health care expenses, and higher death rates, are brought on by aging (25). It is critical to recognize elderly individuals who are malnourished (25). Without a doubt, malnutrition generally contributes to major functional and health issues that negatively impact an individual's well-being and quality of life, in addition to raising expenses and placing a strain on our healthcare system (27).

Similar to Ethiopia, where the aging population has been expanding quickly, this could lead to a rise in the prevalence of non-communicable diseases and malnutrition (11). The elderly are rarely given priority when it comes to humanitarian aid (18). Governments and non-governmental organizations hardly ever evaluate their requirements or specifically target them for programs (19) This is also especially evident in the nutrition sector, where programs prioritize older adults and women of childbearing age (13).

As far as the researcher's best search, there are limited studies in east Gojjam Zone and Debre Markos town to determine the nutritional status and its determinants among these segments of the population. Therefore, determining the prevalence and factors of under nutrition among elderly people is very important for arresting the problem. Hence, this study was carried out to determine the magnitude and determinant factors of under nutrition among elders in Debre Markos town, North West Ethiopia.

1.4 Literature Review

Worldwide, the proportion of elderly people is constantly increasing. According to the United Nations, 2014; in 2025 it is estimated that the population aged 60 years or older will be 1.2 billion and 2 billion in 2050 representing about 22% of the world population (28). Age-related malnutrition is widespread, complex, and has major repercussions since it impairs cognitive, functional, and physical abilities (29). Elderly people are a nutritionally susceptible population, and the prevalence of malnutrition varies greatly depending on the population under study and the diagnostic criteria applied (30).

1.4.1 Prevalence of under nutrition

Many studies have concluded that malnutrition is more common in the elderly population not because that malnutrition is an inevitable side effect of aging, because of many changes associated with the process of aging, can promote malnutrition (31). will be characterized by inadequate dietary intake, poor appetite, muscle wasting, and weight loss **(26)**.

According to MNA, 20.83% of Indians are malnourished in 2014 (15). These statistics show a favorable correlation between age ($p = 0.004$) and female gender ($p = 0.0001$) (29, 32). According to MNA statistics, 5.53% of subjects are malnourished (30). Males in the same age group are more likely to suffer from malnutrition (3.16%) than girls (2.37%). The upper age group of the elderly population (those 80 years of age and older) has a noticeably greater prevalence of malnutrition, and the nutritional status and age factor are inversely correlated (33)

A study conducted on nutritional status and associated factors among elderly people in Anlemo District, southern Ethiopia, in 2016 showed that 26.6% of older people were malnourished (18). Factors including chronic illness, low educational status, elderly marital status, and household food poverty are found to be significant predictors of malnutrition ($p<0.05$) in this study based on multiple logistic regression analysis. However, there is no correlation between the nutritional health of the elderly and other predictable characteristics such as age, occupation, income source, and others (30).

1.4.2 Factors associated with malnutrition

1.4.2.1 socio-demographic characteristics

People's socio-demographic characteristics, have been found to be highly correlated to elderly health and nutrition status (18) Factors such as female gender, older age, being widowed, and a low educational level, appeared to be independently associated with poor nutritional status and It has been found that an individual's diet and age-related health are strongly correlated with their socio-demographic characteristics (19).

A cross-sectional study result in India, 2015 revealed older age, low literacy level, gender, and marital status were found to be the factors affecting malnutrition of elderly

people and, the prevalence of malnutrition was more common in females than males (15.13% vs. 9.52%) and (48.64% vs. 44.44%) (15)

Also, a community-based cross-sectional study conducted in Portuguese in 2015 showed that being widowed was the major factor independently associated with malnutrition (34) and in Pakistan in 2013, age factor and gender were negatively associated with nutritional status and correlated significantly (0.05–.001) with MNA screening score (30)

Similarly, in Ethiopia, the findings of another study conducted in Gonder in 2014 showed that being poor [AOR 1.8 95% CI (1.0–3.2), being older [AOR 38.1 95% CI (15.0-96.9)], being female [AOR 3.0 95% CI (1.6–5.4), and not being able to read and write [AOR 2.7 95% CI (1.7–5.2)] were the significant factors (35).

1.4.2.2 Economic factors

The elderly's nutritional sensitivity is influenced by a number of factors, including their economic situation (36). Reduced family income ($p < 0.001$) is independently associated with poorer MNA scores, as are factors including food insecurity and low income, which have been strongly linked to malnutrition in older individuals (8, 37). malnutrition is a common public health issue that can result in higher death rates and economic difficulties, especially in developing nations, especially in the older population (38).

A cross-sectional study result in Lebanese, 2013 indicate poor income was significantly higher among women than in men, that women were highly disadvantage regarding their socio economic status and health. Indeed, women were significantly more often had a lower income than men, were two times more likely to suffer from worse financial status. More than 40% of the study sample did not have any health insurance (13). Also, another cross-sectional study result in India,2014 revealed the prevalence of malnutrition and at risk of malnutrition was more common in those dependent on others than self-dependent (17.56% v/s 6.94%) and (68.85% v/s 40.0%) respectively, and was significantly difference to their occupation; Malnutrition (P=0.001)and at risk of malnutrition (P=0.001) (34).

The average reported monthly household income in Addis Ababa is 1477.8 Ethiopian birr (82.8 USD). This sample's mean monthly per capital income is 342 birr (19.2 USD), or 0.64 USD per day. Seventy-nine percent of the 550 households in total reported having a

score that indicated they were food insecure (30, 39). According to the scale, 23.3% of households are classified as severely food insecure, while 20.5% and 31.1% of households are mildly and moderately food insecure, respectively (8, 40). Thus, a total of 23.5% of households have a score of 0, indicating they never experienced any form of food insecurity, 9.6% of respondents report that they have ever experienced sleeping hungry; and 3.3% of participants report that they did not eat for an entire day at the time of data collection (41, 42).

Similar results were found in Gondor Town, Ethiopia, where a cross-sectional study conducted in 2014 revealed that middle-class elderly people were 2.5 times more likely to be undernourished than rich elderly people [AOR 2.5 95% CI (1.4-4.7)], and that the risk of under-nutrition was 1.8 higher in low-income elderly people than in rich elderly people [AOR 1.8 95% CI (1.0-3.2)]. As compared to men, women are three times more likely to be undernourished. Thus, it was discovered that elderly people's under-nutrition was related to their wealth index score (22).

1.4.2.3. Food security

Household Food security status is also one of the factors that are associated with under nutrition in the case of the elderly age group. According to the findings of the study conducted in the northern part of Ethiopia, the odds of elderly under nutrition were about two times higher among those household food-insecure participants when compared with that of food-secure participants (26).

1.4.2.4. Life style related factors

Elderly life style pattern had associated with nutritional status, like smoking, excessive alcohol consumption, and excessive use of medication play a role in elder malnutrition (20). Elder malnutrition and low BMI have been linked to the consumption and overuse of medications (43). The results of 2011 studies conducted in Iran demonstrate that smoking and alcohol usage are. Nutrition is more common in males who smoke than in those who do not (80.8% vs. 19.2%), at 15% and 6%, respectively (7, 44).

The study's findings demonstrated a positive and independent relationship between age, smoking, and being underweight (13). In later age groups, the likelihood of being

underweight grew gradually and was higher in the smoker group compared to the never-smoking group. Regardless of the cutoff criteria utilized to evaluate underweight, our results are consistent with those of other research (45)

In India, additional research conducted in 2014 revealed that the prevalence of malnourishment and the likelihood of it among smokers, ex-smokers, tobacco chewers, and non-addicts were 20.25%, 13.38%, 8.30%, and 48.10%, 47.88%, 50.0%, and 44.40%, respectively. Therefore, compared to non-smokers, smokers are more likely to suffer from malnutrition ($p = 0.01$). There was no greater prevalence of underweight among smokers, indicating that stopping smoking may be a factor in older adults' increased body mass (22)

1.4.2.5. Health related factors

In older people, malnutrition is virtually always linked to an illness; nevertheless, the reasons are more varied (21). In addition to the physiological reduction in appetite that comes with aging, many common traits of the elderly, such as difficulty swallowing and chewing food (13). It has been proven to negatively impact dietary intake and are associated with malnutrition (13). Consequently, it was discovered that anemia, neurological disorders, mental health issues, multi-morbidity, and vision impairment were all linked to malnutrition or being at risk for it. It is more common in older adults with acute illnesses like the flu and common colds (13.2% vs. 5.3% and 16.9% vs. 0%, respectively) compared to those without ($p < 0.001$) (46).

Chronic illnesses include diabetes, cancer, heart disease, stroke, and chronic respiratory diseases, Furthermore, hypertension accounted for 54.7% of participants with more than three chronic conditions, with diabetes, dyslipidemia, and cardiovascular disease accounting for a greater proportion of cases in women ($p < 0.001$) (27)

1.5 Conceptual Framework elderly under nutrition

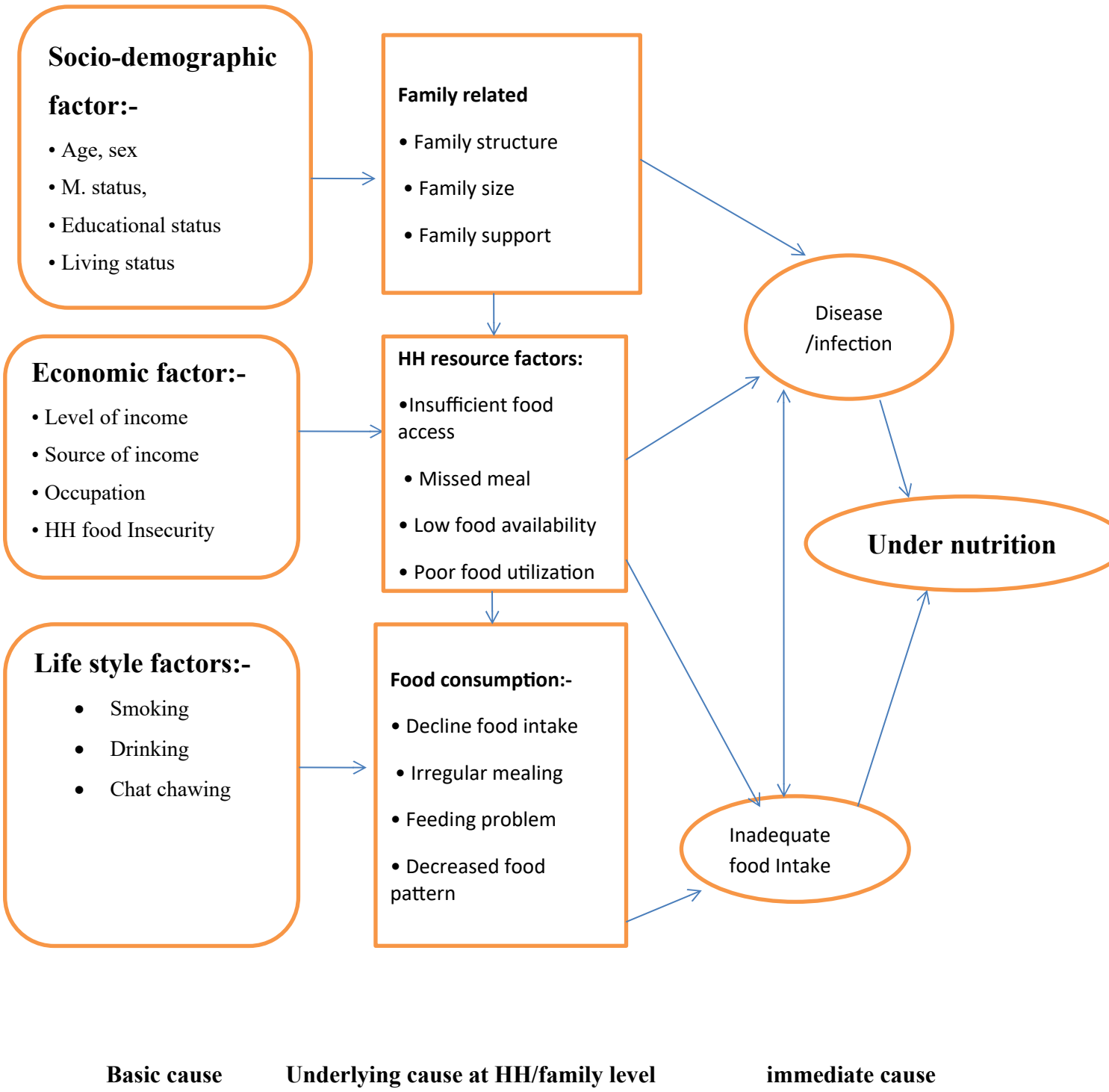


Figure 1:Shows the factors associated with undernutrition among elderly population (18)

1.6 Justification of study

The increasing number of elderly people with less effort to combat their health and nutritional needs seek great attention in Ethiopia. Currently increasing Ethiopian life expectancy is indicative of giving attention to the elderly. However, older people are less prioritized on governmental agendas. Most nutritional interventions and surveys are focusing on children under five, pregnant and lactating women. Despite the high prevalence and serious consequences of under nutrition, prevention, and treatment of under nutrition do not currently receive appropriate attention. Increased awareness of the importance of nutritional screening among older people is needed.

Few studies were conducted to assess the determinants of under nutrition in elderly people in Ethiopia. To assess throughout the literature review, there were substantial information gaps and it forms the core of the problems in elderly nutrition in Ethiopia, which has a key starting point for designing nutrition policies and programs for this group. However, there was no previous study on related topics in the study area. Therefore, this study aimed to assess the prevalence of under nutrition and its associated factors among elderly people in the Debre Markos town, North West Ethiopia.

1.7 Significance of the study

The findings of this study would have useful to baseline data for government officials, non-governmental agents, local governmental organizations and stakeholder groups for planning and designing interventions for old age nutrition. It also serves as a baseline for other researchers to conduct additional studies in the area to address nutritional issues in the elderly nutritional problems. So, directly or indirectly, the first beneficiaries would have our elders. Who are forgotten and haven't received any nutritional intervention because the result of this study, together with those of similar studies, may attempt to design various intervention strategies accordingly. Therefore, the data the elder's nutrition are still lacking, the present study set out to obtain information, which is also essential for other researchers who will investigate further the nutritional status of the elderly population.

2. OBJECTIVES

2.1 General objective: -

To assess the prevalence of under nutrition and associated factors among elderly population in Debre Markos Town, east Gojjam zone, Northwest Ethiopia 2024.

2.2 Specific objective: -

- To assess' the magnitude of under nutrition among elderly people in Debre Markos Town, East Gojjam zone of North West Ethiopia in 2024.
- To identify factors associated with under nutrition among the elderly people in Debre Markos east Gojjam zone of North West Ethiopia in 2024.

3. METHODS

3.1 Study area and Period

The study was conducted in east Gojjam zone Debre Markos Town. It is the capital Town of east Gojjam Zone, and it has four sub-cities. It is 300 km distance from Addis Ababa in northwest Ethiopia and 265 km from the Amhara region capital city, Bahirdar. It's located at 10.3330°N 37.7170°E and has an average elevation of 2,446 meters (8,025 fit) above sea level. The mean annual rainfall in the area is 1000 mm, and the climatic temperature is 21 degrees Celsius(47). Its total population is 122567 males and 140528 females and 17595 people are elders. There are various cultures and different ethnic groups found in Debre Markos Town. The study was conducted from July 7/08/2024 to November 1/2024

3.2 Study design `

A community-based cross-sectional study was conducted.

3.3 Population

3.3.1 Source Population:

All elderly people living in the Debre Markos town were the source population of the study

3.3.2 Study Population:

All elderly individuals (≥60 years) in randomly selected kebeles of Debre Markos town(48)

3.4 Inclusion and Exclusion criteria

3.4.1 Inclusion criteria:

Elders people who have lived in village for the past 6 months or longer in the selected kebeles.

3.4.2 Exclusion criteria

- Those who cannot stand unsupported and critically ill.
- Those having kyphosis and loardosis

3.5 Sample Size Determination and Sampling Procedure

3.5.1 Sample Size Determination:

The sample size is determined by a single population proportion formula for a cross-sectional study by using the formula and take „P" as a suggestion as follows:-

$$n=\frac{(Z_{\alpha 2})^2 p(1-p)}{d^2}=\frac{0.227(1-0.227)(1.96)^2}{(0.05)^2}=270$$

The prevalence of under nutrition among older adults from the previous study (22.7%) (30). and marginal error of 5 % with a 95 % confidence interval, design effect of 1.5, and 10% non-response rate, a total of 446 sample older adults were needed.

For objective 2: Factors associated with under nutrition in the older age group

The sample size for factors associated with under nutrition was calculated for some factors obtained from different literature by using the statistical calculation of EPI INFO statistical software version 7 with the following assumptions: power 80%, 95% confidence level, and the ratio of unexposed to exposed (Table 1)

Table 1: Second objective Sample size calculation to study under nutrition and associated factors among elderly people in Debre Markose town 2024

Variable	%outcome in exposed	%outcome unexposed	CI	power	OR	Sample size	Reference
Monthly income	62.7	44	95	80	2.14	242	(11)
Decline food intake	46.5	26.6	95	80	2.4	202	(30)
Residence	59.7	37.6	95	80	2.45	176	(49)

Monthly income gives a maximum sample size of 242. Adding a 10% non-response rate and multiplying by 1.5 Design effects, the total sample sizes were 399. By comparing the two sample sizes, the largest sample size, which is 446, will be taken as the total sample size for the study participants of this study.

3.5.2 Sampling technique and procedure

Multi stage sampling was used to select eligible elders from randomly selected Kebles from the town admnstration. From total twenty kebeles of the town admnstration five kebele were selected by using simple random sampling techniques. Then the sample size was proportionally allocated for each respective selected kebeles. The allocated numbers of elderly were interviewed from each randomly selected kebeles. Then, the data collectors located the center of kebeles and then randomly select a random direction using random spinning a pen. Then all HHs with older adults were interviewed in that selected direction until the sample size is achieved. If there is more than one elderly in the same household, only one elder was selected randomly. However, when the required sample size is not achieved, another random direction were selected in the similar way and data collected similarly (Figure 2).

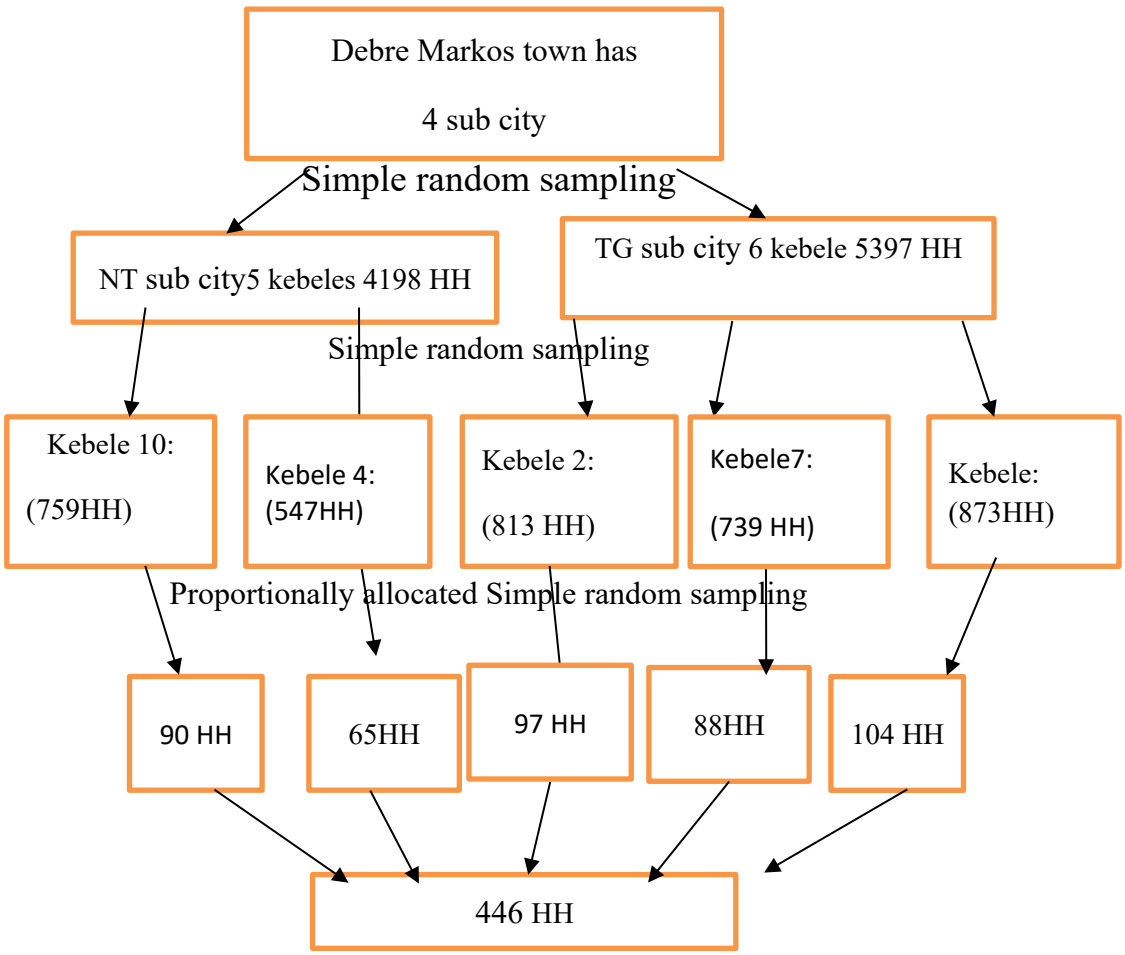


Figure 2: Sampling procedure to select **elderly** in Debre Markos town, North West Ethiopia, 2024

3.6 Study Variables

3.6.1 Dependent variable: - Under nutrition (Yes/No)

3.6.2 Independent variable: -

Socio- Economic and demographic factors (sex, age, income, family size, educational status, marital status, occupation and income). Lifestyle-related factor (meal frequency, chat chewer, alcohol) and Health-related chronic disease and food insecurity

3.7 Operational definitions

- **Under nutrition**. Based on the Mini-nutritional assessment (MNA-SF) tool, individuals who had <7 scores were considered undernourished and coded as "Yes", while those who had a score of > 7 were considered not undernourished and coded as "No" (which includes normal and at risk of malnutrition) (50).
- **Household food security status**: A FCS score of 0-21 points was considered as household food insecure, score of >21.5 points was considered as household food secured(25)
- **Chronic disease (co-morbidities)**: elderly individuals who have clinically confirmed chronic diseases such as hypertension, diabetic mellitus, and chronic heart disease (11).
- **Alcohol drinker** - is a person who, currently drink any alcoholic product either daily or occasionally.(i.e. either daily or occasional drinker)(30)

3.8 Data collection Instrument, Tools and procedure

3. 8.1 Data collection Instrument and tool

Data was collected through respondent face-to-face interviewing and observation/measurement using the following tools and procedures

Mini-Nutritional Assessment Short-Form (MNA-SF)

The elderly nutritional status was determined using the Mini-Nutritional Assessment Short-Form (MNA-SF). Which is the most widely used nutritional screening and assessment tool to identify older adults who are malnourished or at risk of malnutrition. It is a validated first-level nutritional screening instrument highly used by elderly people in a variety of settings (30). MNA exhibits good sensitivity and specificity compared to

other nutritional assessment parameters, including biochemical values, anthropometric values, and dietary intake

MNA-SF gives a maximum of 14 points, and it classifies the elderly as: malnourished (MNA < 7 points), at risk of malnutrition (MNA-SF: 8–11) and well-nourished/normal nutritional status (MNA-SF: 12-14 points). It is a rapid, easy, and reliable tool capable of identifying malnourished individuals and those who are at risk of malnutrition. It showed high sensitivity and high specificity (51).

The sensitivity and specificity of the MNA tool using the established cut-off point were found to be 80.1 and 72.5%, respectively, in our country (30). An advantage of the tool is that no laboratory data is needed. It is developing to be user friendly, quick, non-invasive, and inexpensive, and it takes about 5 minutes to complete the questions easily (52).

Household food security statuses are measured using the Household Food Insecurity Access Scale tool. All socio-demographic, economic, lifestyle, and functionality data is collected from study subjects through interviews(51, 52).

Anthropometric measurements

Weight and height was measured as part of the MNA-SF. Weight was recorded to the nearest 0.1kg using an electronic weight scale with the participants in light dress and no shoes. Additionally, height was measured to the nearest 0.1cm using a stadiometer with the participant standing vertically and looking straight ahead with heels, buttocks, and shoulders pressed against the stadiometer. BMI was calculated as the body weight in kilograms divided by the square of height in meters.

3.9 Method of Data collection

The data was collect by five clinical nurses through house to house visit with interviewer administrative questionnaire and anthropometric measurements. The questionnaire was initially prepared in English and then translated to local languages, namely Amharic, by different language experts to ensure the consistency of the questions before actual data collection. All of the anthropometric measurement performed using standard procedures and calibrated equipment.

3. 10 Data quality control

In addition to appropriate recruitment and training of data collectors, the quality of the data would have monitored frequently both in the field and during data entry. This was done in the field under the close supervision of interviewers. Data quality tables were utilizing. All complete questionnaires were examined for completeness and consistency during the interview. Data was doubled entirely using a programmer's computer software package. The overall data collection processes were controlled and checked by the investigator.

3.11 Data processed and analysis

The collected data were coded and entered into Epidata version 3.1 and then exported to SPSS version 20 for further analysis. Frequency and cross-tabulations were used to summarize descriptive statistics, and the result is presented using text and tables. Frequencies and cross-tabulations were used to summarize descriptive statistics of the data, and tables were used for data. Binary logistic regression was used to assess the association between outcome and explanatory variables. Variables with a p-value<0.25 in a bivariable analysis were fitted into the multivariable analysis to show the independent relationship between dependent and independent variables. Both the crude odds ratio (COR) and the adjusted odds ratio (AOR) with the corresponding 95% confidence interval (CI) were calculated to show the strength of the association. A p-value of 0.05 was used to determine if the association was statistically significant.

3. 12 Ethical Considerations

The ethical clearance letter was obtained from the Debre Markos University Research Ethical Review Committee. A formal cooperation letter was obtained from the Debre Markos town health department, and then submitted to each kebele representative, and permission was obtained from each respective local authority. Verbal consent to participate in the study was secured before conducting the interview. For this, a one-page consent letter is attached to the cover page of each questionnaire, stating the general purpose of the study. An issue of confidentiality is discussed by the interviewers before proceeding with the interview. Additionally, participants were informed that they have a full right to refuse or discontinue participation.

4. RESULT

4.1. Socio-economic and Demographic Characteristics of Respondents:

A total of 446 elderly people were participated in the study. From the total study participants 66.3% were females and 58.4% participants were in the age group of 60-69 years. The majority of respondents (94.3%) were orthodox Christians in religion. Regarding marital status 51.9% were married and 28.7% were widowed. A lowered proportion of respondents (9.8%) cannot read and write. The income result shows that 57.7% of respondents were monthly income of more than 1500birr (Table 2).

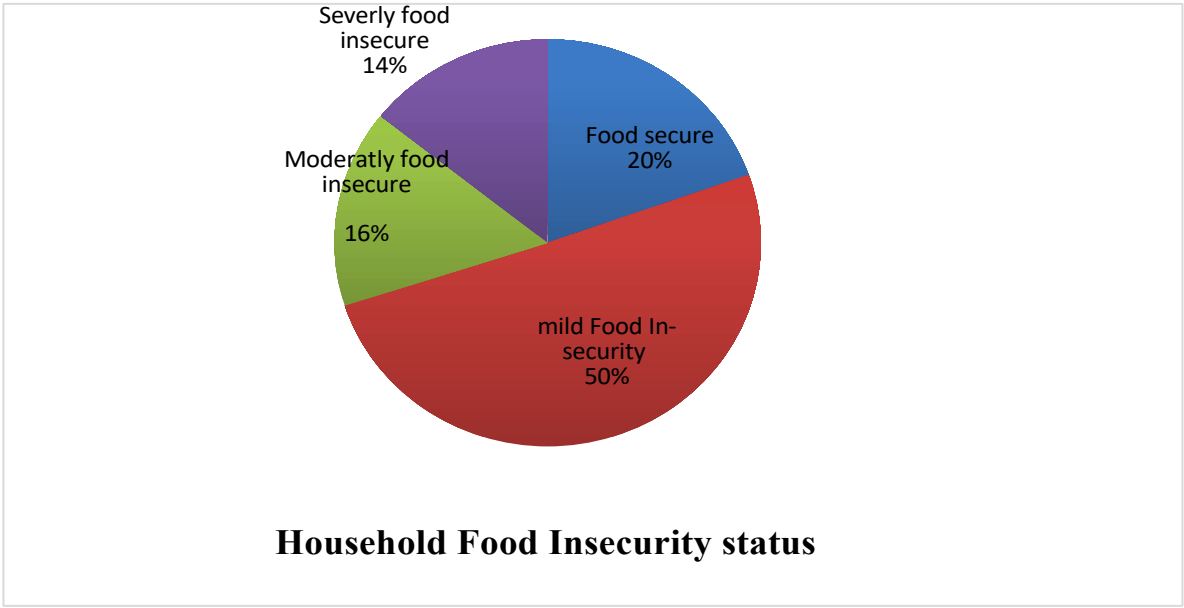
Table 2: Socio-economic and demographic characteristics of elderly people in Debre Markos town, October 2024. (n=418)

Variables	Categories	Frequency	Percentage
Sex	Male	141	33.7%
	Female	277	66.3%
age	age 60-69	244	58.4%
	age 70 –79	155	37.1%
	age >80	19	4.5%
Educational status	Unable to read and write	41	9.8%
	Primary school (1-8 grade)	201	48.1%
	Preparatory school(9-12grade)	112	26.8%
	Diploma and above	64	15.3%
Marital status	Married	217	51.9%
	divorced	81	19.4%
	Widowed	120	28.7%
Religion	Orthodox	394	94.3%
	Muslim	24	5.7%
Family size	<4	137	32.8%
	≥ 4	281	67.2%
Occupation	NG Employed	62	14.8%
	Merchant	211	50.5%
	Farmer	73	17.5%

	No job	72	17.2%
Income(ETB)	≤1000	70	16.7%
	1001-1500	107	25.6%
	>1500	241	57.7%

4.2. Household Food Insecurity status:

According to HFIAS, only 84(20%) of sampled elderly household were food secured



with the rest being food insecure at different levels as shown below in (Fig.3.)

Figure 3: Diagrammatic presentation of HH food security status in Debre Markos Town, Dec 2024

4.3. Mini Nutritional Assessment results among Elderly Population

Most of the study participants (82.8%) had not a decreased food intake over the past three months. Regarding the current mobility status of the study participants 418(100%) of the study participants were currently physically active. About 309 (74.1%) of the study participants BMI were between 19 and 21 kg/m2 (Table 3).

Table 3: MNA-SF result of elderly in Debre Markos Town, North West Ethiopia, 2024 (n=418).

Characteristics	Category	Frequency	Percentage
Food intake decline	Severe decrease in food intake	30	7.2%
	Moderate decrease in food intake	42	10%
	No decrease in food intake	346	82.8%
Weight loss	Weight loss >3kg	19	4.5%
	Does not know	12	2.9%
	Weight loss between 1 and 3kg	59	14.1%
	No weight loss	328	78.5%
Physical activity	Physically active	418	100%
Dementia status	No dementia	418	100%
BMI	BMI < 19	75	17.9%
	BMI ≥19 to <21	310	74.2%
	BMI ≥21 to <23	33	7.9%

4.4. Prevalence of Under-nutrition among Elderly People

The overall prevalence of under-nutrition among the elderly population in Debre Markos town was 17.9% (95% CI: 14.3%, 22.1%) (Figure 4)

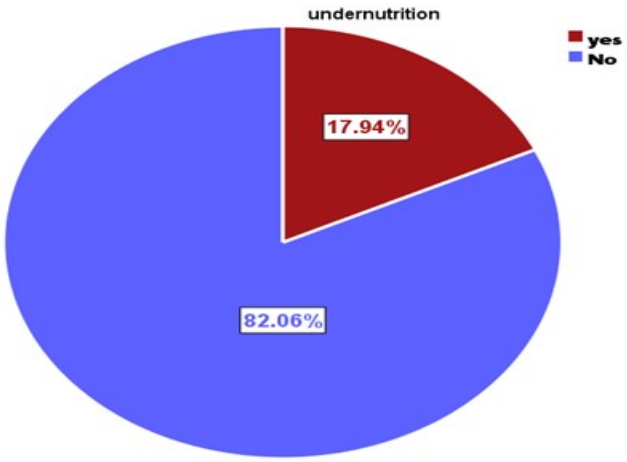


Figure 4: Prevalence of under nutrition among elderly in Debre Markos to town, North West Ethiopia, 2024 (n=418).

4.5. Health related characteristics of the elders:

Regarding the health status of respondents, majority of participant elder 122 (29.3%) was acute illness (sick). From those who were sick, 103(24.6%) of elderly had visit health facility but the rest were not visit any health facility for treatment. The commonly not to visit health facility were; Have Not serious illness 16 (3.8%) and lack of money 3 (.7%). The majority 296 (70.8%) of the participants reported not being diagnosed with any disease. 72 (17.2%) elderly were taking medication/follow-up at the time for the diagnosed diseases, (Table 4).

Table 4: Health related of elderly participants in Debre Markos, December, 2024.

Variables	Categories	**Frequency**	**Percentage**
health problem	Yes	122	29.2%
	No	296	70.8%
Visit health facility	Yes	103	24.6%
	No	19	4.5%
not to visit HF	Not serious	16	3.8%
	Lack-money	3	.7%
Disease confirmed?	Joint-pain	41	9.8%
	HTN	52	12.4%
	Dm	29	6.9%
medication / follow up	Yes	72	17.2%
	No	31	7.4%

4.6. Elderly Life style Pattern:

The result of study show 100% and 68.4% of the participants (both males and females) did not habitually smoking cigarette and drink alcohol but 21(5.1%) of participants were chew khat. Majority of drinker consume Traditional alcohol 20.1% (Table 5).

Table 5: Life style pattern of elderly participants in Debre Markos, December 2024

Variable categories	Categories	**Frequency**	**Percentage** (%)
Smoke Cigarett	yes	-	-
	no	418	100%
Drinks Alcohol	yes	133	31.8%
	no	285	68.2%
Alcohol type	Manufactured	18	4.3%
	Traditional alcohol	84	20.1%
	both	31	7.4%
Chat chew	yes	24	5.7%
	no	394	94.3%

4.7. Factors associated with under-nutrition

In the multivariable logistic regression, sex, monthly Income (ETB) and meal frequency all showed significant association with under-nutrition. Being Females were 1.95 times more likely to be undernourished as compared to males [AOR 1.95:95%CI (1.12, 3.40)]. Moreover, the odds of under nutrition among elderly Individuals for households with monthly income of <1000 birr were 3.45 times more likely to undernourished compared to individuals from households with monthly income >1500 birr [AOR=3.45; 95% CI: 1.46, 8.13] also the odds of undernourished compared to individuals households meal frequency ≥3 times Individuals households meal frequency <3 times a day were 1.94 times more likely to by [AOR=1.94; 95% CI: 1.04, 3.61] **(**Table 6).

Table 6: Multivariable logistic regression analysis for factors associated with under nutrition among elders, Debre Markos town, North West Ethiopia, 2024 (n=418).

Variables		**Under nutrition**		**COR(95%CI)**	**AOR(95%CI)**	**p-value**
		yes	**no**			
Sex	Female	45	232	0.21(0.43,1.20)	**1.95(1.12,3.40)**	**0.019**
	Male	30	111	1	1	
Age group (in year)	60-69	34	210	2.20(.74, 6.51)	0.62(0.19, 2.005)	.430
	70-79	36	119	1.18(.39,3.50)	1.12(.35,3.57)	.848
	≥80	5	14	1	1	
Marital Status	Married	40	177	1.28(0.74, 2.22)	0.48(0.24,.94)	.330
	Divorced	8	73	2.64(1.13,6.17)	0.30(0.12,.78)	.140
	widowed	27	93	1	1	
Income (ETB)	≤1000	14	56	0.41(0.21, .79)	**3.45(1.46, 8.13)**	**.004**
	1001-1500	31	76	0.42(0.23, 0.75)	2.28(1.17, 4.45)	.015
	>1500	30	211		1	
Meal frequency	<3 times /day	42	199	1.47(0.89, 2.43)	**1.94(1.04, 3.61)**	**.037**
	≥3 times /day	33	144	1	1	
Chawing chat	yes	5	51	5.31(0.70, 40.1)	.34(.04, 2.76)	.318
	no	70	292	1	1	

5 .DISCUSSION

This community-based cross-sectional study determined the under nutrition and associated factors of elderly people in Debre Markos Town, east Gojjam zone, Northwest Ethiopia. The nutritional status of elderly was measured by MNA tool in this study. The current study revealed that the prevalence of under nutrition was 17.9%.

This finding is comparable with the study done in the Womberma district, North West Ethiopia, 14.6%, in Harar, Eastern Ethiopia 16.6% and Sodo Zuriya District, Ethiopia (17.1%) of study participants were undernourished (4, 53, 54). This similarity may be due to the study design and data collection tools that both studies used MNA.

However, it was lower than that of the studies done in Anlemo District, hadya zone southern Ethiopia showed that 26.6% of older people were undernourished and south Gondar, 27.6% (55, 56) . This disparity could be created by the variation of geographic, socioeconomic, and inclusion or exclusion criteria of the study participants. But this similarity may be due to the study design and data collection tools that both studies used MNA, and another similarity may be due to the age of study population.

On the other hand, the current study was slightly higher than other similar international studies conducted in India (9.1%) (43) Iran (11.53%) (47) and Portuguese 10.5% (49) , this difference may be caused by economical developed and socio-cultural differences ,where it is known that Ethiopia is one of the developing country in the world, so this makes the change in the prevalence of elderly under nutrition. But this similarity may be due to the study design and data collection tools that both studies used MNA, and anther similarity both of them study prevalence of under nutrition and associated factors among elderly population.

This study revealed that undernutrition was higher among females than males. Being females were nearly two times more likely to be undernourished as compared to male. This is comparable to studies conducted in Gondar and womberma district Ethiopia (4, 56). The reason could be that older females continue homecare for their grandchildren while receiving less care for themselves. In addition to this, cultural beliefs, gender discrimination and low social freedom to access income-generating activities may influence women's nutritional status(56). This is also scientifically supported that,

women are more likely to be exposed to nutritional deficiencies than men, for reasons including women's reproductive biology, low social status, poverty, and lack of education.

Furthermore the association between elderly under nutrition was respondent average monthly household income. Those elderly who have currently average monthly household income (<1000 ETB were more likely undernourished than those elder who were currently average monthly household income ≥1500 ETB. This was supported by studies done in Anlemo District, southern Ethiopia and Shashemene District, West Arsi Zone, Oromia Region, South Ethiopia (54, 57). Low income is linked to food insecurity, poor educational status, and functional impairments. This might be low average household income elderly's people low care needed to themselves because most elderly people were economically dependent.

Regarding meal frequency, there was a significant association with elderly undernutrition. Those elderly who have currently meal frequency <3 times a day were nearly two times more likely to be undernourished compared to individuals households meal frequency ≥3 times a day. This result was consistent with a study done in womberma district Ethiopia and Shashemene District, West Arsi Zone, Oromia Region, South Ethiopia(4, 57). This change in meal pattern could occur as the result of natural aging processes and physiological or physical changes, and it may be due to low access to food.

6. LIMITATIONS AND STRENGTHS OF THE STUDY

This study addressed an important public health concern, under nutrition. However, the cross-sectional nature of this study could not show the causal relationship between the response and explanatory variables. Moreover, the study is not free from recall bias as the measurement of dietary issues was relying on memory, nevertheless, efforts, such as training of data collectors and supervisors and appropriate probing techniques were used to minimize this bias. Another limitation of the study is the collection of data from a small sample population; large scale studies are needed for confirmation of findings. Despite these limitations, this study has several strengths (used validated tools to assess the geriatric syndrome).

7. CONCLUSION

The study revealed that the prevalence of under nutrition in Debre Markos town among elderly individuals were high as most studies carried out in Ethiopia; however. The factors including sex, average monthly household income and meal frequency were significantly associated with under nutrition. It needs great concern by the government and should be an issue for the health sector and other organizations working on elders.

8. RECOMMENDATIONS

Based on the findings of the study, the following recommendations were forwarded. Ministry of Health and Non-Governmental Organizations should consider nutrition intervention programs targeting the elderly people with all aspects of sex, household monthly income and meal frequency.

Lastly researchers should conduct further study with another study design and including the possible unaddressed factors of under nutrition in the present study is also recommended.

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10. ANNEX:-

ANNEXES i: - Data collection tools and consent form.

Consent form Good morning/good afternoon? How are you?

My name is _____, I am from Debre Markos university students of public health master's degree. As part of our academic requirements, I am expected to conduct student research on community health and health related problems. This interview is prepared for obtaining appropriate information on elderly nutritional status in the communities. Therefore, you are kindly requested to be included in the study and provide appropriate information, which will have importance in improving elderly nutritional health status. Participation in this study is completely voluntary based. You have full right to decide not to participate in the study. If you are volunteer, you will be asked and taken some physical measurement about elderly nutritional status. The overall interview may take about 15-20 minutes.

May I continue? 1. Yes 2. No

Interview Starting Time----------Ending time----------

Identification:-Woreda_____Kebele_____village/

gotti_____HH.Id.No_____ Section 1. Socio Demographic Characteristics

Section 1. Socio Demographic Characteristics		
S.NO	Questions	Answers
1	Sex of respondents	1. Female 2. Male
2	How old are you (age)?	
3	What is your marital status	1. Married 2. Divorced 3. Widowed 4.
4	What is your religion of the respondent?	1.Orthodox 2.Catholic 3.Muslim 4. others----------
5	What is your educational status?	1. Illiterate (unable to read and write) 2. Primary education (grade1-8) 3. Secondary education (grades 9-12) 4.

		college and above
6	With whom respondents are living?	1. With partner 2. With children 3. With partner and children 4. Living alone. 5. Living with relatives/ others----------
7	Family Structure.	1. Monogamy 2. Polygamy. 3. Other
8	Total no of household members?	----------
Section 2:- Economical related and Household Food Insecurity Assessment		
1	What was respondent occupation?	1. Farmer 2. Self-employed 3.mearchant 4. Supported by children 5. Others
2	What were the Sources of your HH income?	1. Agriculture 2. Children 3.Pension 4. Other----------
3	What is your average household monthly income?	1.≤1000birr, 2.(1001 –1500)birr ,3.>1500birr
4	How many household members earn an income?	----------
5	Number of dependents on income	----------
Complete:- Yes(1), No(0) , Rarely(once or twice in the past four weeks), Sometimes (three to ten times in the past four wks) ,Often (more than ten times in the past four weeks)		
1	In the past four weeks, did you worry that your household would not have enough food?	0 = No (skip to Q2) 1=Yes
1.1	How often did this happen?	1 .Rarely 2 .Sometimes 3. Often
2	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	0. No (skip to Q3) 1.Yes
2.1	How often did this happen?	1. Rarely 2. Sometimes 3 .Often
3	In the past four weeks, did you or any	0. No (skip to Q4)

	household member have to eat a limited variety of foods due to a lack of resources?	1.Yes
3.1	How often did this happen?	1. Rarely 2. Sometimes 3 .Often
4	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	0. No (skip to Q5) 1 .Yes
4.1	How often did this happen?	1. Rarely 2. Sometimes 3 .Often
5	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	0. No (skip to Q6) 1. Yes
5.1	How often did this happen?	1. Rarely 2. Sometimes 3 .Often
6	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	0. No (skip to Q7) 1 .Yes
6.1	How often did this happen?	1. Rarely 2. Sometimes 3 .Often
7	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	0 .No (skip to Q8) 1. Yes
7.1	How often did this happen?	1. Rarely 2. Sometimes 3 .Often
8	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	0 = No (skip to Q9) 1 = Yes
8.1	How often did this happen?	1. Rarely 2. Sometimes 3 .Often

9	In the past four weeks, did you or any household member go whole day and night without eating anything because there was not enough food?	0 = No (finished) 1 = Yes
9.1	How often did this happen?	1. Rarely 2. Sometimes 3 .Often
Section 3:- Life style related		
1	Do you smoke cigarettes?	1. Yes, daily 2. Yes, occasionally 3. No
2	If yes, Which type of cigarette you use mostly?	1. manufactured 2. Locally hand rolled 3. Both 4. Other (specify) ---
3	On average, how many rolled cigarettes do you smoke a day?	----------
4	Do you drink alcohol?	1. Yes daily 2. Yes occasionally 3.No
5	If yes, Which type of alcohol you use mostly?	1. manufactured 2. Locally hand rolled 3. Both 4. other(specify)--
6	Do you chew chat?	1. Yes, daily 2.Yes, occasionally 3. No
Section 4:- Morbidity related		
1	Is there any Illness you face in the last 4 weeks?	1. Yes 2. No
2	Have you visit health facility?	1. Yes 2. No
3	If no, what was the reason?	1 .Not serious 2.lack transport access 3. Lack money

		4. Does not like/ distrust HW 5. Other (specify)-
4	Is there any health problem, you have been diagnosed and confirmed by health care professionals?	1. Yes 2. No
5	If yes, What was it?	1. Joint pain /Arthritis 2. Hypertension 3. DM 4. TB 5. More than two cases 6. Not I have 99. Other ---
6	Are you taking medication/follow-up?	1. Yes 2. No

Section 5:- Mini Nutritional Assessment (MNA) Weight _____kg: Height (standing)_____ or (Dim span) _____cm:		
Complete the screening by filling in the boxes with the appropriate numbers. Add the numbers for the final screening score and mark it.		
1	Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties	0 = severe decrease in food intake 1 =moderate decrease in food intake 2 = no decrease in food intake
2	Weight loss during the last 3 months	0 = weight loss greater than 3 kg 1 = does not know 2 = weight loss between 1 and 3 kg 3 = no weight loss
3	Mobility	0 = bed or chair bound 1 = goes out 2 = able to get out of bed / chair but does not go out
4	Has suffered acute disease or psychological	0 = yes

	stress in the past 3 months?	1 = no
5	Neuropsychological problems	0 = severe dementia or depression 1 = mild dementia 2 = no psychological problems
6	Lives independently (not in nursing home or hospital)	1 = yes 0 = no
7	Takes more than 3 prescription drugs per day	0 = yes 1 = no
8	Do Have Pressure sores or skin ulcers	0 = yes 1 = no
9	How many full meals does the patient eat daily?	0 = 1 meal 1 = 2 meals 2 = 3 meals
10	Do you Consume two or more servings of fruit or vegetables per day?	0 = no 1 = yes
11	How much fluid (water, juice, coffee, tea, milk...) is consumed per day?	0.0 = less than 3 cups 0.5 = 3 to 5 cups 1.0 = more than 5 cups
12	What is your Mode of feeding	0 = unable to eat without assistance 1 = self-fed with some difficulty 2 = self-fed without any problem
13	What is your Self-view of nutritional status	0 = views self as being malnourished 1 = is uncertain of nutritional state 2 = views self as having no nutritional problem
14	In comparison with other people of the same age, how does the patient consider his / her	0.0 = not as good 0.5 = does not know

	health status?	1.0 = as good 2.0 = better
Total Assessment Score = 12 – 14 points ;- Normal nutritional status , 8 – 11 points ;-At risk of malnutrition and < 7 points ;- Malnourished		

Name of the interviewer _____ Sign _____ Date _____

Name of the supervisor _____Sign _____Date _____

8. አባሪ፡- የአማርኛትርጉም

አባሪ i፡ - የመረጃ መሰብሰቢያ መሳሪያዎች እና የፍቃድ ቅፅ።

የስምምነት ቅጽ አንደም አደራችሁ/ ዋላችሁ?

ስሜ_____እባላለሁ የደብረ ማርቆስ ዩኒቨርሲቲ የህዝብ ስነ-ምግብ የሁለተኛ ዲግሪ ተማሪ ነኝ።እንደትምህርት መስፈርት አካል በማህበረሰብ ጤና እና ጤና ነክ ችግሮች ላይ የተማሪ ምርምር እንዳደርግ ይጠበቃል። ይህ ቃለ መጠይቅ የተዘጋጀው በማህበረሰቡ ውስጥ ስላሉ አረጋውያን የአመጋገብ ሁኔታ ተገቢውን መረጃ ለማግኘት ነው።ስለዚህ እርስዎ በጥናቱ ውስጥ እንዲካተቱ እና ተገቢውን መረጃ እንዲያቀርቡ በአክብሮት እጠይቃለሁ።የአረጋውያንን የአመጋገብ ጤና ሁኔታ ለማሻሻል ጠቀሜታ ይኖረዋል።በዚህ ጥናት ውስጥ መሳተፍ ሙሉ በሙሉ በፈቃደኝነት ላይ የተመሰረተ ነው። በጥናቱ ላለመሳተፍ የመወሰን

ሙሉ መብት አልዎት። በጎ ፈቃደኞች ከሆናችሁ፣ ስለ አረጋዊው የአመጋገብ ሁኔታ አንዳንድ አካላዊ መለኪያዎች እጠይቃለሁ።አጠቃላይ ቃለ መጠይቁከ15-20 ደቂቃ ሊወስድ ይችላል።

ልቀጥል? 1. አዎ 2. አይሆንም

የመነሻ ጊዜ ቃለ መጠይቅ --------የማለቂያ ጊዜ-- ---

መታወቂያ፡-

ወረዳ_____ቀበሌ_____መንደር/ጎጥ_____የቢት/

መታወቂያቁጥር_____

ክፍል 1. የሶሺዮ ስነ-ሕዝብ ባህሪያት		
ተራ ቁጥር	ጥያቄዎች	መልሶች
1	ምላሽሰጪዎችጾታ	1. ሴት 2. ወንድ
2	ዕድሜህ (ሺ) ስንትነው?	
3	የእርስዎ የትዳር ሁኔታ ምንድን ነው?	1. ነጠላ. 2. ያገባ 3. ባል/ሚስትየሞተባት 4.የተፋታ
4	ሃይማኖትዎ ምንድን ነው ?	1.ኦርቶዶክስ 2.ካቶሊክ 3.ሙስሊም 4. ሌላእምንት-------
5	የትምህርት ደረጃህ/ሽ	1.ማንበብእናመጻፍየማይችሉ 2. የመጀመሪያደረጃትምህርት(ከ1-8ኛክፍል) 3. የሁለተኛደረጃትምህርት (ከ9-12ኛክፍል) 4.ኮሌጅእናከዚያበላይ

6	ከማንጋር ይኖራሉ?	1. ከባልደረባጋር 2. ከልጆችጋር 3. ከባልደረባእናከልጆችጋር 4. ብቻውንመኖር. 5. ከዘመዶች/ከሌሎችጋርመ ኖር---
7	የቤተሰብ መዋቅር.	1. ነጠላ 2. ከአንድበላይ3. ሌላ
8	ጠቅላላ የቤተሰብ አባላት ቁጥር?	---
ክፍል 2፡- ኢኮኖሚያዊተዛማጅእናየቤተሰብየምግብዋስትናእጦትግምገማ		
1	ሥራ ምን ነበር?	1. አርሶአደር 2. በግል የተቀጣሪ 3. በግልየሚተዳደር 4. በልጆችየሚደገፍ 5. ሌሎች
2	የገቢ ምንጮዎ ምንነ በር?	1. ግብርና 2. 3.ጡረታ4. ሌላ---
3	የእርስዎ አማካይ ወርሃዊ ገቢ ምን ያህል ነው?	1.≤1000birr, 2.(1001 –1500)birr ,3.>1500birr
4	የቤተሰብ አባላት ምን ያህል ገቢ ያገኛሉ?	----
5	በገቢዎ ላይ ያሉ ጥገኞች ቁጥር	----
ያጠናቅቁ: - አዎ (1) ፣አይ (0) ፣አልፎአልፎ (ባለፉትአራትሳምንታትውስጥአንድወይምሁለትጊዜ) ፣አንዳንድጊዜ (ባለፉትአራትሳምንታትውስጥከሶስትእስከአስርጊዜ) ፣ብዙጊዜ (ባለፉትአራትሳምንታትውስጥከአስርጊዜበላይ)		
1	ባለፉትአራትሳምንታትውስጥ፣ቤተሰብዎበቂምግብአይኖረው ምብለውተጨነቁ?	0 = አይ (ወደ q2 ዝለል)

		1=አዎ
1.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ2 .አንዳንዴ 3. ብዙጊዜ
2	ባለፉትአራትሳምንታትውስጥእርስዎወይምማንኛውምየቤተሰብአባልበግብአትእጦትምክንያትየመረጡትንአይነትምግብመመገብአልቻሉም?	0. አይ (ወደ q3 ይዝለሉ) 1. አዎ
2.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ 2. አንዳንዴ3 .ብዙጊዜ
3	በግብአትእጦትምክንያትየተወሰነአይነትምግብመመገብነበረባችሁ ?	0. አይ (ወደ q4 ይዝለሉ) 1. አዎ
3.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ 2. አንዳንዴ3 .ብዙጊዜ
4	ባለፉትአራትሳምንታትውስጥእርስዎወይምማንኛውምየቤተሰብአባልሌሎችየምግብዓይነቶችንለማግኘትበግብአትእጥረትምክንያትለመመገብየማይፈልጓቸውንአንዳንድምግቦችመብላትነበረባችሁ?	0. አይ (ወደ q5 ይዝለሉ) 1 .አዎ
4.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ 2. አንዳንዴ3 .ብዙጊዜ
5	ባለፉትአራትሳምንታትውስጥእርስዎወይምማንኛውምየቤተሰብአባልበቂምግብስለሌለከምትፈልጉትያነሰምግብተመገባችሁ?	2. አይ (ወደ q6 ዝለል) 3. አዎ
5.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ 2. አንዳንዴ3 .ብዙጊዜ
6	ባለፉትአራትሳምንታትእርስዎወይምሌላየቤተሰብአባልበቂምግብስለሌለበቀንውስጥጥቂትምግቦችንተመገባችሁ	0. አይ (ወደ q7 ዝለል)

		1 .አዎ
6.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ 2. አንዳንዴ3 .ብዙጊዜ
7	በአለፉትአራትሳምንታትውስጥምግብለማግኘትበሀብትእጦት ምክንያትበቤተሰብዎውስጥምንምአይነትየሚበሉትምግብአ ልነበረም?	0 .አይ (ወደ q8 ይዝለሉ) 1. አዎ
7.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ 2. አንዳንዴ3 .ብዙጊዜ
8	ባለፉትአራትሳምንታትውስጥእርስዎወይምማንኛውምየቤተ ሰብአባልበቂምግብስለሌለበረሃብተኝተውነበር?	0 = አይ (ወደ q9 ዝለል) 1 = አዎ
8.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ 2. አንዳንዴ3 .ብዙጊዜ
9	ባለፉትአራትሳምንታትውስጥ፣እርስዎወይምማንኛውምየቤተ ሰብአባልበቂምግብስለሌለምንምሳይበሉሌትተቀንሙሉሄዱ?	0 = የለም (የተጠናቀቀ) 1 = አዎ
9.1	ይህምንያህልጊዜተከሰተ?	1. አልፎአልፎ 2. አንዳንዴ3 .ብዙጊዜ
ክፍል 3፡- ከአኗኗርዘይቤጋርየተያያዘ		
1	ሲጋራታጨሳለህ?	1. አዎ፣በየቀኑ 2. አዎ፣አልፎአልፎ 3. አይ
2	አዎከሆነ፣በብዛትየሚጠቀሙትየትኛውንሲጋራነው?	1. የተመረተ 2. በአገርውስጥበእጅየ ሚጠቀለል 3. ሁለቱም 4. ሌላ (ይግለጹ) ---

3	በአማካይበቀንስንትጥቅልሲጋራታጨሳለህ/ሽ?	----------
4	አልኮልትጠጣለህ/ሽ?	1. አዎበየቀኑ 2. አዎአልፎአልፎ 3. አይ
5	አዎከሆነ፣የትኛውንአይነትአልኮልበብዛትይጠቀማሉ?	1. የተመረተ 2. በአካባቢውበእጅተን ከባሎ 3. ሁለቱም 4. ሌላ (ይግለጹ)--
6	ጨት ታኝካለህ/ሽ?	1. አዎ, በየቀኑ 2.አዎ, አልፎአልፎ 3. አይ
ክፍል 4፡- ከበሽታጋርየተያያዘ		
1	ባለፉት 4 ሳምንታትውስጥየሚያጋጥሙህ/ሽህመምአለ?	1. አዎ 2. አይ
2	የጤናተቋምንጎብኝተዋል?	1. አዎ 2. አይ
3	አይደለምከሆነምክንያቱምንነበር?	1 .ፍላጎትስለሊለኝ 2. የትራንስፖርትመዳረሻእጦት 3. የገንዘብእጥረት 4. hwንአይወድም/አላመነም። 5. ሌላ (ይግለጹ)-
4	የጤናችግርአለ፣ተመርምረዋልእናበጤናባለሙያዎችተረጋግጠዋል	1. አዎ

	?	2. አይ
5	አዎከሆነ፣ምንነበር?	1. የመገጣጠሚያህመም /አርትራይተስ 2. የደምግፊት 3. ዲኤም 4. ቲቢ 5. ከሁለትበላይጉዳዮች 6. የለኝም 7. ሌላ ---
6	መድሃኒትእየወሰዱነው/ክትትል?	1. አዎ 2. አይደለም

ክፍል **5**፡- አነስተኛየአመጋገብግምገማ **(mna)** ክብደት _____ኪግ: ቁመት (ቁመት) _____ ወይም (ዲምስፓን) _____ ሴ.ሜ:		
ሳጥኖቹንበተገቢውቁጥሮችበመሙላትማጣሪያውንያጠናቅቁ. ለመጨረሻውየማጣሪያነጥብቁጥሮችንያክሉእናምልክትያድርጉበት።		
1	የምግብፍላጎትማጣት፣የምግብመፈጨትችግር፣ማኘክወይ ምየመዋጥችግሮችምክንያትባለፉት 3 ወራትውስጥያለውአመጋገብቀንሷል?	0 = የምግብአወሳሰድንበ ከፍተኛሁኔታመቀነስ 1 = የምግብፍጆታመጠነ ኛመቀነስ 2 = የምግብአወሳሰድአል ቀነሰም።
2	ባለፉት 3 ወራትውስጥክብደትመቀነስአለ?	0 = ከ 3 ኪ.ግበላይክብደትመ ቀነስ

		1 = አላውቅም 2 = ከ 1 እስከ 3 ኪ.ግክብደትመቀነስ 3 = ክብደትአይቀንስም።
3	የአንቅስቃሴ ሁኔታ	0 = አልጋወይምወንበርታስሯል 1 = ይወጣል 2= ከአልጋ/ከወንበርመውጣትመቻልግንአይወጣም።
4	ባለፉት 3 ወራትውስጥአጣዳፊሕመምወይምየስነልቦናጭንቀትአጋጥሞታል?	0 = አዎ 1 = አይ
5	የስነ_አምሮችግሮች	0 = ከባድየአእምሮችግርወይምየመንፈስጭንቀት 1 = ቀላልየመርሳትበሽታ 2 = ምንምአይነትየስነልቦናችግርየለም።
6	የሰውነትብዛትመረጃጠቋሚ (bmi) (ክብደትበኪግ) / (ቁመትበሜትር)	0 = bmi ከ19 በታች 1 = bmi 19 ከ 21

		በታች 2 = bmi 21 ከ 23 በታች 3 = bmi 23 ወይምከዚያበላይ
7	ራሱንችሎይኖራል (በአረጋውያንመንከባከቢያወይምሆስፒታልውስጥአይደለም)	1 = አዎ 0 = አይ
8	በቀንከ 3 በላይመድሃኒቶችንይወስዳል	0 = አዎ 1 = አይ
9	የግፊትግፊችወይምየቆዳቁስሎችአጋጥሞትያውቃል?	0 = አዎ 1 = አይ
10	በሽተኛውበየቀኑስንትሙሉምግብይበላል?	0 = 1 ምግብ 1 = 2 ምግቦች 2 = 3 ምግቦች
11	በቀንሁለትወይምከዚያበላይፍራፍሬዎችንወይምአትክልቶችንይበላል?	0 = አይ 1 = አዎ
12	በቀንምንያህልፈሳሽ (ውሃ፣ጭማቂ፣ቡና፣ሻይ፣ወተት...) ይበላል?	0.0 = ከ 3 ኩባያያነሰ 0.5 = 3 እስከ 5 ኩባያ 1.0 = ከ 5 ኩባያበላይ
13	የአመጋገብዘዴ	0 = ያለእርዳታመብላትአለመቻል 1 = በተወሰነችግርራስን መመገብ

		2 = ያለምንምችግርእራስ ንመመገብ
14	በአመጋገብሁኔታንእራስንማየት	0=የተመጣጠነምግ ብእጥረትአለ 1=ስለአመጋገብሁኔታ እርግጠኛአይደለም 2=ራስንምንምየአመ ጋገብችግርእንደሌለበ ትአድርጎይመለከተዋ ል
አጠቃላይየምዘናነጥብ = 24 - 30 ነጥብ ;- መደበኛየአመጋገብሁኔታ፣ 17 - 23.5 ነጥብ; - የተመጣጠነምግብእጥረትየተጋለጠእና < 17 ነጥብ ;- የተመጣጠነምግብእጥረትያጋጠመው		

የቃለ-መጠይቁአድራጊውስም _____ ፊርማ _____ ቀን _____

የተቆጣጣሪውስም

_____ፊርማ _____ ቀን _____

አመሰግናለሁ!!!!!