

2022-04

Chronic Energy Deficiency and Associated Factors Among Disabled Adults in Bahir Dar City, North West Ethiopia, 2021

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COLLEGE OF MEDICINE AND HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF Nutrition And Dietetics

**Chronic Energy Deficiency and Associated Factors Among Disabled
Adults in Bahir Dar City, North West Ethiopia, 2021**

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**A THESIS TO BE SUBMITTED TO DEPARTMENT OF NUTRITION AND
DIETETICS, SCHOOL OF PUBLIC HEALTH, COLLEGE OF MEDICINE AND
HEALTH SCIENCES, BAHIR DAR UNIVERSITY IN PARTIAL
FULFILLMENT OF THE DEGREE REQUIREMENT FOR MASTER IN
PUBLIC HUMAN NUTRITION**

APRIL, 2022

BAHIR DAR, ETHIOPIA

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TITTLE	PREVALENCE OF CHRONIC ENERGY DEFICIENCY AMONG DISABLED ADULTS IN BAHIR DAR CITY, NORTHWEST ETHIOPIA,2021
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TOTAL BUDGET	25,537ETB (ETHIOPIAN BIRR)
STUDY PERIOD	SEPTEMBER 6 TO NOVEMBER 6/ 2021
STUDY AREA	BAHIR DAR CITY

ACKNOWLEDGEMENTS

My deepest acknowledgement goes to Bahir Dar University, the School of Public Health, Department of Nutrition and Dietetics for giving me the chance to learn and conduct research work to find solutions. Heartfelt thanks to my advisor Dr Netsanet Fentahun and Yonatan Menber for their unreserved advice, devoting their expensive time and meticulous comments to the thesis development.

My thanks also go to the Bahir Dar city administration office of Social and Labor Affairs for the necessary information they gave for the research development.

Lastly but not least, I would like to thank data collectors, study participants and Mis.Wolela Endalew for their unreserved support during data collection.

ACRONYM AND ABBREVIATIONS

AOR	Adjusted Odd Ratios
BMI	Body Mass Index
CED	Chronic Energy Deficiency
CL	Confidence Level
COR	Crude Odd Ratios
DDS	Dietary Diversity Score
FANTA	Food and Nutrition Technical Assistance Team
FAO	Food and Agriculture Organization
IDDS	Individual Dietary Diversity Score
IGA	Income Generating Activities
LMIC	Low and Middle-Income Countries
MDG	Millennium Development Goal
MNA-SF	Mini-nutritional Assessment Short Form
MOLSA	Minister of Labor and Social Affairs
NGOs	Non-Governmental Organizations
OR	Odds Ratio
PCA	Principal Component Analysis
PLD	People Living with Disability
SDG	Sustainable Development Goals
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities
UNICEF	United Nations Children Emergency Fund
WASH	Water, Sanitation and Hygiene
WB	World Bank
WHO	World Health Organization
WI	Wealth Index

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ABSTRACT

Background: Malnutrition and disability are interconnected in countries suffering from high levels of malnutrition. Individuals with disability are prone to malnutrition due to different factors. The relationship between disability and malnutrition is under research in developing countries including Ethiopia.

Objective: To determine the prevalence of chronic energy deficiency and associated factors among disabled adults in Bahir Dar city, Northwest Ethiopia, 2021.

Methods: An institution-based cross-sectional study design was conducted on randomly selected 411 disabled adults from September 06-November 06/2021. Both bi-variable and multi-variable logistic regression analysis were used to identify factors associated with chronic energy deficiency. All variables with $p < 0.25$ in the bi-variable binary logistic regression analysis were taken to further analysis to multi-variable binary logistic regression. In multivariable binary logistic regression analysis variables with a p-value < 0.05 were considered statistically significant. Both Crude Odds Ratios and Adjusted Odd Ratios were computed to determine the strength of association.

Results: The overall prevalence of chronic energy deficiency was 35.8%. Adults with multiple disability (AOR=3.68,95%CI:1.25-10.82), having inadequate DDS (AOR=1.91,95% CI:1.07-3.41), severe food insecurity (AOR=4.73,95%CI:1.50-15.00) and moderate food insecurity (AOR=2.92,95%CI:1.22-7.04) were statistically significant with chronic energy deficiency.

Conclusion: The prevalence of chronic energy deficiency among adults living with disability was high as compared to the adult age groups studied through EDHS, 2016. Multiple disabled, inadequate dietary diversity and moderately and severely food insecurity were factors associated with chronic energy deficiency of disabled adults. To improve the nutritional status of disabled persons, appropriate interventional programs related to food access and dietary diversification were required.

Keywords: Chronic energy deficiency, disability, adult

1. INTRODUCTION

1.1. Background

United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) in 2006 defines persons with disability including those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others(1).

The right to food is recognized in the Universal Declaration of Human Rights (Article 25)(2) and it gives the right to food, which specifically emphasizes the rights of individuals with disabilities to physical access to adequate nourishment(3).

There are several dimensions to the relationship between malnutrition and disability. Countries with high levels of malnutrition and nutrient deficiency often report higher rates of disability and developmental delays(4).

Malnutrition is caused by immediate, underlying, and basic causes, according to the UNICEF conceptual framework. Diseases and inadequate nutritional intake are the immediate causes of malnutrition and disability. Inadequate nutritional intake/feeding and care practices, insufficient household food security and nutrition security, and insufficient health services, water, hygiene, and sanitation are among the root reasons. Economic, educational, cultural, political, and ideological influences are all basic or structural aspects that determine nutritional status(5).

Many nations, including Ethiopia, joined the United Nations Convention on the Rights of Persons with Disabilities in 2006 to create equitable opportunity in all aspects of their lives(6). However, there is a significant gap between putting the stated convention into practice and the daily lives of people with disabilities(7).

To avert (tackle) this problem, WHO including its member states designed a global disability action plan which is implemented from 2014 to 2021 states all persons with disabilities and their families live in dignity, with equal rights and opportunities, and can achieve their full potential(8).

After the first-ever jointly report on disability by WHO and the world bank in 2011(9) cost-effective interventions for tackling malnutrition also got attention in the 2013 report of lancet nutrition series(10) and also scaling up nutrition (SUN), launched in 2010 is a major movement to tackling malnutrition by uniting people from government, civil society, united nations, donors, business and researchers in a collective effort to improve malnutrition(11).

The Millennium Development Goals, which run from 2000 to 2015, and the Sustainable Development Goals, to be met by 2030, still have no official disability goal.

Ethiopia has ratified and adopted almost all of the relevant initiatives and international legal texts on the rights of persons with disabilities including the UN Convention on the Rights of Persons with Disabilities (UNCRPD) in 2010 and also growth and transformation plan, GTP II 2015-2020), has various chapters and articles which refer directly or indirectly to persons with disabilities(12).

In 2012, Ethiopia's government produced a National Plan of Action for Persons with Disabilities to provide full participation and equitable opportunity for people with disabilities, ultimately enhancing their lives in all areas including adequate nutrition services. However, nutritional difficulties among these groups of people were not addressed(13) and the National Nutrition Program was established to eradicate hunger by the year 2030(14).However ,the link between nutritional status of disabled persons were no fully addressed and this paper was tried to assess the prevalence of chronic energy deficiency and associated factors among sampled disabled adults in the study area.

1.2. Statement of the problem

According to the World Health Organization, over 1 billion individuals (15%) worldwide live with a disability (15), and up to 190 million (3.8%) people aged 15 years and older have significant difficulties in functioning, often requiring healthcare services that is equivalent to 1 in 7 people and half of them faced unaffordable medical care (16).

According to the World Bank and the World Health Organization's joint World Report on disability, Ethiopia has an estimated 15 million disabled children, adults, and elderly people, accounting for 17.6% of the population and 95% of people with disabilities live in poverty (17)

According to Groce et al (2014) conceptual framework of nutrition and disability, the interaction starts throughout the lifecycle and, there are two-way interactions where malnutrition can cause or contribute to different disabilities, and disabilities can cause or contribute to malnutrition(18). Malnutrition causes impairment and makes them more vulnerable to other illnesses(19).

People with disabilities (PLD) frequently do not receive the same level of assistance as non-disabled members of society(20). Due to physical limitations, the majority of disabled persons are unable to engage in agricultural tasks. Lack of jobs, many disabled persons are forced to live and earn their livelihood by begging on the streets of large commercial cities(21).

People with impairments confront significant obstacles in developing countries. They are frequently subjected to stigma and discrimination, making them especially vulnerable to starvation, malnutrition, and the effects of crises and natural catastrophes(22).

Poverty, poor nutrition, and limited access to essential services such as healthcare are all closely associated with impairments as well as education and health(23). These characteristics are equally applicable in Ethiopia, where the list of problems low living standards, malnutrition, and natural and man-made calamities are some of the causes/factors(24, 25).

With a recent global increase in chronic health issues, the number of people who experience impairment will continue to rise as populations age. Trends in health problems have an impact on national patterns of disability, and additional factors such as traffic accidents, falls, violence, humanitarian aid natural disasters, violence, a poor diet, and suicidal ideation are all examples of crises(9).

Disability is the main determinant of impaired health and nutritional status, especially in developing countries such as Ethiopia, where people with disabilities receive little or no support from the government(26).

People with disabilities are especially vulnerable and receive adequate nutritional and other services, but their health and dietary needs are unfortunately one of the least researched areas in public health care. Evidence reveals that persons with disabilities experience challenges in various situations when it comes to getting the health and rehabilitation treatments they need(16).

Adults with disabilities have less access to community-based health insurance or nutrition services this is due to infrastructure problems and transport, lack of understanding by nutritionists and service providers, and many nutrition related campaigns passed through the school(27).

As a result, reduced food intake, or even over nutrition, is a cause of visual impairment, intellectual incapacity, and physical impairment. Its negative consequences may be irreversible. Furthermore, Malnutrition and disability have many of the same risk factors. Poverty, diseases, and risky behaviours are all factors to consider(28).

To solve or minimize the major problems that disabled persons face, the united nation develops strategies to end hunger by 2030 with key actions of access to food, sustainable food production and end all forms of malnutrition with the main areas of intervention inclusive social protection and food assistance programmes for persons with disabilities and promote the role of persons with disabilities in sustainable food production, to achieve food security(29).

Despite the government's efforts and national and international non-governmental organizations' activities, there is still a huge nutritional related problem for adults with disabilities.

In Ethiopia national data related to the nutritional status of disabled persons is overlooked and little is known about their nutrition-related problems. Also, many types of research that have been done always considered PLD as exclusion criteria. As a result, the goal of this study was to determine the prevalence of chronic energy deficiency and associated factors among disabled adults in Bahir Dar city, Northwest Ethiopia.

1.3. Significance of the study

Information regarding the nutritional status of adults with disabilities is limited in the study area. Currently, many different actors in Ethiopia are providing different types of care and support to disabled persons, however; little is known about their nutritional status.

Therefore, assessing the nutritional status of adults with disability helps to provide information to any interested stakeholders and have paramount importance in identifying the causes or contributing factors for malnutrition and the challenges they face.

The results of the study also reveal information that is useful to Bahir Dar city administration as well as Sub-City level planners, health bureaus, researchers and development actors (NGOs) in both the governmental and non-governmental organizations working in the country with similar socioeconomic, cultural and physical environments.

It will be also used as a base for further study (research work).

2. LITERATURE REVIEW

2.1. The Prevalence of Chronic Energy Deficiency among Disabled Adults

There are studies conducted to know the relationship between disability and the risk of malnutrition. A study done in Bangladesh to know the relationship between malnutrition and functional disability in the community-dwelling geriatric population showed that, the prevalence of malnutrition and people at risk of malnutrition have been 25.4% and 58.8%, respectively. In the case of functionality, 63.3% of subjects have a high falling risk, and 61.8% of subjects can independently do their daily activities while 38.3% are dependent(30).

Physical mobility after illness or injury can leave older adults physically unable to obtain or prepare food for themselves, leading to changes in eating patterns, which can lead to further disability in older adults (31). In studies done in Japan on the rehabilitation nutrition for sarcopenia with a disability, the prevalence of malnutrition in hip fracture assessed by BMI showed 13 %(32).

A study done in India on 300 adults with a disability based on the MNA tool showed that 8.3% of people with disabilities were malnourished and 51.7% of them were at risk for malnutrition(33). In another study in India Hyderabad conducted on the nutritional status of intellectually disabled adults, the prevalence of underweight was 12%(34).

A cross-sectional study done among older adults in China showed that 17.9% were malnourished and 60.1% had poor nutritional status(35). Other studies done in Malaysia to know the prevalence of malnutrition among disabled adults showed 20.3% were underweight(36)

Other studies were done in Gahan on the disability, gender, and employment relationships in Africa the major challenges of disabled women (20-60) years reported unemployment(seasonal and menial jobs), discrimination, most of them were lives in poverty and also have barriers to self-employment and to get employment in the public/private sector(37).

A study done in Kenya on food security and nutrition among adults living with disability, the prevalence of underweight was 23.4%. (38).

2.2. Factors Influencing Nutritional Status

2.2.1. Socio-demographic and Economic factors

The analyses of the World Health Surveys in the World Report on Disability showed that both men and women with disabilities were significantly more likely to report needing healthcare services but not receiving them, than people without disabilities (women: 5.8% versus 3.7%; men: 5.8% versus 4.1%). A cross-sectional study done on adults with disability reported that over 68% were dependent on other people for movement and accessibility to essential services because most of the public facilities were not customized to accommodate PLD(39).

Over 68% were dependent on other people for movement and accessibility to essential services. There is a similar study in Canadian found that adults with disabilities aged 20-64 had three times the level of unmet healthcare needs as adults without disabilities(40).

A study was done in Kenya on food security and nutrition among Adults Living with Disability in showed that most of the respondents (32.6%) were between the ages of 30-39 years. Physical disability (67.2%) was the main disability problem, followed by mental disability (15.2%), deafness/dumbness (10.9%) and visual impairment (5.1%) (38).

2.2.2. Dietary Related Factors

Persons with disabilities are more likely to live in food-insecure households. In 34 out of 35 countries, mostly in Europe, the inability to afford a meal with a protein source like meat, chicken, fish or a vegetarian similar every second day is higher among persons with disabilities than among persons without disabilities. On average, the percentage of persons with disabilities who are unable to afford such a meal is almost double, 17 per cent as compared to 10 per cent for persons without disabilities and females are more prone to this problem(41).

As of 2016, more than 41 million people in the U.S. were food insecure. Individuals with disabilities are especially at risk of food insecurity. Nearly one in three (31.8%) food insecure households include a working-age adult(18-64)years who has a disability(42).

Studies done in Korea on the household food insecurity comparison between Families with and without members with disabilities showed PWDs were 64% higher in food insecurity than without and 13.3% benefitted from food assistance programs compared to 6.4% of households

without. Households with PWDs were also more likely to experience some kind of food insecurity than those without such members. Mild food insecurity was observed in 11.5% of households with PWDs and 7.0% of households without PWDs. Moderate or severe food insecurity was observed in 2.6% of households with PWDs and 1.6% of households without PWDs(43).

A study done in rural Tamil Nadu India, by using a mini nutritional assessment scale showed that 64.7% of the study population with a disability did not consume fruits and vegetables regularly and 73.3% of them consumed either none or one protein marker every day and had multiple disabilities was factors for risk malnutrition(33). Another study done in Kenya Food security and nutrition among adults living with a disability stated that 68.8% of the PLD were food insecure as given by consumption of less than four food groups per day(39).

2.2.3. Hygiene and sanitation-related factors

A vital component of public health is access to clean water, appropriate sanitation, and hygiene (WASH) for the prevention or mitigation of faecal-oral infections (44). Even if limited quantitative data is available, people with disabilities account for up to 15% of the global population and are said to have less access to WASH(45). There are different barriers identified by different scholars for the inaccessibility of WASH services in LMIC. Access to water and sanitation for disabled individuals in these countries varies depending on cultural and geographical circumstances, as well as the type of disability a person has. Thus, a person with a physical impairment may have greater difficulty using a hand pump or an outdoor latrine; a person who is deaf or has an intellectual disability may have no physical difficulty walking to a community latrine, but may be teased or abused, making such a facility inaccessible for social and safety reasons, classified as technical and social barriers(46).

The structural problems that persons with disabilities have in accessing water and sanitation facilities are examples of technical barriers. Toilets/latrines with stairs or raised above ground are frequently inaccessible to those with physical limitations; latrines are frequently too tiny for people using a wheelchair or crutches to enter and close the door behind them. Wood, tile, and other types of flooring can be too slick for persons who have trouble walking or balancing. Millions of people with physical disabilities describe crawling on the floor to reach the latrine in such situations(47).

2.2.4. Access to Media and ICT Related Factors

According to data from three Sub-Saharan African countries, just 8% of homes with disabled members can afford the internet, which is about half the rate of households without disabled members and households with persons with disabilities are also less likely to own a mobile phone (48). Besides these individuals with a disability have more limited access to information and communications technology (ICT) than persons without disabilities. Also, the needs for social protection were higher for disabled persons compared to the general population (49).

2.2.5. Behavioural and Psychosocial related factors

A survey done in the United Kingdom on the lifestyle and health behaviours of adults with an intellectual disability showed that smoking (2.6%) and regular alcohol consumption (10.3%) and consuming less than the recommended daily intake of fruit and vegetables, carbohydrates, dairy and protein(50). Studies done on the Barriers to nutrition as a health promotion practice for women with disabilities showed that 31.8% experienced barriers to nutrition promotion programs. The most common barriers encountered were too tired to cook (54.6%), health foods too expensive (34.8%), nutritious foods too expensive (34.5%), lack of desire or willpower (31.5%), government disability pension does not cover the cost of food (30.6%), difficult to shop (25.1%) and not enough time for the attendant to shop or prepare food (21.2%)(51).

Studies done in Australia showed that 65% of adults with disability aged 18–64 do not do enough physical activity, compared with 48% without disabilities(52).

Studies done in China on older adults showed that more than half (65.3 %) of the participants reported never being involved in social activities and a large number of participants (72.4 %) did not receive sufficient emotional and material support(35).

Studies done in Kenya prevalence of hypertension, diabetes and cardiovascular diseases among adults with disabled was 25.8%, 5.5% and 6.3%, respectively(53).

Conceptual frameworks

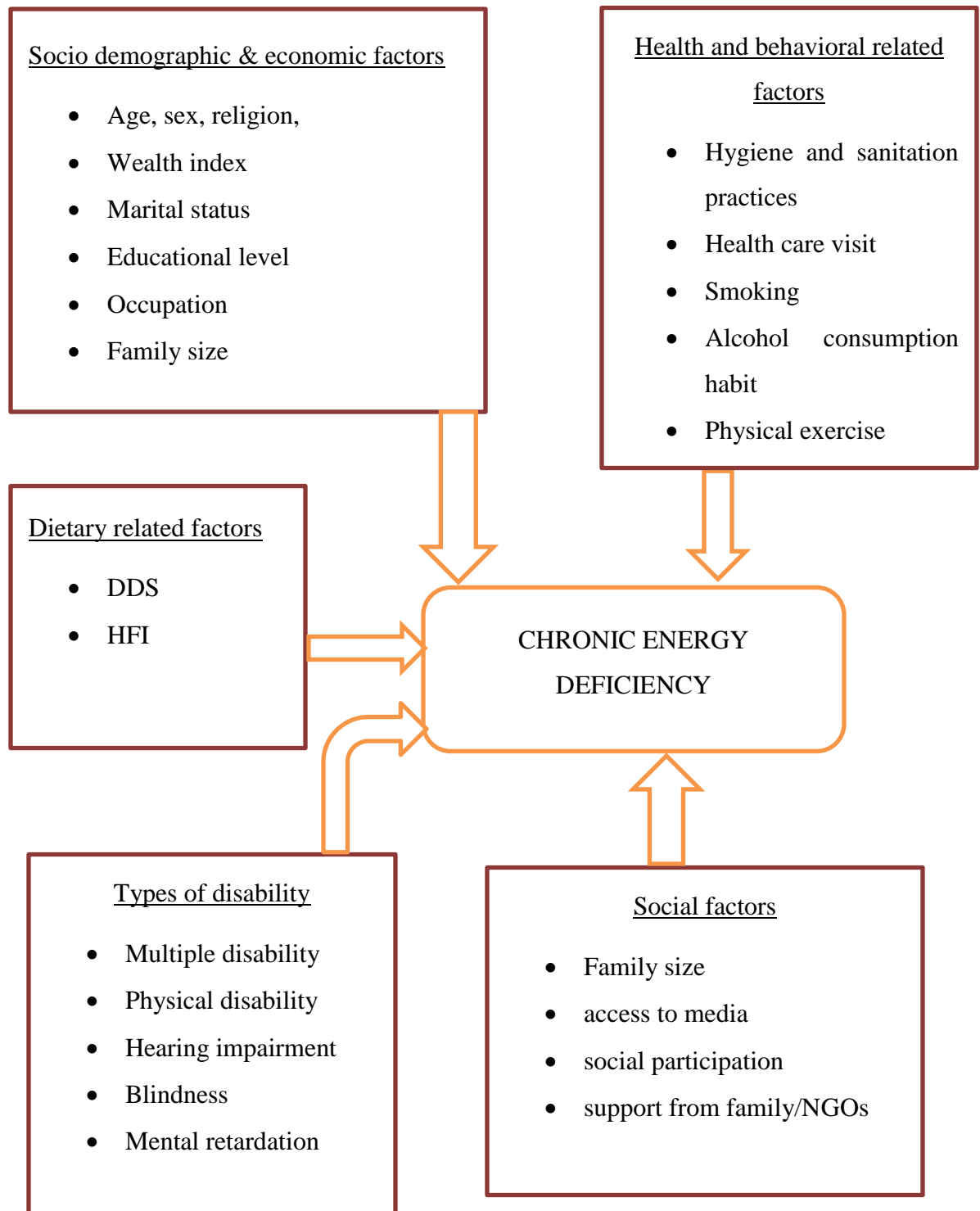


Figure 1:-Nutritional status and associated factors among disabled adults in Bahir Dar city, Northwest Ethiopia, 2021(54-56)

3. OBJECTIVE

3.1. General objective

The general objective of this study was to determine the prevalence of chronic energy deficiency and associated factors among disabled adults in Bahir Dar city, Northwest Ethiopia, 2021.

3.2. Specific objectives

- To determine the prevalence of chronic energy deficiency among disabled adults in Bahir Dar city, Northwest Ethiopia, 2021.
- To identify factors associated with chronic energy deficiency among disabled adults in Bahir Dar city, Northwest Ethiopia, 2021.

4. MATERIALS AND METHODS

4.1. Study design and period

An Institutional based cross-sectional study was conducted from September 06 to November 06/2021.

4.2. Study area

This study was conducted in Bahir Dar city in 2021. Bahir Dar city is the capital city of Amhara regional state which is found in Northwest Ethiopia, 565km far from Addis Ababa, the capital city of Ethiopia. The city has a total population of 318,429 of this 49.5% are male and 50.5% are female(57). In the city, there are 1256 disabled persons registered in the social and labor affairs office and have their chairperson by disability type. Out of these adults with physical disability are 590, blindness 318, mental retardation 143 and the remaining 205 have a hearing impairment.

4.3. Source population

Adults aged 18 years and above who are disabled and live in Bahir Dar city

4.4. Study population

Adults aged 18 years and above who are disabled and live in Bahir Dar city

4.5. Eligibility criteria

4.5.1. Inclusion criteria

Adults with disability who live in Bahir Dar city were included in the study

4.5.2. Exclusion criteria

Adults with lower extremities oedema (elephantiasis) and pregnant mothers were excluded from the study.

4.6. Sample size determination

Since as far as my search no previous studies were found done in Ethiopia and the study area, the sample size was determined by using single population proportion formula based on the following assumption; 95% confidence level, and 5% margin of error to recruit study

participants, 10% nonresponse rate was considered and 50% for proportion to get the maximum sample size.

$$n = \frac{z^2(\alpha/2) \times P(1 - P)}{d^2}$$

Where n=desired sample size

$Z_{\alpha/2}$ = statistic for a level of confidence (95% level of confidence's=1.96, P=population proportion

P=the population proportion (used 0.50 since no previous study conducted in the study area)

d= precision (in proportion of precision 5%, d=0.05)

$$n = \frac{1.96^2 \times 0.5(1 - 0.5)}{0.05^2}$$

$$n=384$$

By considering a 10 % non-response rate the sample size was 422.

For the second objective, as far as my search no previous studies were found and I used 422 for final sample size.

4.7. Sampling techniques

After getting the list of disabled persons (1256) from the office of social and labor affairs of Bahir Dar city (physical disability=590, blindness=318, mental retardation=143 and hearing impairment=205), a simple random sampling technique was used to select a total of 422 study subject from each type of disability through proportional allocation (physical=198, blindness=107, mental retardation=48 and hearing impairment=69). After proportionally allocation by using their name list as an ID, a lottery method was used to select the study participants.

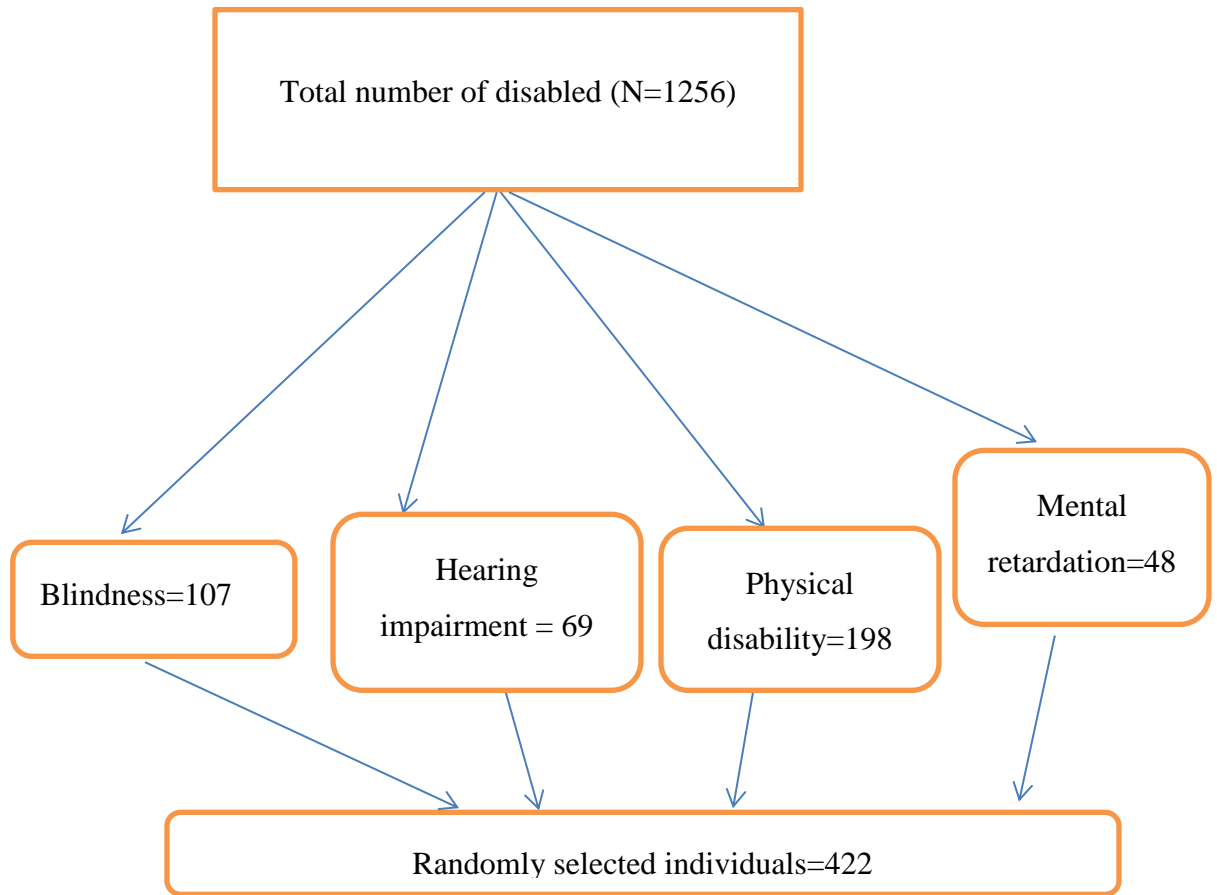


Figure 2:-proportional allocation of sampled disabled adults Bahir Dar City, Northwest, Ethiopia,2021(n=422)

- Proportionally allocation was done as follows:
- $n_i = \frac{n}{N} * N_i$, where
- n_i =sample size of the i^{th} stratum(disability)
- n = total sample size of the disabled adults
- N = total disabled persons
- N_i = population size (number) of i^{th} stratum (disability)

4.8. Variables

4.8.1. Dependent variables

- Chronic energy deficiency (CED & normal)

4.8.2. Independent variables

1. Socio-demographic and economic characteristics
 - Age
 - Sex
 - Religion
 - Wealth index
 - Educational level
 - Marital status
 - Family size
2. Dietary related factors
 - DD (dietary diversity)
 - Food insecurity
3. Types of disability
 - Multiple disabilities
 - Physical disability
 - Hearing impairment
 - Blindness
 - Mental retardation
4. Health and behavioral related factors
 - hygiene, sanitation practices
 - Health care visit
 - Smoking
 - Alcohol consumption habit
 - Physical exercise
 - History of chronic disease
5. Psychosocial factors
 - Living alone/with family
 - access to media
 - social participation
 - support from family/society

4.9. Term and Operational Definitions

Chronic energy deficiency: Chronic energy deficit (CED) is a condition in which a person's body weight and energy storage are low, and their physical ability is likely impaired as a result of prolonged food deprivation, with a BMI of less than 18.5 kg/m² for adults. Body mass index is weight in kilograms divided by the square of the person's height in meters (kg/m²) (58).

Disability: includes those who have long term or current physical, mental, intellectual or sensory impairments(1).

Multiple disabilities: includes persons having more than one form of disability

Physical disability: is those adults with physical deformity (fractured bones, contracture legs, and spinal cord problem) including amputated legs and/ or arms.

Mental retardation: impaired intelligence and social functioning which begins before adulthood and affects normal development(47).

Hearing impairment: diminished acuity to sounds that would otherwise be heard normally(59).

Visual impairment(blindness): is a decreased ability to see to a degree that causes problems not fixable by usual means, such as glasses(60).

Food security, “as defined by the United Nations’ Committee on World Food Security, means that all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life”(61)

Food insecurity is defined by FAO as a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and active and healthy life.

Dietary diversity score: is a composite of 10 food groups which is consumed in the previous 24 hours (62).

Arm span is the distance between the tips of the middle finger of one hand to the other with the trunk upright, arms stretched wide apart sideways and parallel to the ground surface and demispan is the distance from the middle of the sternal notch to the tip of the middle finger (63).

Wealth index (WI): is a composite index of key asset ownership variables; it is used as a proxy indicator of household-level wealth(64).

Physical activity level:

Good physical activity: 150–300 minutes of moderate to intense aerobic physical activity; or at least 75–150 minutes of vigorous to intense aerobic physical activity (brisk walking, swimming, running, home-keeping, digging etc.) a week.

Poor physical activity: less than 150 minutes of moderate to intense aerobic physical activity or less than 75 minutes of vigorous-intensity aerobic physical activity a week(65).

Alcohol consumption: consuming more than 4 drinks on any day or more than 14 drinks(glasses) per week (66).

Smoker: Regular smoker: an adult who had smoked at least 100 cigarettes in his/her lifetime.

Never smoker: an adult who had smoked less than 100 cigarettes in his/her lifetime, or who had never smoked(67).

Khat chewing: Participants were classified as khat chewers if they utilized khat for more than five years in their lifetime and chewed for more than four hours and over 100g of khat per session and If they utilized chat for less than five years and chewed for less than four hours and over 100g of khat in a single chewing session consider as not chewer(68).

4.10. Data collection tools and procedures

The data was collected using a pre-tested interviewer-administered semi-structured questionnaire. The questionnaire includes socio-demographic characteristics, health and behavioural, water, hygiene and sanitation-related, anthropometric measurements, 24hrs dietary recall and food insecurity questionnaires variables. The data were collected during the meeting days of the disabled adults and when they came to the office for services. All types of disabilities have their chairperson and monthly meeting. Two BSc nurses and one BSc nurse were recruited for data collection and one day of training was given about data collection tools and instruments.

During data collection for those who have mental retardation and hearing impairment, we used a translator.

Anthropometric measurements (weight and height) were done to have information on the individual's Body Mass Index (BMI).

The weight of the study participant was measured to the nearest 0.1kg with a standing beam balance. It was measured with light clothing and bare feet. Calibration was done before weighing each participant by setting it to zero. It was measured twice and the average was taken to minimize over or underweight.

The height of the disabled adults was measured using a tape meter and it was measured by using standard procedures. It was measured twice and the average measurement was taken to the nearest 0.1 cm with barefoot.

The instruments used for measurements were checked before data collection in the morning and in-between data collection if any error calibration was done immediately.

Techniques for taking accurate height measurement: the participants remove shoes and head cover and wear light cloth; stand upright in the middle of the vertical board (tape meter); the heels and knees should be firmly pressed against the board by the assistant while the measurer positions the head and the cursor. The head, shoulders, buttocks, knees and heels should be touching the vertical board (tape meter).

The weight and height measurements of amputated adults and spinal cord problems were estimated using the percent of amputated body weight(69) and arm span and demi-span using the equations below.

Wt. for the amputated persons=current wt. * percent of bodies amputated + current weight in kg.

The amputated body part accounts if it is the full leg 15.6%, lower leg 4.5%, forearm 1.6%, foot 1.4% and hand 0.6%

Arm span measurement was used to estimate the height of disabled persons with the curvature of the spine, weakness of back muscles or weakness in the leg muscles and an amputated leg. To do so, the participants stretch out their arms, hands and fingers in a straight line and the measurement was taken.

Height in centimeters for males = $56.9 + (0.64 * \text{arm span})$ and for women $53.4 + (0.64 * \text{arm span})$ (70).

Estimating height from demi-span was calculated through:

For males' height in (cm)= $(1.40 \times \text{demi-span (cm)}) + 57.8$ and for females' height in (cm)= $(1.35 \times \text{demi-span in (cm)}) + 60.1$.

Then by considering variations BMI arm span cut off points equivalent to BMI height cut off described below:

For both males & females BMI height cut off point measurement to CED is 18.5kg/m^2 but BMI in arm span cut off points is different (for males BMI cut-offs is 17.1Kg/m^2 & for females 17.7Kg/m^2).

BMI in arm span for males $+1.4 \text{Kg/m}^2 = \text{BMI in height measurement}$.

BMI in arm span for female $+0.8 \text{kg/m}^2 = \text{BMI in height measurement (70)}$

Measurement of the dietary diversity score

The dietary diversity scores were measured based on a basic count of food groups consumed by disabled adults in the last 24 hours. The dietary diversity score of the respondents was determined by listing all food items consumed by disabled persons (both at home and away from home) starting with breakfast, lunch, dinner and snacks.

Foods groups eaten by the respondents (disabled persons) were classified into 10 food groups: grains, pulses, nuts and seeds, dairy products, meat and fish products, egg, dark green leafy vegetables, vitamin A-rich vegetables & fruits, other Vegetables and Other fruits. Participants received 1 point if they consumed at least once during the last 24 hours any of the foods within each subgroup, and 0 points if they never consumed the food. The IDDS was calculated as the sum of food groups consumed over 24 hours. Individuals who were taking food groups <5 , and ≥ 5 were classified with inadequate and adequate dietary diversity scores respectively.(71).

Household food insecurity was assessed by using the Household Food Insecurity Access Scale (HFIAS) measurement consisting of nine items. The HFIAS consists of 9 items specific to an experience of food insecurity occurring within the previous four weeks. Each respondent indicates whether they had encountered getting the items due to a lack of food or money to buy food in the last month. The scoring procedure was used with 1 point for occurrence and 0 for non-occurrence. The frequency scores were ranged from 0 to 3, while 0 was given the score for non-occurrence, 1 for rarely (once or twice in the past four weeks), 2 for sometimes (three to ten

times in the past four weeks), and 3 for often (more than ten times in the past month). For this paper, we used the total score (9-items based on the frequency score). A total score of 27 represents the most food-insecure household whereas a lower score represents a more food-secure household. The household which experienced from 2 to 10, 11–17, and > 17 food insecurity indicators were considered as mildly, moderately, and severely food insecure households respectively(72).

Wealth index: Household wealth status was assessed using wealth constructs reflecting household assets, utilities and housing characteristics adopted from the Ethiopian Demographic and Health Survey 2016 used for Urban and adding livestock-related questionnaires from the rural. It was assessed by using the selected household assets, house ownership; main materials of the roof and floor, toilet facility, source of drinking water and fuel, livestock ownership, bank book account and hive availability. The first variables were coded between 0 and 1. Then, a principal component analysis was carried out. In the principal component analysis, the power of the variables to explain wealth status was determined to step by step using the communalities values. Those variables having a communality value of greater than 0.5 were used to produce factor scores. Hence, an Eigenvalue of greater than one was considered. The outputs were reported in quintiles of poorest, poor, medium, rich, and richest based on the minimum and maximum wealth index scores(64).

4.11. Data quality assurance

The data collection tools were prepared originally in the English language and then translated to the Amharic language for easy management, then translated back to English to maintain the quality and consistency of information.

The questionnaire (data collection tool) was pre-tested before the main study for its reliability, 5 % of questionnaires will use for the pre-test in Adet city administration.

During data collection:

Calibration or checking of the measuring instruments was done between measurements. The completed questionnaires were checked every day during and after data collection for completeness, clarity and consistency by the supervisor and principal investigator.

After data collection: Counting of the entire questionnaire, checking the completeness and data coding, entry and cleaning were done

4.12. Data processing and analysis

Data were collected and checked for completeness and coded and entered using Epi-Data 3.1 version, consistency was checked and data cleaning and editing were done. Then the data were analyzed by using Statistical Package for Social Sciences, Version 21 (SPSS for Windows, SPSS Inc., and Chicago, IL, USA).

Frequencies and percentages of variables were presented using tables and graphs. After a bivariate logistic regression analysis of variables with a p-value <0.25 was selected for further analysis to multivariable logistic regression (forward likelihood ratio variable selection method) was used to identify variable statistically significant and determinant factors for the chronic energy deficiency of disabled individuals. Adjusted odds ratios (AOR) with a 95% confidence interval and p-values <0.05 were used to show the association between an explanatory variable and a dependent variable. The strength of the association was checked by using the odds ratio (OR). The Hosmer and Lemeshow goodness of model fitness test (p-value >0.05) was used to check model fitness.

Calculation of the asset index was performed through Principal Component Analysis (PCA), a data reduction technique. Assumptions of PCA were checked that is KMO >0.5 , anti-image for each variable should be greater than 0.5, correlation matrix >0.3 and communality for each variable should be greater than 0.5.

For variables that fulfilled the above assumptions, PCA was run and the 1st factor was taken to represent the household's wealth status and then classified into wealth quintiles.

4.13. Ethical clearance

Written ethical clearance paper was obtained from Bahir Dar University College of Medicine and health science Ethical review board. Then the letter was given to the Bahir Dar city administration social and labor affairs bureau/ office to get permission. Finally, the chairperson of the disabled persons and the representative of each type of disability were informed about the purpose of the study.

Each study participant was asked to give verbal consent after they understand the main purposes of the study. Participants have the right to refuse to participate in the study at the very beginning or any stage during the interview (data collection).

The information collected from respondents was kept confidential and is only used for this study. The privacy of respondents was maintained while data collection.

4.14. Dissemination and Utilization of the Result

The study finding will be disseminated to Bahir Dar University College of Medicine and Health Science, Amhara Health Bureau, Bahir Dar city administration social and labor affairs bureau/ office in the form of hard or soft copy. Publication in peer-reviewed journals and at scientific conferences shall also be considered.

5. RESULTS

5.1. Socio-demographic and Economic characteristics

A total of 411 adults living with disability were included in the study with a response rate of 97.39%. Two hundred sixty-six (64.70%) of the participants were males and 244(58.90%) were single. The age of the participants ranged from 18-65 years with a mean age of 29.71 years \pm 11.062. Two hundred seventy-five (60.10%) of the participants were between the age of 18-29 years old. Of 411 participants 74.90% were orthodox followers. About 40.60% of participants had no formal education, while 37.00% had secondary education and above. Regarding household assets from the study participants, 97(23.60%) of disabled adults were categorized as the poorest (Table 2).

Table 1: Socio-demographic characteristics of adults with disability in Bahir Dar City, North West Ethiopia, 2021(n=411)

Variables	Category	Frequency	Percent
Sex	Male	266	64.7
	Female	145	35.3
Age in years	18-29	247	60.1
	30-44	113	27.5
	>45	51	12.4
Religion	Orthodox	305	74.9
	Muslim	81	19.7
	Protestant	25	6.1
Educational status	No formal education	167	40.6
	Primary education	92	22.4
	Secondary and above	152	37.0
Occupation	Weaver	27	6.6
	Merchant	46	11.2
	Housewife	40	9.7
	Student	114	27.7

	job seeker	60	14.6
	civil servant	34	8.3
	daily laborer	43	10.5
	Other**	47	11.4
Marital status	Not yet married	242	58.9
	Married	138	33.6
	Divorced	19	4.6
	Widowed	12	2.9
Family size	1-4	306	74.5
	5-8	105	25.5
Wealth Index	Poorest	97	23.6
	Poor	58	14.1
	Medium	91	22.1
	Rich	83	20.2
	Richest	82	20.0

**=shoe shine & beggar

5.2. Disability-Related Results of the Respondents

One hundred seventy-three (42.1%) of them were physically disabled and 360(87.6%) had information about the availability of support for disabled persons and most of them 119(29.00%) obtained information from NGOs with 23.8% of them were got food support.

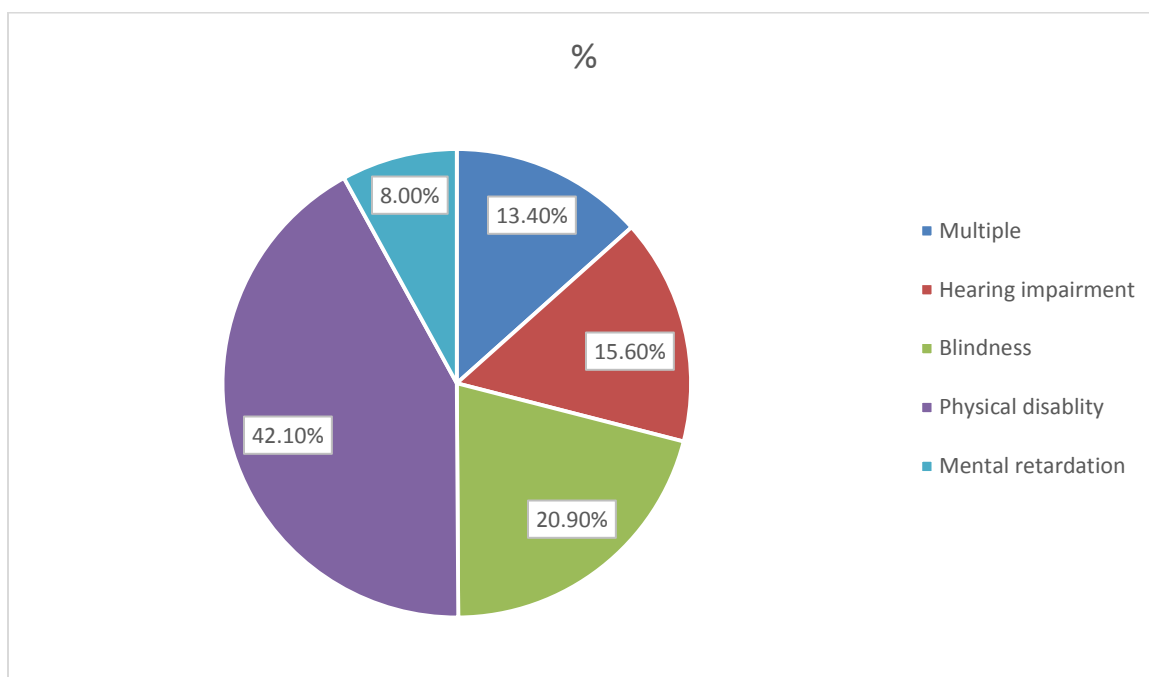


Figure 3:-Types of disability among adults in Bahir Dar City, Northwest Ethiopia, 2021(n=411)

5.3. Health and Behavioral related factors of Disabled Adults

One hundred sixteen (28.2%) had health facility visits in the last one month with musculoskeletal system related problems which account for 35.3%. 89.8% of the study participants used pipe water for drinking and 86.4% had a latrine. Of the study participants 14.4%, 16.8% and 43.6% history of cigarette smoking chat chewing and alcohol intake respectively. During the participation in ceremonies like holidays, weddings or other festive related activities 34.3% of them have faced discrimination and 30.7% had a problem with food access (Table 3).

Table 2:-Health and Behavioral Related Factors of Adults with Disability in Bahir Dar city, North West Ethiopia, 2021(n=411)

Variable	Category	Frequency	Percentage
Health facility visit in the last month	Yes	116	28.2
	No	295	71.8
Type of Visit	Acute	65	15.8
	Chronic	51	12.4
Types of chronic diseases	DM	8	15.7
	Hypertension	12	23.5

	Heart-related diseases	7	13.7
	Diseases of MSS	18	35.3
	Others *	6	11.8
Water sources	Pipe water	369	89.8
	Others **	42	10.2
Amounts of water used in a letter at HH level	10-20 litter	176	42.8
	30-440 litters	136	33.1
	>=50 litters	99	24.1
Latrine availability	Yes	355	86.4
	No	56	13.6
Hand washing facility	Yes	163	39.7
	No	248	60.3
Hand washing practice after toilet use	Yes	274	66.7
	No	137	33.3
The habit of cigarette smoking	Yes	59	14.4
	No	352	85.6
Alcohol consumption	Yes	179	43.6
	No	232	56.4
Physical activity status	Yes	104	25.3
	No	307	74.7
Physical activity level	Good	51	45.5
	Poor	61	54.5
Chat chewing practice	Yes	69	16.8
	No	342	83.2
Ceremony participation	Yes	342	83.2
	No	69	16.8
Discrimination	Yes	141	34.3
	No	270	65.7
Problem with food access	Yes	126	30.7
	No	285	69.3

* =HIV/AIDS, cancer, **=spring, well, river water and bottle water

5.4. Dietary Related Factors of Disabled Adults

5.4.1. Dietary Diversity Score of Disabled Adults

74.2% of disabled adults had inadequate diversity practices (Fig4).

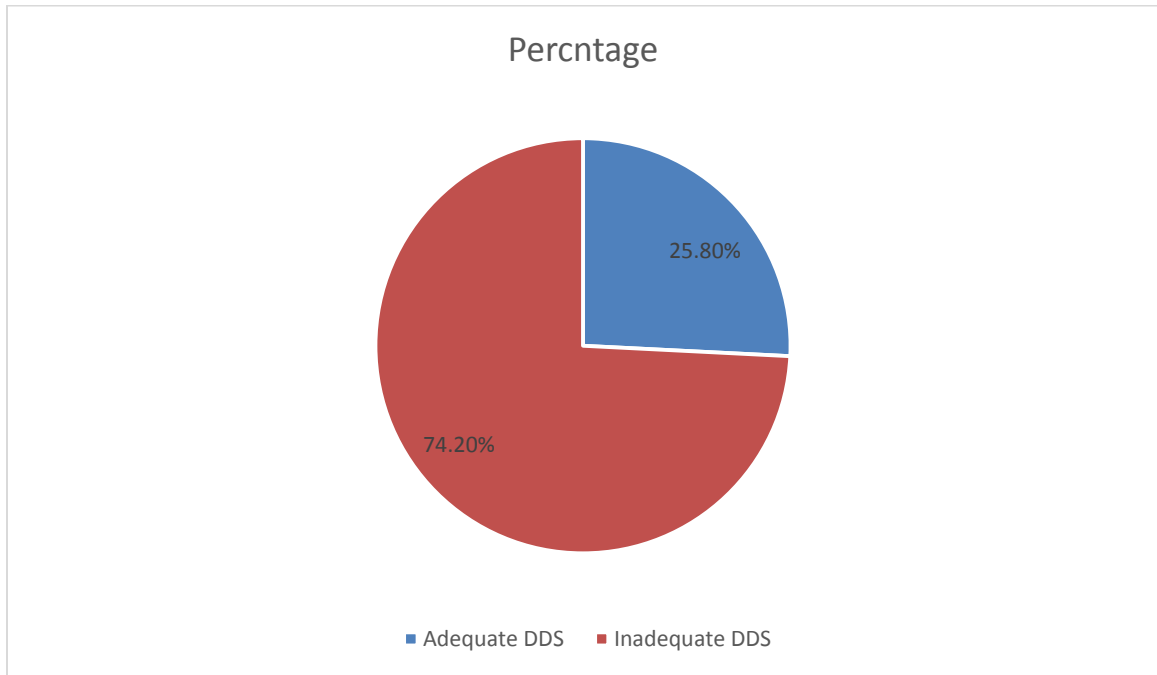


Figure 4:- Dietary diversity practice of disabled adults in Bahir Dar City, Northwest Ethiopia,2021(n=411)

5.4.2. Food security status of Disabled Adults

Of the study participants, seventy-one (42.6%) and 134(32.6%) disabled adults were mildly and moderately food insecure respectively (Fig5).

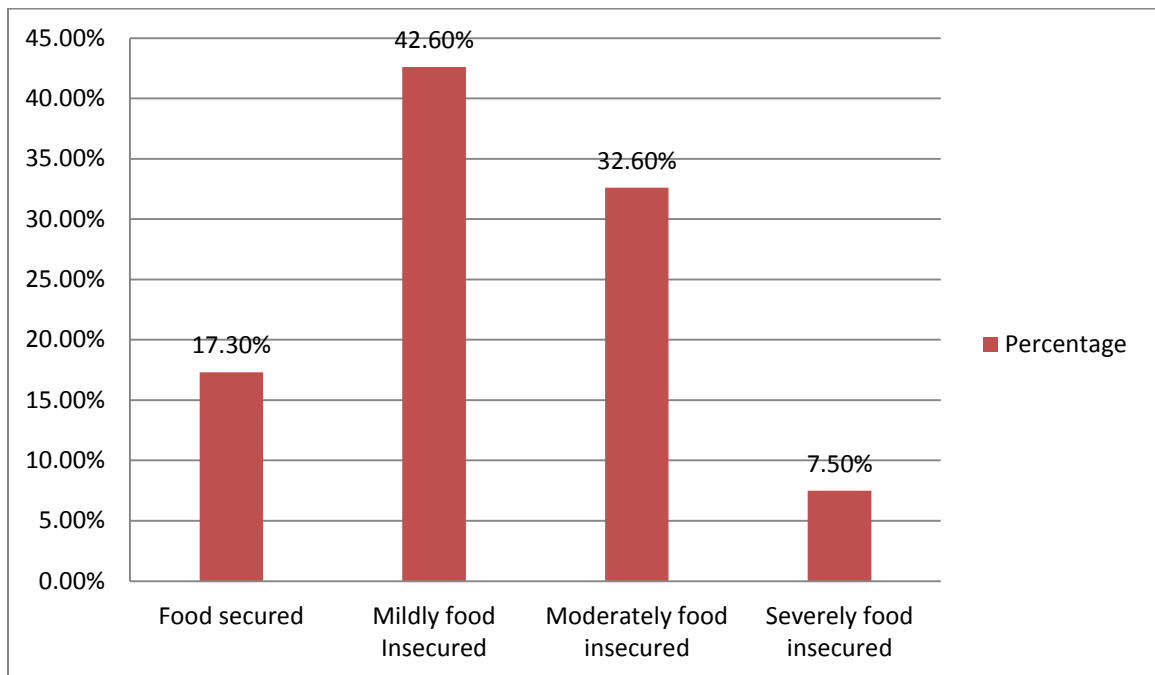


Figure 5:-Food Security Status of Disabled Adults in Bahir Dar City, Northwest Ethiopia, 2021(n=411)

5.5. Nutritional status of The Respondent

The overall prevalence of chronic energy deficiency (BMI<18.5 kg/m²) among adults with a disability was 35.8% (Fig 6).

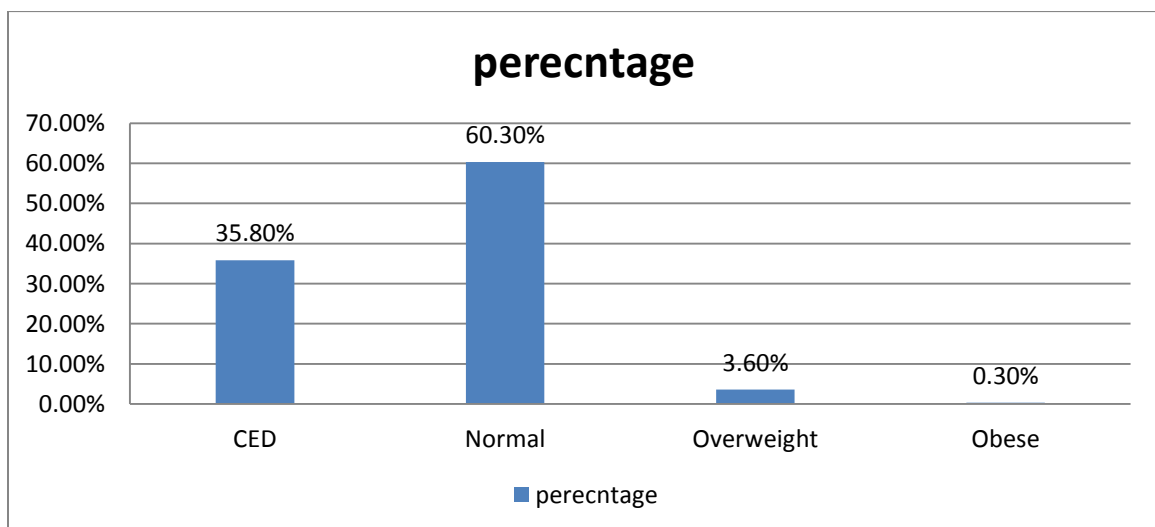


Figure 6:- Nutritional status of a disabled adult in Bahir Dar City, Northwest Ethiopia, 2021(n=411)

5.6. CED Status of the Respondent

35.8% of them had chronic energy deficiency (Fig 7).

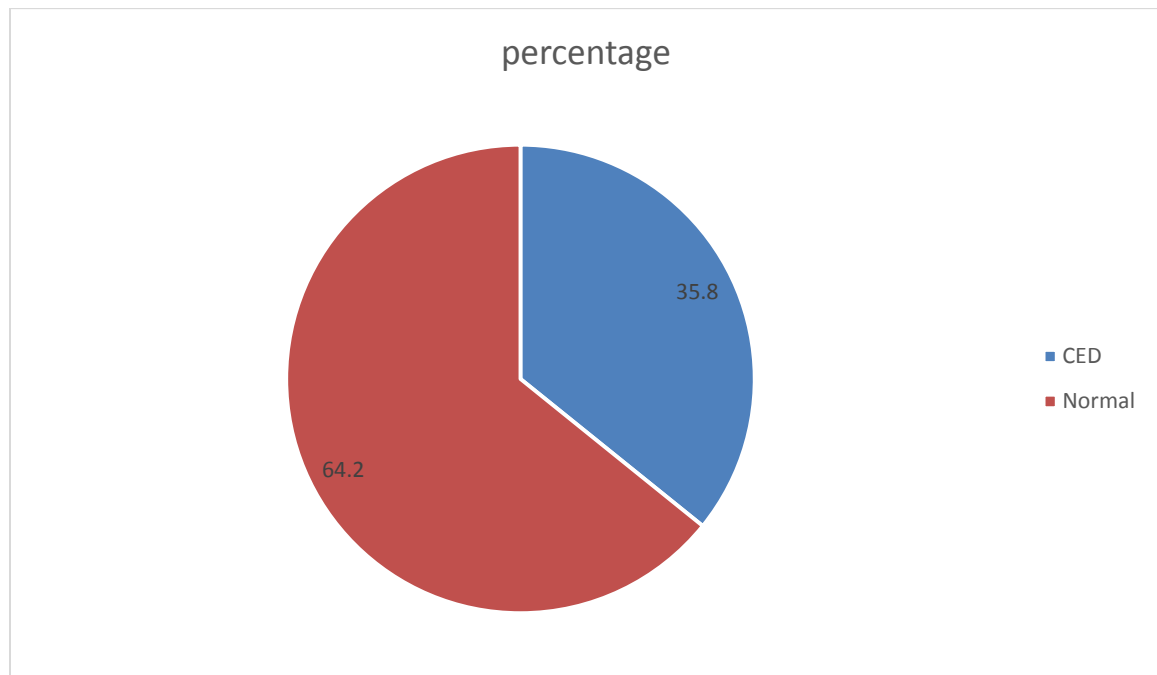


Figure 7:- CED status of Disabled adult in Bahir Dar City, Northwest Ethiopia, 2021(n=411)

5.7. Factors associated with Chronic Energy Deficiency Among Disabled Adults

The covariates, age, marital status, types of disability, latrine availability, hand washing practice, physical activity, alcohol consumption, dietary diversity, household food insecurity, wealth index and educational status were significantly associated with chronic energy deficiency in the bi-variable binary logistic regression analysis. In the adjusted analysis (multi-variable) binary logistic regression analysis types of disability, dietary diversity and household food insecurity were significantly associated with chronic energy deficiency.

The risk of developing chronic energy deficiency in adults who have multiple disabilities were increased by 3.68(AOR=3.68,95%CI:1.25-10.82) as compared to mentally retarded adults. Disabled adults who had poor dietary diversity practice were 1.91(AOR=1.91,95%CI:1.07-3.41) times more likely to develop CED than disabled adults who had adequate dietary diversity.

Disabled adults with severe food insecurity had 4.73(AOR=4.73,95%CI:1.50-15.00) times more likely to have chronic energy deficiency than food secured. Those who had moderate food insecurity were 2.92(AOR=2.92,95%CI:1.22-7.04) times more likely to develop chronic energy deficiency than their counterparts (Table4).

Table 3: Nutritional status and socio-demographic characteristics, dietary diversity and household food insecurity among adults with disability in Bahir Dar city, North West Ethiopia, 2021 (n=411)

Variable		Chronic energy deficiency		COR with 95% CI	AOR with 95% CI	p-value
		Normal	CED			
Age	18-29	158(64%)	89(36%)	1		0.191
	30-44	67(59%)	46(41%)	1.22(0.77-1.92)	1.34(0.74-2.40)	0.335
	>=45	39(76.5%)	12(23.5%)	0.55(0.27-1.11)	0.59(0.25-1.43)	0.246
Education	No formal education	94(56.3%)	73(43.7%)	2.33(1.45-3.76)	1.33(0.72-2.41)	0.363
	Primary education	56(61%)	36(39%)	1.93(1.11-3.37)	1.80(0.96-3.37)	0.069
	Secondary and above	114(75%)	38(25%)	1		0.191
Marital status	Currently not married	161(59.0%)	112(41.0%)	2.05(1.30-3.22)	1.35(0.74-2.45)	0.334
	Married	103(74.6%)	35(25.4%)	1		
Family size	1-4	186(60.1%)	120(39.%)	1		
	5-8	78(74.3%)	27(25.7%)	0.54(0.32-0.88)	0.78(0.44-1.38)	0.396
DDS	Inadequate	188(61.6%)	117(38.4%)	1.58(1.00-2.56)	1.91(1.07-3.41)	0.029**
	Adequate	76(71.7%)	30(28.3%)	1		
Type of disability	Multiple disability	28(50.9%)	27(49.1%)	2.57(1.01-6.52)	3.68(1.25-10.82)	0.018**
	hearing impairment	45(70.3%)	19(29.7%)	1.13(0.44-2.87)	1.14(0.39-2.27)	0.815
	Blindness	63(73.3%)	23(26.7%)	0.97(0.40-2.40)	0.81(0.28-2.36)	0.703

	physical disability	104(60.1%)	69(39.9%)	1.77(0.78-4.03)	1.63(0.62-4.34)	0.325
	mental retardation	24(72.7%)	9(27.3%)	1		0.005
HHFI	Food secured	59(83.1%)	12(16.9%)	1		0.037
	Mildly food insecure	125(71.4%)	50(28.6%)	1.97(0.98-3.97)	1.75(0.81-3.78)	0.158
	Moderately food insecure	69(51.5%)	65(48.5%)	4.63(2.28-9.39)	2.92(1.22-7.04)	0.017**
	Severely food insecure	11(35.5%)	20(64.5%)	8.94(3.41-23.41)	4.73(1.50-15.00)	0.008**
Wealth Index	Poorest	72(74.2%)	25(25.8%)	0.33(0.177-0.62)	0.63(0.25-1.61)	0.331
	Poor	50(86.2%)	8(13.8%)	0.15(0.06-0.36)	0.34(0.11-1.03)	0.056
	Medium	56(62%)	35(38%)	0.60(0.33-1.10)	0.82(0.37-1.80)	0.620
	Rich	46(55.5%)	37(44.5%)	0.77(0.42-1.41)	0.97(0.46-2.05)	0.938
	Richest	40(49%)	42(51%)	1		.0299
Latrine availability	Yes	239(67.3%)	116(32.7%)	1		
	No	264(64.2%)	147(35.8%)	2.56(1.44-4.53)	1.41(0.63-2.86)	0.344
Hand washing after toilet	Yes	188(68.6%)	86(31.4%)	1		
	No	76(55.5%)	61(44.5%)	1.76(1.15-2.68)	1.10(0.64-1.89)	0.738
Alcohol consumption	Yes	108(60.3%)	71(39.7%)	1.35(0.90-2.03)	1.60(0.99-2.56)	0.054
	No	156(67.2%)	76(32.8%)	1		
Physical activity	Yes	66(41.1%)	46(58.9%)	1		
	No	198(66.2%)	101(33.8%)	0.73(0.47-1.14)	0.60(0.35-1.04)	0.067

** P-value<0.05, CI. Confidence Interval

6. DISCUSSION

This study was aimed at assessing chronic energy deficiency and associated factors among disabled adults. According to the study finding, the prevalence of Chronic energy deficiency was 35.8%. Adults having multiple disabilities, inadequate dietary practice and household food insecurity (moderate and severe food insecurity) were significantly associated with chronic energy deficiency.

The overall prevalence of chronic energy deficiency in this study was higher than the findings from Bangladesh 25.4%, Japan 13%, India 8.3%, China 17.9%, Malaysia 20.3%, Nigeria 0.9% and Kenya 23.4% (30, 32, 33, 35, 36, 54, 73). The discrepancy in the prevalence of chronic energy deficiency among different countries might be due to the difference in socio-cultural and economic characteristics, poor diet diversity, educational status, study participants and feeding habits of disabled persons.

Also of the study participants, 34.3% had faced stigma and discrimination due to disability. This study was lower than studies done in Nakuru County, Kenya 53.9%(73). The difference might be due to the socio-cultural difference, norms and community values given to disability.

Of the study participants in this study, 14.4% and 43.6% had a smoking and alcohol intake history. But the study finding was higher than studies done in West Ireland on 157 mentally disabled adults smoking 2.6% and alcohol intake of 10.3% and Nigeria smoking 5.6 and alcohol intake of 30% (54, 74). This is might be due to religious differences, cultural differences and the eating and drinking habits of the community and the study groups.

The prevalence of chronic diseases hypertension 23.5%, diabetic Mellitus 15.7% and cardiovascular diseases 13.7% was comparable with studies done in Kenya (hypertension 25.8%, diabetic Mellitus 5.5 and cardiovascular diseases 6.3%) and Nigeria (hypertension 29.7 and diabetic Mellitus 12.1%)(54, 73). This is might be due to the method of study design, study participants' age group and poor physical activity and alcohol intake.

About 74.2% of the study participants had poor dietary diversity or consume below five food groups per day. This finding is higher than studies done in Kenya 68.8%(73) and India 64.7%(33). This difference might be due to income status, socio-cultural differences and the tools used for the study.

According to this study, 82.70% were mildly, moderately and severely food insecure. This result was higher than studies done in USA 31.8%, Korea 14.1% and Nakuru County, Kenya 40% (43, 73, 75). The difference might be most of the study participants in this study were physically disabled adults, unemployed, students and poor socioeconomic status which makes them unable to obtain adequate food.

This study revealed that adults with multiple disabilities were 3.68(1.25-10.82) times risk for chronic energy deficiency than their counterparts. This finding was supported by studies done in India(AOR=2.13,95% CI 1.093-4.136)(33). This similarity might be due to the data collection tools used, poor dietary practice and adults with multiple disabilities were have poor active engagement in labour-intensive activities and communities' perception (community lacks trust) on their ability.

Disabled adults who had poor dietary diversity practice were at increased risk of developing CED by 1.91(AOR=1.91,95%CI:1.07-3.41) than disabled adults having adequate dietary diversity. As far my search, no study conducted to show an association between dietary diversity with chronic energy deficiency among disabled adults. In fact, if an individual consumes below the recommended daily food groups composition (cereals, legumes, meat products, egg, dairy products and other food groups), he/she becomes malnourished and the body cannot build properly, which leads them to tissue damage and risk for developing chronic energy deficiency.

This study revealed that being moderately and severely food insecure were 2.92(1.22-7.02) and 4.73(1.50-15.00) times risk for chronic energy deficiency respectively. This finding was supported by studies done in Korea (AOR=1.98)(43). This might be due to the economic status of study groups, poor dietary intake, presence of other diseases and inadequate support from NGOs and government and most of them were not engaged in income-generating activities.

7. LIMITATION OF THE STUDY

Since the questions were interviewer-administered; there were social desirability bias and recall bias in answering the dietary diversity, food insecurity and wealth index questions. Also measuring of weight and height for the amputated persons were taken from European guidelines, there might be underestimating.

8. CONCLUSION

The prevalence of chronic energy deficiency in this study was high. Due to this disabled people were exposed to different health and behavioral related problems.

Types of disability, dietary diversity and household food insecurity were significantly associated with chronic energy deficiency among disabled adults.

9. RECOMMENDATIONS

Based on the study findings, the prevalence of chronic energy deficiency among disabled adults was high in the study area. I recommend the following ideas to the respective bureaus(office) and the participants.

For the disabled adults:

To maintain their nutritional status

- Disabled persons should be engaged in income-generating activities and other home garden activities and take diversified food.
- Strong more their association and influence the chairpersons to search for stakeholders that work on disability-specific groups (on job creation, financial support and food support).

Bahir Dar city's zonal health department:

- Health extension workers should strengthen giving participatory nutrition education to disabled persons and develop behavioural change communication for better nutrition services
- Link them to local NGOs which work on disability persons
- Give special attention to those who have multiple disabilities by job creation and food and other support to prevent further complication

NGOs:

- Those NGOs who are working on targeting disabled persons should design projects and programs which focused on improving the health and nutritional status of disabled persons.

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APPENDIXES

Annex-I: Participant Informed Consent Form (English Version)

Participant information sheet

Good morning/afternoon. My name is _____ and I am from _____. I am a member of a data collector team on behalf of the study conducted by Fentahun Yizengaw, who is MPH in public human nutrition, a student at Bahir Dar University.

Title: - prevalence of chronic energy deficiency and associated factors among disabled adults in Bahir Dar city Northwest, Ethiopia, 2021.

Introduction: My name is Fentahun Yizengaw and I am a student at the Bahir Dar University, college of public health. I am here with my team to conduct research on Nutritional status and associated factors among disabled adults in Bahir Dar city. I would like to seek your cooperation regarding this exercise.

The purpose of the study: This study aims to determine the prevalence of chronic energy deficiency and associated factors among disabled adults in Bahir Dar city Northwest, Ethiopia.

Procedure: The method of this research is a community-based cross-sectional study design. The expected duration of the study participant for one-time contact with the interviewer will not be more than 30 minutes. Disabled adults will be screened for chronic energy. You will be asked to participate in this research since the truthful information which you will provide is important for the understanding of the proposed research project. However, your particular participation is affirmed by the procedure of probability sampling technique which provides an equal chance of selection.

Confidentiality: Strict confidentiality will be maintained; all personal identifiers will be removed from the data. Participants in the study will be identified only by specific numbers.

No data will be released outside the study without the explicit consent of my study team. After the research defence and final work are approved by the Bahir Dar university senate, the original data questionnaire will be incinerated securely.

Risk and benefit: Apart from the inconveniences caused by taking part of your time, the process is safe and there are no risks involved. There are no direct benefits to you by choosing to

participate in this study. However, the results of this study will be communicated back to the health facility for necessary action by the health authority. The information you provide will therefore be of benefit not only to you but also to other people and aid in planning strategic interventions for the management of malnutrition (chronic energy malnutrition) in Ethiopia. The results will be also used in writing my thesis as part of the requirements by the university. If you want to participate in the study, you have also the full right to withdraw from the study at any time you wish without any penalty. Nobody will ask or enforce you to explain the reason for withdrawal.

Contact information: For any inquiries in the event of any research-related questions, comments or complaints, the following persons will be available for contact:

Principal Investigator: Fentahun Yizengaw

Telephone: 0918122199/0920465929

Email: fentahunyizengaw29@gmail.com

Data collector name -----

Annex-II: Questionnaire English Version

Questionnaire English Version

Code/ID: _____

Informed consent agreement form, English version

Dear respondent, my name is ----- I am working in the behave of Mrs Fentahun Yizengaw who is an Extension student with a degree of master's program in Bahir Dar University College of Medicine and Health Science School of Public Health Department of Nutrition and Dietetics as a data collector. We are interested in learning more about your nutritional status and the factors affecting it.

This questionnaire is designed for research work which will be approved by Bahir Dar University, College of Medicine and Health Science, School of Public Health, Department of Nutrition and Dietetics to be conducted in partial fulfilment of a Master's Degree in public human nutrition. We hope you will help us by answering this question None of your answers will be available to anyone. Do not give your name. All the information you give us and the measurements we take will be kept in your privacy (confidentiality will keep). Anyone who will not be willing to participate in the study will have the right to discontinue at any time in the process. Confidentiality and privacy will be maintained by ensuring the respondents answer the question in a separate place where no one can see them we need your honest responses to better understand the nutritional status and associated factors affecting it. The results of the study will hopefully serve as an important input to intervention programs that aim to improve the nutritional status of disabled persons. We thank you in advance for taking the time to answer our questions.

Would you be willing to participate in the study?

Agree _____ Disagree _____

Interviewer's name _____, signature _____

Date of interview _____

Supervisor's name _____ signature _____

Additional instructions to the interviewers:

The interview and measurements will continue only after the respondent will agree to the consent

Fill the questionnaire only with a pen

2. Circle the answer from the options of possible responses
3. Strictly follow the skipping pattern.

Questionnaire for an adult with disabilities

Part I: Socio-demographic and economic related questions

No	Questionnaires	Response category	
101	Sex of the respondent	1 = Male	2 = Female
102	Age of respondent	-----	
103	Religion	1. Orthodox 2. Muslim 3. Protestant	
104	What is your educational level?	1.Unable to read and write 2.Can read and write 3.Primary(1-8grade)	4.Secondary (9-12 grade) 5. College & above
105	What is your occupation?	1=Weaving 2=Merchant/Petty trade 3 = Housewife 4 = Student	5=Job Seeking 6=Civil servant/employed 7 = Daily laborer 8= Others
106	What is your marital status?	1=Single 2=Married	3= Widowed 4 = Divorced

Part-II: Disability-related questionnaires

No	Questionnaire	Response category	
201	What type of disability does she/he have?	1=Multiple disabilities 2=Deafness/Hearing impairment 3=Blindness/Visual impairment	4=physical impairment 5=mentally retarded

202	Have you got support from gov't or NGOs?	1. yes 0.no	
203	If yes, where did you hear?	1. TV 2. Radio 3. Newspaper	4. from social media 5. from NGOs
204	If yes for the Q112, the type of support obtained	1. Food 2. Shelter 3. cloth	4.IGA 5. monthly salary 6. Other

Part- III: Water, sanitation, hygiene and behavioural related questions

301	What are the sources of drinking water used at home?	1. Pipe water 2. Spring 3. well 4. river 5. bottle	Pls. select only the predominant one
302	How many litres of water do you use daily	_____liters	
303	Do you have a latrine?	1. yes 0.no	
304	Is there any hand washing facility near the toilet get (door)?	1. Yes 0. No	
305	Have you wash your hand after the toilet?	1. Yes 0. No	
306	Do you have had any health facility visits in the last month?	1. Yes 0. No	
307	If yes, is it related to acute or other chronic illnesses	1. new visit (acute disease) 2. chronic follow up	
308	If the answer for Q207 is 2, mention the diseases	_____	
309	Do you have a history of smoking?	1. yes 0.no	If not go to 211
310	If yes, how many cigarettes did you smoke/per year	1.>=100 tobacco 0. <100 tobacco	
311	Did You drink type of alcohol?	1. Yes 0. No	

312	If yes to Q210 how many glasses do you drink per day or a week?	__day/___week glass	If not go to Q213.
313	Do you do physical activities regularly?	1. Yes 0. No	
314	If the answer is yes for Q211 how long a week you did do?	-----	
315	Have you ever chewed chat?	1.Yes 0. No	
316	Have you participated in any ceremony or social activities?	1. yes 0.no	If not go to part III
317	Have you faced stigma and discrimination?	1. Yes 0. No	
318	If yes, do you think, it affects you from food access?	1. Yes 0. No	

Part-IV: Wealth Index related questionnaires of adults with disabilities

No	Variables	Response category	Number
401	Do you have electricity?	1. Yes 0. No	
402	Do you have a radio?	1. Yes 0. No	
403	Do you have a television?	1. Yes 0. No	
404	Do you have a refrigerator?	1. Yes 0. No	
405	Do you have an electric mitad?	1. Yes 0. No	
406	Do you have a dimming table?	1. Yes 0. No	
407	Do you have a sofa?	1. Yes 0. No	
408	Do you have a bed with a cotton/sponge/spring mattress?	1. Yes 0. No	
409	Does any member of this household have a bank account?	1. Yes 0. No	
410	Do you have a car?	1. Yes 0. No	
411	Do you have a bicycle?	1. Yes 0. No	
412	What type of fuel does your household mainly use for cooking?	1. Electricity 2. Wood 3. Other	
413	What is the main material of the floor in	1. Earth / sand 2. Other	

	your household?		
414	What is the main material of the exterior walls in your household?	1. Bamboo with mud	2. other
415	What is the main material of the roof in your household?	1. Metal / corrugated iron	2. Plastic
416	Do you have land for the farm?	1. Yes 0. No	
417	Do you have a washing machine?	1. Yes 0. No	
418	Do you have a computer?	1. Yes 0. No	
419	Do you have a bathing room?	1. Yes 0. No	
420	Do you have a clock (wall watch)?	1. Yes 0. No	
421	Does the house have windows?	1. Yes 0. No	
Do you have domestic animals listed below			
422	Cow?	1. Yes	0. No
423	Ox?	1. Yes	0. No
424	Horse?	1. Yes	0. No
425	Mule?	1. Yes	0. No
426	Goat?	1. Yes	0. No
427	Sheep?	1. Yes	0. No
428	Chicken?	1. Yes	0. No
429	Bulls?	1. Yes	0. No
430	Donkey	1. Yes	0. No
431	beehives	1. Yes	0. No

Part -V: Dietary Diversity Related Questionnaire

If a food item from the following food groups was consumed in the form of injera, porridge, bread, soup, juice, roast, etc. in the previous day (24 hours)

Food groups (Food items/examples)	1= yes 0= No
501. Grains, white roots and tubers, and plantains (Porridge, bread, rice, pasta/noodles, sorghum, millet, corn, couscous, barley, White potatoes, white yams, manioc/cassava/	

yucca, cocoyam, taro roots or tubers)	
502.Pulses (beans, peas or lentil, hummus, tofu, tempeh	
503. Nuts and seeds (Groundnut/peanut, cashew, walnut, Baobab seeds, chia seeds, flaxseed	
504. Dairy (Milk, Cheese or yoghurt)	
505. Meat, poultry and fish, organ meat (Blood sausage, gizzard, heart, kidney, liver), Red flesh meat from mammals (Beef, goat, lamb, mutton, pork, rabbit, yak), Processed meat (Salami, bacon, bologna, hot dogs), Poultry and other white meats (Chicken, duck, goose, guinea fow), Fish and seafood (Fresh, frozen or dried fish, shrimp, clams)	
506.Eggs (Eggs from poultry or any other bird)	
507. Dark green leafy vegetables (kale, mustard greens, spinach, amaranth greens, chicory, broccoli, Swiss chard)	
508. Vitamin A-rich fruits and Vegetables (Pumpkin, carrots, squash or sweet potatoes& fruits such as Ripe mango, ripe papaya)	
509. Other vegetables (Beets, cabbage, cauliflower, celery, cucumbers, eggplant, zucchini, radish, tomato, mushroom)	
510. Other fruits (Apple, avocado, banana, baobab fruit, berries, pineapple, orange, watermelon, berries, guava, coconut flesh, tangerine)	

Part-VI: Individual food insecurity (IFI) of disabled adults related questions.

After asking the respondents, please write 0 will give the score for non-occurrence, 1 for rarely (once or twice in the past four weeks), 2 for sometimes (three to ten times in the past four weeks), and 3 for often (more than ten times in the past month) in front of the questions listed below.

601	Worry about food	1=Yes 0 = No	1 = Rarely (once or twice in the past 04 weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
602	Unable to eat preferred food	1=Yes 0 = No	
603	Eat just a few kinds of food	1=Yes 0 = No	
604	Eat foods you do not want to eat	1=Yes 0 = No	
605	Eat a smaller meal	1=Yes 0 = No	
606	Eat fewer meals in a day	1=Yes 0 = No	
607	No food of any kind in household	1=Yes 0 = No	
608	Go to sleep hungry	1=Yes 0 = No	
609	Go a whole day and night without	1=Yes 0 = No	

	eating		
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Part-VII: Anthropometric measurements of adults with disabilities

No	Questions	Response category
700	Height of the disabled individual (Cm)	1 = _____
701	Weight (Kg)	1 = _____
702	Arm span in cm	
703	Demispan (cm)	
70	If amputated, wright the amputated part_____	

Thank you for your valuable information and participation!!

Annex-III የ ጥናቱ ተሳታፊዎች መጠይቅ በአሜሪካ የ ተዘጋጀ

መለያ ኮድ/:

የ ጥናቱ ተሳታፊዎች የ ስምምነት መረጋገጫ

እኔ ----- የ መግቢያጠቅታ፣ በባህሪዳር ዩኒቨርሲቲ የህክምና እና የህብረተሰብ ጤና ሳይንስ ኮሌጅ በስርዓተ ምግብ ዲፓርትመንት በአካል ጉዳተኞች የስርዓተ ምግብና ተያያዥ ችግሮች ዘርፍ የሁለተኛ ዲግሪውን በመከታተል ላይ ለመገኘጥ ፈንታሁን ይዘንጋው የመረጫዎ ጥናታዊ ጽሑፍ ለመዘጋጀት በተዘጋጀው መጠይቅ መሰጠት መረጃ ለመስጠት ነው፡፡ መረጃው የአርስዎን ቆይታ ካለ የስርዓተ ምግብ ጋር የተያያዙ ችግሮችን ለመለይት የሚያስችሉ ጠቃሚ መረጃዎችን እንደምናገኝ ተስፋ አደርጋለሁ፡፡

እርስዎ የሚሰጡት ምልሶች ለምንም ዓይነት ሥልጣን (አይሰጡም)፡፡ ከመጠይቁ ላይ ስም አይጻፍም፡፡ ምልሶች እና በልክይታ የሚገኙ መረጃዎች ሚዲያዎችን የተጠበቀ ነው፡፡ ለመጠይቁ ፈቃደኛ ያልሆነ ግልሰብ በምንኛውም ስልት ማቆረጥ ይችላል፡፡ መተይቁን በማሞላት ጊዜ ሚዲያዎችን ተና ደህንነቱ የተጠበቀ ለማድረግ ምንም ሳያይዘው ለብቻዎ ተቀምጠው እንዲሞሉ ይደረጋሉ፡፡ የእርስዎ ቀና መልስ የስርዓተ-ምግብ ችግሮችንና ቁልፍ መንስኤዎችን ለመለየት ይረዳል፡፡ ከጥናት በኋላ የምንገኘው ውጤት የአካል ጉዳተኞችን የስርዓተ ምግብ ችግር ሊቀርፉ የሚችሉ አመለካከት ውጤቶችን ያሳያል ብለን እናምናለን፡፡ ወድ ጊዜዎን ስለሰጠኝ ከልብ ሽናምሰግናለን፡፡

በጥናቱ ለመሳተፍ ፈቃደኛ ነህ/ንሽ?

አዎ _____ አይደለሁም _____

የጠያቂው ስም _____ ፊርማ _____

መጠይቁ የተሞላ ብተ ቅን _____

የተቆጣጣሪ ስም _____ ፊርማ _____

ተጨማሪ መረጃዎች መጠይቁን ለማሞላት ባልሚችሉ ሰዎች፣ መጠይቁን የአካል ልኬታው አካል ጉዳተኞች ከተሰማሙ በኋላ ይጀመራል፡፡

1. ምልሶችን በእስክርቤቶ ብቻ ይሙሉ
2. ከተዘረዘሩት ምርጫዎች መካከል ምልሱን ብቻ ይክበቡ
3. ወደ ማቅጠል ወይም ማሞላት ጥቆማዎችን በጥንቃቄ ይከተሉ፡፡

ለአዋቂ አካል ጉዳተኞች የሚቀርቡ መጠይቆች፤

ክፍል I: የስነ-ህዝብና ማህበራዊ ጉዳዮች መረጃ መጠይቅ

ተ/ቁ	ጥያቄ	አማራጭ	
101	ፆታ	1 = ወንድ 0 = ሴት	
102	እድሜ	-----	
103	ሀይማኖት	1. ኦሮሮ ክስ 2. መስሊም 3. ፕሮቴስታንት	
104	የትምህርት ደረጃ	1. ማንበብ እና መጻፍ የማይችል 2. ማንበብ እና መጻፍ የማይችል	3. የመጀመሪያ ደረጃ ት/ት 4. ሁለተኛ ደረጃ ት/ት 5. ኮሌጅ እና በላይ
105	መተዳደሪያ ስራዎ ምን ድን ነ ወ?	1=ሽመና 2=ንግድ/አነስተኛ ንግድ 3=የቤት አመኔት 4=ተማሪ	5=ስራ ፈላጊ 6=የመንግስት ስራተኛ 7=የቀን ስራተኛ/ስራ 8.ሌላ ከሆነ ይጥቀሱ---
106	የጋብቻ ሁኔታ	1=ያላገባ 2=ባለትዳር	3=የተፋታ 4=በጥንቃቄ የተለየ
107	የቤተሰብ አባላት ብዛት?	በቁጥር _____	
108	ለአካል ጉዳተኞች እርዳታ/ድጋፍ እንድንሰጥ ያወቃሉ?	1.አው 0. አላወቅም	
109	መልስዎ አዎ ከሆነ መረጃዎን ከየት አገኙ?	1. ቴሌቪዥን 2. ራዲዮን 3. ከጋዜጣ	4. ከማህበራዊ ድህረ ገፅ 5. ከረጅም ድርጅቶች
113	ያግኙት የድጋፍ አይነት	1. ምግብ 2. ምጥለያ 3. የአልባሳት	4. የስራ ፈጠራ 5. ወርሃዊ ክፍያ 6. ሌሎች

ክፍል II: የወሀን ፅናና ጠፍን የተመለከቱ መጠይቆች

201	ለመጠጥ አገልግሎት ይመዘገብ ወይ ከየት ታግኛላችሁ?	1.ቧንቧ 2. ጉድጓድ 3. ምንጨ 4. ከወንዝ 5. ሀይላንድ ወይ	አብዛኛውን ጊዜ የሚጠቀሙትን ይምረጡ
202	በቀን ወስጥ ምን ያህል ሊትር ወይ ይትቅማሉ?	_____ ሊትር	
203	መጠጥ ቤት አላችሁ?	1.አዎ 0. የለም	
204	መጠጥ አዎ ከሆነ ከመጠጥ ቤቱ በር አካባቢ ይገኛል ማለት ማለት ነው?	1. አዎ 0. የለም	
205	ከመጠጥ/ቤት መልስ እጅዎን የታጠቡት?	1. አዎ 0. የለም	
206	ባለፈው አንድ ወር ጠፍተዎት ሂደት ነበር?	1. አዎ 0. የለም	
207	መጠጥ አዎ ከሆነ በአዲስ ህመም ነው ወይስ የማይተላለፍ (የቆየ) በሽታ አሞዎት ነው የሄዱት?	1. አዲስ ህመም 0. ለክትትል	
208	መጠጥ ለክትትል ከሆነ የበሽታው ዓይነት ይጥቅሱ?	_____	
209	ሲጋራ አጭብ ወይ ወቃሉ?	1.አዎ 0. የለም	የለም ከሆነ ወደ 211 ይሀለፉ
210	መጠጥ አዎ ከሆነ በይወት ዘመን ምን ያህል ሲጋራ ያጭቡ ነበር?	>=100 ትንባሆ <100 ትንባሆ	
211	አልኮል(ጠላ፣ ጠጅ፣ አረቄ፣ ቢራ/ወይን) ጠጥተዎት ወይስ?	አዎ አላወቅም	አላወቅም ከሆነ ወደ 213 ይሀለፉ
212	አወ ከሆነ ፣ ሥነ ስርዓት ይጠጡ ነበር በቀን (በሳምንት)?	ብር ጭቆ ጠላ/ጠጅ_በቀን -----በሳምንት-----	

213	የአካል ብቃት እንቅስቃሴ አዘወትረው ይሰራሉ?	1.አዎ 0.የልም	
214	መልሰዎ አዎ ከሆነ ለምን ያክል ደቂቃ ይሰራሉ?	-----	
215	ጫታ ቅመውያ ወቃሉ?	1.አዎ አላ ወቅም	
216	የበዓል ዝግጅት ተሳትፈውያ ወቃሉ?	1.አዎ 0. የልም	
217	መገለጫ ደርሶብዎት ነበር?	1.አዎ 0. የልም	
218	ምግብ አቅርቦት ጋር ችግር ነበር?	1.አዎ 0. የልም	

ክፍል III:በቤት ውስጥ ሊገኙ የሚችሉ የህብት ዓይነት መጠይቆች

ተ.ቁ	መጠይቆች	የጥያቄዎቹ አሜሪካውያን መለሰች	
301	የኤሌክትሪክ አገልግሎት ታግኛላችሁ?	1. አዎ 2. የለም	ብዛት ይጠቀስ
302	ስልክ አለህ/አለሽ?	1. አዎ 2. የለም	-----
303	ራዲዮ አለህ/አለሽ?	1. አዎ 2. የለም	-----
304	ቴሌቪዥን አለህ/አለሽ?	1. አዎ 2. የለም	-----
305	ፍሪጅ አለህ/አለሽ?	1. አዎ 2. የለም	-----
306	የኤሌትሪክ ምጣድ አለህ/አለሽ?	1. አዎ 2. የለም	-----
307	ጠረጴዛ አለህ/አለሽ?	1. አዎ 2. የለም	-----
308	ሚሬያ ወንበር አለህ/አለሽ?	1. አዎ 2. የለም	-----
309	አልጋ ከጥጥ/ስፖንጅ/ስፕሪንግ ፍራሽ ጋር አለህ/አለሽ?	1. አዎ 2. የለም	-----
310	ከቤተሰባችሁ መካከል የባንካ ደብተር ያለውአለ?	1. አዎ 2. የለም	-----
311	ለመጠጥ አገልግሎት ይሞገጡ ወይ ከየት ታግኛላችሁ??	1.ቧንቧ 2. ጉድጓድ 3. ምንጩ	4.ከወንዝ 5.ሀይላንድ ወይ

312	በአብዛኛው የምትጠቅሙት የመዳኝ ቤት ምን ዓይነት ነው?	1. የተሻሻለ /ክፍት መዳኝ ቤት 2. የለንም	3. በሜካ/ ጫላ ላይ 4. ሌላ ይጠቀሱ-----
313	አብዛኛውን ጊዜ ምግብ ለማበሰል የምትጠቅሙት የሀይል ምን ጭምን ድን ነው?	1. ኤሌክትሪክ 2. ዕንጨት	3. ሌሎች ይጠቀሱ-----
314	የቤቱ ወለል ከምን የተሰራ ነው?	1. ከአፈር / አሸዋ 2. ኮንክሪት	3. ሌላ ይጠቀሱ-----
315	የቤታችሁ ወጪው ክፍል ከምን የተሰራ ነው?	1. ከጭቃ 2. ከሲሜንት	3. ብለኬት 2. ሌላ -----
316	የቤታችሁ ጣሪያ ከምን የተሰራ ነው?	1. ብረት / ቆርቆሮ 2. ፕላስቲክ	3. ሌላ -----
317	ለትራንስፖርት አገልግሎት የሚገኝ ተንቀሳቃሽ ምን አልዎት?	1. መኪና 2. ሞተር ባይስክል	3. ባጃጅ 4. ጋሪ
319	የእርሻ ሜት አለዎት?	1. አዎ 2. የለም	-----
320	ላወንደሪ አለ?	1. አዎ 2. የለም	-----
321	ኮፒተር አለዎት?	1. አዎ 2. የለም	-----
322	ሻወር አለ?	1. አዎ 2. የለም	-----
323	የግድግዳ ሠዓት አለ?	1. አዎ 2. የለም	-----
324	ቤታችሁ መስኮት አለው?	1. አዎ 2. የለም	-----
ከዚህ በታች ከተዘረዘሩት የቤት እንስሳት ውስጥ የቱ አላችሁ			
325	ላም	1. አዎ 2. የለም	-----
326	በሬ	1. አዎ 2. የለም	-----
327	ፈረስ	1. አዎ 2. የለም	-----
328	በቅሎ	1. አዎ 2. የለም	-----
329	ፍየል	1. አዎ 2. የለም	-----
330	በግ	1. አዎ 2. የለም	-----

331	ዶሮ	1. አዎ 2. የለም	-----
332	ጊደር	1. አዎ 2. የለም	-----
333	አህያ	1. አዎ 2. የለም	-----
334	የንብቀፎ	1. አዎ 2. የለም	-----

ክፍል-IV: ከአመገብ ሁኔታ ጋር የተያያዙ መጠይቆች

ከዚህ በታች ከተዘረዘሩት የምግብ መደቦች ውስጥ በእንጀራ፣ በገንፎ፣ በዳቦ፣ በሾርባ፣ በጭዘቱ እና በተጠበሰ ወዘተ ባለፉት ቀናት፣ ባለፉት 24 ሰዓት እንደተመጣቱ ይግለጹ፡፡

No	የምግብ መደቦች	ምሳሌዎች	አዎ(1)	የለም(0)
401	ጥራጥሬ (ሩዝ፣ ዳቦ፣ እንጀራ፣ ፓስታ፣ ገንፎ)	በቆሎ፣ ሩዝ፣ ስንዴ፣ ማሽላ፣ ወይም ሌሎች ጥራጥሬና ከጥራጥሬ የተዘጋጁ ምግቦች (ለምሳሌ ዳቦ፣ ገንፎ)፣ እንጃራ፣ ወይም ሌሎች የጥራጥሬ ወጠቆች		
402	ማንኛውም ከባቄላ፣ አተር ወይም ምስር፣ አደንጓሬ፣ ከአህልየ ማሰራ ምግብ	ለወዛ፣ ምስር፣ ሽተር፣ ባቄላ፣ ሽንብራ		
403	ነጭ ስራስር እና የድንች ዝርያ ወይንም የእስታርች ምግቦች	የድንች ዝርያ ወይንም የእስታርች ምግቦች፣ ለወዛ		
404	ወተትና የወተት ተዋፅዖ	ወተት፣ አይብ፣ እርጎ		
405	ማንኛውም ስጋ፣ የዶሮ ስጋ፣ አሳ፣ የእንስሳት የወስጥ አካላት ስጋ	ጉበት፣ ኩላሊት፣ ልብ የበሬ/የፍየል/የዶሮ ስጋ፣ አሳ		
406	እንቁላል			
407	ጥቁር አረንጓዴ የሆኑ ቅጠላማ አትክልቶች	አበባ ጎመን፣ ሰላጣ፣ ቆስጣ፣ ሀበሻ ጎመን ወዘተ		
408	በቫይታሚን ኤ የበለፀጉ አትክልትና ፍራፍሬዎች	ዳባ፣ ካሮት፣ ስኳርድንች፣ ፓፓያ፣ ማንጎ፣ ፓፓያ፣ ኮከ፣ 100% የፍራፍሬ ጭዘቱ፣		

		አናናስ፤ መንደሪን፤ እንጆሪ		
409	ሌሎች አትክልቶች	ቲማቲም፣ ሽንኩርትና ሌሎች ቤት ያፈራቸው አትክልቶች		
410	ሌሎች ፍራፍሬዎች	መዝ፣ አፕል፣ ብርቱካን፣ አናናስ፣ 100% የ ፍራፍሬ ጭማቂ		

Part-VI: የ ምግብ ዋስትናን በተመለከተ የ ቀረበ መጠይቅ

አካል ጉዳተኞችን ከምግብ ዋስት ጋር የተያያዙ ጥያቄዎችን ከጠየቁ በሁዋላ ከጥያቄዎቹ ፊት ለፊት የሚከተሉትን መጠኖች ይፃፉ =ባለፉት ወራ ወስጥ ችግሩ ካልተፈጠረ, 1=አንዴ ወይም ሁለቴ በወር ወስጥ ችግሩ ከተከሰተ, 2= ከሶስት እስከ እር ጊዜ ከተከሰተ 3 =ከአስር ጊዜ በላይ በወር ወስት ከተከሰተ

ተ.ቁ	ከምግብ ዋስትና ጋር የተያያዙ መጠይቆች		1=አንዴ ወይም ሁለቴ በወር ወስጥ ችግሩ ከተከሰተ, 2= ከሶስት እስከ እር ጊዜ ከተከሰተ 3 =ከአስር ጊዜ በላይ በወር ወስት ከተከሰተ(ከፊት ለፊቱ በለውይፃፉ)
600	ስለ ማረጋገጫ ቡት ምግብ አዝነ ወ/አስበውየ ወቃሉ	1.አዎ 0. የለም	
601	የ መረጠኝን (የ ፈለጉትን ምግብ ሳያገኙ ቀርተውያቃሉ	1.አዎ 0. የለም	
602	ትንሽ የ ምግብ ዓይነት በልተውየ ቃሉ	1.አዎ 0. የለም	
603	ያልፈለጉትን ምግብ በልተዋል	1.አዎ 0. የለም	
604	በመጠኑ አነስተኛ ምግብ በልተዋል	1.አዎ 0. የለም	
605	በቀን ወስጥ በጣም አነስተኛ ምግብ ተመግበዋል	1.አዎ 0. የለም	
606	ከቤት ወስት ምንምምግብ አልነበረም	1.አዎ 0. የለም	
607	ምግብ ሳይበሉ ይተኛሉ	1.አዎ 0. የለም	
608	በቀን ወስጥ ሳይበሉ ወለወና አድረውያቃሉ	1.አዎ 0. የለም	

ክፍል-VII: የ አካል ጉዳት ያለባቸውአዋቂዎች አንትሮፖሜትሪክ (እድገት)ልኬት መጠይቅ መሟ ቅፅ

ተ.ቁ	መጠይቅ	የ ልኬታ ግኝት
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701	ቁመ(ሴ.ሜ)	1 = _____
702	ክብደት (ኪ.ግ)	1 = _____
703	አርምስፓን (ሴ.ሜ)	
704	ደሜስፓን (ሴ.ሜ)	
705	እግሩ ወይም እጁ የተቆረጠ ከሆነ ይጠቀስ _____	

ስለተሳተፎቻችን ስለሰጠችን ማረጃ ከልብ አመሰግናለሁ!!

Declaration Sheet

I the undersigned, MPH Student declare that this thesis work is my original work in partial fulfilment of the requirement for the degree of Master of public health human nutrition.

Student's Name: Fentahun Yizengaw Signature: [Signature] date 17/06/22

Place of submission: Department of nutrition and dietetics, school of public health, college of medicine and health science, Bahir Dar University.

Date of Submission: 17/06/22

This thesis work will be submitted for examination with my approval as university advisor(s).

Advisors, Name Date Signature

1. Netsanet Fentahun (Associate prof. Double PHD) [Signature] date 17/06/22
2. Mr. Yonatan Menber (Assistance professor) [Signature] date 17/06/22

Examiner name and signature

1. Mr. Oumer Seid (Associate prof., Phd fellow) [Signature] date 17 June 2022

