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PREVALENCE AND ASSOCIATED FACTORS OF STUNTING AMONG CHILDREN BORN TO WOMEN IN THE AGE GROUP 15-19 (EXPOSED) AND THOSE IN THE AGE GROUP OF 20-49 (UNEXPOSED) IN DAMOT GALE WOREDA, SOUTHERN ETHIOPIA, 2023

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Abstract

Background: Undernutrition was covering more than half of under-five mortality where it is still preventable problem.So far there is no study that shows the association of maternal age with child undernutrition. Child mortality in developing countries is one of the public health problems that cause child morbidity and mortality.

Objective: To compare the prevalence of stunting among children born to women in the age group 15-19 (exposed) and those in the age group of 20-49 (unexposed) in Damot Gale woreda, southern Ethiopia,2023.

Methods: Comparative cross-sectional study was conducted from January 2021 to August 2023. Stratified random sampling technique was used to select 2121 mother-child pair of study participants. Data was entered in to Epi Data V4.6 and the Z-scores of indices, WHZ, HAZ, WAZ were calculated using WHO Anthro software. Then, data were exported to SPSS V23 for further analysis. Multivariable logistic regression analysis was done to identify the independent determinants of stunting, wasting and underweight separately and variables with a p-value of <0.05 and 95%CI of AOR was used to declare statistically significance.

Result: The overall prevalence of stunting among the study population was found 35.9%. However, with regards to maternal age category, there was significant difference between mothers of age group15-19 years and 20-49 years old. Stunting was 41.5% (95%CI: 39.6%, 44.7%) among 15-19 years old while only 30.3% (95%CI: 28.3%, 32.3%) among mothers of age group 20-49 years.

Conclusion: This study showed that the overall prevalence of Stunting was moderate, and it has significant difference between children born to mother's age category. Maternal education, history of illness in the last14days, childsex, BMI, ANC, dietary diversity score, Power on deciding for money, Fathers educational status, monthly income, birth order were factors associated with stunting. Zone, district as well as health facilities should in tervene on nutrition related services.

Keywords: Undernutrition, earlymarriage, DamotGaleWoreda

Background

Child malnutrition is defined as a pathological state resulting from inadequate nutrition, including undernutrition (protein-energy malnutrition) due to deficient ingestion of energy and other nutrients; or over nutrition (overweight and obesity) due to excessive consumption of

energy andother nutrients [1]. Globally in 2016, 155 million under-five children were stunted, 52 million werewasted and 41 million were overweight or obese [2]. According to UNICEF statistics, the global rateof LBW is 17%, out of which 6% is observed in industrialized countries and 21% in developing. According to EDHS 2016, nearly 4 in 10 (38%) of children under five in Ethiopia are stunted,or too short for their age,10% of children are wasted (tooth in for height), 24% of children are underweight, or too thin for their age [3].
Globally, about 18 million adolescent girls between 15-19 years give birth each year. Babies born toadolescent mothers account for 11% of all births worldwide; 95% of these occur in developing countries [4]. In 2016, there were 20.3 births for every 1,000 adolescent female's ages 15-19, or209, 809 babies born to females in this age group [5]. In sub-Saharan Africa, in the year 2013, 101births per 1,000 were occurred, some of the highest rates of adolescent fertility in the world [1].Among14.3million adolescent girls who gave birth in 2008 worldwide, one of every three was from sub-Saharan Africa. More than 50% of adolescent girls give birth by the age of 19 in this region. Births to teens aged 15-19 account for 5.3% of all births in 2016. Nearly, Nine in ten (89%) of these births occurred outside of marriage [6].

According to the EDHS 2016, 13% of women in the age group 15-19 years began child bearing: 10% had a live birth, and 2% were pregnant with their first child at the time of interview. The proportionof women aged 15-19 years who began childbearing rose rapidly with age, from 2% among women aged 15years to 28% among those aged 19years [7].

Teenage pregnancy is the biggest killer of young girls worldwide; 1, 000,000 teenage girls die orsufferseriousinjury,infectionordiseaseduetopregnancyorchildbirtheveryyear.Adolescentgirls aged 15 to 19 years are twice as likely to die from complications in pregnancy as are women in theirtwenties.The youngest girls are particularly at risk; the mortality rate for those under 15 is four times higher than for those in their 20s[8].Teenage pregnancy also has significantlong-term social consequences for the adolescents, their children, their families, and their communities; it led adolescents to less educational attainment and high school dropout, poor health and poverty. The children of teenage mothers are also more likely to have lower school achievement and drop out of high school, have more health problems, are incarcerated at sometime during adolescence; give birth as ateenager, and faceunemployment asayoung adult [9].

Even though adolescent pregnancy occurs among all racial, cultural and socioeconomic groups, some adolescents are morelikely than others to become pregnant.Factors such as economic status, education, religion, place of residence, peer's and partners' behaviors, family andcommunity attitudes, age, mass media, lack of reproductive health services and knowledge are contributing factors to the increase of unintended pregnancy among adolescents in Ethiopia [10].

The government of Ethiopia developed strategies to achieve four major objectives: increasing access to quality reproductive health services for adolescents, increase awareness and knowledge about reproductive health issues ,strengthen multi-sectoral partnerships, and design

and implement adolescent and youth reproductive health programs However, teenage pregnancy remains high in the country[11].Up to date evidence on the magnitude of undernutrition and associated factors wasneeded in the study area as well as the country at large. However, there was no previous studycomparing the effect of maternal age, i.e. those between 15-19 years and 20-49 years old on child nutritional status. Therefore, this study will help to identify the magnitude of stunting among the children born to mothers of age group from15-19 and 20-49 years and associated factors.

Materials and Methods

Studyarea, study design and study population

Total area size 255.54 square kilometer, which is about 6.07% of the total areal size of Wolayita zone.The district is located to the south-central direction along the major road from Addis Ababa to ArbaMinch. Astronomically, the district is located between the coordinate of 6°32′24″N and 7°7′30″Nlatitudeand37°44′53″Eand37°56′24″Eoflongitude. Mount Damot is the highest peak in the district with an altitude of 2800 meters above sea level within inter-mediate agro climatic zone of Woina Dega and Kola Bidetisan administrative town of the Damot Gale district.Damot Gale Woreda is bordered on the south west by Sodo Zuria, on the north west by BolosoSore and Damot Pulasa, on the north by the Hadiya Zone, on the east by Diguna Fango, and on the south east by DamotWeyde. It is 300 kilometers south west of the capital, Addis Ababa and 70.7 km from regional city Hawassa. TheTotal population of the Woreda is 145,197(74,051 males and 71,146 females). The total number of children 6–59 months age residing in the rural areas of the district was 22,069. Malnutrition is one of the main health problems in South Regional State.It is predominantly seen among the rural population.The woreda has seven health centers,27 health posts and no hospitals. (Ref_39)

The lively hood condition Wolayta zone is one of densely populated area with nature of very smalll and holdings; frequent rain fall in sufficiency and failure to rain as well as pests frequently push part of the population over the hunger threshold and onto relief food aid. The main food crops are maize and beans inter cropped,and sweet potatoes in two harvests,whilst enset is generally small in volume but important as a back stop in the lean months of February to May.With scarce grazing, livestock must be largely hand-fed with crop residues and fodder bought on the market.The biggest investment is in cattle. Cattle owners commonly contract poorer households to keep and fatten some of their stock, rewarded by a share in the sales.These verity of the seseasonal food shortages and a failure of second season sweet potatoes is a key indicator of impending crisis. (Ref_40)

Community based comparative cross-sectional study was conducted from January 2021 to August 2023. All 6 months to 5 years of age children-mothers (15-49 years) pair who are residents of the Damot Gale Woreda in 2021/2023 were source population while All children 6 months to 5years of age children-mothers (15-49 years) pair who are residents in selected Kebele of the DamotGale Woredaduringstudyperiod werestudypopulation.

Sample size determination and sampling technique

A double population proportion formula is used to calculate the sample size required for studying the prevalence of stunting, wasting and underweight consecutively with 95% level of confidence, and80%power.

$n=(p^1q^1+p^2q^2)f(a,\beta)(P^1-p^2)^2$

Where,

P^1: prevalenceofstunting, wasting andunder weight among children whose mother age is between15-19years.

P^2: prevalence of stunting, wasting and under weight amongchildren whose mother age is between 20-49years

α = level of significanceβ=power

The overall prevalence (P1) of stunting, under weight and wasting among children 6-59 months whose mothers aged 15–19 years was estimated to be 49.9%, 42.9% and 18.8%, respectively.And for those children whose mother is between 20-49 years of age the prevalence (P2) is estimated to be 44.5%, 37.7% and 14.7% for the above indicators respectively. With 80% Power of a study and assumption of 95% confidence level, the sample size for stunting, under weight and wasting was, 1300, 1248 and 1084, respectively. Then, the sample sizes calculated for the factors were smaller than the sample size calculated for magnitude of wasting, stunting and underweight. So, the sample size calculated from magnitudes was considered for this study. Thus, the calculated total sample sizes calculated for prevalence of under nutrition was multiplied by design effect of 1.5; then, total sample size was 1950, 1872, and 1626 for stunting, underweight and wasting respectively. Hence, the largest of the three sample sizes was considered for this study.Including 10% for non-responserate, the total sample size calculated to be 1950 +195 (10%) equals to 2145. So, 2145 mother-child pair was assumed to be selectedfrom both 15-19 years of age mothers and 20-49 yearsof agemothers.

A stratified two stage sampling technique was used to select the study subjects.The total kebeles (27kebeles) in the Woreda were stratified in to three by their geographical distance (kilometers) from the central Woreda town as near, medium and far distances. According, those kebeles within 5 km wereconsidered to be at near distance, 5 -15 km were as medium distance and those >15 km wereconsideredtobeatfardistance.This stratification was done under the assumption that distance from the central Woreda has impact on the variable of interest and nutritional status and awareness ofmothers in nearby Kebeles is expected to have some level of homogeneity. Among the 27 Kebeles ten were selected by simple random sampling technique and study participants will be proportionally allocated to the selected kebeles. A respective sampling frame was created for each kebeles byregistering women of child bearing age and one client in every Kth were included in the study using systematic sampling technique. Inclusion criteria was all children aged 6–59 months and theirmothers (15-49 years of age) who resides in the selected Kebele of the Damot Gale Woreda, while Mother-child pairs who lived in Damot Gale Woreda for less than six months seriously ill mothersandunable to communicate dueto impairmentwasexclusion criteria.

Data collection procedure

Quantitative data were collected from participants by using structured interviewer administeredquestionnaire. Main points included in the questionnaire were socioeconomic and

demographicvariables, illness and WASH related variables, feeding practice. Ten college completed trained females, two supervisors and principal investigator were participated in the data collection procedure.

Anthropometric measurements

Children weight were measured to the nearest 0.1 kg by the seca beam balance (German, Serial No.5755086138219) with graduation of 0.1 kg and a measuring range of up to 25 kg. Weight was takenwith light clothing andno shoes.Instrument calibration wasdone beforeweighing each child.Furthermore, the weighing scale waschecked daily against the standard weight for accuracy. Heightwas measured using the seca vertical height scale (German, Serial No. 0123) standing upright in themiddle of the board. The child's head, shoulders, buttock, knees, and heels touch the vertical board.The length of a child (aged 6–23 months) wasmeasured using a horizontal wooden length board inrecumbentposition, and read to thenearest 0.1 cm.

Data Quality Control

The questionnaire was first prepared in English language. To maintain consistency,the questionnaire was back translated from English to Wolaytegna (the native language of the study area) and was retranslated to English by professional translators. The questionnaire were pretested on 5% of sample outside the study area to check for the consistency in meaning and to explore further variables which might not been included during questionnaire preparation. College completed females were data collectors after getting training for two days on objectives of the study, definition of terms, identification and listing of HH and interview skill. On site supervision was under taken every day by supervisors and the principal investigator during data collection process. Data was checked for completeness and consistency immediately after data collectors filled it.Before the analysis process, the data was checked for completeness and for any missing values during collection. Then it was coded and double entered in to Epi Data V4.6 computer software to cross check for any errors during data entry and exported to SPSS version 24 for further analysis. Frequency tables were used to clean the data by checking missed values, outliers and inconsistencies. Any errors identified at this stage were corrected after revision of the original data using code number. The data collectors and supervisors were given a two-day intensive training ahead of time.

Data Processing and Analysis

Data was entered into the Epi Data V4.6 software, and analysed using SPSS version 24 statisticalpackage. Nutrition related data (sex, age, height, weight,) were entered into the WHO Anthrosoftware.The Z-scores of indices,Weight-for-Height Z-score(WHZ), Height-for-Age Zscore (HAZ) and Weight-for-Age Zscore (WAZ) were calculated and compared using the World Health Organization (WHO) Multicentre Growth Reference Standard. A child with HAZ score <-2SD fromthe reference population was defined as stunted, a child with WHZ <−2 SD from the referencepopulation was classified as wasted, while a child with WAZ <−2SD from the reference population is defined as underweight.

Descriptive statistics, including frequencies and proportions, measures of central tendency andmeasure of dispersion were used to summarize the variables. Bivariable logistic regression analysis was done individually for all independent variables with stunting, wasting and underweight. Variables with a p-values of <0.25 in the bivariable analysis was entered in to a multivariable logistic regression analysis to identify the independent determinants of stunting,

wasting and under weight separately. Both theCrude Odds Ratio(COR) and the Adjusted Odds Ratio (AOR) with a corresponding 95 % Confidence Interval (CI) was computed to show the strength of the association.In the multivariable logistic regression analysis, variables with a p-value of <0.05 was considered as statistically significant. Model fitness was checked by using Hosmer-Lemeshow goodness of fit testandit wasgood.

Operational definition

Underweight: Weight for age < –2 standard deviations (SD) of the WHO Child Growth Standardsmedian

The weight for age index expresses the weight of a child in relation to his /her age. However, this index does not allow differentiation between two children of the same age and weight, one being tall and thin (wasted), the other shorter but not wasted. This index is mainly used during maternal and Child Health clinic visits, since it is a good way of assessing the nutritional evolution of child overtime.

Stunting: Height forage<–2 SDoftheWHOChildGrowth Standards median

The height /age index expresses the height of a child in relation to his/her age.It reveals stunting at a given age, but does not allow discrimination between 2 children of the same age and height, one being thin (wasted) the other one being heavier. This index reflects the past nutritional history of a child rather than his current nutritional status.It is mainly used to identify chronic malnutrition.

Wasting: Weight for height <–2 SDoftheWHO Child Growth Standards median

The weight/height index expresses the weight of achild in relation to his height.It reveals whether achild is thin or not but does not discriminate between 2 children of the same height and weight, one being older than the other, and possibly stunted. It is the index used to measure acute malnutrition called"wasting", meaning current or acute malnutrition at the time of the survey.

Midupper arm circumference

The mid arm circumference is almost stable from 6 to 59 month and hence does not need to be related to the age. But, it is less reliable to measure and so it is only used for the rapid screening of populations to get an idea of the situation and for entry to nutrition programs. It also serves to detect current nutritional status of children. In emergency situations where acute forms of malnutrition are the predominant pattern, the weight for height index (W/H) is the most appropriate index to quantify levels of current acute malnutrition in the population with an assessment of edema. Furthermore, weight for height does no trequire the determination of age which is often difficult in these situations.

Body Mass Index (BMI)

- BMI<17.0indicates moderate and severethinness
- BMI<18.5indicates underweight
- BMI18.5–24.9 indicatesnormal weight
- BMI≥25.0indicatesoverweight
- BMI≥ 30.0 indicates obesity

Improved Drinking-water sources

Improved drinking-water sources are defined in terms of the types of technology and levels of services that are likely to provide safewater.Improved water sources include house hold

connections, public standpipes, boreholes, protected dug wells, protected springs and rain water collection.Un-improved water sources are un-protected wells, un-protected springs, vendor-provided water, bottled water (unless water for other uses is available from an improved source) and tanker truck-providedwater.

Improved sanitation facilities

Improved sanitation facilities are defined in terms of the types of technology and levels of services that are likely to be sanitary. Improved sanitation includes connection to apublic sewers, connection to septic systems, pour-flushlatrines, simple pit latrines and ventilated improved pit latrines. Serviceor bucket latrines (from which excreta are removed manually), public latrines and open latrines are not considered to be improved sanitation.

Ethics and consenttoparticipate

Ethical approval was obtained from PARUL Universty, Doctoral Study, Institite of Public Health.Official letter of permission was obtained from Wolayta Zone health department and Damot Gale woreda health office. The participants were selected according to the sampling procedure and clear justification was given to those who were not included in the study as participant. All the necessary explanation about the purpose of the study and its procedures wereexplained to the respondents with the assurance of confidentiality.A written consent was obtained following an explanation of the purpose, risk and benefit of the study. The participants were provided with clear in formation and were asked if they were willing to participate or not. Only those who were willing to participate were interviewed. They were also informed that they could refuse to answer any question or they could stop the interview at any time. Study participants were informed that they would not get direct benefit or harm for participating in the study,but their participation may help to improve theirs and others health through these research finding. Confidentiality of respondent's wasmaintained throughout the research process and participant's privacies were respected properly. If children participating in the study were found to be undernourished, their mothers were advised totake them to health facility and were linked with the nearby health facility so that they could get appropriate care and treatment.

Result

Socio-demographiccharacteristics

In this study out of 2145 individuals expected, 2121 mother-child pair was interviewed making a total response rate of 98.8%. About 28.2% and 27.3% of respondent's BMI status among age groups 15-19 years and 20-49 was underweight, respectively. The majority of respondent's educational status among mothers age 15-19 had no formal education whereas mothers 20-49 were primary education.In this study, mothers who have power on deciding over the use of money among 15-19 were 69.4 while it was 72% among mothers age group 20-49. When we see, the marital status of respondents, about 90% from bothgroups were currently married.

Table 1: Household and Maternal characteristics of the respondents among children of age 6-59months born to married women of age 15-19 years and those 20-49 years in Damot Gale Woreda, Southern Ethiopia,2023

S.No		Age15-19		Age20-49		Total
	Variables	No	%	No	%	No (%)

1	MaternalNutritionalstatus(BMI)					
	Underweight	299	28.2	279	26.3	578(27.3)
	Normal	692	65.3	661	62.3	1353(63.8)
	Overweight	69	6.5	121	11.4	190(8.9)
2	Parity					
	1	58	5.5	97	9.1	155(7.3)
	2-3	181	17.1	267	25.2	448(21.1)
	4-5	394	37.2	516	48.6	910(42.9)
	6+	427	40.3	181	17.1	608(28.7)
3.	Maritalstatus					
	Nevermarried	22	2.1	9	0.8	31(1.5)
	Currentlymarried	943	89.0	894	84.3	1837(86.6)
	Widowed	51	4.8	90	8.5	141(6.6)
	DivorcedandSeparated	44	4.2	68	6.4	112(5.3)
4.	MaternalEducationalStatus					
	Noformaleducation	377	35.6	358	33.7	735(34.6)
	Primary	343	32.4	380	35.8	723(34.1)
	Secondaryand above	340	32.1	323	30.4	663(31.3)
5.	FatherEducationalstatus					
	Noformaleducation	259	24.4	222	20.9	481(22.7)
	Primaryeducation	420	39.6	432	40.7	852(40.2)
	Secondaryand above	381	35.9	407	38.4	788(37.2)
6.	SexofHHhead					
	Male	803	75.8	802	75.6	1605(75.7)
	Female	257	24.2	259	24.4	516(24.3)
7.	Monthlyincome					
	<500	177	17.5	267	26.5	444(20.9)
	500-1000	317	31.3	414	41.0	731(34.5)
	≥1000	518	51.2	326	32.3	844(39.8)
8.	Employment					
	Employed	92	8.7	100	9.4	192(9.1)
	Unemployed	968	91.3	961	90.6	1929(90.9
9.	Powerindecidingovermoney					
	Yes	736	69.4	764	72.0	1500(70.7)
	No	324	30.6	297	28.0	621(29.3)
10.	HealthFacilitydistanceinmin					
	<30min	82	7.7	94	8.9	176(8.3)
	30min– 1hour	365	34.4	387	36.5	752(35.5)
	≥1hour	613	57.8	580	54.6	1193(56.2)
11.	Mediaaccess					
	Available	960	90.6	960	90.5	1920(90.5)
	Notavailable	100	9.4	101	9.5	201(9.5)

Factors affecting the under nutrition among the children aged 6 –59months

Bi-variable and multi-variable logistic regression result was presented with 95% CI of COR to identify candidate variables for multivariable logistic regression and AOR for factors associated with under-nutrition among children age group from 6-59 months born to mothers of age group15-19 and 20-49years, respectively. Then, variables with p-value <0.25 at bivariable logistic regression and variables with p-value<0.05 at multivariable logistic regression analysis were presented to gether to categories of dependent variables. Bivariable logistic regression result for parity, maternal educational status, father education, maternal power of deciding over money,sex of the child,childage,birth order of the child, number of ANC, measle vaccine use in the last 6 months, have ever breast feed, type of drinking water

source, BMIof mother, monthly income, health facility distance and dietary diversityscore were important factors associated with stunting among under-five children and candidate formultivariablelogistic regression. (Table 1).

Similarly,multivariable binary logistic regression analysis for stunting shows that maternal educational status,birth order of the child,number of ANC follow-up, have ever breastfeed,household monthly income and dietary diversity score were important determinants of stuntingamong children of age group 6-59 months. Children of mothers who did not have formal educationand have attended primary school were 1.39 times (AOR= 1.39, 95%CI: 1.09, 1.78) and 1.39 times (AOR= 1.39, 95%CI: 1.09, 1.79) more likely to be stunted than children whose mothers attendedsecondary and above school. Sex of the child was also important factor associated with stunting.Accordingly, male children were 1.26 times more likely to be stunted than female children (AOR=1.26, 95%CI: 1.03, 1.55). Children whose birth order were 6 and above were 1.91 times more likelyto be stunted than first order children (AOR= 1.91, 95%CI: 1.25, 2.90). Children whose mothers hadonly first and second ANC follow up during pregnancy of index child were 1.63 times (AOR= 1.63, 95%CI: 1.16, 2.31) and 1.32 times (AOR= 1.32, 95%CI: 1.01, 1.73) more likely to be stunted than children whose mothers had four ANC follow up. Children whose mother's household earn <500ETBand500-1000ETB were 1.75 times (AOR=1.75,95%CI:1.34,2.28) and 2.28 times (AOR=2.28, 95%CI: 1.80, 2.88) more likely to be stunted than children whose households earn monthly income of more than 1000ETB.Children whose households had poor dietary diversity score were1.76 times more likely to be stunted than children whose household had good dietary diversity score(AOR=1.76, 95%CI: 1.41, 2.21)(Table 1).

Table 2: Multivariable logistic regression result on factors associated with stunting among childrenof age from 6 months to 59 months born to mothers of age group 15-19 and 20-49 years old in DamotGale Woreda, Southern Ethiopia, 2023(n=2121)

S. No	Variable	Stunted	Normal	COR(95%CI)	AOR(95%CI)
		No	No		
1	Parity				
	1	49	106	1	
	2-3	127	321	.86(.58,1.27)	
	4-5	322	588	1.18(.82,1.71)	
	6+	264	344	1.66(1.14,2.42)	
2	Maternaleducationstatus				
	Noformaleducation	282	453	1.43(1.14,1.79)	**1.39(1.09,1.78)***
	Primaryeducation	279	444	1.44(1.15,1.81)	**1.39(1.09,1.79)***
	SecondaryandaboveEducation	201	462	1	1
3	Fathereducationalstatus				
	Noformaleducation	197	280	1.49(1.18,1.89)	
	Primaryeducation	309	539	1.22(.99,1.49)	
	SecondaryandaboveEducation	251	533	1	
4	Powerindecidingovermoney				
	Yes	512	988	1	
	No	250	371	1.30(1.07,1.58)	
5	Childsex				
	Male	395	620	1.28(1.07,1.53)	**1.26(1.03,1.55)***
	Female	367	739	1	1

5	Birthorderofthechild				
	1	49	108	1	1
	2-3	123	306	.89(.59,1.32)	.81(.52,1.24)
	4-5	351	644	1.20(.84,1.73)	1.37(.92,2.04)
	6+	231	295	1.73(1.18,2.52)	**1.91(1.25,2.90)***
6	ANC				
	First ANC	111	134	1.97(1.45,2.68)	**1.63(1.16,2.31)***
	2nd ANC	223	348	1.52(1.19,1.95)	**1.32(1.01,1.73)***
	3rd ANC	258	472	1.30(1.03,1.64)	1.13(.87,1.48)
	4th ANC	170	404		
7	Haveeverbreastfeed				
	No	327	1012	1	
	Yes	435	343	3.93(3.25,4.74)	
8	Measlevaccineinthelast6months				
	Yes	526	1075	1	
	No	231	280	1.69(1.38,2.07)	
9	Drinkingwatersource				
	Improved	483	987	1	
	Unimproved	279	372	1.53(1.27,1.85)	
10	BMIofmother				
	<18.5(Undernourished)	232	346	1.32(1.08,1.61)	
	18.5-24.99(Normal)	456	897	1	
	≥25(Overweight)	74	116	1.25(.92,1.72)	
11	MonthlyIncome				
	<500ETB	194	318	1.62(1.28,2.05)	**1.75(1.34,2.28)***
	500-1000ETB	344	444	2.06(1.67,2.54)	**2.28(1.80,2.88)***
	>1000ETB	224	595	1	1
12	Healthfacilitydistanceinminutes				
	<30minutes	53	123	1	
	30-60minutes	273	479	1.32(.93,1.89)	
	>60minutes	436	757	1.34(.95,1.89)	
13	DietaryDiversityScore				
	Poor	244	299	1.67(1.37,2.04)	**1.76(1.41,2.21)***
	Good	518	1060	1	1

Discussion

This study explored the magnitude and associated factors of stunting among children of age from 6-59 months born to mothers of age group15-19 years and 20-49 years.The overall stunting prevalence in the study was 35.9%.. There was significant difference of undernutrition among children born to mother's age group of 15-19 years and 20-49 years, stunting was 41.5% among15-19 years old while only 30.3% among mothers of age group 20-49 years.The prevalence of stunting was found to be high among the children 6-59 months born to mothers of age group15-19 years than children born to mothers of age group 20-49 years old,accordingly stunting (41.5%,95%CI:40.3%,44.7%),(30.3%,95%CI: 28.3%, 32.3%). Since we don't have other studies comparing the prevalence ofundernutrition of children among mothers age category, we only compared the under nutrition (stunting) of children born to mothers'age group of 15-19 years.The findings of this study regarding stunting were consistent with the study from Afar Regional State, east and west Gojjam, Albukodistrict in south Wollo, EDHS 2016 for only age group 15-19 years [3, 12-14]. This may be dueto these communities may have similar socioeconomic characteristics with the study population. Since this study is the first in its kind of studying the comparative cross-sectional on undernutrition among the

children of age 6-59 months born to mothers of age group 15-19 years and 20-49 years, we were not able to compare with the other similar study.

The factors associated with under nutrition (stunting) among children of age 6-59 months born to mothers of age group15-19 years and20-49 years old were;maternal education,history of illness in the last 14 days, BMI of the mother, monthly income, health facility , maternal educational status,child sex, birth order of the child, ANC follow up during pregnancy of index child, monthly incomeand dietary diversity score for stunting and maternal educational status, child sex, Power in deciding over money were factors affecting nutritional status of the children in the study area.

Regarding stunting, children with mothers with no formal education and attended only primary school were more likely to be stunted than children whose mothers attended secondary and above educational status.This pattern has been shown consistently in previous studies from Albuko district, EDHS 2016 analysis and systematic review from SSA [3, 14, 22]. This may be due to the fact that uneducated or less educated mothers were tend to have low income to spend on appropriate nutritional foods and low awareness to consume for themselves and to feed their children with the available resource.

However, educational status of the mother was found to be not significant in the studies from Takusa district, Durbete Town, Tanzania and agricultural regions of Mali [23-25]. Since, our study included large number of study participants and it was community-based study; that enable this study toidentifysmall differencebetween the population groups, so it is moreprecise.

Sex of the child was important determinant of stunting among the study population. Accordingly, male children were 1.26 times more likely to be stunted than female children. This pattern has been shown consistently in previous studies from Dolo Ado, Butajira and Kemba district of southern Ethiopia[26-28].This may be dueto biological difference between males and females.However,sex of the child did not show significant association in studies from Hawassa University TechnologyVillage,mini-EDHS 2019[29, 30], 2014 #91].

Birth order of the children has also significantly associated with stunting. Accordingly, children whose birth orders were 6 and above were 1.9 times more likely to be stunted than children of first birth order.This may be dueto the fact that as the birth order increases mothers may give less attention for children as theybecome loaded with many children.

ANC followup of mothers was important factor affecting stunting of children 6-59 months.Accordingly, children whose mothers had only 1 and 2 ANC follow up were 1.6 times and 1.3times more likely to be stunted than children who had 4 ANC follow-up. This was consistent with the study from Hawassa City and systematic review on undernutrition in sun-Saharan Africa[21,22].This may be dueto the fact that mothers who have more ANC follow-up were more likely to be counseled about nutrition related services so that they take more care for their children.

Monthly income of the house hold was associated with stunting of children age 6-59 months. Inview of that, children whose house holds had monthly income of less than500ETB and500-1000 ETBwere 1.8 times and 2.3 times more likely to be stunted than children whose

households earn monthly income of more than1000ETB. This may be dueto mothers with less income were lesslikely to have food security so they were more likely to be exposed for chronic malnutrition.

Dietary diversity score was also associated with stunting of children 6-59 months.Therefore, children whose house holds had poor dietary diversity score were 1.8 times more likely to be stunted thanchildren whose household had good dietary diversity score. This may be because children who werefrom households with poor dietary diversity were more likely to be exposed for different infectionthatmaylead them to be undernourished.

Conclusion

There is difference in prevalence of stunting among children age 6-59 months born to mother's age between15-19years and 20-49 years old.The magnitude of stunting among children of age group6-59 months born to mothers of age group 15-19 years old was higher than mothers of age group 20-49 years. Maternal educational status, Power in deciding over money, Birth order of child, and ANC were factors significantly associated with stunting. Maternal educational status,child sex,birth orderof the child, ANC follow up of the mother, having ever breastfeed, monthly income and dietary diversity score were factors associated with stunting. Consider intervention on early marriage to reduce undernutrition resulted from stunting and other effects of early marriage. Zonal health Department should give due emphasis to earlymarried women to improve their nutrition practice and effective counseling on family planning utilization. Consider strengthening of supportive supervision on food system and nutrition related services to the Woreda health office and health facilities and provide feedback. Consider improving the Governance and leadership of health system and infrastructure for services related to health and providing basic education for mothers regardinghealth-related services through building training centers and capacitation on nutrition leadership.Mother of under-five children at a distance taking more than 30 minutes to the health facility should be given due consideration during monthly screening of children for nutrition and food supplementation programs. Consider providing continuous support for mothers of children with no formal education and only attended primary school. The district should monitor continuously on ANC utilization of pregnant mothers to Acton early intervention of stunting. They should take their children to the health center or healthpost for early identification and management of children with malnutrition such as wasting, underweight and stunting through screening. The researcher's are needed to do furtherresearch on theeffectofageon childundernutrition.

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Abbreviations

AM,AcuteMalnutrition;ANC,AntenatalCare;ARI,AcuteRespiratoryTractInfection;BMI,Body Mass Index; CI, Confidence Interval; EDHS, Ethiopian Demographic and Health Survey; HAZ,Height for Age Z-Score; HH, House Hold; HTP, Harmful Traditional Practice; LBW, Low BirthWeight;MDG,MR,MisganaWolderufael;Millennium DevelopmentGoal; MOH, Minster of Health; MUAC, Middle Upper Arm Circumference ;OR, Odds Ratio; PEM, Protein Energy Malnutrition; SD, Standard Deviation; SDG, Sustainable Development Goal; SNNPR, South Nation Nationality and People Region; SPSS, RB(DR), DR. Rajendra Baxi ;Statistical Product and ServiceSolutions; SSA, Sub Saharan Africa; TTBA, Trained Traditional Birth Attendant; UNICEF, UnitedNations Children's Fund; WHZ, Wight for Height Z-Score; WAZ, Wight for Age Z-Score; WHO,World Health Organization.

Author's contributions: MR conceived and designed the study, developed the data collection instruments, performed the statistical analysis and wrote first version of the manuscript, designed implementation, analysis and report writing. RB (DR) and PPHI critically revised and approved the final manuscript.

Availability of data and materials: For those who are interested; the data sets of this studycould be accessed from the corresponding author on reasonable request.

Consent to publish

Not applicable.But we didn't take image, voice and video at all. By considering the benefit of the study the findings are submitted forpublication.

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