Prevalence of Wasting and its Associated Factors among Children age from 6-59 Months in Debre Tabor Town Amhara Region of Ethiopia 2019: A Multi-center Community-based Cross-sectional Study

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Abstract

Introduction: Wasting is acute malnutrition that has harmful short-term consequences for children and it is determined by inadequate diet. Therefore, this study was aimed to assess the prevalence and associated factors of wasting among children age 6-59 months at Debre Tabor town Ethiopia, 2019.

Method: A community-based cross-sectional study was conducted on wasting using simple and systematic random sampling. A sample of 436participants completed a questionnaire designed for the study. The questionnaire was coded and entered into Epi info version 7.2.0.1 and exported to SPSS 20.0 for data analysis. Principal component analysis (PCA) was used to compute family wealth status. Bivariable and multivariable logistic regression analyses were done to see which independent variables have an association with the dependent variable, and a *P* value of less than 0.05 was considered as significant at 95% CI.

Results: The result revealed that wasting for children age 6-59 months was 6.2 %(95% CI 3.9%-8.5 %,). Children with the age group of 6-11 months were 4.3 times more likely to have wasted than those age group of 24-59 months [AOR: 4.3; 95% CI: 1.5–12.5]. Similarly, parents who have poor wealth status in their family are 3.1 times more likely to have wasted children than those who have rich wealth status in their family [AOR: 3.1 (1.01–9.35)]. Mothers who gave first birth at the age group of 20-25 years of age were 4.3 times more likely to have wasted children than those who gave birth at an age group of greater than 30 years [AOR: (4.3(1.56-12.5)].

Conclusion: Undernutrition especially wasting is still an important public health problem in children with an age group of 6-59 months. Age of the child, wealth status of the family, and giving the first birth before 20 years of age were significantly associated with wasting. Therefore, family wealth status should be modified, create awareness to the mothers regarding maternal and child health care and responsible bodies should be designed for further nutritional intervention programs.

Introduction

Wasting is acute malnutrition that has harmful short-term consequences for children and it is determined by inadequate diet. Furthermore, it is a direct cause of mortality among children 6–59 months of age(1). Wasting is a state of nutritional deficiency that brings severe health consequences, the most immediate being a pointed risk of mortality(2).

Globally wasting accounts for more than 51 million children(3). Each year more than 800,000 deaths are attributed to wasting. Moreover, approximately 13% of worldwide deaths among children under 5 years of age were attributed to wasting in 2015, representing 875,000 preventable child deaths(2). There has been less progress regarding reducing the number of wasted children worldwide (4). Africa and Asia stand the greatest point of wasting(4).In Ghana 9.9%(5), East Africa 6%(6), in Uganda 12%(7), Study done in Ethiopia 17%(8), in Somalia regional state of Ethiopia 20%(9) in south Ethiopia 14.6%(10), East Bedawacho District South Ethiopia 7.6%(10) in Sodozuriasouth Ethiopia 11.1%(6), Damot gale south

Ethiopia 9%(11), in Afar regional state of Northeast Ethiopia 16.2%(12) in Northern Ethiopia 24.6%(13) in Lalibela Amhara region 8.9%(14), In Gondar city Northwest Ethiopia 7.3% (15), in Western Amhara 11.6% (16) in East Belesa District Northwest Ethiopia 16%(17).

According to the Ethiopia Demographic and Health Survey (EDHS) of 2019, the prevalence of wasting was 7 %(18). The prevalence of wasting has decreased considerably, from 12 % in 2005 to 7 % in 2019 but in Ethiopia, the burden of child wasting has continued as a severe public health problem for decades(18).

About one-third of deaths among children below 5 years of age were attributed to Under-nutrition and it can lead children to be at greater risk of death and severe illness due to common childhood infections and consequently leads children to low school performance, physical and mental impairment (13, 19).

According to the revision of the literature, the following contributing factors of wasting in children were intra-uterine growth retardation, low birth weight, inadequate exclusive breastfeeding, inappropriate complementary feeding, low maternal education, low nutritional knowledge, insufficient energy and less micro-nutrient intake, birth spacing, socio-economic background, less food availability, poor sanitation, poor health services, low vaccination coverage, and infectious diseases(3, 20–23). As a result, this study was aimed to assess the burden of wasting among children aged 6–59 months at Debre Tabor Town, North West Ethiopia.

Methods And Materials

Study design

A cross-sectional study was conducted in Debre Tabor Town Northwest, Ethiopia, from March 1 to 30, 2019. The source population was all children aged 6-59 months in Debre Tabor Town during the specified study period. The study population was all selected children aged 6-59 months in Debre Tabor town during the specified study period. All children aged 6-59 months and their mothers with complete information. Averbal consent was taken from mothers/guardians. Socio-demographic, maternal, and child characteristics were used as independent variables.

Sample size and sample size determination

The sample size for the study was determined using the assumptions of single population proportion formula assuming the prevalence of wasting of 16% (17), 5% margin of error, 95% confidence level, adding 10% for possible non-response rate, design effect of 2, the calculated sample size was 454.

Out of 6kebeles, 4 kebeles were selected randomly. The total sample size was allocated to each kebele proportionally. Households were selected using systematic random sampling and when there is more

than one child 6-59 months of age in the selected household, a lottery method was used to randomly select the child.

Data Collection Tools and Data Quality Control

A structured questionnaire was used and mothers/guardians were interviewed face to face. Four bachelor's degree graduates with prior experience in data collection and fluent speakers of the local language were recruited.

The training was given to data collectors and supervisors about the questionnaire, selecting study participants, anthropometric measurements, and ethics. They were also standardized on taking anthropometric measurements. The questionnaire was pretested on 5% of the actual sample size other than the study area. The length of a child (aged 6–23 months) was measured with a horizontal wooden length board in a recumbent position. The height of a child (aged 24–59 months) was measured with a vertical wooden height board while the child standing upright on the board. The length and height measurements were read to the nearest 0.1 cm. Weight was measured using a Seca digital weight scale and read to the nearest 0.1 kg. All measurements were taken twice and the mean was used for analysis. Supervisors checked the completeness and consistency of the questionnaire.

Dependent Variable

- Wasting (below-2SD) children age from 6-59 months

Independent Variables

- Socio-economic and demographic variables (age, educational level, marital status, family wealth, and family size)
- MaternalCharacteristics (ANC start month, family planning use, age at first birth)
- Childs' Characteristics (age, sex of the child)

Operational definitions

Wasting is the weight-for-height z-score (WHZ) is below − 2 SD of the WHO median standard curve(4).

Data analysis

Data was checked, sorted, categorized, and coded. After coding data, it was fed to the computer to make them ready for processing and analysis. Data was entered into the EPI info version (7.2.0.1) and analyzed

by using the SPSS 20.0 statistical program. Anthro software was used to convert nutritional data into Z-scores of the indices; weight-for-height taking age, sex, weight, and height into consideration using WHO standards. Tables and charts were used to present results.

Binary logistic regression was used to identify variables associated with wasting, and variables significant at P<0.25 were entered into the final multivariable logistic regression model to identify significant factors at P≤0.05.

Ethical consideration

Ethical clearance was obtained from the school of the nursing ethical review committee on behalf of the University of Gondar. An official letter was written by a school of nursing to the DebreTabor town administrative health department office. Informed verbal consent was obtained from mothers/guardians before data collection. Privacy and confidentiality of respondents were secured.

Result

Socio-Demographic Factors of the Study Participants

From a total of 454 proposed study participants, 436 with a 96% response rate were included in the analysis. Among the total participants, 388 (89%) were married in their marital status and the majority 297(68.1%) were fathers who have secondary and above education level. The majority of the 176(40.4%) were rich in family wealth status(Table 1).

Table-1

Characteristics of Participants for Wasting Among Children Age from 6 to 59 Months in Debre Tabor Town Amhara Region of Ethiopia, 2019

Characteristics	Categories	Total N=436	Status of a child	
			Wasted	Not wasted
Mothers' age group Mean=31±5.41 SD	20-24	31(7.1%)	6	25
	25-29	181(41.5%)	11	170
	≥30	224(51.4%)	10	214
Mother age group at first birth	20-25	97(22.2%)	12	85
	26-29	238(54.6%)	8	230
	≥30	101(23.2%)	7	94
Mothers' educational level	No formal education	99(22.7%)	8	91
	Primary education	105(24.1%)	7	98
	Secondary education and above	23253.2%)	12	220
Fathers' educational level	No formal education	56(12.8%)	5	51
	Primary education	83(19%)	9	74
	Secondary education and above	297(68.1%)	13	284
Marital status of a mother	Married	388(89%)	20	368
	Single	48(11%)	7	48
Family planning use	Yes	323(74.1%)	19	304
	No	113(25.9)	8	105
ANC start month	≤3 months	291(66.7%)	18	273
	>3 months	145(33.3%)	9	136
Family size	Less than five	350(80.3%)	20	330
	Greater than equal to five	86(19.7%)	7	79
Sex of child	Male	233(53.4%)	11	222
	Female	203(46.6%)	16	187
Child age	6-11 months	131(30%)	13	118
	12-23 months	105(24.1%)	8	97
	24-59 months	200(45.9%)	6	194

Family wealth status	Poor	142(32.6%)	14	128
	Medium	118(27.1%)	8	110
	Rich	176(40.4%)	5	171

SD: Standard Deviation.

Wasting Among Children Age from 6 to 59 Months in Debre Tabor Town Amhara Region of Ethiopia

From the total participants of the survey age from 6 to 59 months of children, 6.2% (95% CI 3.9%-8.5%) were found wasted (Figure 1)

Factors Associated with wasting among Children Age from 6 to 59 Months in Debre Tabor Town Amhara Region of Ethiopia

Bivariable and multivariable logistic regression analyses were used to determine factors affecting the wasting of children age from 6 to 59 months. The bivariable analysis showed that birth order, sex of the child, age of the mother at first birth, marital status of the participant, mothers' educational level, fathers' educational level, place of delivery,

Bivariable and multivariable logistic regression analyses were used to determine factors affecting the wasted of children age from 6 to 59 months. The bivariable analysis showed that the educational status of the father, educational status of the mother, age of the child, wealth status of the family, age of the mother, and age of the mother at first birth was associated with wasting considering *p*-value≤0.2. For adjusting potential confounders those variables which were significant at bivariable analysis were entered into multivariable logistic regression. The result revealed that the age of the child, wealth status of the family, and age of the mother at first birth were significantly associated with wasting for children age 6–59 months. However, the remaining listed above variables were not significant at a *p*-value≤ of 0.05 (Table-2)

Table 2

Bivariate and Multivariable Logistic Regression Analyses for Wasting Among Children Age from 6 to 59 Months in Debre Tabor Town Amhara Region of Ethiopia, 2019

Variables	Categories	Total N=436	Status of children		AOR/95%CI
			Wasted	Not Wasted	
Mothers' education	No formal education	99(22.7%)	8	91	2.11(0.57-7.81)
	Primary education	105(24.1%)	7	98	2.24(0.78-6.44)
	Secondary education and above	232(53.2%)	12	220	1
Fathers' education	No formal education	56(12.8%)	5	51	1.01(0.32-3.15)
	Primary education	83(19.1%)	9	74	0.93(0.33-2.63)
	Secondary education and above	297(68.1%)	13	284	1
Mothers'age group	20-24	31(7.1%)	6	25	3.09(0.87-10.95)
	25-29	181(41.5%)	11	170	1.63(0.63-4.19)
	≥30	224(51.4%)	10	214	1
Mothers'age group at first birth	20-25	97(22.2%)	12	85	4.35(1.56-12.5)
	26-29	238(54.6%)	8	230	0.67(0.22-2.00)
	≥30	101(23.2%)	7	94	1
Child age	6-11 months	131(30%)	13	118	4.32(1.49-12.55)
	12-23 months	105(24.1%)	8	97	2.58(0.82-8.1)
	24-59 months	200(45.9%)	6	194	1
Family wealth	Poor	142(32.6%)	14	128	3.07(1.01-9.35)
	Medium	118(27.1%)	8	110	2.53(0.76-8.38)
	Rich	176(40.4)	5	171	1

*Notes: 1=reference group, *significant p-value<0.05, CI, confidence interval; COR, crude odds ratio; AOR, adjusted odds ratio.*

Children with an age group of 6-11 months were 4.3 times more likely to have wasted than those children with an age group of 24-59 months [AOR: 4.3; 95% CI: 1.5–12.5]. Similarly, parents who have poor wealth status in their family 3.1 times more likely to have wasted children than those who have rich wealth status in their family [AOR: 3.1 (1.01–9.35)]. Children of mothers' who give first birth at the age group of 20-25 years of age were 4.3 times more likely to have wasted than those who give birth at the age group of greater than 30 years.

Discussion

Under-nutrition among children age 6-59 months of age is still a major public health problem in developing countries, including Ethiopia. The magnitude of wasting in this study was 6.2 %(95% CI 3.9%-8.5%).

Age of the child, wealth status of the family, and giving the first birth before 20 years of age was associated with higher odds of wasting.

This study was in line with the study done at Gondar city Northwest Ethiopia 7.3%(15), East Bedawacho District South Ethiopia 7.6%(10), WolaytaSodo Town, Southern Ethiopia 7.8%(24)

EDHS 2019 7%(18) and in East Africa 6% (6). However, this study was lower as evaluated to the study done in East Belesa District Northwest Ethiopia16%(17), in Western Amhara Region Ethiopia 11.6%(16), Norther Ethiopia 24.6%(13), Afar regional state Northeast Ethiopia 16.2%(12), Damot gale South Ethiopia 9%(11), Sodozuria South Ethiopia 11.1%(6), in South Ethiopia 14.6%(10), Somalia regional state of Ethiopia 20%(9), a study done in Ethiopia 20%(8), Uganda 12%(7), in Ghana 9.9%(5). The possible reason might be due to different study periods and most studies were nationwide while this study was specific to Debretabor town Ethiopia.

In the present study children's age was one of the predictors of wasting among children age 6-59 months. Children who had 6-11 months of age were 4.3 times more likely to have wasted than 24-59 months of age. The result is supported by the research done in North ShewaOromia, Ethiopia(20), Lalibela, Northern Ethiopia(14), Uganda(25), Myanmar South Asia(26). The possible justification might be with increase the child age the frequency of wasting decrease due to the increased susceptibility of younger children to infection/illness(22).

Another predictor of wasting for children age 6-59 months was family wealth status. In this study families who have poor wealth status 3.1 times more likely to have wasted children than those families who have rich wealth status. This study is supported by the study done in Uganda(7), Gondar town northwest Ethiopia(15), Dabat, northwest Ethiopia(8). The possible reason might be due to children who have poor family wealth status lack adequate nutrition's in their household, and this leads to a nutritional imbalance between demand and supply.

The last predictor of wasting for this study was maternal age at first birth. Children of mothers who give first birth at the age group of 20-24 years of age were 4.3 times more likely to have wasted children than those who gave birth at the age group of greater than 30 years. The possible reasons might be due to the high demand for nutrition at first conception, again this leads to the child being wasted. Furthermore, the income of Youngers has a great impact on their family nutritional status since most of the Youngerswithin the age group of 20-24 are unemployed.

Limitations of the Study

The present study has some limitations. It was focused on children's characteristics rather than environmental factors, and also the study is cross-sectional it does not show a cause-effect relationship between wasting and associated factors.

Conclusion

Undernutrition especially wasting is still an important public health problem in children with an age group of 6–59 months. Age of the child, wealth status of the family, and giving the first birth before 20 years of age were significantly associated with wasting. Therefore, family wealth status should be modified, create awareness to mothers regarding maternal and child health care and responsible bodies should be designed for further nutritional intervention programs.

Abbreviations

ANC=Ante Natal Care, AOR = Adjusted Odds Ratio, CI = Confidence Interval, COR = Crude Odds Ratio, HH = House Holds, KM = Kilo Meter, PCA = Principal Component Analysis, SPSS = Statistical Package for Social Sciences, WHO = World Health Organization

Declarations

Ethical Approval and Consent to Participate:

Ethical clearance was obtained from the school of the nursing ethical review committee on behalf of the University of Gondar review board. The verbal informed consent was acceptable and approved by the ethical review board on the behalf of the University of Gondar.

A permission letter was obtained from the Debre Tabor town department of health. Participants were informed about voluntarism and that they can withdraw at any time of the study if they want not to respond. For those who were a volunteer to participate, verbal informed consent was obtained from the parent/legal guardian/ for the children involved in this study. At the end of the interview, participants were informed about wasting and associated potential effects.

Consent to publication:

Not applicable

Availability of the Data:

Data will be available upon request from the corresponding author.

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Authors' Contribution:

All authors made substantial contributions to conception, design, acquisition of data, or analysis and interpretation of data. And took part in drafting the article or revising it critically for important intellectual content; agreed to submit to the current journal; gave final approval of the version to be published, and agree to be accountable for all aspects of the work. All authors have read and approved the final manuscript.

Disclosure

The authors report no conflicts of interest

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Figures

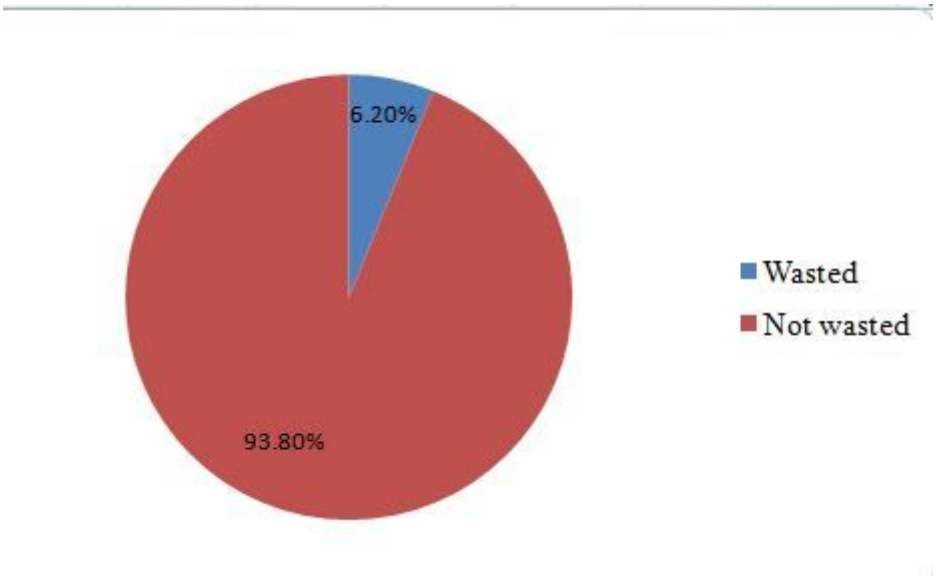

Figure 1

Prevalence of wasting among children age from 6–59 months in Debre Tabor town Amhara Region of Ethiopia, 2019.