

DOI: 10.21767/1791-809X.1000518

Prevalence and Predictors of Stunting among Children of Age between 24 to 59 Months in Butajira Town and Surrounding District, Gurage Zone, Southern Ethiopia

Zeritu Dewana¹, Teshale Fikadu^{2*}, Wolde Facha² and Niguse Mekonnen²

¹Arba Minch College of Health Sciences, Arba Minch, Ethiopia

²School of Public Health, College of Health Sciences and Medicine, Wolaita Sodo University, Wolaita Sodo, Ethiopia

*Corresponding author: Teshale Fikadu, Department of Public Health, Arba Minch University, PO Box 21, Arba Minch, Ethiopia, Tel: 0911721177; E-mail: fikaduteshale1@gmail.com

Received date: 29 May 2017; Accepted date: 22 August 2017; Published date: 29 August 2017

Copyright: © 2017 Dewana Z, et al. This is an open-access article distributed under the terms of the creative Commons attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Citation: Dewana Z, Fikadu T, Facha W, Mekonnen N (2017) Prevalence and Predictors of Stunting among Children of Age between 24 to 59 Months in Butajira Town and Surrounding District, Gurage Zone, Southern Ethiopia. Health Sci J. Vol. 11 No. 4: 518.

Abstract

Background: Stunting is one of the major causes of morbidity and mortality among under-five children. It is used to assess nutritional status of children by measuring their length/height and age. The purpose of this study was to assess prevalence and factors associated with stunting among children of ages between 24 to 59 months in Butajira town and surrounding district, Gurage zone, Southern Ethiopia.

Methods: Community based cross sectional study was conducted among children of ages between 24 to 59 months in February 2013. A multistage sampling technique was used to select the study participants. A total of 764 participants were included in our study with 95.3% response rate. Data were entered into Epi data version 3.1 and exported to SPSS 20.0 statistical software for analysis. Bivariate and multivariate analysis was done to assess factors associated with stunting. Odds ratio with 95% CI was used to identify statistically significant association between independent variables with stunting.

Result: The prevalence of stunting in our study was 52.5%. Children whose age were between 24 to 35 months were 3.13 times; AOR=3.13 (95% CI=1.88, 5.18) more likely developed stunting than children whose age were between 48 to 59 months. Those children residing together with three under-five children were 4.52 times; AOR=4.52 (95% CI=2.41, 8.45) more likely developed growth stunting than single child in the household. The likely hood of stunting were 4.27 times higher among divorced/widowed compared to married mothers; AOR=4.27(95% CI=1.72, 10.57). Those children who fed breast for less than two years were 5.32 times more likely developed stunting compared to those who fed two or more years; AOR=5.32(95% CI=2.23, 12.71) and those who had repeated acute respiratory tract infection attack were about 2 times more likely developed stunting

compared to their counterpart; AOR=2.07(95% CI=1.13, 3.56).

Conclusion: Being younger child, living with other under five children, divorced/widowed marital status, repeated attack of respiratory infection and less than two years duration of breast feeding were significantly associated with growth stunting. Thus concerned body working on child health should consider these factors to alleviate the burden of stunting.

Keywords: Stunting; Community; Infectious diseases; Malnutrition

Introduction

Chronic malnutrition (stunting) is one of the major causes of morbidity and mortality among under-five children [1]. Stunting reflects failure to receive adequate nutrition over a long period of time [2]. It is hidden, not detected timely in early life and thus leading to decreased physical growth, and increased child morbidity and mortality, and later on resides in adverse functional consequences: deprived cognition and educational performance, low adult wages, and lost productivity [3-6].

In Ethiopia under nutrition is described as long term year round phenomenon due to chronic food inadequacies and high levels of illness in under five children. Thus 53.6%, 32.7% and 7% of children aged 24 to 59 months were stunted, underweight and wasted respectively [2]. Under nutrition was underlying cause for 57% of child deaths and more than half of it was caused by stunting and wasting [7,8].

The causes of malnutrition intertwined with each other and are hierarchically related. The most immediate (proximate) determinants are poor diet and disease which are themselves caused by a set of underlying factors; residence, breast feeding practice, maternal child caring practice, access to health

services and healthy environment. These underlying factors themselves are influenced by the basic socio-economic and political conditions [9-16].

Knowledge about the prevalence and associated factors of stunting is an important precondition for developing nutritional intervention strategies. However; there were limited studies conducted in our study area. Therefore, the aim of this study was to identify the prevalence and associated factors of stunting among children of age between 24 to 59 months in Butajira town and surrounding district. The finding of this study will help development and improvement of implementation and intervention strategies to reduce child mortality and morbidity.

Materials and Methods

Study design and setting

Community based cross sectional study was conducted in Butajira town and surrounding district, Gurage zone, Southern Ethiopia in February 2013. Butajira is located at 130 kilometers south of Addis Ababa (the capital city of Ethiopia) and the town with its surrounding district had a total of 21,970 children between the ages of 24 to 59 months in the year 2012/13, which is projected from 2007 Ethiopia Central Statistical Agency. The area has a total of two hospitals, eight health centers and forty health posts providing maternal and child health care services.

Sample size determination and sampling procedure

Sample size was calculated using Epi info version 7 statistical software by assuming the proportion of stunting to be 53.6% [2], confidence level of 95%, 5% degree of precision, 5% for non-response rate and design effect of 2. The final sample size was 802. A multistage sampling technique was used. Nine kebeles (the smallest administrative unit in Ethiopia) were selected out of 24 kebeles by simple random sampling technique (lottery method). Then the total sample size was allocated proportionally to the selected kebeles based on the number of children. A list of households with children aged between 24 to 59 months was obtained from health post EPI registration book. Then simple random sampling method (generated by computer) was used to select the study participants from each selected kebele. If two or more eligible children were found in the same household, then one of them was selected randomly.

Measurement and tools

Pre-tested interviewer administered structured questionnaire adopted from different literatures were used to collect data. The questionnaire was initially prepared in English and translated into local language, then retranslated by another person to check consistency. The instrument was pre-tested in 5% of sample size in non-selected kebele.

Data collection and analysis

Data were collected using structured questionnaire via face to face interview from mothers/care givers. Eighteen data collectors (nine degree holders with one assistant for each) were participated during data collection after two days training. Height was measured in a standing up position to the nearest 0.1 cm using a standard vertical board with a detachable sliding headpiece. The ages of children were obtained from immunization card (if available) or from mothers/care givers report. The indices were calculated using WHO Anthroplus version 3.2.2 statistical software. Filled questionnaires were checked daily for its completeness by three supervisors then it were edited, coded and entered into Epi data version 3.1 and exported to SPSS 20.0 statistical software for analysis. After cleaning data for inconsistencies and missing values, descriptive statistics were done. Then bivariate analysis was done for all explanatory variables to identify their association with stunting. Variables with p-value less than 0.25 in the bivariate analysis were included in a backward stepwise logistic regression procedure. Odds ratios (95% confidence intervals) were calculated to determine the association between stunting and independent variables. Model fitness was assessed using Hosmer and Lemeshow test ($p=0.879$). Collinearity and interaction between independent variables were checked and not found.

Ethical Consideration

Ethical clearance was obtained from Arba Minch Health Science College ethical review committee. Letter of cooperation was obtained from Butajira town and surrounding district health office to respective health centers and health posts. Verbal informed consent was obtained from the mothers/care givers the study participant.

Results

Among 802 children, 764 were participated in the study with response rate of 95.3%. In our study, 401(52.5%) of the study participant were stunted (whose height for age below-2SD). Majority of participants' mothers, 592 (77.5%) were muslim by religion, 711(93.1%) were Gurage by ethnicity and 722(94.5%) were married. Concerning educational status nearly half, 359(47%) of the mothers were unable to read and write (**Table 1**).

Health related characteristics

Most of the respondents, 575(75.3%) were delivered at home, 755(98.8%) were immunized, 748(97.9%) were ever breast fed and 708(92.7%) were using pipe source of drinking water. Less than quarter, 103(13.5%) of the study participants had developed diarrhea two weeks prior to data collection (**Table 2**).

Table 1 Socio-demographic characteristics of the study participant in Butajira town and surrounding district, February 2013.

Variable	Number	Percent
Height for age		
above -2SD	363	47.5
below -2SD	401	52.5
Sex		
Male	405	53
Female	359	47
Age of children (in months)		
24-35	252	33
36-47	296	38.7
48-59	216	28.3
Number of under 5 children		
1	335	43.8
2	340	44.5
3	89	11.6
Age of mother in years		
20-24	45	5.9
25-29	304	39.8
30-34	213	27.9
above 35	202	26.4
Religion		
Muslim	592	77.5
Orthodox	106	13.9
Protestant	66	8.6
Ethnicity		
Gurage	711	93.1
Other than Gurage	53	6.9
Maternal education		
Unable to read and write	359	47
Read & write only	52	6.8
1st cycle (Grade 1-4)	115	15
2nd cycle (Grade 5-8)	177	23.2
Secondary and above	61	8
Marital status		
Married	722	94.5
Divorced/widowed	42	5.5
Fathers' education		
unable to read and write	183	24
Read & write only	81	10.6
1st cycle (Grade 1-4)	163	21.3
2nd cycle (Grade 5-8)	225	29.4

Secondary and above	112	14.7
Fathers' occupation		
Farmer	640	83.8
Merchant	124	16.2

Table 2 Health related characteristics of the study participants in Butajira town and surrounding district, February 2013.

Variable	Number	Percent
Place of delivery		
Health institution	189	24.7
Home	575	75.3
Immunization		
Yes	755	98.8
No	9	1.2
Had repeated diarrheal episode		
Yes	103	13.5
No	661	86.5
Had repeated malaria attack		
Yes	68	8.9
No	696	91.1
Had repeated respiratory tract infection		
Yes	106	13.9
No	658	86.1
Ever breast fed		
Yes	748	97.9
No	16	2.1
Source of drinking water		
River/ Pond	56	7.3
Pipe	708	92.7
Solid waste disposal		
Disposal pit	505	66.1
Open field	229	30
Burning	30	3.9
Liquid waste disposal		
Disposal pit	188	24.6
Open field	576	75.4

Factors associated with stunting

The prevalence of stunting was 401(52.5%). Children whose age were between 24-35 months and 36-47 months were 3.13 times; 3.13 (95% CI=1.88, 5.18) and 2.64 times; AOR 2.64(95% CI=1.64, 4.23) more likely developed stunting than children whose age were between 48-59 months respectively. Children

residing with three under-five children were about 4 times; AOR=4.52(95% CI=2.41, 8.45) and those residing with 2 under-five children were about 2 times; AOR=2.08(95% CI=1.38, 3.14) more likely developed growth stunting than single child in the household. The likely hood of stunting were 4.27 times higher among divorced/widowed compared to married mothers; AOR=4.27(95% CI=1.72, 10.57). Those children who had

repeated acute respiratory tract infection attack were about 2 times more likely develop stunting compared to their counterpart; AOR=2.07(95% CI=1.13, 3.56) and those who fed breast for less than two years were 5.32 times more likely develop stunting compared to those who fed two or more years; AOR= 5.32(95% CI=2.23, 12.71) (**Table 3**).

Table 3 Independent predictors of stunting among children of age 24 to 59 months in Butajira town and surrounding district, February 2013.

Variables	Height for age		COR(95%CI)	AOR(95%CI)
	Stunted No (%)	Not stunted No (%)		
Child age in months				
24-35	162(40.4)	90(24.8)	3.00(2.06,4.38)	3.13(1.88, 5.18)
36-47	158(39.4)	138(38.0)	1.91(1.33, 2.73)	2.64(1.64, 4.23)
48-59	81(20.2)	135(37.2)	1	1
No of < 5 children				
1	137(34.2)	198(54.5)	1	1
2	196(48.9)	144(39.7)	1.97 (1.45, 2.67)	2.08(1.38, 3.14)
3	68(17.0)	21(5.8)	4.68(2.73, 7.99)	4.52(2.41, 8.45)
Marital status				
Married	368(91.8)	354(97.5)	1	1
Divorced/widowed	33(8.2)	9(2.5)	3.53(1.66,7.47)	4.27(1.72, 10.57)
Had repeated acute respiratory infection				
Yes	73(18.2)	33(9.1)	2.22(1.45, 3.45)	2.07(1.13, 3.56)
No	328(81.8)	330(90.9)	1	1
Duration of breast feeding				
less than 2 year	52(13.0)	12(3.3)	4.32(2.27,8.26)	5.32(2.23,12.71)
2 and more year	349(87.0)	348(96.7)	1	1

Discussion

Stunting is much more common nutrition problem that mainly affects developing countries and often goes unrecognized in children but until recent time stunting was not given priority inspite of its prevalence. In this study the prevalence of stunting was 52.5%. This is consistent with a study done in Ethiopia but inconsistent with a study conducted in South Africa [9,17].

Study participant whose age were between 24 to 35 months were about 3 times and whose age were between 36 to 47 months were about 2 times more likely developed stunting than the age of 48 to 59 months. This is consistent with studies conducted in west Gojam and Tigray region of Ethiopia and India [14,18,19].

In this study children from 2 under-five children were about 2 times and from 3 under-five children were 4.52 times more likely developed growth stunting than one under-five child in the house hold. This could be the fact that as the number of

under-five children increases in the household the care given to the children decreases and also causes strain on family resources, as well as increases the risk of infectious diseases. The cumulative effect of these increased the risk of stunting in the house hold having more under-five children. This is consistent with community based studies conducted in southern Brazil [15].

The likelihood of stunting was about four times higher among children whose mothers were divorced/widowed when compared with those whose mothers were married. This might probably be as a result of decreased house hold resources generation by parents as well as inadequate child care provision time.

The likelihood of stunting was 2 times higher among children with repeated attack of acute respiratory tract infection than their counter parts. This might be due to that during illness nutritional requirement increases despite loss of appetite which later on exposed the child for stunting. This is

consistent with study conducted in Gojam such that illness increased the risk of stunting [14].

Study participants who fed breast for less than two years were about 5 times more likely developed stunting compared to those who fed breast for two years and more. This might be due to the fact that feeding breast for less than the recommended two years and above time exposed children for nutritional deficiency. Additionally, breast milk decrease food preparation time that give more time for the mother to provide care for the child so this might decrease the probability of developing growth stunting. This finding is consistence with studies conducted in rural Bangladesh and west Gojam of Ethiopia [14,20]; but it is inconsistent with studies conducted in Pakistan [21].

Strength and limitation of the study

Since the reliability of information was based on the ability of remembering, the result was subjected to recall bias. Absence of data on maternal nutrition, heights of the mothers, household food security and parasitic infections could affect stunting of children. There may be misclassification because it is very difficult to get accurate age of children, especially if not registered during birth, in country like Ethiopia but efforts were made to get accurate age by asking for immunization card of the participants.

Conclusion

Our study showed that number of under-five children, maternal marital status, duration of breast feeding, child age and repeated attack by respiratory infection were independently associated with growth stunting. Thus, intensifying intervention strategies by programmers and stakeholders working on nutrition should focus on these determinants to reduce growth stunting and realize millennium development goals.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

Teshale Fikadu: Involved from the inception to design, acquisition of data, analysis and interpretation, drafting the manuscript.

Wolde Facha: Involved in the analysis & interpretation of data, manuscript preparation and revises the manuscript.

Zeritu Dewana: Involved from the inception to design, acquisition of data, analysis and interpretation, drafting the manuscript. Finally all authors read and approved the final manuscript.

Niguse Mekonnen: Involved in the analysis & interpretation of data, manuscript preparation & revises the manuscript.

Acknowledgement

We would like to extend our deepest gratitude to the data collectors and supervisors and our special thanks also go to mothers who participated in the study.

References

1. World Health Organization (2011) Maternal, infant and young child nutrition. WHO, Geneva.
2. Central Statistical Agency, ICF International (2012) Ethiopia demographic and health survey 2011.
3. Mercedes O, Adelheid O, Elaine B, Amani S, Monika B et al. (2012) Worldwide implementation of the WHO child growth standards. *SN Public Health Nutrition* 15: 1603-1610.
4. Black RE, Allen LH, Bhutta ZA, Caulfield LE, Onis M, et al. (2008) Maternal and child under nutrition: Global and regional exposures and health consequences. *Lancet* 371: 243-260.
5. Sally GM, Cheung YB, Cueto S, Glewwe P, Richter L (2007) Child development in developing countries: Developmental potential in the first 5 years for children in developing countries. *Lancet* 369: 60-70.
6. Kathryn GD, Khadija B (2011) Long-term consequences of stunting in early life. *Matern Child Nutr* 7: 5-18.
7. Federal Ministry of Health (2007) Protocol for the management of severe acute malnutrition. Federal Ministry of Health, Ethiopia.
8. Save the Children (2009) Ethiopia national nutrition strategy, review and analysis of progress and gap. Save the Children, UK.
9. Onis MO, Blossner M, Borghi E (2011) Prevalence and trends of stunting among pre-school children, 1990–2020. *NS Public Health Nutrition* 15: 142-148.
10. Cristina R, Israel P, Sa Leal V, Oliveira JS, Cristina S, et al. (2011) Determinants of stunting in children under five in Pernambuco, Northeastern Brazil. *Rev Saude Publica* 45: 1079-1087.
11. Zottarelli LK, Sunil TS, Rajaram S (2007) Influence of parental and socioeconomic factors on stunting in children under 5 years in Egypt. *La REvuedesante de al Mediterraneeorientale* 13: 6.
12. Hortensia R, Ricardo P, Araceli S, Raúl C, José I, et al. (2004) The family as a determinant of stunting in children living in conditions of extreme poverty. *BMC Public Health* 4: 57.
13. Muchina EN, Waithaka PM (2011) Relationship between breastfeeding practices and nutritional status of children aged 0-24 months in Nairobi, Kenya. *AJFAND* 10: 2358-2378.
14. Teshome B, Wambui KM, Getahun Z, Taye G (2009) Magnitude and determinants of stunting in children under-five years of age in food surplus region of Ethiopia: The case of West Gojam Zone. *Ethiop J Health Dev* 23: 2.
15. Filiz E, Pinar O, Gonca A, Erdal B (2007) Nutritional status and risk factors of chronic malnutrition in children under five years of age in Aydın. *Turkish J Pediatr* 49: 283-289.
16. Giashuddin S, Kabir M, Rahman A, Hannan M (2003) Exclusive breastfeeding and nutritional status in Bangladesh. *Indian J Pediatr* 70: 471-475.
17. Ramoteme LM, Marianne A, Nelia PS, Henriette AD, Naomi SL (2005) Prevalence and determinants of stunting and overweight in 3-year-old black South African children residing in the Central

- Region of Limpopo Province, South Africa. *Public Health Nutrition* 8: 501-508.
18. Ramli, Agho KE, Inder KJ, Bowe SJ, Jacobs J, et al. (2009) Prevalence and risk factors for stunting and severe stunting among under-fives in North Maluku province of Indonesia. *BMC Pediatr* 9: 64.
 19. Mulugeta A, Hagos F, Kruseman G, Linderhof V, Stoecker B, et al. (2005) Factors contributing to child malnutrition in tigray. Mekelle University, Mekelle.
 20. Kamal M (2011) Socio-economic determinants of severe and moderate stunting among under-five children of rural Bangladesh. *Mal J Nutr* 17: 105-118.
 21. Farid-ul-Hasnain S, Raafay S (2010) Prevalence and risk factors for stunting among children under 5 years: A community based study from Jhangara town, Dadu Sindh. *JPMA* 60: 4.