

Factors Associated With Nutritional Status of Under-Five Children in Yirgalem Town, Southern Ethiopia

Alemneh Kabeta¹, Dayanand Belagavi¹, Yordanos Gizachew²

¹School of Nursing and Midwifery, College of Medicine and Health Sciences, Hawassa University, Ethiopia

²Department of Nursing, College of Medicine and Health Sciences, Arbaminch University, Ethiopia

Abstract: Healthy nutritional status is one of the pinpoint to be observed in assessing health status of an individual. It is also used as a direct and indirect indicator body's strength to defend unhealthy happenings. Health statuses of under-five children are among the under-nutrition vulnerable population segments. Thus, this study was conducted to assess factors associated with nutritional status of under-five children in Yirgalem town, southern Ethiopia. A kebele (Lower administrative Unit) was selected using lottery method from kebeles in the town. A community based cross-sectional study design was employed on a total of 398 child and mother/caregiver pairs selected through simple random sampling. Data was collected using semi-structured questionnaire, analyzed by descriptive statistics and Chi-squared (χ^2) test was used to identify associated independent variables. Z-scores for nutritional statuses were generated using WHO Anthro software. The result revealed that the prevalence of wasting, stunting, underweight and overweight were 2.01%, 35.17 %, 5.27% and 23.36% respectively. Immunization status ($X^2 = 0.004$, $p = 0.05$) and fathers' educational status ($X^2 = 0.018$, $p = 0.05$) were found statistically significant associated with underweight and stunting respectively. Wasting, stunting and underweight are public health nutritional deficits of children under the age of five in Yirgalem town, Ethiopia. Dimension and degree of already identified associated variables better be addressed using sound study protocol with strong epidemiological and statistical considerations to address limitations of this study before forecast of interventions to reduce under-nutrition in the study area.

Keywords: Stunting, under-five children, underweight, wasting

I. Introduction

Nutrition is the body's process of taking in and digesting food; using it for growth, reproduction, immunity, breathing, work and health; and storing nutrients and energy in appropriate parts of the body [1]. Nutritional status of children is an indicator of the level of development and future potential of the community. It is the result of complex interactions between food consumption and the overall status of health. Numerous socioeconomic and cultural factors influence patterns of feeding and nutritional status of children. The first five years of children with due emphasis from conception to second birth date are important for optimal growth, health, and development. Unfortunately, this period is often marked by micronutrient deficiencies that interfere with optimal growth [2].

Malnutrition generally refers to both under nutrition and over nutrition. Many factors can cause malnutrition, most of which relate to poor diet or severe and repeated infections, particularly in underprivileged populations. Inadequate diet and disease, in turn, are closely linked to the general standard of living, the environmental conditions, and whether a population is able to meet its basic needs such as food, housing and health care. Malnutrition is thus a health outcome as well as a risk factor for disease and exacerbated malnutrition and it can increase the risk of morbidity and mortality. Although it is rarely the direct cause of death (except in extreme situations, such as famine), child malnutrition was associated with 54% of child deaths (10.8 million children) in developing countries [3].

According to WHO (2011), under nutrition among children remains common in many parts of the world. About 178 million children under five years worldwide were too short for their age group; while 115 million were underweight. The same report showed that stunting rate among children was higher in Africa and Asia than elsewhere [4]. In Ethiopia, malnutrition is one of the major public health problems and common in children under five years old [5,6].

Malnutrition is one of the leading causes of morbidity and mortality among under five children in developing countries. Ethiopia being among developing countries, malnutrition is an important public health problem. Because this age (under five) is the time were children attain both physical and mental growth rapidly, so this study identified the prevalence and associated factors of nutritional status among under five children.

II. Objective

To assess the prevalence of nutritional status and factors associated with nutritional status of under-five children in Yirgalem town, Southern Ethiopia in 2015.

III. Methodology

3.1 Study design

A community based cross sectional study was employed on a total of 398 under-five child and mother/caregiver pairs selected using simple random sampling technique. The study was conducted in Yirgalem town, in Sidama Zone, southern part of Ethiopia from March to April 2015. Semi-structured questionnaire was used to collect the data. Weight, height and MUAC of each child were taken by the investigators. Weight for height Z-score (WHZ), height for age Z-score (HAZ) and weight for age Z-score (WAZ) were generated using WHO anthro. Data was enter in to SPSS version 20 for windows, cleaned and checked for completeness and then, after generating descriptive statistics chi-square (X^2) is used to identify associated independent variables. Letter of permission was obtained from Hawassa University College of Medicine and Health Sciences and submitted to local administrative department before joining the community for data collection. The purpose and importance of the study were explained to each participant and oral consent was secured from each participant (mother/caregiver). Confidentiality was maintained at all levels of the study. Participant involvement in the study was solely voluntary. Those who were unwilling and need to break their participation in between were informed of the freedom with no negative impact for doing so.

IV. Result

4.1 Socio demographic and housing characteristics

Table 1: Frequency and percentage distribution of studied children

Age(months) *	Male (%)	Female (%)	Total (%)
0-5	14(3.51)	14(3.51)	28(7.03)
6-11	23 (5.77)	24 (6.03)	47(11.8)
12-23	29(7.28)	22 (5.52)	51(12.81)
24-35	34 (8.54)	36 (9.04)	70 (17.58)
36-47	41 (10.3)	70(17.58)	111 (27.88)
48-59	47(11.8)	44 (11.05)	91 (22.86)
Total	188 (47.23)	210 (52.76)	398 (100%)

*The median age calculated for both sex is 29.6.

Table 1 shows that all 398 study subjects were included in the study, out of which 188 (47.23%) were males and 210 (52.76%) were females. The mean age for the study subject was 29.66 months for both sexes.

Table 2: Frequency and percentage distribution of Socio-demographic and housing characteristics of the parents

Variables	Frequency (n=398)	Percentage (%)
Study subject/mother		
One child	298	74.8
Two children	72	18
Three children	22	5.52
Above three	6	1.5
Educational level		
Mother		
Illiterate	20	5
Formal education	378	95
Father		
Illiterate	3	0.8
Formal education	395	99.24
Occupation of the father		
Farmer	12	3
Daily labourer	90	22.6
Civil servant	195	49
Merchant	92	23.1
Others	09	2.3
Ethnic group		
Sidama	202	50.75
Gurage	66	16.6
Amhara	52	13.1
Oromo	53	13.3
Others	25	6.28
Marital status		
Married	355	89.2
Widow	4	1
Divorced	15	3.76

Single	24	6
Religion		
Protestant	172	43.2
orthodox	169	42.5
Muslim	52	13.1
Others	5	1.25
Housing condition		
Corrugated	380	95.44
Thatched	18	4.52
Room		
One	129	32.4
Two	215	54
Two or more	54	13.3
Kitchen		
Separate	369	92.7
In living room	29	7.28
Water source		
Protected well	109	27.38
Un protected well	14	3.5
Spring	85	21.35
Pipe	190	47.73
Latrine		
Yes	398	100
No	0	0

Table 2 depicts that a total of 398 mothers responded to the questionnaire, out of this 298 (74.87%) had single child, 72 (18%) had two children and 22(5.5%) had three children respectively. Majority 355 (89.2%) of children were born to married couples.

Half, 202 (50.8%) of the respondents belong to Sidama ethnic group, in which, protestant were 172(43.2%) and orthodox 169(42.5%). Most of the parents were literate 378 (95%) of the mothers and 299 (99.2%) of fathers. The majority of the houses were with corrugated roof 380(95.5%). Households with only one room constitute 129 (32.4%).

4.2 Prevalence of Nutritional status of under five children

The below Fig. 1 pie chart depicts that prevalence of nutritional status among under five children, 21(5.27%) were underweight (low weight for age), 140(35.17%) were stunted (low height for age), 8 (2.01%) were wasted (low weight for height) and 93 (23.36%) were overweight, whereas, 136 (34.17%) were well nourished.

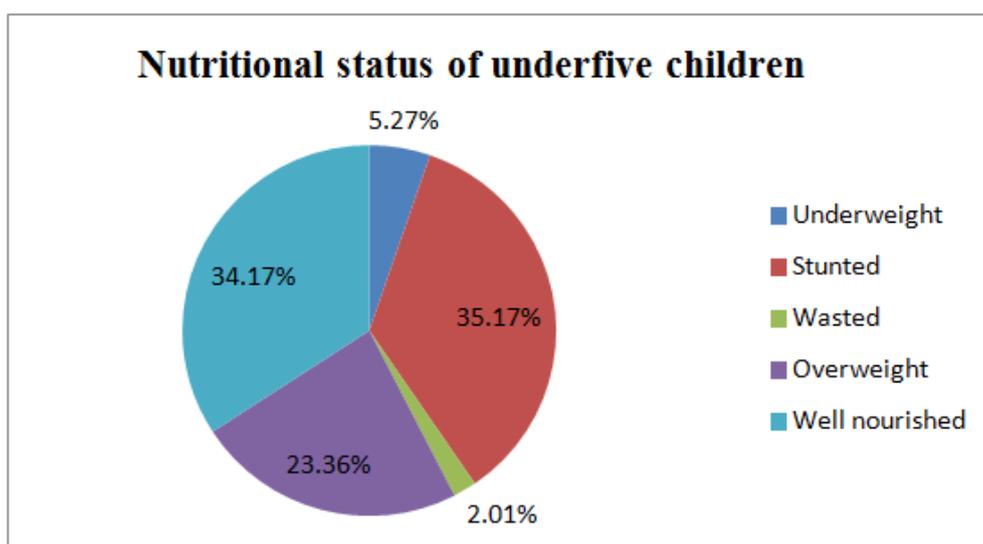


Fig 1: Prevalence of under five children nutritional status

4.3 Nutritional status of the studied children as measured by WHZ in relation to WHO standard

Fig. 2 illustrates that the nutritional status as measured by weight for height (WHZ) of the studied children in relation to the WHO standard. The figure shows shift to the right of the WHO curve which means the children are over nourished (overweight) in relation to the curve.

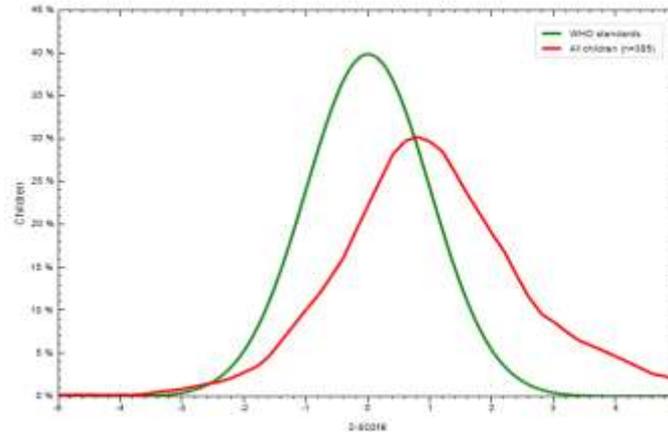


Fig 2: Nutritional status of the studied children as measured by WHZ in relation to WHO standard

4.4 Nutritional status of the studied children as measured by HAZ in relation to WHO standard

Figure 3 depicts nutritional status of the studied children as measured by Height for age (HAZ). The shift of the graph in the figure shows shift to the left, the children are undernourished (stunted) in relation to the WHO curve.

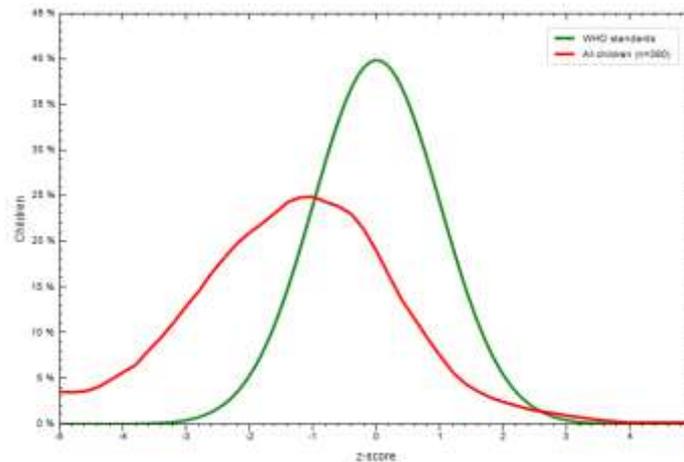


Fig 3: Nutritional status of the studied children as measured by HAZ in relation to WHO standard

4.5 Nutritional status of the studied children as measured by WAZ in relation to WHO standard

Fig 4 depicts that the nutritional status of the children as measured by weight for age (WAZ). It can be seen from the figure that the children are almost normal (well nourished) in relation to the curve provided by WHO.

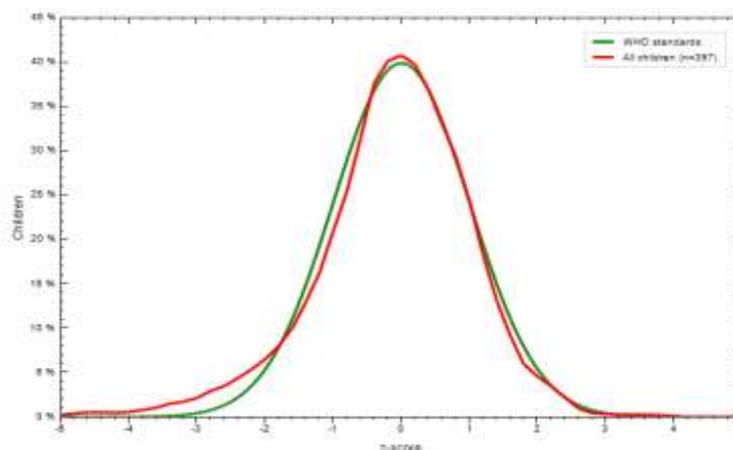


Fig 4: Nutritional status of the studied children as measured by WAZ in relation to WHO standard

4.6 Nutritional status as measured by MUAC

Among 370 children eligible for MUAC, 31 (7.8%) were found to be malnutrition as measured by MUAC.

4.7 Factors associated with nutritional status of under five children

Table 3: Factors associated with nutritional status as measured by Height for Age (n=398) among under five children

Variables	HAZ		Chi-square	P value
	Well nourished	Malnourished		
Age in month				
<29 month	110(27.63%)	73(18.34%)	3.303	0.069
≥29 month	148(37.18%)	67(16.84%)		
Sex of under five				
Female	144(36.18%)	66(16.58%)	2.738	0.098
Male	114(28.64%)	74(18.59%)		
Marital status				
Married	234(58.79%)	121(30.4%)	4.478	0.214
Single	15(3.76%)	9(2.26%)		
Divorced	6(1.5%)	9(2.26%)		
widowed	3(0.75%)	1(0.25%)		
Age at first marriage				
≤18 years	108(27.13%)	65(16.33%)	0.771	0.380
≥19 years	150(37.86%)	75(18.84%)		
Father's occupation				
Employed	255(64.07%)	138(34.67%)	0.52	0.820
Unemployed	3(0.75%)	2(0.5%)		
Mother's occupation				
Employed	136(34.17%)	75(18.84%)	0.27	0.870
Un employed	122(30.65%)	65(16.33%)		
Ethnicity				
Sidama	133(33.41%)	69(17.33%)	6.279	0.616
Gurage	45(11.3%)	21(5.27%)		
Oromo	29(7.28%)	24(6.03%)		
Amhara	32(8.04%)	20(5%)		
Father's education				
Illiterate	3(0.75%)	0	5.571	0.018*
Formal education	258(64.82%)	137(34.42%)		
Mother's education				
Illiterate	14(3.51%)	6(1.5%)	0.247	0.619
Formal education	244(61.3%)	134(33.66%)		
Income in month				
<1000 birr	135(33.9%)	66(16.58%)	0.975	0.323
≥1001 birr	123(30.9%)	74(18.59%)		
Immunization status				
Immunized	227(57.03%)	120(30.15%)	0.419	0.518
Partially immunized	31(7.78%)	20(5%)		
Religion				
Orthodox	113(28.39%)	56(14.07%)	3.799	0.434
Protestant	106(26.63%)	66(16.58%)		
Muslim	34(8.54%)	18(4.5%)		
Supplementary started				
<6 month	53(13.31%)	36(9.04%)	3.364	0.186
7-9 month	163(40.95%)	93(40.95%)		
≥10 month	17(4.27%)	4(1%)		

* P value, value for which <0.05 is significantly associated

Table 3 reveals that father's education was significantly associated with height for age (stunting) of under five children

Table 4: Factors associated with nutritional status as measured by Weight for Age (n=398) among under five children

Variables	WAZ		Chi-square	P value
	Well nourished	Malnourished		
Age in month				
<29 month	168(42.2%)	15(3.76%)	5.781	0.16
≥29 month	209(52.5%)	6(1.5%)		
Sex of under five				
Female	202(50.75%)	8(2%)	1.914	0.167
Male	175(43.96%)	13(3.26%)		

Marital status				
Married	335(84.14%)	20(5%)	1.208	0.751
Single	23(5.77%)	1(0.25%)		
Divorced	15(3.76%)	0		
widowed	4(1%)	0		
Age at first marriage				
≤18 years	164(41.2%)	9(2.26%)	0.003	0.954
≥19 years	213(53.5%)	12(3%)		
Father's occupation				
Employed	372(93.46%)	21(5.27)	0.282	0.595
Unemployed	5(1.25%)	0		
Mother's occupation				
Employed	201(50%)	10(2.51%)	0.259	0.611
Unemployed	176(44.22%)	11(2.76%)		
Ethnicity				
Sidama	188(47.23%)	14(3.5%)	3.631	0.889
Gurage	64(16.08%)	2(0.5%)		
Oromo	52(13.06)	1(0.25%)		
Amhara	49(12.3%)	3(0.75%)		
Father's education				
Illiterate	2(0.5%)	1(0.25%)	4.761	0.29
Formal education	375(94.22%)	20(5.02%)		
Mother's education				
Illiterate	19(4.77%)	1(0.25%)	0.003	0.955
Formal education	358(89.9%)	20(5.02%)		
Income in month				
<1000 birr	191(47.98%)	10(2.51%)	0.74	0.786
≥1001 birr	186(46.7%)	11(2.76%)		
Immunization status				
Immunized	333(83.66%)	14(3.5%)	8.355	0.004*
Partially immunized	44(11%)	7(1.75%)		
Religion				
Orthodox	163(40.95%)	6(1.5%)	2.306	0.680
Protestant	160(40.2%)	12(3%)		
Muslim	49(12.3%)	3(0.75%)		
Supplementary started				
<6 month	82(20.6%)	7(1.75%)	2.822	0.244
7-9 month	247(62.06%)	9(2.261%)		
≥10 month	20(5.02%)	1(0.25%)		

* P value, value for which <0.05 is significantly associated

Table 4 illustrates that immunization status was significantly associated with weight for age (underweight) of under five children.

V. Discussion

The present study was conducted to assess factors associated with nutritional status of under-five children in Yirgalem town, southern Ethiopia. Community based cross-sectional study revealed that the overall prevalence rate of malnutrition in the study population was high. Some of the study subjects were affected by more than one type of malnutrition. The prevalence of underweight was low when compared to the report of nationwide survey conducted which showed 25% and 26.3% of the national and regional report of underweight children in the similar age group. On the other hand the prevalence of wasting was very high 37.28% when compared to both the national and the regional figure 11% and 10% respectively [7].

The result of the study was comparable to Somalian study which showed 34.4% of the children were stunted and 42.3% were wasted even though the rate of underweight 47.7% was higher than our findings [8]. This may be due to different socio-economic and cultural factors between the two communities. The study result was different to the finding of 22 developing countries that were done in 1985, which showed prevalence rate of 39% below reference median weight-for-age which is much higher than our finding 5.3% [9].

The descriptive statistics result showed malnutrition increased with age in both sexes up to the age of three and then relatively decreases as age increases. This is in agreement with the report from India which showed the nature of malnutrition to be strongly dependent on age [10]. The result of study showed a significant association between father's education and immunization status of the children and prevalence of malnutrition. The social variables studied, immunization and father's educational level were the two factors that showed the strongest association with the nutritional status [11]. The study did not show significant association between malnutrition and type of housing (type of roof and number of rooms).

VI. Conclusion

The findings of the present study indicated that the magnitude of malnutrition in the study population was high. The prevalence of wasting, stunting and underweight (< -2 SD) by WHO standards was 37.8%, 35.142% and 5.3% respectively. Factors significantly influencing nutritional status in the study population found to be father's educational status and immunization status of the child. This calls for collaboration of different sectors of society for ensuring educational coverage specially fathers of children and ensuring adequate provision of immunization based on the expanded program on immunization.

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