

Assessment of nutritional status of preschool children of Gumbrit, North West Ethiopia

Melkie Edris

Abstract

Background: Economically Ethiopia remains one of the poorest countries in the world and malnutrition is one of the major and most pressing health problems; especially among children.

Objective: To assess the nutritional status of preschool children in a rural locality of Northwest Ethiopia

Methods: A cross-sectional survey was conducted in a rural locality called Gumbrit. Weight and height of the study children were measured and the socio-demographic characteristics of the subjects were collected using a questionnaire.

Results: The overall prevalence of malnutrition in the community was high with 28.5% of the children being underweight, 24% stunted and 17.7% wasted. Among the socio-economic variables included in the study only family income was significantly associated with malnutrition.

Conclusion: The nutritional status of children in rural communities is affected by low family income. To improve nutritional status of children the full implementation of the poverty alleviation programmes should be considered and appropriate measures need to be taken to support needy families with children. [*Ethiop.J.Health Dev.* 2007;21(2):125-129]

Introduction

Ethiopia is located on the Eastern Horn of Africa. Economically it remains one of the poorest Third World Countries, with an annual per capita income of US\$ 110, an infant mortality rate of 97 per 1000 lives births, and a life expectancy of 47 and 49 years for men and women, respectively. The National Demographic Health Survey conducted by Central Statistic Office (CSO) in Ethiopia in 2005 showed that the prevalence of wasting, under weight and stunting was very high; 9.7, 35.7 and 51.3%, respectively (1).

The most important forms of malnutrition in Ethiopia are protein energy malnutrition (PEM), vitamin A deficiency, Iodine deficiency disorders, and Iron deficiency anemia (2). Absolute poverty, poor health and sanitary conditions, limited knowledge of nutritional matters among certain households, and fluctuations in incomes are some of the principal reasons for the high prevalence of malnutrition (3, 4). Improved nutrition is assumed to be directly linked to expanded food production while increased income is a good proxy for improved nutrition. (4, 5).

Malnutrition varies from country to country depending on economic, ecological, social, and other factors. In Ethiopia at present the most serious nutritional problems are mainly due to low intake of foods in general. The problem is more severe among children aged 1-3 years who suffer from Kwashiorkor and Marasmus (4%) and under weight (60%) (5). Any change in income or income form influence the nutritional status at the household and individual levels. The effect of income is measured by expenditure on food which reflects a household's income and resources (6, 7).

It has been hypothesized that one of the most serious obstacles limiting the development in rural agricultural societies is the amount of land available to the families. It is also known that the greater the amount of land available to the small-scale farming families, the better the nutritional status of the young children in the families. (9) Associated with the nutritional status of young children and may thus be used as an indicator of health and nutritional status of the family (10). Among all other things, land is a useful means of classifying much of the rural population in terms of food, nutrition, and poverty considerations. In many developing countries including Ethiopia land reform has been done to alleviate malnutrition and promote economic equity (11,12).

Gumbrit is located near Gondar town, which is about 15km west of Gondar town with the population of 4300. The people in this area are engaged in different activities such as farming, weaving and trading. Even though Gumbrit is near the town of Gondar, it has no social services such as grinding mill, market, all weather road and transport. Therefore, the people have to travel a long distance for some of social services. The people of Gumbrit are Orthodox Christians and Muslims by religion and live together and work harmoniously. In general, the standard of living of these people is low and the environmental sanitation is very poor.

Until recently, most Muslims in the study area had no land and their means of income was only weaving and trading while Christians have been farmers (peasant farmers). Now all people in this area have equal access to land regardless of religion and sex and the land size is proportional to family size, But most Muslims are not in a position to cultivate the land and use it to produce food crops due to lack of farm animals, instruments, and

experience. However, they can rent their land to other farmers who have knowledge of farming, farm animals, instruments, and experience and get enough food crops for consumption for the year round.

The purpose of this study was to determine the level of malnutrition in the study area and identify the most important socio-economic factors which have impact on malnutrition.

Methods

This cross-sectional study was undertaken in Gumbrit in September 2006. The study was intended to assess the nutritional status of preschool children and associated factors. A sample size of 450 was required assuming a 60% prevalence of malnutrition, margin of error of 5% and a 20% contingency for non response.

A uniform questionnaire was administered to the mother/caretaker of the study children. The questionnaire comprised three different parts: demographic, socio-economic, and anthropometrics measurement, together with the morbidity experience of the study children. The data were collected by nurses who were trained for two days. The data were checked every day by the principal investigator who stayed with data collectors for the duration of the survey, which was two weeks.

Measurements on weight and height were taken from children aged 6-59 months. The parents were asked about the morbidity experience of their children within the previous two weeks. The socio-demographic characteristics included in the questionnaire were: age, sex, religion, ownership of land, educational status of the mothers, and household income.

Digital weight scale was used for weighing the under five children while height measure for older children above two years of age, and length of the young children and infants below two years of age were measured by recumbence scale. The nutritional status of the study children was assessed using the indicators weight-for-age, weight-for-height, and height-for-age, according to the NCHS reference standard taking $-2.S.D$ as the cut-off point indicating malnutrition (under weight, stunting, and wasting).

Pre-test of questionnaires was done on 30 preschool children in a similar area, which was not included in the study and some modifications were made on the basis of the findings. Written and verbal consent was obtained from the farmer association and from heads of households, respectively.

The EPI-INFO 6 and 2000 statistical packages were used to enter and analyze the required data as appropriate. Both the bivariate and multivariate (logistic regression) statistical methods were employed to analyze the data. P-

values less than or equal to 0.05 were considered statistically significant.

Results

The study included a total 446 children out of which 210(47.1%) were males and 236 (52.9%) were female. The number of preschool children in the age group of 48-59 months constituted about a third of the study population. The socio-demographic characteristics of the study subjects are shown in Table 1.

Table 1: **Socio-demographic characteristics of study children, Gumbrit, September-December 2006**

Variable	Number	Percent
Sex of children		
Male	210	47.1
Female	236	52.9
Age of children		
6-11	35	7.6
12-23	70	15.7
24-35	82	18.4
36-47	95	21.3
48-59	164	37.0
Religion		
Orthodox Christian	419	93.9
Muslim	27	6.1
Maternal education		
Illiterate	404	90.6
Literate	42	9.4
Annual HH income		
<1000	149	33.4
≥ 1000	297	66.6
Ownership of land*		
Yes	415	93.0
No	31	7.0

*Shows possession of cultivable land

According to the NCHS reference standard taking $-2.S.D$ as cutoff point, the study children who fell below $-2.S.D$ of the indicators (Underweight, Stunted, and Wasted) were computed as 28.5%, 24% and 17.7%, respectively (Figure 1). In this study, there were no cases of over nutrition.

In order to investigate the association of selected demographic and socio-economic variables with the anthropometric results, both Bivariate and Multivariate analyses were used. Accordingly, as shown in Table 2, the nutritional condition as measured by underweight was associated with age and income. However, there was no statistically significant association with sex, maternal education, land possession and religion. As the age of the children increased there appeared a kind of decreasing trend in the level of underweight (χ^2 for linear trend test, $P<0.01$). A similar trend was also observed as the income levels of households increased ($P=0.009$).

The Bivariate analyses carried out between malnutrition as measured by stunted and each of the variables (age, sex, income, maternal education, religion and ownership of land) did not show any statistically significant association. The P-values were observed to be very much higher than 0.2 (i.e., $P > 0.2$) in each case (Table not included).

Table 3 shows that children's age and family income were the only variables which were significantly associated with malnutrition as measured by wasting ($P < 0.001$ for each variable). On the other hand, sex of children, maternal education, religion and possession of land did not have any statistically significant association with malnutrition (wasting).

There was also some interest to reanalyze the association between all variables together and malnutrition of the study children using multivariate logistic regression. In this regard, only the level of family income was significantly and independently associated with

malnutrition (underweight) ($P < 0.02$). On the other hand, there was no statistically significant association between maternal education, religion, possession of land, age and sex of a child. More or less similar results were also found when the logistic regression analysis was carried out by taking 'wasted' as the outcome variable and by keeping the independent variables as before (data not shown).

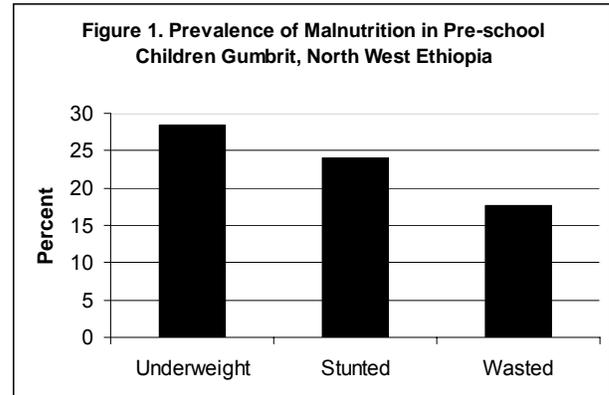


Table 2: Bivariate analyses showing the impact of selected variables on malnutrition as measured by underweight, Gumbrit, September-December 2006.

Variable	Underweight		Crude OR	95% CI
	Yes	No		
Sex				
Male	61	149	1.00	
Female	62	170	0.89	0.58, 1.38
Age				
6-11	10	24	1.00	
12-23	26	44	1.42	0.54, 3.77
24-35	33	49	1.62	0.63, 4.18
36-47	23	72	0.77	0.29, 2.01
48-59	35	130	0.65	0.26, 1.60
Annual H.H Income				
< 1000	54	95	1.00	
≥1000	73	224	0.57	0.37, 0.90
Maternal education				
Illiterate	105	272	1.00	
Literate	13	26	1.30	0.60, 2.75
Land possession				
Yes	115	300	1.00	
No	12	19	1.65	0.73, 3.7
Religion				
Orthodox Christian	117	302	1.00	
Muslim	10	17	1.52	0.63, 3.63

* Significant association

Table 3: **Bivariate analyses showing the impact of selected variables on malnutrition as measured by wasted, Gumbrit, September-December 2006.**

Variable	Wasted		Crude OR	95% CI
	Yes	No		
Sex				
Male	34	176	1.00	
Female	45	191	1.22	0.73, 2.05
Age				
6-11	12	22	1.00	
12-23	18	52	0.63	0.24, 1.68
24-35	19	63	0.55	0.21, 1.44
36-47	11	84	0.24	0.08, 0.68*
48-59	19	146	0.24	0.09, 0.61*
Annual HH income				
<1000 Birr	39	110	1.00	
≥ 1000 Birr	40	257	0.44	0.26, 0.74*
Maternal education				
Illiterate	67	310	1.00	
Literate	7	32	1.01	0.39, 2.53
Land possession				
Yes	71	344	1.00	
No	8	23	1.69	0.66, 4.16
Religion				
Orthodox Christian	75	344	1.00	
Muslim	4	23	0.80	0.23, 2.53

* Shows significant association

Discussion

The levels of underweight, wasting and stunting were 28.5%, 17.7% and 24.0%, respectively. These prevalence rates of malnutrition indicated that the under five children of this study area were in a better condition compared to malnutrition reported by a number of other studies (1, 4, 6, 8, 9). The level of stunting obtained in this study showed that malnutrition, especially stunting was not a serious problem among the study children of the study area. This could be attributed to a large extent to the income of their parents.

Although the prevalence rates of malnutrition computed from the anthropometric measurements of the study children are not very severe compared to the national figure, there is still a high level of malnutrition, which needs the attention of the responsible bodies. The Ethiopia Demographic and Health survey indicates that underweight, wasted and stunted are 35.7, 9.7 and 51.3%, respectively (1).

Maternal education showed a non-significant association with nutritional status of children in this study. This could be attributed to the fact that the overwhelming majority of the mothers in this study were illiterate and sample size was not adequate to detect differences. This finding is contrary to the results of a number of other studies conducted elsewhere in this country (13-16).

Whether having or not having land to cultivate was not statistically associated with malnutrition in this study. This could probably be due to the low yields that farmers got from their small plots of land.

The prevalence of wasting was relatively higher than the national figure indicating a serious problem in the study area at the time of data collection (1). The data were collected in September when most rural areas have shortage of food this could probably be one of the reasons for high prevalence of wasting in the area.

Family/household income was significantly associated with nutritional status of the under five children. Children belonging to the low-income group were at a higher risk of being wasted, underweight and stunted than children of better income families. Although the economic differentials seem to be silent in rural society it appears to be an important predictor of childhood nutritional status. Low income levels of developing nations limits the kinds and the amounts of food available for consumption (Ref). Low income also increases the likelihood of infection through such mechanisms as inadequate personal and environmental hygiene (11).

This study mainly indicated family income as an important predictor of malnutrition even in the seemingly uniformly poor society. Thus, development and poverty alleviation programme must focus on the poorest segment of societies to improve their economic status and thereby the health conditions.

Acknowledgements

The author would like to express appreciation for the Research and Publication Office (RPO) University of Gondar for financing this study. Parents of the study

children are thanked for sparing their time to participate in the study. A special thanks is due for project staff participated in data collection and write up.

References

1. Ethiopia Demographic and Health Survey, Central Statistic Agency 2005.
2. Edris M. Textbook of Food and Nutrition. University of Gondar. 2004.
3. Anderson, per-pinstrup. Nutritional consideration into Agricultural and Rural Development, International Food Policy Research Institute; Washington, D.C. U.S.A. Food and Nutrition Bulletin 1981;4:2.
4. Eksmyr R. Anthropometry in Privileged Ethiopian Pre-School children. CNU Report no. 33, Acta Pediat Scand. 1970;59:159-163.
5. Ethiopian Nutrition Institute 1989. News Letter Publications of the Ethiopia Nutrition Institute Ministry of Health.
6. Merrill, W. Report of Workshop on income and Nutrition effects of increasing commercialization of semi-subsistence Agriculture. Air lie House Virginia. December 1984:3-5.
7. Chaudhary H.R. (1984). Determinants of nutrient adequacy in a rural area of Bangladesh. United Nations Department of Technology Co-operation for development, Katmandu, Nepal. Food and Nutrition Bulletin, 1986; 8:4.
8. Collines and Frances Moore Lappe: Nick Allen, and Paul Rice. Nicaragua: What differences could a revolution make? Food and Farming in the new Nicaragua. 2nd ed. Food First Institute for food and development policy, 1985.
9. James P. Grant. UNICEF. The state of the world's children. Oxford University press, 1986:134-135.
10. Jemal Haidar, Tsegaye Demessie. Ethiopian Health and Nutrition Research Institute. SAJ Nutr. February. 1998;89(2):181-183.
11. Omawale, Mcleod J. Food consumption and poverty in Rural Jamaica Ecology of food and nutrition. 1984;14.
12. Ethiopian Provisional Military Administrative Council 1975. A Proclamation to provide for the public ownership of rural lands. Negarit Gazeta. Proclamation no. 31 April 1975. Addis Abeba.
13. Genebo T, Girma W, Haider J and Demisse TS. The association of children's nutritional status to maternal education in Zigbaboto, Guragie Zone. Ethiop J Health Dev 1999;13(1):55-6111.
14. Yimer G. Malnutrition among children in Southern Ethiopia: Levels and risk factors. Ethiop J Health Dev 2000;14(3):283-292.
15. Shamebo D, Sandstrom A, Muhe L, Freji L, Krantz I, Lonnberg G, Wall S. The Butajira Project in Ethiopia: A nested case-reference study of under five mortality and its public determinants. Ethiop J Health Dev. 1994;8:389-396.
16. Edris M. Comparison of nutritional status of preschool children of the cooperative and individual farmers, north west Ethiopia M.Sc thesis 1991:27-29.