ORIGINAL ARTICLE

Nutritional Status and Effect of Maternal Employment among Children Aged 6–59 Months in Wolayta Sodo Town, Southern Ethiopia: A Cross-sectional Study

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ABSTRACT

BACKGROUND: Childhood malnutrition remains common in many parts of the world; the magnitude of worldwide stunting, underweight and wasting in children under five years of age were 24.7 %, 15.1 % and 7.8 %, respectively. More than 150 million children under the age of five years in the developing world are malnourished. Ethiopia is one of the countries in sub-Saharan Africa with the highest rates of malnutrition. In Ethiopia, 44.4% and 9.7% of children under-five years old were stunted and wasted, respectively. This study was aimed to assess nutritional status and effect of maternal employment among children aged 6–59 months.

METHODS: A cross-sectional study was conducted in Wolayta Sodo Town, Southern Ethiopia. Socio-demographic characteristics, child feeding and healthcare seeking practice of mothers, and child's anthropometric status were assessed. Probability proportional to size sampling approach was used to select a sample of 316 mothers having children aged 6-59 months. The study was ethically approved by Institutional Review Board of Health Science College, Hawasa University.

RESULT: The overall result revealed that the prevalence of stunting was 22.2%, of which 21.8% and 22.6% were in children of employed and unemployed mothers, respectively. Low-weight-for age was 10.8% for children of employed mothers and 13.4% for children of unemployed mothers. Wasting was 8.8% and 10.8% for children of employed and unemployed mothers, respectively. There was no statistically significant association between maternal employment and nutritional status of their children. However, chronic malnutrition (stunting) was influenced by being educated mother (OR: 0.37) child age group of 24-59 months (OR: 0.36) and households' fifth wealth quintile (OR: 0.28).

CONCLUSION: Low prevalence of stunting was observed. Stunting is a public health concern in the study area. Furthermore, stunting is significantly influenced by mothers' education, household wealth and child age. However, maternal employment was not statistically associated with child nutritional status. Thus, nutritional intervention initiatives should focus on improving household food security, maternal education and agricultural diversification.

KEYWORDS: Childhood Nutrition, Maternal employment, Southern Ethiopia

INTRODUCTION

Childhood malnutrition remains common in many parts of the world; it is the underlying cause of death in an estimated 45% of all deaths among children under five years old (1). The magnitude of worldwide stunting, underweight and wasting in children under five years of age were 24.7%, 15.1 % and 7.8%, respectively (2). More than 150 million (39.9%) children under the age of five years in African countries are malnourished (3). Ethiopia is one of the countries in sub-Saharan Africa with the highest rate of malnutrition. According to the recent EDHS report, 44.4%, 9.7 % and 38% of children under five years old were stunted, wasted and underweight, respectively (4).

The causes of malnutrition are classified as immediate, underlying and basic. The immediate or direct causes are inadequate or inappropriate dietary-intake and infectious diseases, whereas insufficient access to food, childcare, water supply and environmental sanitation are underlying causes. Political, cultural, religious, economic and social systems including women's status in the society are considered as basic causes for malnutrition(5).

Women's employment increases household income with consequent benefit to increase women's status and power. This may bolster a woman's preference to spend her earnings on health and nutrition. In effect women without control over their income and decision-making authority within the household economic power have an ability to take actions on their babies' nutritional status (6) However, it may also have negative effects on the nutritional status of children as it decrease mothers' time spent for their children's caring, feeding and breastfeeding and increases care giving by

Therefore, this study examined the association of mothers' employment status on other individuals than by their mothers (7). On the other hand, children's nutritional status may not associate with maternal employment. nutrition and health status of children. We believed that the finding of the study would be helpful in producing applicable recommendations that could show more areas of effective interventional programs for both government & non-government organizations for continued improvement of child health and nutritional status.

METHODS

A community based cross-sectional study was conducted in January 2014 at Wolayta Sodo Town, located 380 km away from the capital city Addis Ababa to South in South Nations Nationality Peoples' Region(SNNPR). The town lies between 4.43°- 8.58° North latitude and 34.88° - 39.14° East longitude. It has a total population of 126,759: 67,331(53.11%) males and 59,428(46.88%) females.

In this study, all households that had at least one child aged 6 to 59 months in the town were the source population, whereas households who resided in selected Kebels were the population. Furthermore, in this study, mothers who had regular jobs with a specified salary respective to the index child's age at the data collection time were considered as employed mothers. However, mothers who were irregularly employed after giving the index child birth were excluded from the study.

Sample size was calculated using single population proportion formula by taking 32% prevalence of stunting in children (4), 95% confidence interval (CI), and relative precision 5% and expected response rate 90%. Accordingly, the calculated optimal sample size was 367 households that had at least one child of 6 to 59 months old. However, the source population is less than 10,000 i.e. 2,274 and the finite population correction is greater than 5%. Thus, it needs sample size correction which gives 316 households that had at least one child aged 6 to 59 months were included in the study.

Probability proportional to size sampling procedure was employed to select the study participants. First, we listed all Kebeles existing in Wolayta Town with their target tion size prepared from the preliminary survey. Following we computed the

cumulative frequency and sampling interval by dividing in to 30% of the Kebeles (three) were 2,274 and 758, respectively. Finally, randomly, we chose a number between 1 and 758 to determine the first cluster sample and followed the interval until the required three kebele were identified, and finally simple random sampling was applied to select the study units from each kebele. However, if more than one child aged 6 to 59 months were found in the sampled single household, lottery method was applied to select the index child.

An adapted questionnaire was used to collect the data by six trained diploma holding nurse data collectors (4). Anthropometric measurement of children were made using electronic weight scale (Seca 770) wearing light shirt of known weight, and stadio-meter for length and height for under-two children, and for 24-59 months children without shoes, respectively. Weights and lengths/heights were taken to the nearest 0.1 kg and 1-cm, respectively. Furthermore, in addition to instrument calibration, scale indicators were checked against zero reading after weighing every child.

To enhance instrument reliability, the adapted questionnaire was translated into the local language, Amharic, and back translated into English by another language expert. Moreover, the instrument was pre-tested on 5% of the actual sample size and necessary corrections were made accordingly. Three-day training was given to data collectors and supervisors before the data collection. The overall data collection process was monitored on a daily base by BSc holding supervisors and investigators. An Epi-data 3.1 statistical package was used for data entry, whereas data processing and analysis was made using SPSS version 20.0.

Anthropometric indexes, Z-scores for Height-for-age (WAZ), weight-for-Height (WHZ) and MUAC-for-age were computed from the WHO 2006 multi-center growth reference data using the computer program WHO Anthro 2007 (8). Variables in the binary analysis found at p-value ≤ 0.10 were further considered into the final model multiple logistic regression to evade unstable estimate (9). Finally, backward stepwise logistic regression analysis was applied to describe the practical associated factors of childhood malnutrition. A point estimates of Odds ratio (OR) with 95% confidence interval (CI) was computed to assess the strength of association between the independent variables and the outcome childhood malnutrition. For all statistical significance tests, p-value < 0.05 was used as a cut-off point.

The study was ethically approved by Hawassa University Ethical Review Board, and support letter was obtained from Wolayta Hone Health Department. A written informed consent from the next of kin, caretakers or guardians on behalf of the minors/children enrolled in the study was obtained before each interview and measurement. Sick and severely malnourished children were referred to health facilities, and health/nutritional advice was given to parents. Moreover, confidentiality of the data was assured. RESULTS

Socio-demographic characteristics of the study population: Three hundred sixteen mothers having children age 6-59 months were planned to be included in this study. Out of these, 315 were enrolled in the data collection which gives a response rate of 99.6%. Among the study participants, 195(61.9%) mothers with children aged 6-59 months were unemployed, while 120(38.1%) mothers with children age 6-59 months were employed.

The majority, 289(91.7%), of the mothers were married. However, more of the employed mothers were divorced 8(2.5%) compared to their counterpart were null. Regarding religion, Protestant Christian was slightly more than half, constituting 185(58.7%) followed by Orthodox. The mean ages of mothers and children were 26.6 years and 29.5 months, respectively. On the other hand the mean family size of the study participant was 5.09. The majority of mothers, 264(83.8%), were literate, but only 97(30.8%) of them were employed. Majority of the household's wealth was third level (Table 1).

Table 1: Socio-demographic characteristics of study participants (n=315), Wolayta Sodo Town, January 2014

Variables	Employed n (%)	Unemployed n (%)
Mean(SD)		
Child age in month	30.73±14.8	27.4±14.2
Maternal age	27±5.23	26.2±5.34
Family size	5.17±1.88	5.01±1.76
Marital status		
Married	102(32.4)	189(59.4)
Unmarried	1(0.3)	2(0.6)
Divorced	8(2.5)	0(0)
Widowed	9(2.9)	6(1.9)
Education		
Literate	97(30.8)	167(53.0)
Not read & write	23(7.3)	28(8.9)
Religion		
Protestant	72(22.8)	113(35.9)
Orthodox	43(13.7)	75(23.8)
Muslim	6(1.9)	3(1.0)
Catholic	2(0.6)	1(0.3)
Under five children size		
One	102(32.4)	166(52.7)
Two	16(5.1)	27(8.6)
Three	2(0.6)	2(0.6)
Household wealth		
First	19(15.8)	44(22.6)
Second	24(20.0)	40(20.5)
Third	19(15.8)	44(22.6)
Fourth	31(25.8)	35(17.9)
Fifth	27(22.5)	32(16.4)

Child feeding pattern and health seeking behaviors: About 270(85.7%) of the respondents had breastfed their child3n, of which 109(90.8%) were employed mothers. The rest introduced other food and/or fluids. Concerning the time of initiation of breastfeeding, the majority, 200(74.1%), of the children were initiated at appropriate time (with in the 1st hour after birth). Of these, 29.3% were children of employed mothers.

No mother reported that she had started additional food to her child immediately after birth. However, 180(66.7%) of the mothers started complementary food to their children at the age of 6 months; of these, 67(37.2%) were employed mothers. Fifty-seven (21.1%) mothers started additional food to their children after 6 months of age. Of these, 21(19.3%) mothers were employed, while 33(12.2%) of them started additional food to the children before 6 months of age after birth.

Pertaining to mothers' knowledge about complementary feeding, about 298(94.6%) of the mothers explained the time for starting complementary feeding as 4-6 months of age, and 312(99 %) explained as exclusive breast feeding should be given for up to 6 months.

The majority of the children, 291(92.4%), had received immunization for common childhood

illnesses. Among the study participant mothers 48(87.3%) for fever, 54(67.6%) for cough and 23 (69.7%) for diarrheal childhood illness seeks advice or treatment from different public and private health facilities.

Concerning the delivery place, half 56(46.7%), of the employed mothers delivered at health institutions. The remaining gave birth at home assisted by Traditional Birth attendants (TBAs) and/or relatives.

According to the mothers' responses and records obtained from child vaccination cards, 93(47.7%) of the children of unemployed mothers and 45(37.5%) of the children of employed mothers were weighed at birth. Among children whose weights were measured, 5(3.6%) were below 2500gms; of these 3(2.5%) and 2(1.03%) belonged to unemployed and employed mothers, respectively (Table 2).

Table 2: Child feeding practices and Health Seeking Behaviors of the respondents (n=315), Wolayta Sodo Town, January 2014.

Variables	Employed n (%)	Unemployed n (%)
Initiation of breast feeding(n=270)		
First hour	79(29.3)	121(44.8)
Within 8 hours	29(10.7)	30(11.1)
After 24 hours	1(0.4)	10(3.7)
Initiation of complementary feeding(n=270)		
At 6 month	67(37.2)	113(62.8)
After 6 month	21(36.8)	36(63.2)
Less than 6 month	21(63.6)	12(36.4)
Seeking advice or treatment for sickness		
Fever (n=48)	20(90.9)	28(84.8)
Cough (n=54)	25(69.4)	29(65.9)
Diarrhea (n=23)	8(61.5)	15(75.0)
Immunization		
Yes	108(90.0)	183(93.8)
No	12(10.0)	12(6.2)
Place of delivery		
Health institution	56(46.7)	106 (54.4)
Outside Health institution (home)	64(53.3)	89 (44.6)
Children weighed at birth		
No	75 (62.5)	102(52.3)
Yes	45(37.5)	93(47.7)

Nutritional status description: Thirty-eight (12.1 %) of the children were underweight, of these, 10.8% from employed mothers and 13.4% from the counter parts. On the other hands 70 (22.2%) were stunted of which 21.8% and 22.6% in children from employed and unemployed mothers, respectively. Thirty-one (9.8%) of the children

were wasted. Of these, 8.8% and 10.8% were children of employed and unemployed mothers, respectively. The mean ($\pm$SD) weight-for-age, height-for-age and weight-for-height Z scores were, 2.85($\pm$0.42), 2.73($\pm$0.51) and 2.83($\pm$0.32), respectively (Table 3).

Table 3: Anthropometric characteristics of children involved in the study (n=315), Wolayta Sodo Town, January 2014.

Variables	Frequency (n)	Percent (%)
Weight-for-age Z score		
Normal (≥-2 SD)	277	87.9
Underweight (< -2 SD)	29	9.2
Severely underweight (<-3SD)	9	2.9
Height-for-age Z score		
Normal (≥-2 SD)	245	77.8
Stunted (< -2 SD)	58	18.4
Severely stunted(<-3SD)	12	3.8
Weight -for-height Z score		
Normal (> -2SD)	284	90.2
Wasted (< -2 SD)	29	9.2
Severely wasted (<-3SD)	2	0.6
MUAC- for-age Z score		
Normal (> -2SD)	250	79.4
Wasted (< -2 SD)	57	18.1
Severely wasted (<-3SD)	8	2.5

Factors influencing the nutritional status of children: As shown in Table 4, stunting was insignificantly associated with maternal employment and maternal age. However, stunting appeared to be significantly influenced by maternal education, child age and household wealth. Children of literate mothers were 63% less likely to be stunted as compared to children of illiterate mothers [OR: 0.37, 95%CI: (0.19, 0.74)]. Also, children from the fifth wealth quintile household and child age group 24-59 months were 70% and 64% less likely to be stunted compared to lowest wealth quintile household and child age group of 6-23 months [OR: 0.28, 95%CI: (0.10, 0.77)] and [(OR :0.36, 95%CI: (0.17, 0.77)], respectively.

Table 4: Predictors of childhood malnutrition (n=315), Wolayta Sodo Town, January 2014

Variables	Crude OR with 95% CI	Adjusted OR with 95% CI		
		Stunting	Wasting	Under weight
Maternal employment				
Unemployed	1	1	1	1
Employed	0.87(0.49,1.55)	0.87(0.49,1.55)	0.75(0.34,1.66)	0.83(0.41,1.69)
Education				
Can't read & write	1	1	1	1
Literate	0.45(0.24,0.86)	0.37(0.19,0.74)*	0.53(0.15,1.80)	0.48(0.22, 1.07)
Maternal age				
15- 34	1	1	1	1
35- 54	1.58(0.92,2.72)	1.58(0.92,2.72)	0.53(0.25,1.11)	0.54(0.27,1.08)
Child age				
6 - 23	1	1	1	1
24 - 59	0.39(0.82,1.02)	0.36(0.17,0.77)*	1.97(0.45,8.64)	0.42(0.18,1.01)
Household Wealth				
First	1	1	1	1
Second	0.39(0.41,1.11)	0.38(0.13,1.09)	0.79(0.17,3.69)	0.56(0.23,1.82)
Third	0.35(0.13,0.98)	0.32(0.12,0.93)	0.37(0.09,1.49)	0.65(0.20,2.11)
Fourth	0.34(0.12,0.93)	0.35(0.12,1.10)	0.43(0.11,1.74)	0.74(0.22,2.47)
Fifth	0.28(0.10,0.77)	0.28(0.10,0.77) *	0.34(0.09,1.32)	0.58(0.18,1.86)

*P< 0.05

DISCUSSION

The study found that about 38.1% of the respondents were employed in different governmental and non-governmental organizations. This is consistent with the national survey report 40% of urban women (10-12).

The overall result showed that the prevalence of malnutrition was 29.9%, 18.4% and 29.9% for underweight, stunting and wasting, respectively. However, the prevalence of underweight and stunting were lower than the reported prevalence in the national survey of SNNPR in which they were 34.7% and 51.6%, respectively, while the prevalence of wasting was higher than the SNNPR report of 6.5% (12–14).

The study also showed that 90.8% and 82.6% of the children of employed and unemployed mothers, respectively, were breastfed. The percentages in both groups were lower than the national report of 96.6% (5,12,15,16). Regarding complementary feeding practice, the majority, 66.7% (62.7 unemployed and 37.2 employed), mothers was started complementary feeding for their children of 6 months of age. This result is higher than the study done in Addis Ababa in which it was 21.8% (13), but high percent of employed women was started complementary feeding as early as the recommended age compared with their unemployed counterparts.

This study revealed that the overall nutritional status of children of employed mothers showed insignificant difference from that of children of unemployed mothers. The same insignificant association was reported in Ethiopia. Likewise, another studies reported no significant association between stunting and employment status of mothers (4,17). This may be explained due to similarity of caregiver during maternal leave for those employed mothers, and/or babies may get the same care by other individuals than by their mothers.

Maternal education proved to be the most important predictor of chronic malnutrition. The possible explanation could be that the knowledge and understanding of mothers have on child nutrition and feeding practices were likely to have a positive impact on their children nutritional status. Proper education of mothers, in addition to improving their children's feeding practices, will enable them to recognize signs of malnutrition and increase health care seeking behaviors. A similar finding was also reported in a study done in Bangladesh (11).

In this study, household wealth was significantly associated with chronic malnutrition (stunting) of children, and in this regard, the importance of the socio-economic status of a population in determining malnutrition was evident. Thus, the result suggests that household economy could be an important factor for the nutritional status of children. This finding was also consistent with a study done elsewhere (11, 12,18,19).

The prevalence of stunting was significantly higher (22.2%) in the age group of 6-23 months compared with their older counterparts of 24-59 years of age (10.8%). This supports the fact that there is the highest prevalence of stunting in the younger children than in older children (11). Overall, this study may be subjected to recall bias on exclusive breast-feeding, initiation of complementary feeding and initiation of breast-feeding.

In conclusion, the overall nutritional (anthropometric) status of children of employed mothers and unemployed mothers were compared. Nevertheless, the difference was not statistically significant. Overall, a high prevalence of stunting was so observed that it is a public health concern in the study area. Stunting is significantly influenced by mothers' education, household wealth and child age. Thus, nutritional intervention initiatives should focus on improving household food security and support maternal income generation as well as education. Further research work on the indifference between employed and unemployed mothers on under-five nutrition status is also recommended.

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