Comparative Study on Nutritional Status of under Five Children with Employment Status of Mothers in Adama Town, Central Ethiopia

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Abstract

Background: As of many developing countries malnutrition is one of the most important health and welfare problems among infants and young children in Ethiopia. Inadequate and/or inappropriate dietary intake and infectious diseases are the immediate/direct causes which in turn are related to a number of socio-economic, demographic, child-care, and environmental factors among these factors one is women's employment which has both negative and positive effects on nutritional status of children.

Objectives: To determine the effect of maternal employment status on nutritional status of 6-59 month-old children in Adama town

Methods: Community-based comparative cross-sectional study design with a multistage sampling technique was used to draw a sample of 319 non-employed mothers and 319 employed mothers. A total of 638 study participants were included and interviewed using a structured, pre tested questionnaire. Anthropometric measurements were taken using standard procedures and appropriate quality control measures. Height/length and weight of children was converted to Z-score of height for age, weight for height and weight for age by using WHO anthro software, the z-score indices were calculated using WHO 2007 growth reference. The data were entered using Epi Data version 3.5.1 and analyzed using SPSS version 16.

Result: The prevalence of stunting, underweight and wasting was found to be 33.8%, 12.6% and 8.3% respectively. The result of this study showed that the overall nutritional status of children of employed mothers is significantly better than that of children of non-employed mothers, with AOR (95%CI) for stunting 3.12 (1.42,6.83), underweight 3.06 (1.61,5.83) and wasting 3.12 (1.42,6.83).

Conclusion and recommendation: The result of this study showed that there was statistically significant difference in child nutritional status among children of employed and non-employed mothers. Concerted efforts should be made to greatly decrease the number of malnourished children, by educating and motivating the public, empowering women through education and other affirmative action.

Keywords: Nutritional status; Employment; Unemployment

Introduction

Adequate nutrition is essential in early childhood to ensure healthy growth, proper organ formation and function, a strong immune system, and neurological and cognitive development. Economic growth and human development require well-nourished populations who can learn new skills, think critically and contribute to their communities [1].

Malnutrition remains among the most devastating problems currently being faced by the majority of the world's poor. As of many developing countries malnutrition is one of the most important health and welfare problems among infants and young children in Ethiopia studies showed that is a result of both inadequate food intake and illness. Inadequate food intake is a consequence of insufficient food available at the household level, or improper feeding practices, or both [2,3].

Traditionally, a woman's place has been her home and a generation ago, her employment outside her home was looked down by the society. This situation has now changed and women have started seeking employment outside their homes, these entering the work field have both negative and positive effects, the one is that it increases the family income and it may give the women some economic independence and status in the society. It however also increases her work load and cuts into the time that she has to spend with her children [4-6].

It is estimated that more than one-third of under-five deaths are attributable to under nutrition every hour of every day, 300 children die because of malnutrition and is an underlying cause of more than 2.6 million child deaths every year, a third of the global total of child deaths, globally, one quarter of under-five children are stunted in developing countries this figure is as high as one in three. Sub-Saharan Africa and South Asia have particularly high prevalence, at almost 40% and 39%, respectively. The prevalence rate of stunting and underweight among Ethiopian children is one of the highest in the world which is 44.4%, and 28.7% respectively even higher than the average prevalence rate for Sub Saharan African countries [1,7,8].

In today's world, there is a need for women to enter the work place due to various reasons; financial needs, self-actualization, etc. Globally 48% of women above the age of 15 years are in the labor force.

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Women's participation in the work force in developing countries has been increasing steadily over the last several decades, In Ethiopia, the proportion of women currently employed rises from 27% in 2005 to 38% in 2010 [9,10].

Activities carried out by women such as breast feeding, preparing food, and seeking preventative and curative medical care are crucial for children's healthy development, women also play an important roles as generators of family income, whether in household farms or businesses or as wage employees. This inevitable change, women entering the work field have an effect on the child care and development [5].

The overall effect of maternal employment on children's dietary patterns and diet quality is hard to predict. Although some aspects of diet quality related to income might be improved other aspects related to the caregiver's time availability might be worsened, greater use of prepared foods, diet patterns such as skipping meals and frequency of meals and snacks could also be either improved or worsened, because of increased financial resources on the one hand and reduced supervision on the other [11].

The fact that women have dual responsibilities placed on them; to provide care and to provide income, justifies a particular focus on the relation of maternal employment to child nutritional outcomes. So, there is an argument that income earned by mother or maternal employment has a direct effect on childcare, nutritional status of children and the mother themselves. Such argument, however, has not been substantiated by studies from developing countries [6].

Therefore, it is important to assess the nutritional status of children is affected more by the time constraints of women who perform the dual role of a mother, or by the increased income generated by the mother's employment.

Methods and Materials

Study area and period

The study was done in Adama town central Ethiopia, 99 km southeast of Addis Ababa. The town has a total population of 287,437 (2004EC) of which 142,233 (49.5%) males and 145,204 (50.5) females. The area of the town is 29.86 square kilometers, with a population density of 7,374.82; all are urban inhabitants, there are of 60,174 households' in this city and an average of 3.66 persons per household, 59,431 housing units and 47,140 under five children. There are governmental health facilities (1 hospital, 4 health centers) non-governmental health facilities (3 hospitals, 1 health center, 48 clinics). There are also 61 drug stores 28 pharmacies. Data were collected from February 25-March 25 /2013.

Study design

Community-based comparative cross-sectional study design was used.

Source population

All 6-59 month-old children of employed and unemployed mothers, residing in Adama town.

Study population

6-59 month -old children of employed and unemployed mothers, who fulfill the inclusion criteria.

Inclusion and exclusion criteria

Inclusion criteria:

➤ 6-59 month -old children residing with their mothers

Exclusion criteria:

➤ A child whose mother died or a child and mother live separately

Sample size and sampling procedures

Sample size calculation: The sample size was determined by using Epi Info- statistical software version 3.5.1 using two population proportion formula and the following assumptions:

- Confidence level=95%
- Power (1-β): 80%
- Design effect=2
- Ratio=1:1
- Odds ratio=2
- P_1=46%, proportion of stunting among under five children of unemployed mothers [12].
- P_2=63%, estimated proportion of stunting among under five children of employed mothers.

Considering 10%possible non response rate, 319 unemployed and 319 employed mothers were included.

Sampling procedures: By using multi stage sampling techniques, from the total 14 kebeles in the town four kebeles were selected randomly using simple random sampling technique. Then complete enumeration of the selected kebeles of the town were conducted before the actual data collection process, to know the total number of under five children among employed and unemployed mothers and sampling frame was prepared, finally the study participants were selected, among all mothers who fulfill the inclusion criteria from sampling frame by simple random sampling technique, using open Epi software, computer generated random number. In case of households with more than one children of age between 6-59 months, one child was selected randomly using lottery method.

Data collection tools

Data were collected using interviewer administered pre-tested structured questionnaire adapted from relevant literature modified to the local context. The instrument comprises five parts the first part assess socio-demographics and economic characteristics, followed by child characteristics such as child age, sex, birth weight, and vaccination status of the child were assessed. Part three and four addressed maternal characteristics and environmental condition finally on section five maternal work characteristics was measured.

Measurement

Weight: UNICEF seca Electronic personal Scale (seca 881U) was used to weigh the study participantplaced on a hard board over a flat surface bare foot wearing light underclothing or a diaper. It was calibrated against known weights regularly. Weight was recorded to the nearest 100 grams.

Height: Height was measured in a lying position with standard measuring board for children of age under two years (below 85 cm) and for children above two years in standing position using Seca portable stadiometer height measuring instrument (Seca 214) with precision of 0.1 cm.

MUA: MUAC was measured on left arm, half way between the olecranon and acromion process using non stretchable tap to the nearest 1 mm

Data collectors

Six data collectors who are diploma nurses and one BSc health officer were recruited for super vision. And training was given to the data collectors and supervisors for two days on how, to interview mothers, fill questionnaire and how to take anthropometrics measurements.

Data collection procedure: Interview was conducted with mother of the children to fill the questionnaire. Height weight and MUAC measurements were taken from the child immediately following the interview. For those mothers who are employed data collection time was arranged by considering their working time, on weekend and out of regular working time.

Data quality control: The questionnaire was prepared in simple understandable English language and translated into Amharic. The data collectors and the supervisors were trained for two days on data collection technique, particularly in the proper filling of questionnaire, and the use of the weight and height scales and how to measure. The data collection instrument was pre-tested with a 5% of sample population in adjacent kebeles to see for accuracy of responses and to estimate time needed. Modification was made on the instrument as necessary.

Weighing and height/length scale was calibrated against known weights and length test scales regularly In order to minimize intra observer errors two measurements of height and weight for each child was registered by single observer, and the third measurement was considered for those cases where the difference between the two measurement was greater than 0.5 cm or 0.1 kg. The data collection process was closely monitored by supervisors and the principal investigator. The completeness and consistency of the data was checked before the study participant leaves. Extreme values of z-score, >5 or <-5 were excluded from the analysis.

Data processing and analysis

The height/length and weight of children were converted to Z-score of height for age, weight for height and weight forage by using WHO anthro software. Data were entered using EPi-data version 3.5.1 and analysis was done using SPSS version 16.0. Descriptive statistics were computed for all variables according to type. Frequency, mean and standard deviation was produced for continuous variables while categorical variables were assessed by computing frequencies and proportions. Bivariate analysis was done to see the association between independent and outcome variables. Multiple logistic regression was used for the final model variable that shows significant effect at p value <0.25 to control the effect of confounding variables. Comparisons between employed and non-employed mothers' children nutritional status and the proportion of malnutrition were assessed using chi square test. Reliability test was performed to be involved in measuring the wealth of the households and Chronbach's alpha was calculated to be 0.79. The tertile (poor, middle and rich) were generated using (PCA) statistical technique.

Ethical considerations

Ethical clearance was obtained from health research and post graduate, college of public health and medical science, of Jimma University. Verbal consent was obtained from each study participant. Prior to the study, each participant was fully informed about the nature of the study, the research objectives, All the information collected from the study participants is handled confidentially through omitting their personal identification, conducting the interview in private place. Participants were also informed about their rights to respond or not to respond for the questions. All data collected are kept confidential and used for the study purpose only. Study participants were assured whether there is no potential risk related to measurement or data collection.

Results

Socio, demographic and economic characteristics

A total of 638 mothers with under five children sampled for the study, the overall response rate was 634 (99.4%),

The age of respondents ranged from 16-50 years, the mean (SD) ages of the respondents were 28.5(5.5) years. Concerning marital status majority of the respondents 462 (72.9%) were married in union and 61 (9.6%) were married and lives separately, the rest 44 (6.9%), 41 (6.5%) and 26 (4.1%) were widowed, divorced and single, respectively

Majority of the respondent were Orthodox for both employed and non-employed groups 322 (50.8%) followed by Muslim 204(32.2%). Regarding to educational status, higher number of illiterates among non-employed groups 86 (27%) whereas 40 (12.7%), for employed mothers and nearly half had attended at least primary school 162 (49.8%) from non-employed and 161 (50.2%), from employed mothers. Among mothers who attended college and above majority were employed mothers 46 (14.6%) and 18 (5.7%) were from the non-employed groups. By ethnic composition Oromo and Amhara comprises 218 (34.4%) and 180 (28.4%) respectively, followed by Gurage 164(25.9%), Tigre 30 (4.5%) and 42 (6.6%) others (Table 1).

Maternal characteristics

The overall mean (± SD) of age for the index children's mothers was 28.6 ± 6.1 years (29.2 ± 6.1 for the employed and 27.92 ± 6.1 for the unemployed). Maternal age, though not statistically significant, was inversely related to child stunting; as maternal age increases above 18 years, child stunting conditions decreases similarly, the mean number of children born to these mothers were 1.27 ± 1.4. Total numbers of children per household has no statistical association with child stunting or wasting. A large proportion 423 (66.4%) of the mothers [241 (72.8%) of the employed and 182 (59.5%) of the unemployed] (P<0.05) have claimed that they have consumed extra food during pregnancy or lactation. Accordingly, it was learned that consumption of additional supplementary food during pregnancy for mothers had no statistically significant association with both wasting and stunting.

Regarding services utilization during pregnancy, 584 (92.1%) of the mothers have reported visiting antenatal care services at health facilities in the town, From the total 584 (92%) mothers who reported utilization of ANC services, majority 342 (54.9%) reported a complete (at least four times or more) antenatal care visit during their last pregnancy. The least number 45 (7.4%) of visits was reported for at least two or more visits and some 113 (17.7% 0 of the mothers reported a single ANC visit during their last pregnancy. On a bivariate analyses, it was possible to learn that as the number of ANC visit increases from one to four or more, though not statistically significant, the prevalence of stunting (not wasting) steadily deceases [OR (95%CI)=1.31 (0.61, 2.85), 0.98 (0.54, 1.79) and 0.95 (0.44, 1.09)], respectively.

Pertaining to hand washing practices of respondents, majority 415 (65.5%) of the mothers (192 (61.3%) of the employed and 223 (69.5% of the non-employed) reported washing of their hands after toilet. Only 6

Variables		Employment status		p-Values
		Employed n (%)	Unemployed n (%)	
Religion N=613	Orthodox Christian	168 (52.2)	154 (47.8)	0.019
	Muslim	88 (43.1)	116 (56.9)	
	Protestant	42 (13.3)	43 (13.5)	
	Catholic	15 (49.4)	4 (51.6)	
Ethnicity	Oromo	100 (45.9)	118 (54.1)	0.025
	Amhara	99 (55.0)	81 (45.0)	
	Gurage	75 (45.7)	89 (54.3)	
	Tigre	22 (47.6)	8 (52.4)	
Family size	1-3	91 (48.4)	97 (51.6)	0.298
	4-6	219 (51.2)	209 (48.8)	
	7-10	6 (49.8)	12 (50.2)	
Marital status of the mother	Married & live together	199 (43.2)	262 (46.8)	0.000
	Married but separated	49 (80.3)	12 (19.7)	
	Divorced	20 (44.3)	25 (45.7)	
	Widowed	32 (78.0)	9 (22.0)	
	Never married	16 (61.5)	10 (38.5)	
Mother's educational status	Illiterate	40 (31.7)	86 (68.3)	0.000
	Grade 1-8	161 (49.8)	162 (50.2)	
	Grade9-12	69 (57.0)	52 (43.0)	
	College and above	46 (71.9)	18 (28.1)	
Household wealth score	Low	96 (43.8)	123 (56.2)	0.056
	Medium	99 (50.5)	97 (49.5)	
	High	121 (55.3)	98 (44.7)	

Table 1: Summary of socio demographic characteristics of employed and non-employed mothers of under five children in Adama town.

Maternal characteristics	Employed No (%)	Unemployed No (%)	p-Values	P-Value
Mothers who consumed extra food During pregnancy				0.001
Yes	232 (55)	190 (45)	0.001	
No	84(39.6)	128 (61.4)		
Health status of the mother during their last pregnancy				
Good	283 (49.5)	289 (50.5)	0.24	0.24
Not good (sick)	33 (50.2)	29 (49.8)		
Mothers who had ANC visit				
Yes	293 (50.1)	292 (49.9)	0.90	0.90
No	23(46.9)	26 (43.1)		
Number of ANC visits during the last pregnancy				
Once	65 (57.5)	48 (42.5)		
Twice	26 (55.3)	21 (44.7)	0.210	
Three times	42 (47.7)	46 (47.7)		
Four or more times	163 (47.0)	184 (53.0)		
Hand washing practices				
After toilet	199 (47.1)	218 (52.3)		
Before preparation of food	55 (45.5)	66 (54.5)	0.002	0.002
After preparing food	56 (68.3)	26 (31.7)		
All the time	6 (42.9)	8 (57.1)		
Modality of hand washing practices				
Using water only	19 (48.7)	20 (51.3)		
Seldom use of soap	184 (47.7)	202 (52.3)	0.166	0.166
Use of soap always	113 (54.1)	96 (45.9)		

Table 2: Characteristics of Mothers of 6-59 month old Children in Adama town, Oromia Region, Ethiopia - April, 2013.

(1.9%) of the employed and 8 (2.5%) of the unemployed ones reported to wash their hands all the times required to do so. Condition of hand washing practices is not also associated with child stunting as well as wasting (P>0.05).

The main modalities to wash hands reported by 385 (60.7%) of the mothers was seldom use of soap with water; only 211 (33.5%) of the mothers reported use of soap with water always when they are done it, the rest 38(6%) reported to wash their hands simply by the use of water alone. In the same manner, none of the above hand washing practices were associated with child wasting; nevertheless, those who practice frequent use of soap and water to wash hands have a 50% reduction in child stunting [OR (95%CI)=0.51 (0.22, 0.98) (Table 2).

Factors influencing nutritional status of children

Stunting: Stunting was found to be strongly associated with maternal education, marital status and maternal employment Children of mothers who attended college and above were less likely to be stunted [AOR (95% CI) 0.37(0.18,0.77)] compared to children of illiterate women. Regarding marital status the odds of a child being stunted was 6.2 times as much in single mothers compared to those children of

married and live together [AOR (95% CI) 6.20(2.10, 18.3)] concerning employment status children of unemployed mothers are more likely to be stunted compared to children of employed mothers [AOR (95% CI) 1.59(1.08, 2.33)]. Whereas no statistically significant difference was seen with regard to other socio demographic variables (Tables 3 and 4).

Wasting: Wasting appeared to be influenced more by maternal employment status, in which the odds of a child being wasted was 3.1 times as much in unemployed mothers compared to those children of employed mothers [OR (95% CI) 3.12 (1.42,6.83)]. Other variables

were not associated with wasting among study children (Tables 5 and 6).

Under weight: Underweight was found to be strongly associated with maternal education and maternal employment like stunting, Increasing level of maternal education is a protective factor against under-weight, Children maternal education children of who attended college level education and above are less likely to be wasted compared children of unemployed mothers [OR (95% CI) 0.33 (0.11, 1.17)]. Regarding maternal employment status the odds of a child being underweight was 3 times as much in unemployed mothers compared to

Variables	Nutritional status		Crude OR (95% CI)	Adjusted OR (95% CI)
	Stunted (<-2SD)	Not stunted (>-2SD)		
Employment status*				
Employed	88(54.3)	226(45.7)	1	1
Unemployed	124(39.5)	190(60.5)	1.65(1.18,2.30)	1.59(1.08,2.33)
Marital status*				
Married & live together	149(32.7)	307(67.3)	1	1
Never married	19(73.1)	7(26.9)	5.56(2.30,13.60)	6.20(2.10,18.3)
Maternal education**				
Illiterate	66(52.4)	60(47.6)	1	1
Grade1-8	96(30.1)	223(69.9)	0.39 (0.26,0.60)	0.46(0.29,0.74)
Grade9-12	33(27.7)	86(72.3)	0.35(0.20,0.59)	0.42(0.23,0.76)
College +	17(26.6)	47(73.4)	0.33(0.17,0.63)	0.37(0.18,0.77)
Maternal age				
<24	40(38.1)	65(61.9)	1	1
24-29	135(50.4)	133(49.6)	0.98(0.60,1.60)	1.07(0.64,1.78)
30-34	89(52.0)	82(48.0)	1.17(0.70,1.97)	1.37(0.79,2.36)
≥35	52(59.1)	36(40.9)	1.52(0.84,2.75)	1.78(0.94,3.35)
Household wealth				
Low	80(37.7)	136(63.0)	1	1
Medium	58(27.4)	136(70.1)	0.72(0.48,1.10)	0.87(0.56,1.38)
High	74(33.9)	144(66.1)	0.87(0.59,1.29)	0.98(0.63,1.52)

N.B* p value <0.05

Table 3: Association of child and maternal related variable with child stunting in Adama town central Ethiopia 2013.

Variables	Employment status							
	Employed				Unemployed			
	Stunted	Not stunted	Crude OR (95% CI)	Adjusted OR (95%CI)	stunted	Not stunted	Crude OR (95%CI)	Adjusted OR (95%CI)
Household wealth								
low	29 (30.9)	65 (69.1)	1		51 (41.8)	71 (58.2)	1	
medium	21 (21.2)	78 (78.8)	0.60 (0.31,1.16)		37 (38.9)	58 (61.1)	0.89 (0.51,1.53)	
high	38 (31.4)	83 (68.6)	1.03 (0.57,1.84)		36 (37.1)	61 (62.9)	0.82 (0.47,1.42)	
Marital status*								
Married & live together	54 (27.4)	143 (72.6)	1	1	95 (36.7)	164 (63.3)	1	
Never married	11 (68.8)	5 (31.2)	5.83 (1.93,17.5)	5.50 (1.70,18.46)	8 (80)	2 (20)	6.90 (1.44,33.2)	
Mothers education*								
Illiterate	15 (37.5)	25 (62.5)	1		51 (59.3)	35 (40.7)	1	1
G 1-8	47 (29.4)	113 (70.6)	0.69 (0.34,1.43)		49 (30.8)	110 (69.2)	0.31 (0.18,0.53)	0.33 (0.18,0.58)
G 9-12	17 (25)	51 (75)	0.56 (0.24,1.29)		16 (31.4)	35 (68.6)	0.31 (0.15,0.65)	0.31 (0.14,0.68)
College+	9 (19.6)	37 (80.4)	0.40 (0.15,1.07)		8 (31.4)	10 (68.6)	0.55 (0.20,1.53)	0.53 (0.18,1.53)
Mothers age								
15-35	71 (27.0)	192 (73.0)	1		105 (37.9)	172 (62.1)	1	
≥35	17 (33.3)	34 (66.7)	1.35 (0.71,2.57)		19 (52.8)	17 (47.2)	1.83 (0.91,3.68)	
child's sex								
Male	40 (27)	108 (73)	1		70 (44)	89 (56)	1	
Female	48 (28.9)	118 (71.1)	1.10 (0.67,1.80)		54 (34)	101 (65.2)	0.68 (0.43,1.07)	
Child's age in month								
23-Jun	20 (28.2)	51 (71.8)	1		38 (34.5)	72 (65.5)	1	
24-59	65 (27.4)	172 (72.6)	0.96 (0.53,1.74)		85 (42.5)	115 (57.5)	1.4 (0.86,2.27)	

N.B : *p value < 0.05

Table 4: Comparison of stunting with child and maternal related variables of employed and non-employed mothers in Adama town central Ethiopia April 2013.

Variables	Nutritional status		Crude OR (95% CI)	Adjusted OR (95% CI)
	Wasted (<-2SD)	Not wasted (>-2SD)		
Employment status				
Employed*	15 (5.4)	263 (94.6)	1	1
Non employed	38 (13.4)	246 (86.6)	2.71 (1.45,5.05)	3.12 (1.42,6.83)
Marital status				
Married & live together	34 (8.4)	371 (91.6)	1	1
Single	3 (12.0)	22 (88.0)	1.49 (0.42,5.23)	1.26 (0.31,5.09)
Maternal education*				
Illiterate	21 (18.3)	94 (81.7)	1	1
Grade1-8	17 (6.3)	268 (93.7)	0.30 (0.15,0.59)	0.39 (0.18,0.82)
Grade9-12	10 (9.3)	98 (90.7)	0.46 (0.20,1.02)	0.46 (0.17,1.25)
College+	5 (7.5)	49 (92.5)	0.36 (0.12,0.12)	0.21 (0.21,2.45)
Maternal age				
<24	10 (10.4)	84 (89.6)	1	1
25-29	20 (8.4)	218 (91.6)	0.77 (0.35,1.71)	0.09 (0.54,2.05)
30-34	15 (9.8)	138 (90.2)	0.91 (0.39,2.12)	1.07 (0.44,2.50)
≥35	8 (10.7)	67 (89.3)	1.00 (0.37,2.68)	1.17 (0..41,3.34)

N.B* p value <0.05

Table 5: Association of child and maternal related variable with child wasting in Adama town central Ethiopia 2013.

Variables	Employment status							
	Employed				Unemployed			
	Wasted	Not wasted	Crude OR (95%CI)	Adjusted OR (95%CI)	Wasted	Not wasted	Crude OR (95%CI)	Adjusted OR (95%CI)
House hold wealth								
low	3 (3.5)	83 (96.5)	1		13 (12.1)	94 (87.9)	1	
medium	3 (3.6)	81 (96.4)	1.02 (0.20,5.23)		15 (16.7)	75 (83.3)	1.45 (0.65,3.23)	
high	9 (8.3)	99 (91.7)	1.51 (0.66,9.59)		10 (11.5)	77 (88.5)	0.94 (0.39,2.26)	
Marital status								
Married & live together	8 (4.7)	162 (95.3)	1		26 (11.1)	209 (88.9)	1	
Never married	1 (6.2)	15 (93.8)	1.35 (0.16,11.5)		2 (22.2)	7 (77.8)	2.30 (0.45,11.6)	
Mothers education*								
Illiterate	3 (8.1)	34 (91.9)	1		18 (23.1)	60 (76.9)	1	1
College+	7 (5.0)	134 (95.0)	0.59 (0.14,2.41)		11 (7.6)	134 (92.4)	0.27 (0.12,0.61)	0.27 (0.11,0.64)
Mothers age								
15-35	13 (5.5)	223 (94.5)	1		32 (12.8)	218 (87.2)	1	
≥35	2 (4.8)	40 (95.2)	0.85 (0.19,3.95)		6 (18.2)	27 (81.8)	1.51 (0.58,3.95)	
Child's age								
23-Jun	2 (3.1)	63 (96.9)	1		12 (12.0)	88 (88.0)	1	
24-5	12 (5.8)	196 (94.2)	1.93 (0.42,8.85)		26 (14.4)	154 (85.6)	1.24 (0.59,2.57)	

N.B :*p value < 0.05

Table 6: Comparison of wasting with child and maternal related variables of employed and non-employed mothers in Adama town central Ethiopia April 2013.

those children of employed mothers [or (95% CI) 3.06 (1.61,5.83)]. It's association with regard to other relevant socio demographic variables was not statistically significant (Table 7).

Discussion

The overall child malnutrition (stunting, underweight and wasting) among children of employed and unemployed mothers was found to be 33.8%, 12.6% and 8.3%, respectively. This finding is also very close and consistent with the national EDHS 2011 survey results and so many other studies conducted in Sub-Saharan Africa region [9].

The results of this study showed that high prevalence of stunting, underweight, and wasting were observed among children of unemployed mothers. Accordingly, children born to unemployed mothers had added risk of becoming stunted than those mothers who were employed. This finding is consistent with the finding of a study conducted in Vietnam which reports that the prevalence of

underweight, stunting and wasting among children who had a mother who was a farmer or a housewife was higher than that of children who had a mother who was an office worker. This association can be explained by maternal employment increases economic gain of a mother that has a positive impact on children's dietary intake and anthropometry whereas children born to unemployed mothers might have had inadequate access to good nutrition over a long period of time as they may lack the economic means to purchase adequate food for the family than those mothers who are employed [13-17].

Among the socio demographic variables, the nutritional status of children's (stunting, wasting and underweight) found to be influenced by mothers' educational level, this finding is consistent with EDHS 2011 and other studies which show inverse relation of maternal education and child stunting possible explanation could be educated mothers are more conscious about their child's health and they tend to look after their children in a better way, more aware of the health services

Variables	Under weight		Crude OR (95% CI)	Adjusted OR (95% CI)
	Under weight (<-2SD)	Not under weight (>-2SD)		
Employment status*				
Employed	19 (6.3)	284 (93.7)	1	1
Unemployed	50 (16.4)	255 (83.6)	2.93 (1.68,5.10)	3.06 (1.61,5.83)
Marital status*				
Married & live together	45 (10.2)	397 (89.8)	1	1
single	8 (32.0)	17 (68.0)	4.15 (1.70,10.16)	3.81 (1.32,11.02)
Maternal education*				
illiterate	32 (26.0)	91 (74)	1	1
Grade8-12	23 (7.4)	286 (92.6)	0.23 (0.13,0.41)	0.30 (0.15,0.57)
Grade9-12	10 (8.6)	106 (91.4)	0.27 (0.12,0.58)	0.34 (0.15,0.78)
College+	4 (6.7)	56 (93.3)	0.20 (0.07,0.6)	0.33 (0.11,1.17)
Maternal age				
<24	14 (14.0)	86 (86.0)	1	1
25-29	31 (12.2)	224 (87.8)	0.85 (0.431.67)	0.94 (0.453,1.67)
30-34	16 (9.6)	150 (90.4)	0.65 (0.30,1.41)	0.65 (0.30,1.41)
≥35	8 (9.4)	77 (90.6)	0.64 (0.25,1.60)	0.64 (0.25,1.60)

N.B* p value <0.05

Table 7: Association of child and maternal related variable with child under weight, in Adama town central Ethiopia 2013.

available and also the acceptance to utilize the same is better among them. Literate mothers can easily introduce new feeding practices scientifically [16,18-20].

This study revealed that the risk of a child being stunted, wasted and underweight was higher among children of single mothers compared to those children of married and live together. This finding is consistent with the findings of a study conducted in Addis which shows children of married women were less likely to be stunted and wasted compared to children of single mothers [14].

According to the finding of this survey, prevalence of stunting was found to be high among males and age group 24-36 months were affected more by stunting from the other age groups, as the age increases stunting was also found to be increase and started to decrease at the age of 49-59 months in both groups of children, similarly EDHS 2011 indicated that male children are slightly more likely to be stunted and highest prevalence of chronic malnutrition found in children age 24-35 months as ref. [9]. Others socio demographic variables like, household wealth and family size, had no influence on nutritional status of children (stunting, wasting and underweight) in the study area. This finding was not consistent with the results obtained in a study done in other parts of Ethiopia [9].

In this study, all maternal characteristics except for maternal employment, maternal education and marital status left insignificant for an association with child nutritional status. Though not statistically significant, maternal age was inversely related to rate of child stunting; as maternal age increases above 18 years, child stunting conditions decreases. Whereas it starts to increase above the age of 35. This might be also related to close care of children by those elder mothers than the youngsters for better nutrition and good health condition of the child. This finding, however, is not consistent with other studies conducted in other parts of Sub-Saharan Africa region [17].

In the same way, all environmental health related characteristics investigated also failed to have a statistically significant association with any of the child nutritional status characteristics (stunting, wasting and underweight). This result is not consistent with the EDHS 2011 and other studies too [2,9,16,18].

Conclusion

The result of this study showed that the overall nutritional status of children of employed mothers is significantly better than that of children of unemployed mothers. It was identified that nutritional status was strongly associated with maternal education. When the level of maternal education increases rate of stunting, wasting and underweight decreased. The study of this result showed that, socio-demographic as well as socio-economic variables except for maternal education, marital status, maternal employment and the modest association of maternal age with stunting; others have no effect on the nutritional status of children in the study area.

Child-related study characteristics including child age, birth weight, vaccination status, etc., were also not directly associated with acute as well as chronic nutritional statuses of the child.

Based on the finding of the study concerted efforts should be made to greatly decrease the proportion of malnourished children, by educating and motivating the public, empowering the women via education and other affirmative action. This is possible through strengthening the currently available sources of information, use of local radio, television as well as other media to disseminate child nutrition related information, giving particular attention for mothers with no employment opportunities.

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