WOMEN EMPOWERMENT AND UNDER-FIVE CHILDREN NUTRITION STATUS

Does women empowerment improve nutrition status among under-five children?

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Abstract

Malnutrition among children under five years is a major public health concern in most of developing countries. Many studies found that, there is a link between women empowerment and child nutrition, where only few studies have been conducted in Tanzania by using small samples. This study was conducted to access the level of malnutrition among under-five children and to analyse the association between women empowerment and child nutrition status by using Tanzania Demographic and Health Survey (TDHS) 2010 data obtained from national and regional representative samples.

Descriptive statistics was used to assess by-variety association between women empowerment indicators, maternal characteristics and children nutrition outcomes. Regression analysis was done to assess the malt-variety association between women empowerment and children nutrition status. The study found that in by-variety analysis, women empowerment indicators had no significant association with children stunting and underweight. Decision making was associated with wasting (low weight for height) which is the children long term nutrition outcome. Maternal education and wealth have emerged to be the strongest variables in influencing child stunting as they were significantly associated at ($p<0.01$). Therefore, empowering women by providing them with education can have greater impacts on other empowerment indicators and their contribution to household income and hence improved child nutrition.

Key words: Women empowerment, Stunting, Underweight, Wasting

INTRODUCTION

Malnutrition among children is one of the major public health concerns in developing countries, where it represents both a cause and a manifestation of poverty (UNICEF, 1998; Madise *et al*., 1999). Child under nutrition in developing countries is usually a consequence of poverty with its attributes of low family income, poor education, poor environment and housing and inadequate access to food, safe water, and health care services (Madise *et al*., 1999; Peña and Bacallao, 2002). The evidence of short and long-term consequences of nutritional deficiencies includes increased risk of both morbidity from infectious diseases and mortality; it reduces long-term physical development, cognitive skills, and consequently enrolment in schools and productivity in later life (Grantham-McGregor *et al*., 1995; Tarozzi and Mahajan, 2007). It reduces learning abilities in school and leads to poor work capacity in adulthood (Ricci and Becker, 1996; De Onis *et al*., 2000). On the other hand, an improved nutritional and health status enhances the learning ability of children. In the long run, it leads to increase in the strength of the labour force and thus contributes to economic growth.

Many researchers argue that Women's empowerment is closely linked to positive outcomes for families and societies (for example, Presser and Sen, 2000). This argument has been most important in child health outcome. Osman and Sen argued that, gender inequality and women's lack of empowerment is one of the most significant factors that contribute to both high prevalence of under nutrition and low birth weight. Many studies have been conducted to analyse the association between women empowerment and child health in developing countries. Majority have used data from small samples. This study has been conducted to bridge the gap by using DHS data obtained from a national representative samples in order to bring the real picture of the influence of women empowerment on child nutrition outcomes.

Women empowerment concepts

Women empowerment is a concept that capture multidimensional constructs including: control of household resources and assets, decision making capabilities, position in society, and knowledge level, among many others (Kishor 2000; Osmani and Sen 2003; Smith et al. 2003; Silverman et al. 2009). This has lead women empowerment to have many definitions with focus on agency and process (Malhotra, Schuler, and Boender 2002). Kabeer (2001, 19) defines empowerment as "the expansion in people's ability to make strategic life choices in a context

where this ability was previously denied to them." For the purpose of this study, women empowerment implies the process of enabling women to participate in decision making on issues as household large purchase, mobility and on their own health, to have positive attitude towards equal power relations with their spouses and to have ability to refuse sex when a partner is suspected to have Sexually Transmitted Infections (STIs).

Child Nutrition Concepts

Child malnutrition is indicated through the use of three anthropometric indices of nutrition status which are height-for-age, weight-for-age and weight-for-height. According to data from the Tanzania Demographic and Health Survey (TDHS) 2004/05, about 40% of children under five years of age were stunted (short for their age). This is an indicator of chronic under-nutrition, about 3% were wasted (low weight for height) this is indicator of acute under-nutrition (National Bureau of Statistics (NBS) Tanzania and ORC Macro, 2005. It was also estimated that, 22% children were underweight (low weight for age) which is a composite measure of long-and-short term under-nutrition.

Influence of Maternal Characteristics and Empowerment on Child Nutrition

Bhagowalia et al., 2012 found that mobility and decision making do not emerge as strong determinants of child nutrition, though they suggested that, the relative importance of these two factors should not be underestimated. This is because given the contextual setting, it is possible that these factors do not directly enhance the nutritional status of children but could have important effects on other child outcomes. However, the study found that stunting, a measure of nutrition outcome which is related to long-term growth, was likely to be strongly correlated with chronic stressors such as violence.

Poor growth in children was found to be associated with illiteracy, experience of maternal disharmony, younger age at marriage, and less decision making power among mothers. This is an indicator of the effect of less empowerment on child nutrition and growth in general. Previous studies on child health in developing countries found that health indicators such as nutrition and mortality are generally better in urban areas than in rural areas. For example; (Sahn and Stifel, 2003; Fosto, 2006, 2007; Smith et al., 2005, Mussa, 2011) found that, urban children are better nourished and they are less likely to suffer from malnourishment than their rural counterparts. However, recent evidence from developing countries indicates a shifting pattern of poverty and

malnourishment from rural to urban areas, as the number of urban poor and undernourished is increasing more quickly than those in rural areas (Haddad *et al*., 1999; Menon *et al*., 2000).

Many studies (Castro-Martin, & Juarez 1995; Heaton, Frost, Hoffmann, & Flake, 2005; Mussa, 2011) found that, maternal education influences children's health outcomes by providing changes in individual behavior. The effect of maternal education was more seen in children's growth, development and nutritional status because mothers allocate more family resources to increase children's nutrition than fathers (Gloyd, & Ramirez, 2001). According to Smith and Haddad, 1999 the increase in women's education is one indicator of women's empowerment that has contributed to reduction of more than 50 percent in the prevalence of underweight. Mother's schooling was among factors that emerge consistently as strong determinant of long-term child nutrition and diet diversity (Behrman et al. 2009 & Bhagowalia et al. 2012).

Maternal education is very important as it increases their chances of being employed that may help to increase the total household income (Ebot, 2010). According to Research on Poverty Alleviation (REPOA), 2004, children of mothers with secondary education were less likely to be stunted but the difference in child's nutrition between mothers with no education and children of mothers with primary education was not significant.

Poverty has affected the quality of life of the urban poor, and children are more vulnerable in terms of health and nutritional status. The large consequences of urban poverty on children have been well documented (for example in Brockerhoff and Bernan, 1998; Harpham *et al*., 1998; UNICEF, 2002). It has been observed that large health disparities between the children of more affluent and less affluent city residents exist in terms of proper nutrition and vitamin intake. On the other hand, income has indicated the complex relationship between income and nutrition within and among households and nationality. Despite of the fact that income can indicate food accessibility and the purchasing power for food with regard to the market price and hence food security, some studies for example; Kilama, Mkenda, 2004, Aldeman et al, 2005 and Leach, Valerie & Blandina, 2009 found that increasing income account only part of the decrease in malnutrition rates.

Data and Methods

The source of data of this study was the 2010 Tanzania Demographic and Health Survey (TDHS). The survey was the fifth in series of DHS surveys conducted in Tanzania since 1991to 1992. These are nationally and regionally representative surveys which involve scientifically selected samples of households. Individual women of reproductive age (15-49) years are interviewed in face-to-face interviews on their background characteristics, fertility levels and desires, contraceptives use, as well as the use of maternal and child health services. These data are found in the women's file records. Data on children nutrition status were obtained through anthropometry, where they are recorded in households' files records. Therefore, in order to tress the nutrition status of children and their association to women empowerment, those two files were merged.

The study used a sample of 1604 women basing on the criteria of being the mother or guardian of under-five child(ren) who suffered at least one of the poor nutrition outcome (i.e stunt, underweight and waste) in twelve months preceding the survey.

The association between women empowerment indicators and child nutrition outcomes was tested through logistic regression where four models were constructed for each child nutrition outcome as follows;

$$\text{Stunting} = \beta_0 + \beta_1(\text{Decision Making}) + \beta_2(\text{Place of Residence}) + \beta_3(\text{Mothers education}) + \beta_4(\text{Mothers Occupation}) + \beta_5(\text{Wealth index})$$

$$\text{Stunting} = \beta_0 + \beta_1(\text{Attitude towards wife beating}) + \beta_2(\text{Place of Residence}) + \beta_3(\text{Mothers education}) + \beta_4(\text{Mothers Occupation}) + \beta_5(\text{Wealth index})$$

$$\text{Stunting} = \beta_0 + \beta_1(\text{Attitude towards refuse sex}) + \beta_2(\text{Place of Residence}) + \beta_3(\text{Mothers education}) + \beta_4(\text{Mothers Occupation}) + \beta_5(\text{Wealth index})$$

$$\text{Stunting} = \beta_0 + \beta_1(\text{Decision Making}) + \beta_2(\text{Attitude towards wife beating}) + \beta_3(\text{Attitude towards refusing sex}) + \beta_4(\text{Place of Residence}) + \beta_5(\text{Mothers education}) + \beta_6(\text{Mothers Occupation}) + \beta_7(\text{Wealth index})$$

$$\text{Underweight} = \beta_0 + \beta_1(\text{Decision Making}) + \beta_2(\text{Place of Residence}) + \beta_3(\text{Mothers education}) + \beta_4(\text{Mothers Occupation}) + \beta_5(\text{Wealth index})$$

Underweight = $\beta_0 + \beta_1$(Attitude towards wife beating) + β_2(Place of Residence) + β_3(Mothers education)+ β_4(Mothers Occupation)+ β_5(Wealth index)

Underweight = $\beta_0 + \beta_1$(Attitude towards refuse sex) + β_2(Place of Residence) + β_3(Mothers education)+ β_4(Mothers Occupation)+ β_5(Wealth index)

Underweight = $\beta_0 + \beta_1$(Decision Making) + β_2(Attitude towards wife beating) + β_3(Attitude towards refusing sex) + β_4(Place of Residence) + β_5(Mothers education) + β_6(Mothers Occupation) + β_7(Wealth index)

Wasting = $\beta_0 + \beta_1$(Decision Making) + β_2(Place of Residence) + β_3(Mothers education)+ β_4(Mothers Occupation)+ β_5(Wealth index)

Wasting = $\beta_0 + \beta_1$(Attitude towards wife beating) + β_2(Place of Residence) + β_3(Mothers education)+ β_4(Mothers Occupation)+ β_5(Wealth index)

wasting = $\beta_0 + \beta_1$(Attitude towards refuse sex) + β_2(Place of Residence) + β_3(Mothers education)+ β_4(Mothers Occupation)+ β_5(Wealth index)

Wasting = $\beta_0 + \beta_1$(Decision Making) + β_2(Attitude towards wife beating) + β_3(Attitude towards refusing sex) + β_4(Place of Residence) + β_5(Mothers education) + β_6(Mothers Occupation) + β_7(Wealth index)

Results and Discussion

Socio-Economic Characteristics of Respondents

Results in Table 1 indicate that, the majority 60% of respondents were living in countryside. More than half 73% had primary education and 52 were engaged in agriculture activities.

Table 1: Socio-economic Characteristics of Respondents

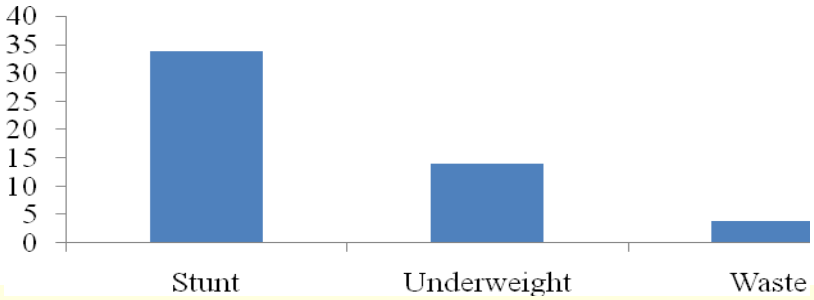
Characteristics	Frequency	Percentages
Place of Residence		
Capital	222	13.8
Small Capital	148	9.2

Town	167	16.7
Countryside	967	60.3
Education		
Non-formal Education	246	15.3
Primary	1174	73.2
Secondary and above	184	11.5
Occupation		
Not-Working	270	16.8
Non-Agriculture	507	31.6
Agriculture	827	51.6
Wealth Indicators		
Poor	616	38.4
Middle	479	29.9
Rich	509	31.7
Total	**1604**	**100.00**

Children Characteristics and Children Nutrition Outcomes

Majority of children were stunted (short for their age) (37%) followed by underweight (low weight for their age) (14%) and lastly wasted (low weight for their height) (4%) as shown in Figure 1.

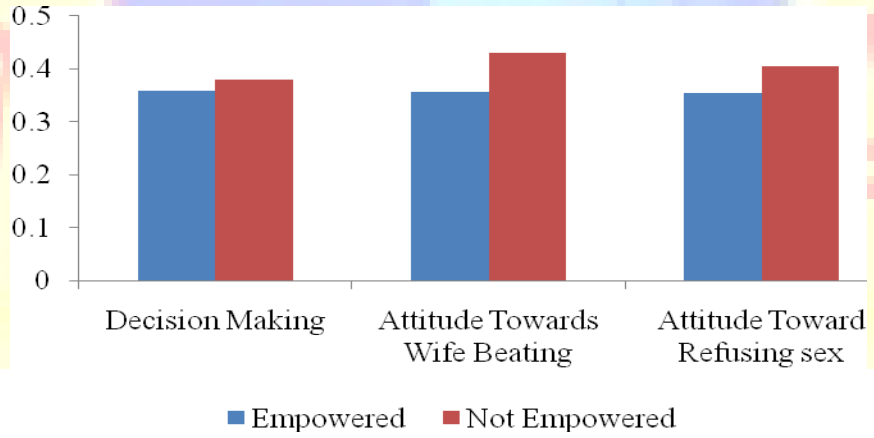
Figure 1: Children nutrition indicators for year 2010



Bi-Variety Association between Women Empowerment and Child Nutrition Status

Bi variety analysis indicates that there were no significant association between women empowerment and stunting among under-five children. However, figure 2 indicates that the proportions of children who were stunt were slightly higher for those whose mothers did not participate in decision making, had positive attitudes towards wives beating and did not agree that women can refuse having sex with their partners when they suspect them to have STIs.

Figure 2: Bi-variety association between women empowerment indictors and stunting among under-five children



The study indicates that there were significant associations between the place of residence, mother's education, and household wealth index at ($P<0.001$). All those variables seem to influence children's nutrition status due to the fact that there were high proportions of children

stunt among children who were residing in countryside, whose mothers had non-formal education, working in agriculture compared to others as shown in table 2.

Table 2: Bi-variety association between mother's socio-economic characteristics and stunting among under-five children

Residence	**Frequencies**	**Percentages**	X^2
Capital	49	22	59****
Small City	45	30.5	
Town	69	25.7	
Country Side	424	43.8	
Education			
No Education	115	46.9	50****
Primary	444	37.8	
Secondary	27	14.9	
Occupation			
Not working	88	32.6	48****
Non-Agriculture	132	26.0	
Agriculture	366	44.3	
Wealth Indices			
Poor	215	51.7	75****
Middle	117	41.9	
Rich	254	28.0	

Bi-Variety Association between Women Empowerment Indicators and Children Underweight

The results of the study indicate that, there is slightly difference in underweight among children of empowered and not empowered mothers as indicated in figure 3.

Figure 3: Bi-variety Results on the association between women empowerment indictors and underweight among under-five children

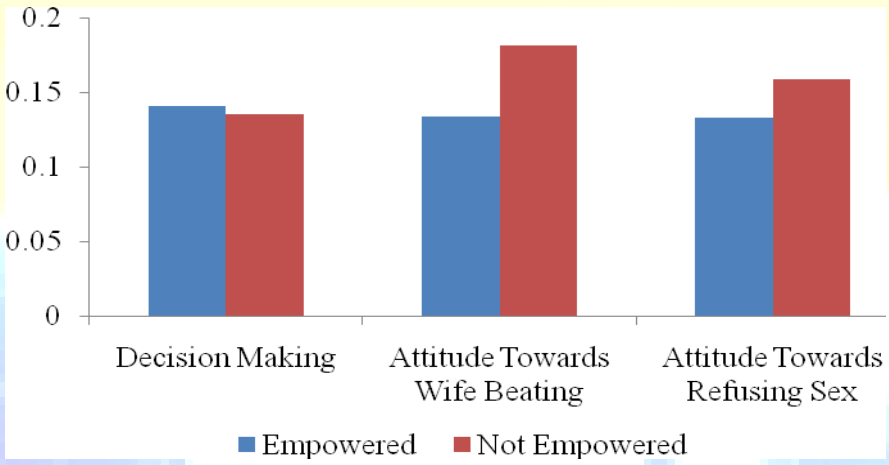


Figure 3 shows that, attitudes towards equalities among men and women are strong variables in children's underweight while, women participation in decision making seem to be weak in influencing underweight among under-five children. The study indicates in table 3 that the place of residence had no significant association with underweight among under-fives. On the other side, mother's education and occupation had significant association at ($P<0.01$). However, wealth indicators was highly significant associated ($P<0.001$) with underweight among under-five children.

Table 3: Bi-variety association between mother's socio-economic characteristics and underweight among under-five children

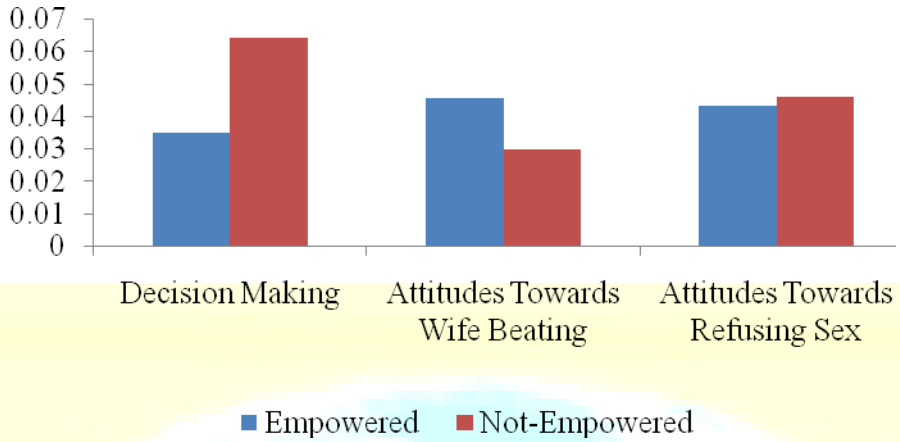
Residence	**Frequencies**	**Percentages**	**X^2**
Capital	25	11.4	15.3
Small City	19	12.7	

Town	20	7.6	
Country Side	158	16.4	
Education			
No Education	39	16.0	11.6**
Primary	172	14.7	
Secondary	11	5.9	
Occupation			
Not working	39	14.5	25.7**
Non-Agriculture	38	7.7	
Agriculture	145	17.5	
Wealth Indices			
Poor	86	20.9	27.7**
Middle	42	15.2	
Rich	93	10.3	

Association between Women Empowerment Indicators and Children Wasting

Bi-variety association between women empowerment indicators and wasting among under-fives was high for decision making compared to other indicators. This is due to the fact that, the proportion of being wasted among children whose mothers were not involved in households' decision making was higher compared to other indicators as shown in figure 4.

Figure 4: Bi-variety Association of Women Empowerment Indicators and Children Wasting



This implies that empowering women in decision making aspects can have higher influence on enhancing expenditures that are directed on child's nutrition and hence child nourishment also can influence other empowerment indicators.

Table 4: Bi-variety association between mother's socio-economic characteristics and underweight among under-five children

Residence	**Frequencies**	**Percentages**	X^2
Capital	14	6.5	15.3
Small City	10	7.1	
Town	8	3.1	
Country Side	37	3.8	
Education			
No Education	11	4.4	0.2
Primary	50	4.3	
Secondary	9	5.0	
Occupation			

Not working	25	4.1	18**
Non-Agriculture	19	3.9	
Agriculture	26	3.1	
Wealth Indices			
Poor	13	3.0	7.2*
Middle	7	2.6	
Rich	50	5.6	

Multivariate Association between Women Empowerment and Child Nutrition Status

Similar to Bhagowalia et al., 2012 the multivariate results in table 5, 6 and 7 indicate that women empowerment in terms of participation in decision making, negative attitudes towards wife beating and positive attitudes on the right of women on sexual matters have no association with stunting and underweight among their children. However, there was significant association ($p<0.05$) between women's participation in decision making and wasting among children. The odds of wasting were 47% lower for the children whose mothers/women guardians participate in decision making compared those who do not participate in household decision making.

Place of Residence and Child Nutrition

Tables 1, 2 and 3 indicate that, place of residence had no significant association with children nutrition indicators (stunting, underweight, and wasting) though there was a noticeable difference in stunting among children with respect to place of residence. The odds of stunting among children living in countryside and small city were higher than those living in capital by (73%) and (57%) respectively. This is similar to the results of studies by Sahn and Stifel, 2003; Smith *et al*., 2005; Fosto, 2006, 2007; Smith et al., 2005, Mussa, 2011. There were slight differences in the odds of being underweight among children living in small city (16%) higher than those living in capital but lower for town and countryside by (51%) and (9%) respectively. These results are not surprising as the same was found by the studies done by Haddad *et al*., 1999 and Menon *et al*., 2000. This shift can be pronounced by rapid urbanization which

increases the number of urban poor who normally suffer severe malnutrition as an outcome of absolute poverty.

Mothers Education and Child Nutrition

Multivariate results in table 5 indicate that, the odds of stunting among children were (65%) lower for children whose mothers had secondary education and above compared to non-formally educated mothers and it was highly significant ($p<0.01$) throughout model 1, 2, 3 & 4. These results are of no surprise as they tally with the findings of Behrman et al. 2009 & Bhagowalia et al., 2012 who found that mother's schooling was among the factors that emerge consistently as strong determinants of long-term child nutrition and diet. Underweight and wasting among children did not show any significant association with mother's education throughout the four models.

Occupation did not show any significant association with children's stunting and underweight throughout the models while non-agriculture occupation had significant ($p<0.05$) association with wasting among the children in all four models. The odds of stunting, underweight and wasting were lower (5%), (44%) and (59%) respectively for the children whose mothers were working in non-agriculture occupation compared to those who were not working. This result is supported by the study by Ebot, 2010 which documented the importance of maternal education in enhancing their employability which results into an increase in household income and hence food security.

Wealth Indices and Child Nutrition

Table 5 and 6 show that, wealth index had significant ($P=0.005$) and ($P<0.05$) influence on children underweight and stunting respectively. The odds of underweight and stunting were less by (43%) and (47%) respectively among children whose mothers were under rich quintile compared to their poor counterparts. Similar results were found by the studies by Bradley *et al*., 1992; Brockerhoff and Bernan, 1998; Harpham *et al*., 1998; UNICEF, 2002 who documented the consequences of urban poverty on child nutritional status.

The study shows surprising results whereby the odds of wasting for the children whose mothers were under rich quintile were (94%) higher than those whose mothers were poor. This was

different from the middle quintile where the odds of wasting for the children were less by (11%) compared to their poor counterparts.

Conclusion and Recommendation

In by-variety analysis, women empowerment indicators have not been strong variables to influence children nutrition status. Multi-variety analysis has indicated that, women participation in household's decision making is significantly associated with wasting among under-five children. This implies that, women participation in decision making has effect on long term children's nutrition status.

Maternal education has emerged to be a strong variable for child nutrition because it plays both roles of empowerment and employability among women. Moreover, maternal education increases the confidence of women to participate in household's decision making and changes their attitude towards gender equalities. Apart from acting as a change agent, it also increases women's contribution to household income which in turn reduces the risks of being food insecure in the household. There has been a shifting paten of malnutrition from countryside to large capitals due to rural to urban migration which leads to the increase of urban poor due to high costs of living. Urban poverty affects children more than other groups of migrant population in terms of lack of access to nutritious food and health care. Therefore there is a need to direct more efforts to improve urban poor women in terms of education and employability skills so as to improve their households' income and hence child's nutrition.

APPENDIX 1: Multivariate Association between Stunting amo**ng Under-fives and Women Empowerment**

	Model 1		Model 2		Model 3		Model 4	
	OR	**C.I**	**OR**	**C.I**	**OR**	**C.I**	**O.R**	**C.I**
Empowerment Indicators								
Index 1	0.98	0.72-1.34					0.99	0.72-1.35
Index 2			1.05	0.67-1.62			1.05	0.67-1.64
Index 3					1.05	0.67-1.62	0.86	0.62-1.20
Residence								
Capital	1.00							
Small City	1.57	0.83-2.96	1.57	0.83-2.96	1.57	0.83-2.97	1.58	0.84-3.00
Town	1.04	0.59-1.84	1.04	0.59-1.84	1.04	0.59-1.85	1.06	0.6-1.88
Countryside	1.73*	1.00-3.02	1.73*	1.00-3.02	1.74*	1.00-3.02	1.74*	1.00-3.03
Education								
No Education	1.00							
Primary	0.9	0.59-1.36	0.9	0.59-1.38	0.9	0.59-1.37	0.9	0.59-1.37
Secondary +	0.36***	0.19-0.66	0.36**	0.19-0.66	0.35**	0.19-0.65	0.36**	0.19-0.66
Occupation								
Not working	1.00							
Non-agriculture	0.95	0.63-1.42	0.95	0.63-1.42	0.95	0.64-1.41	0.96	0.65-1.43
Agriculture	1.03	0.70-1.52	1.03	0.70-1.52	1.03	0.71-1.49	1.05	0.71-1.54
Wealth Indicators								
Poor	1.00							
Middle	0.71	0.48-1.06	0.71	0.48-1.06	0.71	0.48-1.06	0.72	0.48-1.06
Rich	0.57**	0.38-0.84	0.57**	0.38-0.84	0.56**	0.38-0.84	0.56**	0.38-0.84
Number of Under-fives								
2 or less	1.00							
More than 2	0.79	0.37-1.67	0.79	0.37-1.67	0.79	0.37-1.70	0.79	0.37-1.68
Child's Birth weight								
Lower	1.00							
Average	0.5**	0.31-0.82	0.5**	0.31-0.82	0.5**	0.31-0.82	0.5**	0.31-0.82
Higher	0.32**	0.15-0.68	0.32**	0.15-0.68	0.32**	0.15-0.67	0.32**	0.15-0.68
_cons	0.961	0.12-7.58	0.92	0.11-7.41	0.92	0.11-7.41	0.9	0.11-7.31

APPENDIX 1: Multivariate Association between Underweight among Under-fives and Women Empowerment

	Model 1		Model 2		Model 3		Model 4	
	OR	**C.I**	**OR**	**C.I**	**OR**	**C.I**	**OR**	**C.I**
Empowerment Indicators								
Index 1	1.12	0.74-1.7					1.15	0.75-1.75
Index 2			0.89	0.49-1.63			0.88	0.48-1.59
Index 3					0.91	0.58-1.43	0.9	0.57-1.42
Residence								
Capital	1.00							
Small City	1.16	0.43-3.14	1.16	0.43-3.12	1.17	0.43-3.16	1.13	0.32-4.07
Town	0.49	0.22-1.07	0.48	0.22-1.07	0.49	0.22-1.08	0.53	0.16-1.81
Countryside	0.91	0.41-2.02	0.9	0.41-2.01	0.91	0.41-2.01	1.19	0.42-3.36
Education								
No Education	1.00							
Primary	1.18	0.71-1.97	1.22	0.73-2.03	1.2	0.72-2.00	0.83	0.33-2.07
Secondary +	0.63	0.26-1.53	0.65	0.27-1.57	0.64	0.27-1.56	0.84	0.26-2.68
Occupation								
Not working	1.00							
Non-agriculture	0.56	0.3-1.07	0.57	0.3-1.1	0.58	0.31-1.11	0.41*	0.17-1.01
Agriculture	1.26	0.74-2.16	1.29	0.75-2.22	1.3	0.76-2.25	0.48	0.22-1.05
Wealth Index								
Poor	1.00							
Middle	0.73	0.4-1.33	0.72	0.4-1.31	0.73	0.4-1.32	0.92	0.34-2.47
Rich	0.53*	0.31-0.89	0.53*	0.32-0.9	0.53*	0.32-0.89	1.92	0.91-4.04
Number of Under-fives								
2 or less	1.00							
More than 2	0.72	0.34-1.52	0.71	0.33-1.5	0.7	0.33-1.48	0.05**	0.01-0.39
Birth weight								
Low	1.00							
Average	0.31	0.19-0.50	0.31	0.19-0.51	0.31	0.19-0.5	0.78	0.31-1.95
High	0.07	0.01-0.30	0.07**	0.02-0.31	0.07**	0.02-0.31	0.42	0.07-2.7
_cons	0.7	0.24-2.08	0.8	0.25-2.59	0.79	0.26-2.34	0.17	0.01-4.03

APPENDIX 1: Multivariate Association between Women Empowerment and Wasting among Under-fives

	OR Sig	C.I	OR Sig	C.I	OR Sig	C.I	OR Sig	C.I
Empowerment Indicators								
Index 1	0.53*	0.29-0.97					0.52*	0.29-0.93
Index 2			1.31	0.41-4.20			1.42	0.46-4.34
Index 3					1.07	0.47-2.46	1.16	0.53-2.57
Residence								
Capital	1.00							
Small City	1.14	0.33-3.93	1.15	0.33-4.02	1.13	0.31-4.18	1.13	0.32-4.07
Town	0.53	0.16-1.75	0.55	0.17-1.80	0.53	0.15-1.86	0.53	0.16-1.81
Countryside	1.18	0.42-3.33	1.23	0.45-3.35	1.21	0.44-3.37	1.19	0.42-3.36
Education								
No education	1.00							
Primary	0.86	0.35-2.10	0.79	0.32-1.95	0.81	0.34-1.98	0.83	0.33-2.07
Secondary and above	0.88	0.28-2.77	0.79	0.25-2.50	0.82	0.26-2.56	0.84	0.26-2.68
Occupation								
Not working	1.00							
Non-agriculture	0.41*	0.17-1.01	0.37*	0.15-0.92	0.37*	0.15-0.92	0.41*	0.17-1.01
Agriculture	0.48	0.22-1.06	0.42*	0.18-0.97	0.42*	0.18-0.96	0.48	0.22-1.05
Wealth Index								
Poor	1.00							
Middle	0.89	0.34-2.34	0.94	0.36-2.46	0.92	0.35-2.38	0.92	0.34-2.47
Rich	1.94	0.93-4.06	1.88	0.89-3.97	1.89	0.90-3.97	1.92	0.91-4.04
Number of Under-fives								
2 or less	1.00							
More than 2	0.05**	0.01-0.41	0.05**	0.01-0.45	0.06**	0.01-0.46	0.05**	0.01-0.39
Birth weight								
Low	1.00							
Average	0.79	0.32-1.99	0.79	0.30-2.07	0.80	0.31-2.07	0.78	0.31-1.95
Higher	0.44	0.07-2.79	0.42	0.07-2.63	0.42	0.07-2.60	0.42	0.07-2.70
_cons	0.23	0.01-5.01	0.16	0.01-3.11	0.21	0.01-3.90	0.17	0.01-4.03

REFERENCES

Haddad L., Ruel M.T., Garret J.T. (1999), "Are urban poverty and under nutrition growing? Some newly assembled evidence", *World Development*,

Kumar A., Mohanty S.K. (2011), "Intra-urban differentials in the utilization of reproductive healthcare services in India, 1992-2006", *Journal of Urban Health*, 88(2): 311-328.

Madise N.J., Matthews Z., Margetts B. (1999), "Heterogeneity of child nutritional status between households: A comparison of six sub-Saharan African countries", *Population Studies*, 53(3), 331-343.

Menon P., Ruel M.T., Morries S.S. (2000), "Socio-economic differentials in child stunting: Results from 11 DHS data sets", *Food and Nutrition Bulletin*, 21(3), 282-289.

Sahn D.E., Stifel D.C. (2003), "Urban-rural inequalities in living standards in Africa", *Journal of African Economies*, 12(4), 564-597

Smith L.C., Ruel M.T., Ndiaye A. (2005), "Why is child malnutrition lower in urban than rural areas? Evidences from 36 developing countries", *World Development*, 33(8), 1285-1305.

Tarozzi A., Mahajan A. (2007), "Child nutrition in India in the nineties", E*conomic Development and Cultural Change*, 55(3), 441-486

UNICEF (2002), "Poverty and exclusion among urban children, Innocent Digest No. 10, UNICEF Innocent Research Centre (www.unicefisdc.org)

Von Braun J., Mccomb J., Fred-Mensah B., Pandya-Lorch R. (1993), Urban food insecurity and malnutrition in developing countries: Trends, policies, and research implications, International Food Policy Research Institute, Washington, D.C.

De Onis, M., Yip, R., & Mei, Z. (1997). The development of MUAC-for-age reference data recommended by a WHO Expert Committee. *Bulletin of the World Health Organization,75*(1), 11.

Kishor, S. (2000). Empowerment of women in Egypt and links to the survival and health of their infants. In Harriet Presser & Gita Sen (Eds.), *Women's Empowerment and Demographic Processes*: Oxford University Press.

Smith, L. C., Ramakrishnan, U., Ndiaye, A., Haddad, L., & Martorell, R. (2003). *The importance of women's status for child nutrition in developing countries* (Vol. 131): International Food Policy Research Institute.

Kabeer, N. 2001. Reflections on the measurement of women's empowerment. In *Discussing women's empowerment-theory and practice.* Sida Studies No. 3. Stockholm: Novum Grafiska AB.

Malhotra, A., S.R. Schuler, and C. Boender. 2002. *Measuring women's empowerment as a variable in development.* World Bank Working Paper. Washington, D.C.: The World Bank.

Presser, H. and G. Sen, eds. 2000. *Women's empowerment and demographic processes: Moving beyond Cairo*. New York: Oxford University Press.

UNICEF. Malnutrition: causes, consequences and solution. The state of the world's children 1998.

Osmani, S., and A. Sen. 2003. "The Hidden Penalties of Gender Inequality: Fetal Origins of Ill-Health." *Economics & Human Biology* 1 (1): 105–121.

Silverman, J. G., M. R. Decker, J. Gupta, N. Kapur, A. Raj, and R. T. Naved. 2009. "Maternal Experiences of Intimate Partner Violence and Child Morbidity in Bangladesh", *Arch Pediatr Adolesc Med.* 163: 700-705.