

# Measuring Women Empowerment And Its Contribution Towards Child's Nutritional Status: An Evidence From Developing Regions

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## ABSTRACT

The second goal of Sustainable Development Goals (SDG) targeted to zero hunger needs to improve child health. This study analyzed the role of women empowerment in the nutritional status of children under five years in the five regions of developing economies. Five different dimensions are used to measure women empowerment stated as work status, awareness, decision making, self-esteem, and self-confidence. Child health is analyzed through three anthropometric measures. The latest data from Demographic and Health Surveys (DHS) of 38 countries are used to analyze the effect of women empowerment on child health. Binary logistic regression is employed for analysis. The results explain the positive impact of women/mother empowerment on the child's health. Furthermore, the micro factors; mother education, mother's BMI, father education, child gender, child ever have the vaccination, urban residence, and household wealth have a positive impact on the child's health.

**Keywords:** women empowerment, child health, socio-economic factors

JEL Classification Codes: J12 J13 J16

## INTRODUCTION

### Malnutrition; Causes and Consequences

Malnutrition is the most significant issue for sustaining a healthy and productive life (Endris,

Asefa, & Dube, 2017). But in the current scenario, poor nutritional status gives adverse consequences in terms of disease, disability, poor brain development, low level of educational

attainment, reduction in economic productivity, and decelerates the economic growth. Malnutrition in all its forms (stunting, wasting, underweight), insufficient vitamins or minerals, overweight, and obesity are public health issues (UNICEF, 2019). Malnutrition involved dietary deficiencies, and irregular and poor-quality food intake, which results in reduced muscles and tissues, breathing difficulties, respiratory infections, and chest infections, and all these diseases take a longer time to recover (UNICEF, 2018b).

Malnutrition is especially dangerous for children under the age of five in underdeveloped countries. Poverty, a higher rural population share, social and economic inequities in these regions all contribute to malnutrition in children below the age of five. Malnutrition is responsible for more than half of all deaths in children below the age of five. Stunting affects about one-third of youngsters in South Asia and Sub-Saharan Africa, according to research. In 2018, Sub-Saharan Africa accounted for about a quarter of all wasted children, while South Asia accounted for more than half (UNICEF, 2018b).

According to the 2018 Global Hunger Index (GHI), the global level of hunger and undernutrition has decreased from the severe category to the moderate category, from 29.2 in 2000 to 20.9 in 2018. Malnutrition, stunting, wasting, and mortality among children have all decreased as a result of this achievement. - Even though there has been improvement, stunting, wasting, and being underweight still need to be treated more effectively in some countries. Furthermore, 50.2 percent of children in Timor-Leste are stunted; 71.7 percent of children in Haiti die before reaching the age of five; and 40.0 percent of children in Chad & Zambia are stunted, respectively (UNICEF, 2018a). Poverty, a low per capita gross domestic product (GDP), a rural population, a high adolescent birth rate, a high fertility rate, and larger gender disparities are among the issues encountered by nations with a

higher Global Hunger Index score. The World Children's Fund is a non-profit organization dedicated to reducing poverty among children throughout the world (UNICEF, 2018a).

The fifth Sustainable Development Goal is to "promote gender equality and the empowerment of all women and girls." Equal access to health care, education, and career opportunities, and decision-making autonomy, will help to create and maintain family well-being and overall well-being. According to past studies, there is a positive relationship between family well-being and family health, with a focus on child health. Women's emancipation, both within and outside the house, is critical to eradicating gender inequality and ensuring equal opportunity for men and women. It's also necessary for ending poverty, guaranteeing food security, and improving health. Female self-determination and gender equality are important human rights that have received a lot of attention in recent years, both (domestically and globally). On the other hand, inequity between men and women is more common in South Asia and Sub-Saharan Africa than elsewhere. With a gender disparity of 34.2% in 2018, South Asia is only slightly better than the Middle East & North Africa (40%), and Sub-Saharan Africa (37%) on the Gender Disparity Index (Economic-Foundation, 2018).

The regions with a higher gender gap in 2018 more than 20% in Global Gender Gap Index (GGGI) are North Africa and West Asia, Central Asia, Latin America, South Asia and the Caribbean, Sub-Saharan Africa, and Southeast Asia. These are the regions where the prevalence of malnutrition is also at its highest rate followed by stunting in children under five is 38 % in South Asia and Southeast Asia, 21 % in Central Asia, 12.9% in West Asia & North Africa, 33% in Sub-Saharan Africa and 22.2% in Latin America & Caribbean (World Bank & Nations, 2018).

The purpose of this research is to establish a relationship between the empowerment of women and the health of

children. Researchers have previously examined factors that influence children's health, such as decision-making, awareness, workforce participation, self-esteem, confidence, and political representation, all of which have been linked to children's health (Akinyemi, Adedini, & Odimegwu, 2017; Haroon, 2018; Hasan & Uddin, 2016; Scantlan & Previdelli, 2013). The goal of this research work is to see how these five components of women's empowerment: awareness, work status, self-esteem, decision-making, and self-confidence, as well as these five aspects of the empowerment of women: education and awareness, affect children's nutritional status. The five elements of the empowerment of women: awareness, education, and participation are also being looked upon.

This research looked at micro and macroeconomic aspects of socioeconomics that had previously gone unnoticed in previous studies. A relationship between the empowerment of women and the health of children has also been identified in a few developing countries. A comprehensive assessment of emerging economies, on the other hand, was omitted. This study looked at the micro and macroeconomic aspects of child health in 38 developing countries from several perspectives. As a result, our study filled a gap in the existing body of information.

The study's origins may be traced back to the realization of worldwide child health issues, particularly in developing countries. Following the identification of the problem, a comprehensive review of previous studies on the health of children and the empowerment of women was carried out. Using DHS and World Bank data, the connection between the empowerment of women and the health of children in developing countries was investigated using binary logistic regression in the presence of micro and macro socio-economic determinants (dimensions and composite level). After this examination, the conclusion and discussion of the

results, as well as the overall study, have been interpreted.

## LITERATURE REVIEW

Malnutrition in developing countries has traditionally been assessed through community-based surveys (Achakzai & Khan, 2016; Khan & Raza, 2014a; Khan & Raza, 2016, 2017; Khan, 2018; Laghari et al., 2015; Shah, Selwyn, Luby, Merchant, & Bano, 2003; Zainab & Kadir, 2016), hospital-based surveys (Hamad, Sarwar, Ranjha, & Ahmad, 2016), and laboratory- (Jaiswal et al., 2017; Mushtaq et al., 2012; Shivaprakash & Joseph, 2014).

Children under the age of five were engaged in the community and hospital-based studies, while children between the ages of five and ten were recruited for school-based research to determine their level of malnutrition. Müller & Krawinkel, 2005; Smith & Haddad, 2000; Müller & Krawinkel, 2005; Smith & Haddad, 2000; Müller & Krawinkel, 2005; Smith & Haddad, 2000; Müller & Krawinkel, 2005; Smith & Haddad, 2000; Müller & Krawinkel, 2005; Smith & Haddad, 2000; Müller & Krawinkel, 2005; Smith & Haddad, 2000; Müller & Krawinkel, 2005; Smith & Haddad, 2000; Müller Children under the age of five are malnourished at greater rates than older children in Sub-Saharan African countries, and their nutritional health is linked to their gender, family size, and household socioeconomic status (Keats, 2018a; Ukwuani & Suchindran, 2003a).

Lack of education, societal and cultural restrictions, agricultural and food shortages, and inadequate sanitation all contributed to inhibiting the growth of children in Indonesia (Sutrisna, Beal, Tumilowicz, Izwardy, & Neufeld, 2018). Investing in the health and well-being of women, children, and families has been demonstrated to have a favorable impact on family health and well-being at both the household and individual levels. Abbi and Christian (1991), Gujral and Gopaldas (2013), Abekah-Nkrumah (2013),

Ahsan & Maharaj (2018), Augsburg & Rodriguez-Lesmes (2018), and Abekah-Nkrumah (2013) are among the other publications.

For decades, the question of whether there is a link between the empowerment of women and malnutrition of children has sparked passionate debate (Mugo et al., 2015). Some studies in Nicaragua have found that having a mother's job is a strong predictor of empowerment when it comes to lowering child malnutrition rates (Lamontagne, Engle, & Zeitlin, 1998). Working in India has also been shown to greatly enhance the possibility of malnutrition and mortality of infants (Abbi et al., 1991).

As a result, the empowerment of women has traditionally been described in terms of their capabilities (Sen, 1993), their ability to access resources (Sebayang, Efendi, and Astutik, 2017), their social and economic participation, access to information, and inclusion in local and organizational capacity (Abrar ul Haq, Jali, and Islam, 2018). (Sebayang, Efendi, and Astutik, 2017). Sebayang, Efendi, and Astutik (Sebayang, Efendi, and Astutik, 2017). Authors that have written about this issue include Bennett (2002; Jamal, 2017; Khan and Bibi (2011); Kishore & Reid (2000; Sen, 1993). According to Kabeer (1999), empowerment of women is "the process by which folks who have been denied the ability to make strategic life choices achieve such a capacity" (Kabeer, 1999). Power is typically connected with a person's potential to assemble independent decisions and exert pressure on others.

Even though empowerment refers to women's ability to control and profit from their life, as well as their ability to manage risk and enhance their economic position and well-being, evaluating women's empowerment remains difficult (Carlson, Kordas, & MurrayKolb, 2015). (MurrayKolb, Carlson, Kordas, and Carlson, 2015). It is difficult to establish a causal link between the empowerment of women and consequences of health due to the deficiency of

recognized indicators for all aspects of the empowerment of women together with the scarcity of data on the empowerment of women in the person, family, and community levels. (Alkire, 2005; Malhotra & Schuler, 2005; Mason & Smith, 2003).

The bulk of previous research has related women's empowerment and decision-making to their children's health. Because of its tight relationship with decision-making, this link has the potential to enhance child health outcomes, stunting, and vaccination (Ibrahim, Tripathi, & Kumar, 2015a). Scantlan and Previdelli (2013) examined children's nutritional status using both direct and indirect measures, such as decision-making capacity and the chance of being exposed to violence. Women's empowerment, as well as health care and buying decisions made by women, have become increasingly crucial for children's health (Hasan & Uddin, 2016).

Female political participation is one facet of female empowerment that has a negative influence on infant mortality but a positive impact on measles vaccination. Because mothers are more sensitive and severe in caring for their children than their husbands, it has been established that women's engagement in politics has a favorable influence on child health through higher investment in child health (Quamruzzaman & Lange, 2016b). The majority of previous research has found a relationship between child health and household socioeconomic status. The mother's socioeconomic status has been connected to socioeconomic aspects that influence her child's health (Arif & Arif, 2012).

## **METHODOLOGY**

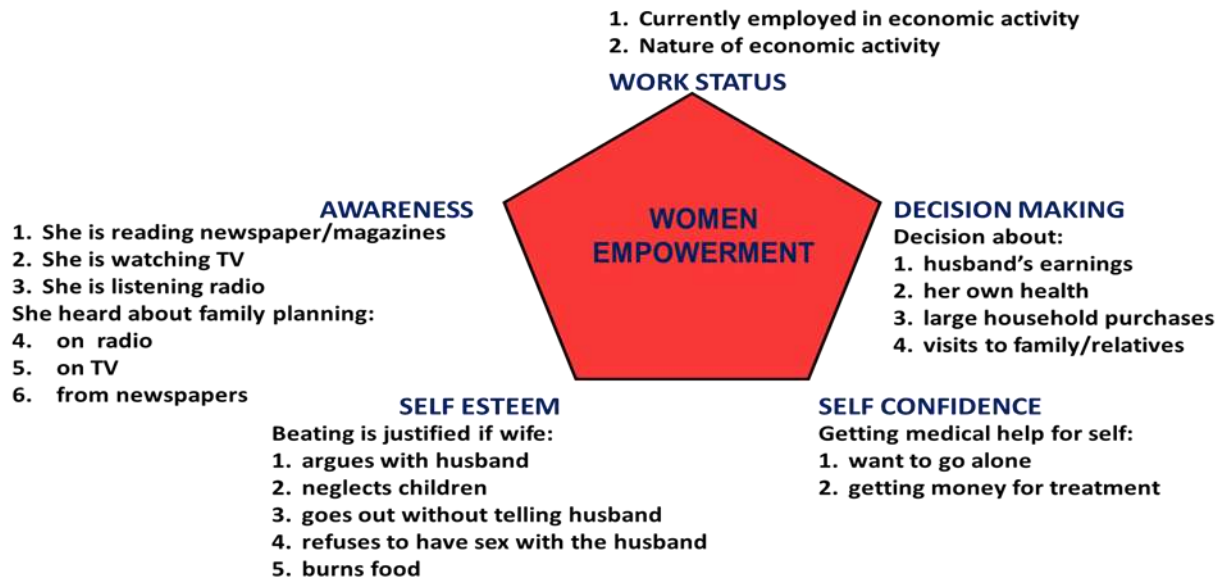
### **Conceptual Framework of Women Empowerment and Child Health**

Women's Empowerment including awareness, work status, self-confidence, decision-making,

and self-esteem and health of children, were investigated in this research work to see how these behaviors had an impact on their health. Stunting, wasting, and being underweight are three indications of malnutrition that must be considered while assessing the health of children. The capacity of a woman to make her own health-care decisions is connected to her ability to better care for her family and children, which leads to improved health for her, her children, and other women and children (Ibrahim & Pandey, 2014). The capacity of a woman to work and the health of her children may or may not be linked. Some studies (Bhattacharya, Currie, and Haider 2006; Lamontagne et al. 1998) in Nigeria (Ukwuani & Suchindran, 2003b), Pakistan (Jamal, 2018), and

India (Ukwuani & Suchindran, 2003b) have shown a positive or negative relationship between work status and child health, but this has not been demonstrated in all studies (Bhattacharya, Currie, and Haider, 2006; Lamontagne et al. 1998). Lamontagne & coworkers, (1998) concerned about rising healthcare expenditures have an impact on children's eating habits (Arif & Arif, 2012). According to a study, being self-assured can have a significant impact on a woman's approach to family and child care (Jamal, 2018). People's perceptions of their health and work status, as well as awareness, household decision-making, self-worth, and self-confidence, all played a role in the study, according to the researchers (Scantlan & Previdelli, 2013).

**Figure 1:** Model of Women Empowerment and Child’s Nutritional Status



**Model Estimation**

In their time allocation and updated theories of choice, Becker (1965) and Thomas and Strauss (1995) defined a home as a multi-person family unit that is expected to generate and consume a vector of commodities (Yi).

$$U=U(Y_1...Y_n) \tag{1}$$

Subject to the resource allocation

$$\sum P_i Y_i = I = W + V \tag{2}$$

Yi represents the market goods purchased, pi represents the retail amount, I represents money stipend, W represents wage income, and V represents additional sources of income (Aguiar, Botelho, Lago, Maças, & Sampaio, 2012; Aguiar & Hurst, 2007; Juster & Stafford, 1985). Households regularly combine time and money to generate a greater need for

general commodities (healthy children), which have a quick impact on the family's and country's human capital accumulations. The newly defined household utility function is now denoted by  $U=f(Y_i, N_i, L_i)$

(3)

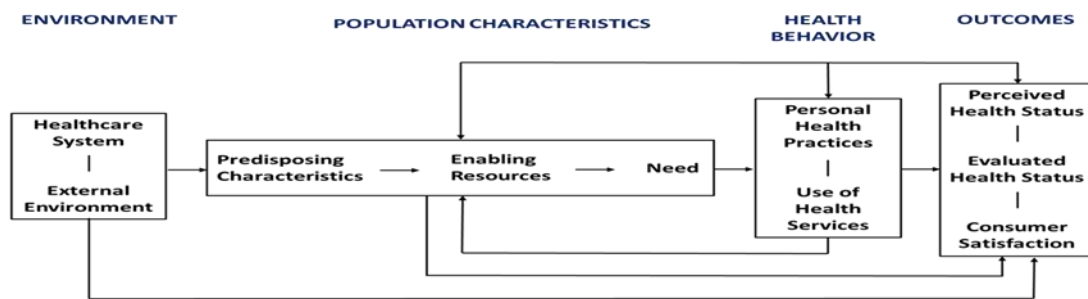
The household then generates a vector of goods called  $N_i$ . Numerous initiatives aimed at improving children's nutrition have been related to these goods (Becker, 1965; Becker, Fonseca-Becker, & Schenck-Yglesias, 2006; Grossman, 1972; Willis, 1973). An individual's anthropometric measures must be standardized to evaluate their nutritional status (Stunting, Wasting, and underweight). In this way, the utility function of the household is maximized despite various restrictions, such as seasonal diets and limited funds. Grossman's (1972) general health production function may be used to calculate the reduced form of health (nutritional status) production function for children living at home. (Garcia, Alderman, & Sathar, 1989; Jamal, 2018; Khan & Raza, 2014b, 2016)

$$H_i = f(WEmp, M_i, C_i, F_i, H_i, C_i) \quad i=1,2,3 \quad (4)$$

$H_i$  stands for health (nutritional status), and it is determined by a vector of health inputs, including empowerment of women/mother (WEmp), characteristics of the mother ( $M_i$ ), characteristics of the child ( $C_i$ ), characteristics of the father ( $F_i$ ), home characteristics ( $H_i$ ), and characteristics of the country. The goal of the research work is to establish a link between health outcomes (nutritional status) and empowerment, as well as the characteristics of parents and families. The health production function (5) depicts the business of non-retailer interests, which are significant and serve as a vector of inputs for the production of sell products (Becker, 1974, 1981; Becker & Lewis, 1973; Cummins et al., 1991). Exploring time into a child's health is a kind of investment in human capital development that leads to higher wages and productivity throughout their lives (Browning et al., 2014).

**Figure 2:** The framework of Child Health

**Andersen and Newman's Framework of Health Services Utilization: Theoretical Underpinnings of the Current Study**



The estimation equation derived from the above model is expressed as

$$CNS_i = \alpha_0 + \alpha_1 WS + \alpha_2 AWS + \alpha_3 DM + \alpha_4 SE + \alpha_5 SC + \alpha_6 BMI + \alpha_7 WE + \alpha_8 AFB + \alpha_9 ANC + \alpha_{10} HE + \alpha_{11} CA + \alpha_{12} CASq + \alpha_{13} CG + \alpha_{14} CHEV + \alpha_{15} WI + \alpha_{16} PR + \alpha_{17} SSA + \alpha_{18} SS + \alpha_{19} NImp. + \mu_1 \quad (5)$$

$$\text{CNS}_i = \beta_0 + \beta_1 \text{CWEI} + \beta_2 \text{BMI} + \beta_3 \text{WE} + \beta_4 \text{AFB} + \beta_5 \text{ANC} + \beta_6 \text{HE} + \beta_7 \text{CA} + \beta_8 \text{CASq} + \beta_9 \text{CG} + \beta_{10} \text{CHEV} + \beta_{11} \text{WI} + \beta_{12} \text{PR} + \beta_{13} \text{SSA} + \beta_{14} \text{SS} + \beta_{15} \text{NImp.} + \mu_1 \quad (6)$$

The correlation between the empowerment of women and the health of children was identified using the binary logistic regression approach. The health patterns of growing children can reveal how much a child has deviated from the norm and what limitations the youngster has (WHO, 2018). The World Health Organization (WHO) uses child growth factors to measure both undernutrition and obesity in children. According to the World Health Organization, undernutrition manifests itself in three ways: stunting (low height for age), wasting (low weight-for-height) and underweight (low weight for age). Stunting, wasting, and being underweight were the three anthropometric measures employed in this study (Dhok & Thakre, 2016).

Factor analysis scores have been used to examine five different characteristics of women's

empowerment: employment status (Mugo et al., 2015), awareness (Haroon, 2018), decision-making (Ibrahim et al., 2015a), self-esteem (Scantlan & Previdelli, 2013), and self-confidence (Haroon, 2018). Additionally, the study looked at the characteristics of women, such as their education, age, and age at birth, as well as their BMI (Ahsan & Maharaj, 2018a; Arif & Arif, 2012; Scantlan & Previdelli, 2013).

Previous studies have been evaluated how husband's qualities, age, education, and work status impact child's nutritional health (Bhattacharya et al., 2006; Ukwuani & Suchindran, 2003b). In addition, the household's wealth and location were analyzed. Dummy variables were employed to represent regions, secular states, and countries that import food (Dhok & Thakre, 2016).

**Table 1:** Dimensions of women empowerment and Measurement Scales

Dimensions	Description	Measurement Scale in DHS Data
Work Status (WS)	Respondent is employed	Yes=1. No=0.
	Respondent's Profession	9=professional/technical/managerial 8=services, 7=sales, 6=agricultural – employee 5=clerical, 4=agricultural - self-employed 3=household domestic, 2=Skilled manual 1=unskilled manual, 0=did not work
Awareness (AW)	Watching TV	0=not at all, 1= almost daily, 2=at least once a
	Reading Newspaper	0=not at all, 1= almost daily, 2=at least once a
	Listening Radio	0=not at all, 1= almost daily, 2=at least once a week
	Awareness about family planning from the radio	not at all=0, 1= less than once a week 2=at least once a week, 3= almost daily
	Awareness about family planning from the TV	not at all=0, 1= less than once a week 2=at least once a week, 3= almost daily
	Awareness about family planning from the TV	not at all=0, 1= less than once a week 2=at least once a week, 3= almost daily

Decision Making (DM)	The decision regarding to spends women's Husband earnings	0=Husband has no earnings. 1=Someone else. 3=Respondent and husband/partner 2=Husband/partner alone. 4=Respondent alone
	The decision regarding women's Health	1=Someone else. 2=Husband/partner alone 3=Respondent and husband/partner.
	The decision regarding large household purchases	1=Someone else. 2=Husband/partner alone 3=Respondent and husband/partner.
	The decision about visits to family or relatives	1=Someone else. 2=Husband/partner alone 3=Respondent and husband/partner.
Self Esteem (SE)	Beating justified if wife disagree with husband	0= Yes justified, 1= Not justified
	Beating justified if the wife abandon children	0= Yes justified, 1= Not justified
	Beating justified if Without informing the husband	0= Yes iustified. 1= Not iustified
	Beating justified if the wife refuses to have sex with the husband	0= Yes iustified. 1= Not iustified 0= Yes justified
	Beating justified if Food is burned by my wife	0= Yes iustified. 1= Not iustified
Self Confidence (SC)	Getting medical help for self: Want to go alone	0=Big Problem, 1=Not a big problem
	Getting medical help for self: Getting money for treatment	0=Big Problem, 1=Not a big problem
Women Empowerment Index	Women Empowerment Index	Low Medium High
Women personal characteristics	Women Education (WE)	No Education Primary Secondary Higher
	Age at first birth (AFB)	Below than 19 Above than 19
	Body Mass Index (BMI)	Lower than 18.5 kg/m2 Greater than 18.5 kg/m2



	No. of Visits Antenatal care Visits during Pregnancy	No visits 1-2 3-4 More than 4
Husband Characteristics	Husband Education (HE)	No Education Primary Secondary Higher
Women Children Information's	Child Have Ever Vaccination	Yes No
	Child Age	In months (1-59)
	Child Gender	Female Male
Household's Characteristics	Household Wealth Index (WI)	Poorest Poorer Middle Rich Richest
	Place of residence (PR)	Urban Rural
Regions	The region is included as a dummy variable (Sub-Saharan is selected due to the highest prevalence of malnutrition as compared to other regions)	Sub Saharan Africa =1, otherwise 0
Food Importing Countries	Macro-level variable used as dummy	Food Importing country = 1, otherwise 0
Secular States	A macro-level variable used as dummy	Secular states=1, otherwise 0

**Table 2:** Measurement Scale for Child Nutritional Status ( Dependent Variable)

Measure	Description	Measurement Scale in DHS Data
Stunting	Height-for-Age	If the child is stunting 1, otherwise 0
Wasting	Weight-for Height	If the child is wasting 1, otherwise 0
Underweight	Weight-for Age	If child is underweight 1, otherwise 0

CIAF Composite Index of Anthropometric Failure  
If Child is undernourished 1, otherwise 0

### Data and Sampling

For the research, data has been extracted from the most recent Demographic Health Surveys (DHS) of 38 developing countries from five regions-- South & Southeast Asia, Central Asia, Latin & Caribbean countries, North Africa & West Asia, and Sub-Saharan Africa. Due to the variations in the economic, social, and demographic factors of different regions, it is important to utilize micro data sets to capture the relationship between the empowerment of women and the health of

children. The World Bank provided data on macro factors including imports, exports, and secular states.

### RESULTS AND DISCUSSION

The data from the DHS and the World Bank were evaluated in this study using anthropometric measurements and binary logistic regression. Table 3 summarizes the results of anthropometric failure in children under the age of five.

**Table 3:** Classification of Anthropometric Failure among Children

CIAF	Frequency	Percent
No Failure	164158	61.1
Stunting	45452	16.9
Wasting	2342	1.9
Stunting and Wasting	30658	11.4
Underweight	8816	3.3
wasting and underweight	6337	2.4
Stunting, wasting, and underweight	7685	2.9
Total	265448	100

The correlation between the empowerment of women and the health of children was calculated using SPSS 22. The results of the binary logistic

model for child health and women empowerment have been mentioned in table 4.

**Table 4:** Result of Binary Logistics Models on Health of Children and Empowerment of Women (Dimensions)

Independent Variables	Coefficient (SE., P-value)			
	Stunting <-2SD	Wasting <-2SD	Underweight <-2SD	CIAF <-2SD
<b>Mother/Women Empowerment</b>				
Work Status	.145(.012,.000)	.148(.017,.000)	.062(.018,.000)	.135(.011,.000)
Awareness	-.166(.015,.000)	-.184(.017,.000)	-.140(.022,.000)	-.170(.014,.000)

Decision Making	.006(.012,.646)	-.062(.013,.000)	-.143(.017,.000)	-.027(.011,.018)
Self Esteem	-.064(.011,.000)	-.097(.012,.000)	-.060(.016,.000)	-.091(.011,.000)
Self Confidence	.097(.013,.000)	-.056(.014,.000)	-.046(.019,.015)	.094(.012,.000)
<b>Mother Body Mass Index (less than 18.5 kg/m2 is reference category)</b>				
More than 18.5 kg/m2	-.427(.030,.000)	-.649(.032,.000)	-.538(.041,.000)	-.458(.030,.000)
<b>Mother's Education (No Education is reference category)</b>				
Primary	-.250(.033,.000)	-.453(.037,.000)	-.402(.050,.000)	-.309(.032,.000)
Secondary	-.450(.037,.000)	-.660(.041,.000)	-.486(.055,.000)	-.487(.036,.000)
Higher Education	-.819(.058,.000)	-1.41(.073,.000)	-.805(.087,.000)	-.849(.054,.000)
<b>Mother's age at first birth (Below than 19 years old is reference category)</b>				
Above than 19 years	-.024(.023,.316)	-.023(.027,.090)	-.048 (.034,.058)	-.028(.022,.209)
<b>Visits for Antenatal care During Pregnancy (No Visits is reference category)</b>				
1-2	-.053(.035,.130)	-.031(.040,.430)	-.004(.051,.933)	-.038(.033,.251)
3-4	-.076(.034,.027)	-.025(.039,.513)	-.001(.050,.976)	-.046(.033,.155)
Above than 4	-.030(.029,.298)	-.011(.033,.738)	-.014(.042,.734)	-.020(.027,.469)
<b>Father Education (No Education is reference category)</b>				
Primary	-.192(.036,.000)	-.274(.039,.000)	-.280(.052,.000)	-.213(.035,.000)
Secondary	-.254(.036,.000)	-.254(.040,.000)	-.214(.052,.000)	-.282(.035,.000)
Higher Education	-.331(.052,.000)	-.272(.059,.000)	-.059(.074,.428)	-.270(.049,.000)
<b>Child Age</b>	-.001(.003,.654)	-.001(.003,.794)	.006(.004,.056)	.001(.003,.862)
<b>Child Age Square</b>	.008(.027,.777)	.009(.031,.759)	-.005(.025,.080)	-.009(.026,.731)
<b>Child Gender (Male child as reference category)</b>				
Female Child	-.037(.022,.091)	-.053(.025,.035)	-.011(.032,.728)	-.027(.021,.200)
<b>The child has ever Vaccination (No is reference category)</b>				
Yes	-.161(.027,.000)	-.053(.032,.058)	-.027(.041,.508)	-.176(.026,.000)
<b>Household's Wealth status (Poorest is reference category)</b>				
Poorer	-.218(.045,.000)	-.285(.052,.000)	-.398(.067,.000)	-.364(.043,.000)
Middle	-.168(.044,.000)	-.225(.050,.000)	-.356(.065,.000)	-.300(.041,.000)
Richer	-.148(.041,.000)	-.252(.048,.000)	-.364(.062,.000)	-.289(.039,.000)
Richest	-.117(.038,.002)	-.134(.045,.003)	-.180(.057,.002)	-.192(.036,.000)
<b>Type of Residence (Rural areas are reference category)</b>				
Urban Areas	-.054(.028,.045)	-.127(.032,.000)	-.167(.042,.000)	-.125(.027,.000)
<b>Regions</b>				
Sub Saharan Africa	.112(.038,.004)	.501(.046,.000)	.198(.061,.001)	.054(.037,.147)
Secular States	.071(.038,.062)	.306(.046,.000)	.287(.060,.000)	.141(.037,.000)
Net Imports	-.204(.030,.000)	-.036(.034,.281)	.211(.044,.000)	-.025(.028,.341)
Constant	.145(.132,.278)	.794(.149,.000)	.311(.192,.108)	1.031(.125,.000)
Cox & Snell R Square	.051	.075	.027	.062

Nagelkerke R Square	.072	.117	.056	.086
No. of Observations	1,85343			

The intercept terms are included in the regressions. Statistical significance is indicated by \*\*\*, \*\*, and \* at the 1%, 5%, and 10% levels, respectively.

**Table 5:** Results of Binary Logistics Models on Health of Children and the Empowerment of Women

Independent Variables	Coefficient (SE., P-value)			
	Stunting <-2SD	Wasting <-2SD	Underweight <-2SD	CIAF <-2SD
<b>Mother/Women Empowerment Index (Low Empowerment is reference category)</b>				
Medium	-.065(.046,.165)	-.073(.037,.051)	-.086(.048,.073)	-.069(.034,.042)
High	-.087(.033,.009)	-.247(.054,.000)	-.396(.071,.000)	-.068(.044,.123)
<b>Mother Body Mass Index (less than 18.5 kg/m2 is reference category)</b>				
More than 18.5 kg/m2	-.431(.030,.000)	-.687(.032,.000)	-.577(.041,.000)	-.466(.029,.000)
<b>Mother's Education (No Education is reference category)</b>				
Primary	-.299(.033,.000)	-.541(.036,.000)	-.479(.049,.000)	-.363(.032,.000)
Secondary	-.590(.035,.000)	-.841(.039,.000)	-.622(.052,.000)	-.633(.034,.000)
Higher Education	-.954(.056,.000)	-1.585(.071,.000)	-.951(.084,.000)	-.994(.052,.000)
<b>Mother's age at first birth (Below than 19 years old is reference category)</b>				
Above than 19 years	-.015(.023,.525)	-.020(.026,.444)	-.048(.034,.045)	-.019(.022,.405)
<b>Visits for Antenatal care During Pregnancy (No Visits is reference category)</b>				
1-2	-.053(.035,.129)	-.013(.039,.737)	.012(.051,.807)	-.036(.033,.282)
3-4	-.068(.034,.045)	-.008(.038,.824)	.008(.049,.871)	-.038(.033,.247)
Above than 4	-.026(.029,.371)	.001(.032,.977)	-.005(.042,.902)	-.015(.027,.575)
<b>Father Education (No Education is reference category)</b>				
Primary	-.192(.036,.000)	-.295(.039,.000)	-.304(.051,.000)	-.216(.035,.000)
Secondary	-.299(.036,.000)	-.294(.039,.000)	-.226(.052,.000)	-.327(.035,.000)
Higher Education	-.394(.052,.000)	-.320(.059,.000)	-.069(.073,.344)	-.328(.048,.000)
<b>Child Age</b>	-.002(.003,.584)	-.001(.003,.772)	.006(.004,.083)	.001(.003,.966)
<b>Child Age Square</b>	.009(.027,.734)	.008(.031,.775)	-.046(.039,.038)	-.008(.026,.766)
<b>Child Gender (Male child as reference category)</b>				
Female Child	-.038(.022,.085)	-.053(.025,.034)	-.010(.032,.753)	-.028(.021,.177)

<b>The child has ever Vaccination (No is reference category)</b>				
Yes	-0.204(.027,.000)	-.069(.031,.054)	-.023(.040,.562)	-.223(.026,.000)
<b>Household's Wealth status (Poorest is reference category)</b>				
Poorer	-.111(.044,.012)	-.234(.051,.000)	-.384(.065,.000)	-.261(.042,.000)
Middle	-.064(.043,.134)	-.175(.049,.000)	-.340(.064,.000)	-.200(.040,.000)
Richer	-.061(.041,.132)	-.210(.047,.000)	-.354(.061,.000)	-.204(.038,.000)
Richest	-.064(.038,.094)	-.109(.045,.015)	-.174(.057,.002)	-.140(.036,.000)
<b>Type of Residence (Rural areas are reference category)</b>				
Urban Areas	-.122(.027,.000)	-.218(.032,.000)	-.238(.041,.000)	-.194(.026,.000)
<b>Regions</b>				
Sub Saharan Africa	.079(.035,.025)	.396(.042,.000)	.122(.056,.028)	.150(.034,.000)
Secular States	.007(.038,.848)	.262(.044,.000)	.274(.059,.000)	.060(.036,.092)
Net Imports	-.148(.029,.000)	-.046(.033,.153)	.219(.042,.000)	-.044(.027,.128)
Constant	.464(.095,.000)	.079(.102,.640)	-.734(.130,.000)	.972(.085,.000)
Cox & Snell R Square	.044	.069	.025	.035
Nagelkerke R Square	.063	.108	.051	.070
No. of Observations	1,85343			

Statistical significance is indicated by \*\*\*, \*\*, and \* at the 1%, 5%, and 10% levels, respectively.

As seen in table 4, stunting, wasting, being underweight, and a composite anthropometric index all have a link to low self-esteem and self-awareness. Making bad judgments can result in wasting, underweight, and CIAF development. It's been discussed in scholarly journals before (Chakrabarti, 2017; Chipili, Msuya, Pacific, & Majili, 2018; Desai, 2010; Quamruzzaman & Lange, 2016a). The other two components of women empowerment-employment status and self-confidence, put children at risk of malnutrition. Working moms have less time with their children than stay-at-home parents, who are with them all day. Ibrahim and Pandey discovered a relationship between women's employment status and child malnutrition (2014). According to Goode and Mavromaras (2014), working women may contribute to young children's malnutrition. The combined women's empowerment index and child health, as well as micro and macro determinants, were investigated in Table 5.

Malnutrition is reduced as the amount of empowerment grows, according to a combined women empowerment index. Malnutrition is less likely in the children of women with a lot of authority (Ibrahim & Pandey, 2014).

The woman's health, education, age, and the number of prenatal visits she got during her pregnancy are all considerations to consider. Every indicator of a child's nutritional health was shown to be significantly linked to the mother's BMI. Mothers with BMI less than 18.5 kg/m<sup>2</sup> are more likely to have children with CIAF, stunting, underweight, and wasting. Women who are in better health are more likely to look after their children (Kar, Pascual, & Chickering, 1999; Khan & Raza, 2013; Khan & Raza, 2014b). The degree of education a woman has a significant impact on her child's health. Malnutrition is aggravated when a mother is illiterate (CIAF, stunting, underweight, and wasting). A higher level of education is better for a child's health than a lower education (Keats, 2018b; Siddhanta & Chattopadhyay, 2017; Endris et al., 2017; Roy

et al., 2018) Children born to moms who are beyond the age of 19 when they give birth for the first time are less likely to be overweight. It's been proven that moms who were older when they had their first child have a higher chance of having a baby with a higher birth weight.

Similar to mothers, dads have a direct impact on the health and well-being of their children. The prevalence of composite anthropometric failure, stunting, wasting, and underweight reduced as the educational attainment of fathers increased. Fathers' attributes, such as their level of education, age, and work, all influence their children's health. As the father's age grows, the combined anthropometric failure, stunting, wasting, and underweight, diminishes.

Malnutrition is promoted by a non-linear connection between child age and malnutrition. The age of a child has a favorable correlation with being overweight. Underweight children are more likely to become adults as a result of their low nutritional state. Malnutrition is less likely among girls and children who have had their vaccines. In disadvantaged nations, boys are more prone to suffer than females (Khan & Raza, 2016).

Tables 3 and 4 demonstrate that a child's health improves when his or her family's financial situation improves. According to a new study, children from rich households are less likely to suffer from malnutrition than those from poorer families. Poverty and a lack of resources have a severe influence on a family's ability to get food and health care (Burroway, 2017; Ibrahim & Pandey, 2014; Ibrahim, Tripathi, & Kumar, 2015b). The type of housing a family lives in has a significant impact on the health of their children. When compared to rural children, urban children had greater access to all child health services, and urban children had better health than rural children (Huicho et al., 2016).

The nutritional status of children is significantly influenced by an area-specific

dummy variable. Malnutrition is more common among young individuals in Sub-Saharan Africa. Malnutrition is more prevalent in secular countries. Malnutrition is less common among children in countries where food exports exceed food imports.

## CONCLUSION

According to the findings of the study, women's empowerment has a significant impact on the health of their children at home. Increasing the status of women does not appear to reduce the likelihood of malnutrition in children. The ability of women to make their own decisions has a positive impact on the health of children (Scantlan & Previdelli, 2013; Ukwuani & Suchindran, 2003a). Women who have a strong sense of self-worth are more confident and take better care of themselves, which helps to keep their children from being malnourished (Haroon, 2018). The well-being of children is intrinsically tied to the empowerment of women in society. Among children in developing nations, the socio-economic condition of their parents has a substantial influence on the health of the children in their care. It is critical for parents to be educated when it comes to improving the health of their children (Ahsan & Maharaj, 2018b). The nutritional condition of a woman or mother is influenced by several factors, including the health of her newborn kid and her age at first delivery (Akinyemi, Adedini, & Odimegwu, 2017).

Malnutrition is less likely to occur in countries where food imports dominate food exports. Because several of these nations, notably Pakistan, India, and Nepal, where food exports outweigh imports, have a higher Global Hunger Index and larger gender disparity in their populations, Secular states have a higher prevalence of malnutrition than non-secular ones. Five countries are in the same boat: Gabon (Africa), India (Africa), Ethiopia (Africa), and Nigeria (Africa). Malnutrition was decreased as a result of net food imports. In Sub-Saharan Africa,

malnutrition is at an all-time high compared to the rest of the globe.

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