

The Role of Mother Empowerment and Macro-Economic Factors for Child Health: An Evidence from Developing Economies

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Abstract: *Objective:* To analyzed the role of maternal empowerment and macro-economic variables in the improvement of child health in developing economies.

Methodology: Maternal empowerment has measured through five dimensions: work status, awareness, decision making, self-esteem, and self-confidence. Moreover, countries' net foods imports, countries as secular or non-secular and region are selected as macro-economic factors. On the other hand, child health has analysed through the anthropometric measure, i.e. stunting. The most recent data sets of Demographic and Health Surveys (DHS) of 38 countries have been used. Data has been analyzed through the use of binary logistic regression and explore the impact of maternal empowerment and macro-economic factors on child health.

Results: The results explain the positive impact of mother empowerment in the improvement of child health. Furthermore, net food imports are positively effecting the child's health. Sub-Saharan Africa and Secular states proved to have negative impacts on child health. Most probably the more empowered mothers are more contributors and implement positive effects on their children's health.

Conclusion: The countries which can fill their food deficiencies through food imports have the probability of improved health for the next generation.

Keywords: Child Health, DHS, Binary Logistic, BMI, Net food Imports, Secular States.

1. INTRODUCTION

Child health is seeking primary attention all over the world and necessary for sustainable development. Every child has its natural right to grow, learn and develop under a healthy socio-economic environment. Because a healthy socio-economic environment help to improve the nutritional intake, which ultimately improves the growth and health of under five-year children. Nutritional deficiencies can cause children under five years to become stunted¹. All over the world 159 million children under five years are become stunted due to chronic deficiencies of nutrition likewise stunting, wasting and underweight. Stunting among the children results into an immature brain along with continuing harmful damages, low mental and learning ability, poor school performance in childhood, reduced earnings and increased risks of nutrition-related chronic diseases, such as diabetes, hypertension, and obesity. The number of campaigns, program, debates, and conferences are held all over the world for reducing stunting among children. Regardless of this improvement, there are still many countries all over the world where the prevalence of stunting needs to be

reduced. Timor-Leste(South & South Asia), Haithi (Latin America & Caribbean's), Sieria Leon, Chad, and Zambia(Sub-Saharan Africa) are still suffering from severe level of stunting, 50.2% stunted children in Timor-Leste, 71.7% child mortality in Haithi, and 40% children are stunted in Sieria Leon, Chad, and Zambia [1].

At household level mother's health, education, empowerment and socio-economic conditions of household influenced child health [2, 3]. Furthermore, one of the most common reasons for stunting is the mother's low body mass index, early age deliveries, and high fertility rate [4, 5]. Mother health and child health are interlinked which is further influenced by many other micro and macro-level factors² [6-9]. Moreover, there are many other macro-economic factors like net imports of food, countries religion backgrounds and the region from a country belongs have influenced on the nutritional status of children and need to be addressed. This study is an effort to fill this gap and provide the significance of the mother's empowerment and macro-economic factors on child health. Because a healthy future (children) and healthy present (mothers) both are complimentary for sustainable development. At the same time improvement in the nutritional status of children helps

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¹Short hight according to age.

²GDP per Capita, Governance index, Urbanization rate, Temperature anomaly, Rainfall anomaly

to grow, learn and develop them according to their age. In previous literature, only a few indicators of decision making, working status, education, health and violence have been used to find out their impact on child health [3, 10-12]. In the present study, it is trying to measure women empowerment through five dimensions, work status, awareness, decision making, self-esteem, and self-confidence including the maximum direct indicators of women empowerment and evaluate their role for improving the child health. In this way, the current study could capture the multi-dimensional effect of mother empowerment in improving the nutritional status of children, along with macro-economic factors.

2. REVIEW OF LITERATURE

In the previous literature, a link between women's empowerment and child health in developing countries was limited and ambiguous [13]. In the context of different countries, some studies find that maternal employment as the indicator of empowerment improves child health in Nicaragua [14]. While others find out that employment increases the risk of malnutrition and infant death in India [15] or that it is not statistically significant [13]. Most of the other studies provide different results depending on the health outcome in Nigeria [16] or the gender of the child [17].

Empowerment has been defined in different terms and women empowerment is well defined as "... the process by which those who have been denied the ability to make strategic life choices gain such an ability" [18]. Despite of that women empowerment refers to the ability for women to enjoy their rights to control and benefit from resources, assets, income and their own time, as well as the ability to manage risk and improve their economic status and wellbeing, measurement of women's empowerment remains a major challenge [19-21]. Although importance of women empowerment has been considered at every forum but establishing the link between women's empowerment and health outcomes, are the ambiguity in the concept, lack of direct indicators of all dimensions of women's empowerment and lack of data on the individual, household and community levels that reflect all dimensions of women's empowerment [21-23].

Most of the previous studies have developed a link between direct indicators of women empowerment-decision making with the child's health status. This link proves a good sign to improve the child's health outcomes, child stunting, and child immunisation, as

they showed a strong relationship with decision making [24]. Scantlan and Previdelli [12] highlight the direct measures like decision making and experience of violence have been used instead of indirect measures like education, a labour force participation was used to capture their effects on child nutritional status. Children's health-seeking behaviour is a very important indicator of women empowerment along with the health care of women and decision making in household purchases [25].

Different dimensions of women empowerment have been used in previous literature like education, health, decision making and employment [26-31]. Instead of making separate dimensions of women empowerment, a combined index has a strong and positive impact on child nutritional status [26]. Parental health has a significant impact on child health [32]. Women's community and household level decision making related to health, have high effects on the child's survival as well as mothers age at childbirth, education and wealth index have a significant impact on child's nutritional status in Nigeria [33].

At the macro level, the relationship between national income and national health are correlated, higher the rate of economic growth and provision of health services become more feasible [34, 35]. In some studies macro (economic growth), and micro (individual nutritional status) both types of data were used to find the association between them [36]. Several studies have examined the price shock of food effects on the nutrition status [37-40]. In many regions, religious aspect effects the diet pattern and nutrition's of their populations. Religions believe, and practices have a strong effect on human health [41, 42].

There are very few studies that incorporate the micro and macro factors altogether, and this study addresses this gap in the literature. And quantify the effect of mother empowerment³ and macro-economic factors on stunting in developing economies.

3. FRAMEWORK AND METHODOLOGY OF STUDY

Child health and mother empowerment are globally addressed issue. Stunting (height for age) is used as the indicator of child health [4, 43, 44]. In households, mothers are the primary caregiver of children. Child health status improved and grew up under the

³Mother empowerment is measured at individual levels.

observation of mothers. At the same time, macro-economic factors and religion effects (Secular States) have a great influence on health [41, 45]. The current study addressed child health at the household level and households is considered as a multi-person unit where a family or group of persons lives together. For this study, we start from the household which maximizes a preference function

$$U=f(Y_i, N_i, L_i) \tag{1}$$

Y_i are the market commodities and household is then assumed to produce a vector of commodities N_i . These commodities are associated with different types of activities related to nurturing and rearing children to enhance their health status (L_i) [46-49]. Good health is estimated by standardizing anthropometric measures (Stunting). Following by the work of Grossman (1972) general health production function, the reduced form production function of the health of a child in a household can be derived as [4, 5, 26, 50]

$$H_i=f(MEmp, ME) \quad i=1,2,3 \tag{2}$$

H_i is health (stunting) which depended on the vector of health inputs; mother's empowerment (MEmp), and macro-economic factors. In this study, the focus is on

the developing of the relationship between health (stunting) and empowerment along with macro-economic factors. The production function of health presents the economics of non-market activities (mother empowerment) which is more important and plays a role of vector of inputs for the production of market goods [51-54].

3.1. Data & Methodology

Data has been extracted from the most recent Demographic Health surveys (2005-2016) for analyses Women age 15 to 49 years are appropriate to participate, and men aged 15 to 65 years have been included in analysis. Furthermore, the collection and sampling methodology used for DHS surveys are present on the website [55].

Only countries were having DHS datasets (2006-2016), and data on stunting (under five-year children) and the indicators of mother empowerment were included in the study. Following the criteria, only 38 developing countries from South and Southeast Asia (Pakistan, Timor Leste, Cambodia, India Nepal) North Africa West Asia Europe (Azerbaijan, Jordan, Armenia, Egypt), Central Asia (Tajikistan, Kyrgyz Republic), Latin America & Caribbean's economies (Haiti, Honduras,

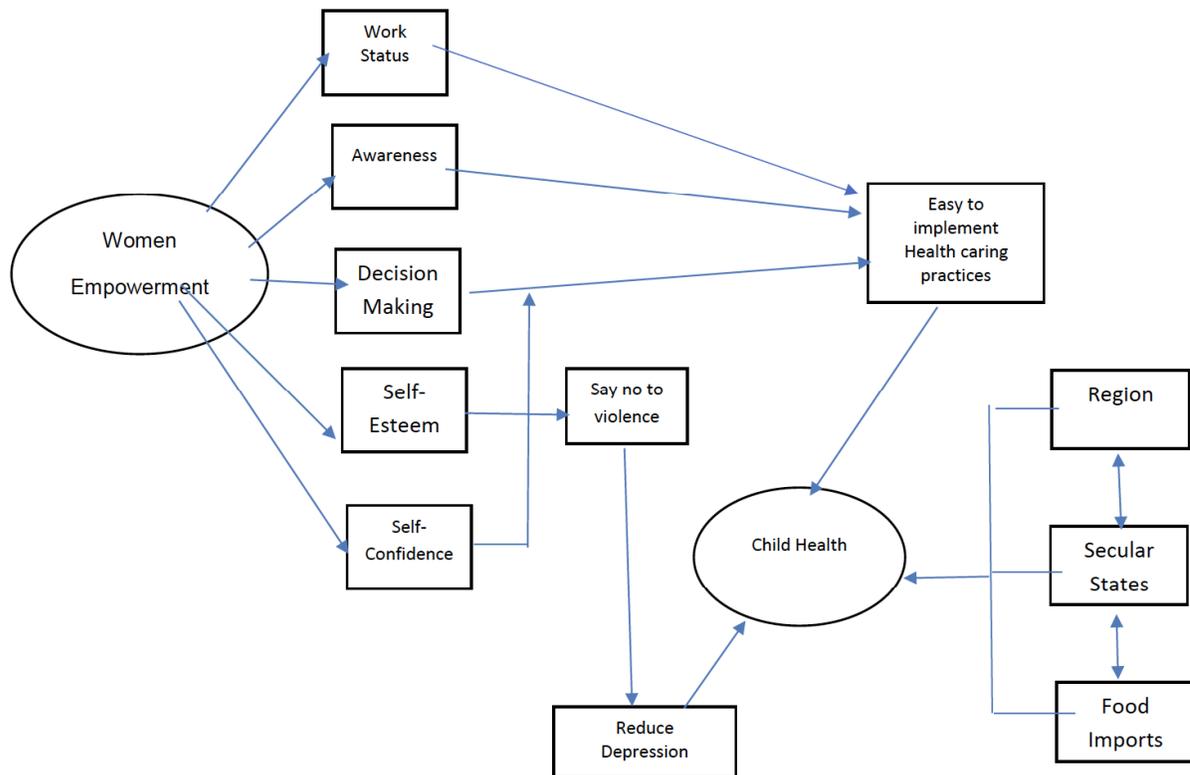


Figure 1: Women Empowerment hypothesised to improve the child health.

Source: An idea of Author.

Peru, Guatemala, Dominican Republic) and Sub-Saharan Africa (Ethiopia, Gabon, Gambia, Comoros, Congo Democratic, Cote d'Ivoire, Cameroon, Chad, Kenya, Liberia, Mali, Malawi, Mozambique, Namibia, Nigeria, Sierran Leon, Tanzania, Tonga, Uganda, Zimbabwe, Zambia, Burkna Faso) are selected according to availability of data.

3.2.a. Stunting as the Indicator of Child Health (Dependent Variable)

The three anthropometric measures are used for the indications of malnutrition in children are stunting (low height-for-age); wasting (low weight-for-height) and underweight (low weight-for-age) Z score below than -2 standard deviations (SD) [4, 43]. For this study, stunting is used as an indicator of health.

3.2.b. Independent Variables

Women Empowerment

It is difficult to define empowerment in a single dimension because it is a multidimensional process. Kabeer [18] explained the ability to exercise choices in terms of three interrelated dimensions: resource, agency and achievement. Resources are not only economic but also included human and social, which serve to enhance the ability to exercise choices. Change in resources; change the ability to make choices because resources are measured as potential rather than actualized choices. Agency is the ability to recognize one's goal and acts upon it. It is also expressed in the sense of motivation, purpose, and means to carry out activities for actualized choices. Agency tends to be operationalized as decision-making in social science literature. In the scenario of Kabeer [18], resource-agency-achievement framework, the present study explained empowerment as a process that can be attained in terms of five interrelated dimensions- work status, awareness, decision making, self-esteem, and self-confidence.

Macro-Economic Factors

Macro-economic factors have a significant effect on the health of any country. In this study net food imports, secular states⁴ and region. For this study, countries have been selected from five regions but only Sub-Saharan Africa⁵ is used as dummy variable to capture the effect of region.

3.3. Statistical Analysis

Chi-Square test was employed for cross-tabulation and describe the prevalence of the stunting within the different dimensions of women empowerment and macro-economic factors. SPSS 22.0 version was used to analyze the data. The mother empowerment Index is calculated through the Factor Analysis. These underlying factors are inferred from the correlations among the p variables. Each factor is estimated as a weighted sum of the p variables. The ith factor is thus

$$F_i = W_{i1}S_1 + W_{i2}S_2 + W_{i3}S_3 + \dots + W_{ip}S_p \quad (3)$$

W_{ip} is the weight for mth principal component and Pth variables and S variables (dimensions of empowerment) used in factor analysis [56-58].

These factor scores have been assigned as sub-indices of women empowerment and form a composite mother empowerment index depicts in the range of 1-4.4. It shows from low to higher empowerment. This mother empowerment index is then further categorized into three groups low, medium and high as followed by [59, 60]

Binary logistic regression was used to determine the role of women empowerment and macro-economic factors in reducing stunting.

4. RESULTS AND DISCUSSION

According to the results in Table 2, decision making, self-esteem, and awareness have a negative impact on stunting. Negative impact indicates that these three dimensions of women empowerment reducing the stunting and reduction in stunting will improve the child health. The other two dimensions of women empowerment--work status and self-confidence, increase the risk of stunting in children. Working women have less time to look after their children as compared to the mother stay at home and spend the whole day with their children at home. Previously it was proved in the study of Ibrahim and Pandey [61] that the work status of women causes stunting among their children. Goode and Mavromaras [62] also found working women, causing stunting among their children. Empowered mothers improve the well-being of family, and this well-being leads to improve the children health [63]. In developing countries women are the deprived part of the population in attaining health, education and employment due to gender-based discrimination [64]. For the social and economic development, women and children got primarily importance and debates were

⁴Secular state is a country where law does not play a role in the formations of any law and constitution

⁵In Sub-Saharan Africa stunting is at its highest level as compared to other regions.

Table 1: Measurement Scale of Dimensions of Women Empowerment along with other Explanatory Variables

Dimensions	Description	Measurement Scale in DHS Data	
Work Status (WS)	Respondent is currently Working	No=0, Yes=1	
	Respondent 's Employment Status	0=did not work, 1=unskilled manual	
		2=Skilled manual, 3=household domestic,	
		4=agricultural - self-employed, 5=clerical	
		6=agricultural – employee, 7=sales, 8=services 9=professional/technical/managerial	
Awareness (AW)	Respondent Watching TV	0=not at all, 1= almost daily, 2=at least once a week	
	Respondent reading Newspaper or Magazines	0=not at all, 1= almost daily, 2=at least once a week	
	Respondent listening to the radio	0=not at all, 1= almost daily, 2=at least once a week	
	Heard about family planning on the radio	not at all=0, 1= less than once a week 2=at least once a week, 3= almost daily	
		Heard about family planning on TV	not at all=0, 1= less than once a week 2=at least once a week, 3= almost daily
	Heard about family planning from newspapers		not at all=0, 1= less than once a week 2=at least once a week, 3= almost daily
Decision Making (DM)		The decision to spend's about 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 to women's Health		1=Someone else, 2=Husband/partner alone 3=Respondent and husband/partner, 4=Respondent alone, 4=Respondent alone
			The decision about large household purchases
	The decision about visits to family or relatives	1=Someone else, 2=Husband/partner alone 3=Respondent and husband/partner, 4=Respondent alone, 4=Respondent alone	
		Self Esteem (SE)	Beating justified if wife argues with husband
	Beating justified if the wife neglects children		0= Yes justified, 1= Not justified
Beating justified if Without telling husband	0= Yes justified, 1= Not justified		
Beating justified if the wife refuses to have sex with the husband	0= Yes justified, 1= Not justified 0= Yes justified		
	Beating justified if a wife burns food		0= Yes justified, 1= Not justified
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	
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 a dummy	Secular states=1, otherwise 0	

Source: Demographic Health Survey.

Table 2: Results of Bivariate Analysis of Child Health and Women Empowerment through Chi-Square test

Characteristics	Stunting
Women Empowerment	
Work status Index	
Low	29.90%
Medium	35.40%
Higher	33.00%
Awareness Index	
Low	36.00%
Medium	27.80%
Higher	24.90%
Decision Making	
Low	33.20%
Medium	31.40%
Higher	28.30%
Self Esteem	
Low	35.90%
Medium	33.30%
Higher	31.30%
Self Confidence	
Low	28.40%
Medium	34.30%
Higher	31.50%
Macro-economic Factors	
Net food Imports Countries	37.9%
Secular States	28.9%
Non-Secular States	21.9%
Countries from Sub-Saharan Africa	31.8%

All chi-square (χ^2) test showed a statistically significant association with $p < 0.05$ at 95% CI.

Table 3: Results of Binary Logistics Models Child Health and Women Empowerment (Dimensions)

Independent Variables	Stunting <-2 SD			
	Coefficient	Standard Error	P value	Marginal Effects
Mother/Women Empowerment				
Work Status	.1202191	.0069958	0.000***	1.97899
Awareness	-.2810227	.0072788	0.000***	1.97899
Decision Making	-.0719045	.0068782	0.000***	5.05039
Self Esteem	-.0862933	.0062644	0.000***	4.94928
Self Confidence	.0832629	.0080487	0.000***	4.28987
Sub Saharan Africa	.0530779	.0202878	0.000***	1.49588
Secular States	.1600286	.0200729	0.000***	.343303
Net Food Imports	-.1772089	.0161955	0.000***	.324272
Constant	-.2231986	.0714014	.0000***	

Pseudo R2 0.0185.

No. of Observations 1,85343.

The regressions include intercept terms. ***, ** and * denote statistical significance at the 1 and 5 and 10 percent levels, respectively.

held on national and international forums but still they are ignored in developing countries. Gender-based discrimination in health still exists which causes the poor health in children [65-67]. Empowering the mother can minimize this gender-based discrimination which has come from the birth of children and shift in the next generation.

Dummy variable of the region has a strong relationship with the nutritional status of children. Sub-Saharan Africa has a positive impact on stunting. Countries belonging to these regions have a higher probability to be the prevalence of stunting among the children under five years. In Sub-Saharan Africa, children have a higher risk of stunting. The secular states have a positive impact on stunting. Countries considered as secular states increase the risk of malnutrition. Net food imports showed a dynamic role to reduce the stunting in developing countries. Countries that import more food than their exports have a lower probability of prevalence of stunting compared to where food exports are more than food imports.

5. CONCLUSIONS

The empirical results of this study indicate that at the household level, women empowerment has a great influence on child nutritional status at their different levels. All dimensions of women empowerment are not reducing the risk of malnutrition in children. Women who have autonomy in decision making have a positive impact on child nutritional status [12, 16]. Awareness and women with self-esteem feel confidence and better care of their children and this care, in turn, reduces the chance of malnutrition in children [3]. Women empowerment has a crucial role in determining child health. Countries that import more food than their exports have a lower risk of malnutrition. Because most of these countries where exports of food are more than food imports have a higher Global Hunger Index and with higher gender inequality, i.e. Pakistan, India, Nepal, Timor-Leste, Haiti, Ethiopia, Zambia and Sierra Leone [1].

REFERENCES

- [1] UNICEF. Levels and Trends in Child Mortality Report 2018 2018 [44]. Available from: https://www.unicef.org/publications/index_103264.html.
- [2] Chipili G, Msuya J, Pacific R, Majili S. Women Empowerment and the Nutrition Status of Children Aged Between 6-59 Months. *Journal of Nutrition and Health Sciences* 2018; 5(2): 208. <https://doi.org/10.15744/2393-9060.5.208>
- [3] Jamal H. Exploring the relationship between mothers Empowerment and Child Nutritional Status : An Evidence from Pakistan. *Pakistan Journal of Applied Economics* 2018; 28(2): 189-211.
- [4] Khan REA, Raza MA. Child malnutrition in developing economies: a case study of Bangladesh. *Quality & Quantity* 2014; 48(3): 1389-408. <https://doi.org/10.1007/s11135-013-9842-4>
- [5] Khan REA, Raza MA. Determinants of malnutrition in Indian children: new evidence from IDHS through CIAF. *Journal of Quality & Quantity* 2016; 50(1): 299-316. <https://doi.org/10.1007/s11135-014-0149-x>
- [6] Korin MR. *Theory and Fundamentals of Health Promotion for Children and Adolescents*. Health Promotion for Children and Adolescents: Springer; 2016. p. 9-21. https://doi.org/10.1007/978-1-4899-7711-3_2
- [7] Lamontagne JF, Engle PL, Zeitlin MF. Maternal employment, child care, and nutritional status of 12–18-month-old children in Managua, Nicaragua. *Social Science Medicine* 1998; 46(3): 403-14. [https://doi.org/10.1016/S0277-9536\(97\)00184-6](https://doi.org/10.1016/S0277-9536(97)00184-6)
- [8] Li Y-N, Nong D-x, Wei B, Feng Q-M, Luo H-y. The impact of predisposing, enabling, and need factors in utilization of health services among rural residents in Guangxi, China. *BMC Health Serv Res* 2016; 16(1): 592. <https://doi.org/10.1186/s12913-016-1825-4>
- [9] Mary S. How much does economic growth contribute to child stunting reductions? *Economies* 2018; 6(4): 55. <https://doi.org/10.3390/economies6040055>
- [10] Akinyemi, Adedini, Odimegwu. Individual v. community-level measures of women's decision-making involvement and child survival in Nigeria. *South African Journal of Child Health* 2017; 11(1): 26-32. <https://doi.org/10.7196/SAJCH.2017.v11i1.1148>
- [11] Hasan MN, Uddin MSG. Women empowerment through health seeking behavior in Bangladesh: Evidence from a national survey. *South East Asia Journal of Public Health* 2016; 6(1): 40-5. <https://doi.org/10.3329/seajph.v6i1.30343>
- [12] Scantlan, Previdelli. *Women's empowerment and childhood malnutrition in Timor-Leste: a mixed-methods study*. Oregon: Mercy Corps 2013.
- [13] Mugo N, Zwi AB, Botfield JR, Steiner C. Maternal and child health in South Sudan: priorities for the Post-2015 agenda. *Sage Open* 2015; 5(2): 2158244015581190. <https://doi.org/10.1177/2158244015581190>
- [14] Lamontagne JF, Engle PL, Zeitlin MF. Maternal employment, child care, and nutritional status of 12–18-month-old children in Managua, Nicaragua. *Social Science Medicine* 1998; 46(3): 403-14. [https://doi.org/10.1016/S0277-9536\(97\)00184-6](https://doi.org/10.1016/S0277-9536(97)00184-6)
- [15] Abbi R, Christian P, Gujral S, Gopaldas T. The impact of maternal work status on the nutrition and health status of children. *Food Nutrition Bulletin* 1991; 13(1): 1-6. <https://doi.org/10.1177/156482659101300409>
- [16] Ukwuani, Suchindran. Implications of women's work for child nutritional status in sub-Saharan Africa: a case study of Nigeria. *Social Science Medicine* 2003; 56(10): 2109-21. [https://doi.org/10.1016/S0277-9536\(02\)00205-8](https://doi.org/10.1016/S0277-9536(02)00205-8)
- [17] Morrill MS. The effects of maternal employment on the health of school-age children. *Journal of Health Economics* 2011; 30(2): 240-57. <https://doi.org/10.1016/j.jhealeco.2011.01.001>
- [18] Kabeer N. Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Dev Change* 1999; 30(3): 435-64. <https://doi.org/10.1111/1467-7660.00125>

- [19] Carlson GJ, Kordas K, Murray-Kolb LE. Associations between women's autonomy and child nutritional status: a review of the literature. *Maternal and child nutrition* 2015; 11(4): 452-82. <https://doi.org/10.1111/mcn.12113>
- [20] Kishor S, Gupta K. Women's empowerment in India and its states: evidence from the NFHS. *Economic and Political Weekly* 2004; 694-712.
- [21] Mason KO, Smith HL. Women's empowerment and social context: Results from five Asian countries. Gender and Development Group, World Bank, Washington, DC 2003.
- [22] Alkire S. Subjective quantitative studies of human agency. *Social Indicators Research* 2005; 74(1): 217-60. <https://doi.org/10.1007/s11205-005-6525-0>
- [23] Malhotra A, Schuler SR. Women's empowerment as a variable in international development. *Measuring empowerment: Cross-disciplinary perspectives* 2005; 1(1): 71-88. <https://doi.org/10.1037/e597202012-004>
- [24] Ibrahim A, Tripathi S, Kumar A. The effect of women's empowerment on child health status: study on two developing nations. *International Journal of Scientific and Research Publications* 2015; 5(4): 1-8.
- [25] Hasan MN, Uddin MSG. Women empowerment through health seeking behavior in Bangladesh: Evidence from a national survey. *J South East Asia Journal of Public Health* 2016; 6(1): 40-5. <https://doi.org/10.3329/seaiph.v6i1.30343>
- [26] Jamal H. Exploring the relationship between mother's empowerment and child nutritional status: An Evidence from Pakistan. *Pakistan Journal of Applied Economics* 2018; 28(2): 189-211.
- [27] Abekah-Nkrumah G. Women's Empowerment and Household Health in Sub-Saharan Africa: Examining the Importance of Social Norms: The University of Manchester (United Kingdom); 2013.
- [28] Acharya DR, Bell JS, Simkhada P, van Teijlingen ER, Regmi PR. Women's autonomy in household decision-making: a demographic study in Nepal. *Reproductive Health* 2010; 7(1): 15. <https://doi.org/10.1186/1742-4755-7-15>
- [29] Ahmad F, Sultan M, editors. Women's empowerment and mobility in Pakistan: Result from a National Survey. Fifth Annual Research conference; 2004.
- [30] Ahmed S, Creanga AA, Gillespie DG, Tsui AO. Economic status, education and empowerment: implications for maternal health service utilization in developing countries. *PloS one* 2010; 5(6): e11190. <https://doi.org/10.1371/journal.pone.0011190>
- [31] Akter S, Rutsaert P, Luis J, Htwe NM, San SS, Raharjo B, *et al.* Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. *Food Policy* 2017; 69: 270-9. <https://doi.org/10.1016/j.foodpol.2017.05.003>
- [32] Ahsan MN, Maharaj R. Parental human capital and child health at birth in India. *Economics Human Biology* 2018; 30: 130-49. <https://doi.org/10.1016/j.ehb.2018.06.006>
- [33] Akinyemi J, Adedini S, Odimegwu C. Individual v. community-level measures of women's decision-making involvement and child survival in Nigeria. *J South African Journal of Child Health* 2017; 11(1): 26-32. <https://doi.org/10.7196/SAJCH.2017.v11i1.1148>
- [34] Ruel MT, Alderman H, Maternal, Group CNS. Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition? *The lance* 2013; 382(9891): 536-51. [https://doi.org/10.1016/S0140-6736\(13\)60843-0](https://doi.org/10.1016/S0140-6736(13)60843-0)
- [35] Mary S. How much does economic growth contribute to child stunting reductions? *J Economies* 2018; 6(4): 55. <https://doi.org/10.3390/economies6040055>
- [36] Vollmer S, Harttgen K, Subramanyam MA, Finlay J, Klasen S, Subramanian S. Association between economic growth and early childhood undernutrition: evidence from 121 Demographic and Health Surveys from 36 low-income and middle-income countries. *The lancet Global Health* 2014; 2(4): e225-e34. [https://doi.org/10.1016/S2214-109X\(14\)70025-7](https://doi.org/10.1016/S2214-109X(14)70025-7)
- [37] Torlesse H, Kiess L, Bloem MW. Association of household rice expenditure with child nutritional status indicates a role for macroeconomic food policy in combating malnutrition. *The Journal of Nutrition* 2003; 133(5): 1320-5. <https://doi.org/10.1093/jn/133.5.1320>
- [38] Brinkman H-J, De Pee S, Sanogo I, Subran L, Bloem MW. High Food Prices and the Global Financial Crisis ave reduced access to Nutritious Food and worsened nutritional status and health. *The Journal of nutrition* 2009; 140(1): 153S-61S. <https://doi.org/10.3945/jn.109.110767>
- [39] Christian P. Impact of the economic crisis and increase in food prices on child mortality: exploring nutritional pathways. *The Journal of Nutrition* 2009; 140(1): 177S-81S. <https://doi.org/10.3945/jn.109.111708>
- [40] Webb P. Medium-to long-run implications of high food prices for global nutrition. *The Journal of Nutrition* 2009; 140(1): 143S-7S. <https://doi.org/10.3945/jn.109.110536>
- [41] Shatenstein B, Ghadirian P. Influences on diet, health behaviours and their outcome in select ethnocultural and religious groups. *Nutrition* 1998; 14(2): 223-30. [https://doi.org/10.1016/S0899-9007\(97\)00425-5](https://doi.org/10.1016/S0899-9007(97)00425-5)
- [42] Trepanowski JF, Bloomer R. The impact of religious fasting on human health. *Nutrition Journal* 2010; 9(1): 57. <https://doi.org/10.1186/1475-2891-9-57>
- [43] Jamal H. Explaining Spousal Physical Violence through Dimensions of Women Empowerment: Evidence from Pakistan 2017.
- [44] Huicho L, Segura ER, Huayanay-Espinoza CA, de Guzman JN, Restrepo-Méndez MC, Tam Y, *et al.* Child health and nutrition in Peru within an antipoverty political agenda: a Countdown to 2015 country case study. *The Lancet Global Health* 2016; 4(6): e414-e26. [https://doi.org/10.1016/S2214-109X\(16\)00085-1](https://doi.org/10.1016/S2214-109X(16)00085-1)
- [45] Shi T, McAllister DA, O'Brien KL, Simoes EA, Madhi SA, Gessner BD, *et al.* Global, regional, and national disease burden estimates of acute lower respiratory infections due to respiratory syncytial virus in young children in 2015: a systematic review and modelling study. *The Lancet* 2017; 390(10098): 946-58. [https://doi.org/10.1016/S0140-6736\(17\)30938-8](https://doi.org/10.1016/S0140-6736(17)30938-8)
- [46] Becker GS. A Theory of the Allocation of Time. *The Economic Journal* 1965: 493-517. <https://doi.org/10.2307/2228949>
- [47] Becker S, Fonseca-Becker F, Schenck-Yglesias C. Husbands' and wives' reports of women's decision-making power in Western Guatemala and their effects on preventive health behaviours. *Soc Sci Med* 2006; 62. <https://doi.org/10.1016/j.socscimed.2005.10.006>
- [48] Grossman M. On the concept of health capital and the demand for health. *Journal of Political Economy* 1972; 80(2): 223-55. <https://doi.org/10.1086/259880>
- [49] Willis RJ. A new approach to the economic theory of fertility behavior. *Journal of Political Economy* 1973; 81(2, Part 2): S14-S64. <https://doi.org/10.1086/260152>

- [50] Garcia M, Alderman H, Sathar ZA. Patterns and determinants of malnutrition in children in Pakistan: impact of community health [with comments]. *The Pakistan Development Review* 1989; 28(4): 891-902.
- [51] Cummins RO, Chamberlain DA, Abramson N, Allen M, Baskett P, Becker L, *et al.* Recommended guidelines for uniform reporting of data from out-of-hospital cardiac arrest: the Utstein Style. A statement for health professionals from a task force of the American Heart Association, the European Resuscitation Council, the Heart and Stroke Foundation of Canada, and the Australian Resuscitation Council. *Circulation* 1991; 84(2): 960-75.
<https://doi.org/10.1161/01.CIR.84.2.960>
- [52] Becker GS, Lewis HG. On the Interaction between the Quantity and Quality of Children. *Journal of Political Economy* 1973; 81(2, Part 2): S279-S88.
<https://doi.org/10.1086/260166>
- [53] Becker GS. A theory of social interactions. *Journal of Political Economy* 1974; 82(6): 1063-93.
<https://doi.org/10.1086/260265>
- [54] Becker GS. Altruism in the Family and Selfishness in the Market Place. *Economica* 1981; 48(189): 1-15.
<https://doi.org/10.2307/2552939>
- [55] Measure DHS. DHS Overview 2019 [Available from: https://dhsprogram.com/What-We-Do/Survey-Types/DHS-Questionnaires.cfm#CP_JUMP_16175.
- [56] Hightower WL. Development of an index of health utilizing factor analysis. *Med Care* 1978: 245-55.
<https://doi.org/10.1097/00005650-197803000-00006>
- [57] Gupta K, Yesudian PP. Evidence of women's empowerment in India: A study of socio-spatial disparities. *Geo Journal* 2006; 65(4): 365-80.
<https://doi.org/10.1007/s10708-006-7556-z>
- [58] Antony G, Rao KV. A composite index to explain variations in poverty, health, nutritional status and standard of living: Use of multivariate statistical methods. *Public Health* 2007; 121(8): 578-87.
<https://doi.org/10.1016/j.puhe.2006.10.018>
- [59] Brajesh, Shekhar DC. Level of Women Empowerment and It's Determinates in Selected South Asian Countries. *Journal Of Humanities And Social Science (IOSR-JHSS)* 2015; 20(4): 94.
- [60] Jeckoniah J, Nombo C, Mdoe N. Determinants of women empowerment in the onion value chain: a case of Simanjiro district in Tanzania. *Journal of Economics and Sustainable Development* 2012; 3(10): 88-99.
- [61] Ibrahim A, Pandey KK. Women's Empowerment and Child Health Outcomes: A Comparative Study between India and Nigeria. *Journal of Medical Science and Clinical Research* 2014; 2(12): 3277-92.
- [62] Goode A, Mavromaras K. Family income and child health in China. *China Economic Review* 2014; 29: 152-65.
<https://doi.org/10.1016/j.chieco.2014.04.007>
- [63] Siddhanta A, Chattopadhyay A. Role of women's empowerment in determining child stunting in Eastern India and Bangladesh. *J Social Science Spectrum* 2017; 3(1): 38-51.
- [64] Newman C. Time to address gender discrimination and inequality in the health workforce. *Human Resources for Health* 2014; 12(1): 25.
<https://doi.org/10.1186/1478-4491-12-25>
- [65] Hill K, Upchurch DM. Gender differences in child health: evidence from the demographic and health surveys. *Population Development Review* 1995: 127-51.
<https://doi.org/10.2307/2137416>
- [66] Mehrotra S. Child malnutrition and gender discrimination in South Asia. *Economic Political Weekly* 2006: 912-8.
- [67] Fikree FF, Pasha O. Role of gender in health disparity: the South Asian context. *Bmj* 2004; 328(7443): 823-6.
<https://doi.org/10.1136/bmj.328.7443.823>