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Women's Empowerment as a Determinant of Child's Nutrition: Evidence from a Cambodia Demographic and Health Survey

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Abstract

Does the empowerment of women improve a child's long-term health outcome? Although the relationship seems intuitive in daily life, most studies done globally have found no association. This paper explicates the relationship between women's empowerment and children's malnutrition by taking Cambodia as a case study and adding new empirical evidence to the debate. Data were drawn from the Cambodia Demographic and Health Survey (DHS) 2014, with a sample of 4,118 children nationwide. To measure children's nutritional status, this study employed the WHO's height-for-age (HFA) and weight-for-age (WFA) metrics, and at the same time, used the Survey-Based Women's emPowERment Index (SWPER), which encompasses three well-recognized dimensions indicating a high degree of female financial independence and social autonomy to measure women's empowerment. It was found that their empowerment has a significant and positive effect on children's short- and long-term nutritional status.

Keyword: Child, Cambodia, Empowerment, Nutrition, Women

1. Introduction

Child's malnutrition has been a grave public health concern and an issue for individual physical growth, cognitive functions, neurodevelopment, health outcome, productivity, and labor market consequences in the populations of low- and middle-income-countries (Black et al., 2008; Zhang et al., 2021), and it has led to a remarkable number of deaths and disease disorders. To put it into perspective, undernutrition, either directly or by a resultant increased susceptibility to succumb to disease, kills about 230,000 children under the age of 5 annually worldwide (Phalkey et al., 2015). Even though the number of malnourished children has continued to decrease, progress has been slow in the least-developed countries, especially those in Sub-Saharan Africa and South Asia, where 90 percent of the world's underweight children live (Wali et al., 2019).

With that said, malnutrition is also a critical challenge for Cambodia, with 32 percent of children under the age of 5 being stunted and 10 percent being wasted (National Institute of Statistics et al., 2015). The prevalence of stunting is also much higher in rural provinces such as Preah Vihear than in urban areas, namely the capital Phnom Penh, and thus it is believed

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that there is much room for improvement. Additionally, given its detrimental consequences, such statistics deserve serious attention, and efforts should be made to understand the determinants of undernutrition so that effective policies can be suggested to reduce child mortality and help children grow. However, the relationship between children's nutritional status and other factors affecting such status has been rarely studied in Cambodia, let alone with a rigorous quantitative method. This notion can be corroborated by the limited number of studies in the country (Fujii, 2010). As a result, research has had to rely mostly on general literature to build knowledge. However, such literature typically lacks specific context and, as a result, often does not paint a complete picture of an issue in a particular country.

Using Cambodia as a case study, this study investigates the determinants of children's undernutrition. Specifically, we assess the relationship between children's long-term health outcomes measured by height-for-age and women's empowerment. In particular, this paper addresses one key question: does women's empowerment improve a child's height for age? We found a strongly significant and positive relationship between these two variables, unlike most studies done globally, which found no association between women empowerment and children's nutritional status (Santoso et al., 2019) despite an intuitive correlation in daily life. In their study, Miller & Rodgers (2009) explored the association between a mother's education and whether her child was stunted or underweighted in Cambodia using the logit model; they found a negative correlation between stunting and women's schooling. However, their study did not use the latest World Health Organization's (WHO) international measurement standard, as employed here.

In terms of the significance of the research, we also extend this study's scope to include women's empowerment, whose measurement was theoretically developed by Ewerling et al. (2017). We incorporated their calculation method and applied it to the Cambodia Demographic and Health Survey 2014 to generate new empirical evidence for Cambodian and general literature on child's nutrition to highlight the important relationship between women's empowerment and children's long-term health outcomes. At the same time, our paper demonstrates a slightly improved new method to measure women's empowerment using survey-based data. Moreover, by providing strong and generalizable findings, this paper aims to offer policy implications for relevant authorities that deal with the challenges related to the nutritional status of children under age 5.

2. Conceptual Framework on Child Undernutrition

Empirical research studies on children's long-term nutritional history in recent years have tended to be contingent on the UNICEF Multi-Sectoral Approaches to Nutrition (United Nations International Children's Emergency Fund, 2014; Wali et al., 2019), which in turn evaluates reviewed papers published in The Lancet and respected journals on clinical nutrition. The UNICEF Approaches provides an interconnected multi-level framework in which it highlights the importance of women empowerment and girl/mother's education as key determinants to improve the nutrition of children, their mothers, and their health outcome. However, this framework is too broad in that no quantitative research can cover every aspect and level, ranging from individual children to varying ecological environments and national policies. Therefore, the framework would fit better for a doctoral thesis rather than a research

article, which would be of more interest if it focused on a single and most important aspect — the household — because household economics theories generally agree that households influence their members' wellbeing (Becker, 1993).

Other quantitative studies have shown a mother's schooling to be a significant factor in reducing the prevalence of child's malnutrition and small birth size in developing countries (E. Miller & Rodgers, 2009; Moestue & Huttly, 2008; Skoufias, 1999; Smith & Haddad, 2000). These studies attribute their findings to more educated mothers having a better understanding of nutritional knowledge and the ability to earn a higher income. In another attempt, Burchi (2010) also suggests a strong effect of a mother's education on a child's well-being in later life. What's more, women's empowerment, which should have a strong and positive association with their education as well, is found to have a positive and vital consequence on a child's growth (Sen & Begum, 2015). Women who are empowered and can decide how to spend their income have a significant, positive impact on their children's well-being (Ahuru, 2021). Similarly, following old-age pension program policy reform in South Africa, Duflo (2003) found that younger girls in a household whose older women received a pension had better health outcomes than their peers living in a family whose older men received such money. The author attributed the result to the perception that the pension reforms were a permanent boost to income and to women's bargaining power within households. In contrast, Haushofer & Shapiro (2016) observed almost no differences in household consumption, production, and investment decisions between male and female recipients of unconditional cash transfers in Kenya. Even so, it should be highlighted that the concept of women empowerment is qualitative, thus vague in nature and difficult to measure. Hence, findings and methods are often arguable.

3. Research Methodologies

3.1 Data and Sample

This study uses nationally representative data from the Cambodia Demographic and Health Survey (DHS) 2014, collected by the National Institute of Statistics. The survey was conducted nationwide across all 25 provinces in urban and rural areas between June 2 and December 12, 2014. The survey team used a two-stage sampling approach. In the first stage, stratified random sampling was used to divide the domain into urban and rural areas, and all provinces were segregated into 38 strata comprising 611 enumeration areas (188 in urban areas and 423 in rural areas). The size of sampling households in each enumeration area differs, with some big areas having as many as 200 households. Selection of an enumeration area, also done in the first stage, was based on probability proportional to size technique. In the second stage, samples were chosen randomly from each enumeration area, with the number of samples selected based on the number of local households. Initially, 16,356 households were selected, but only 15,937 households were found occupied and surveyed.

All women between the ages of 15 and 49 in the selected households were invited to answer questions. Of the 18,012 women who agreed to participate, 98 percent finished the interviews without interruption. These women had 6,970 children under the age of 5 living with them. The sample excluded children for a lack of height and weight measurements: either their parents refused collection of such data, the child was absent, or no measurement was found in the household, leaving only 4,427 children. In addition, 53 were dropped because of

unusually high or low Z-scores after calculating the WHO measurement for child nutritional status, as described in the following section. Finally, some children were excluded because of missing details about their parents and/or household that were required for constructing the women empowerment index and data analysis. Ultimately, the sample comprised 4,118 children of information that includes the characteristics of the household and its head, and that of the child's micro-nutritional status, such as weight and height. It should also be highlighted that DHS is a standardized survey that has been consistently developed for use globally; thus, the results are comparable worldwide.

[Table 1 here]

Table 1 shows the sample's descriptive statistics. On average, the mothers finished 5.3 years of education regardless of the quality of teaching and learning, with only a small number of them having completed secondary school. Their husbands, however, averaged about 1.2 more years of education. With that said, the average household head had only 5.3 years of education. The data also show women's age at first cohabitation and first birth since these variables are crucial for calculating the women's empowerment index. It is worth noting that in a developing Asian country like Cambodia, the age at first cohabitation is usually the age at first marriage, 20.1 years old, while the age at first birth is 21.8.

Men manage 80 percent of households, showing their dominance in household decision-making. In addition, an average of 5.7 members occupy each household, which indicates the prevalence of extended family. It should be highlighted that the household head may report members living in the same compound but under a different roof as living in the same household, which is the case in rural areas where a compound may have more than one household. Most households are also situated in rural areas, and that would partially explain why the average head has not finished primary school since access to education would be limited and, in certain cases, expensive. Finally, it is worth noting that many households have more than one child under age 5. This figure has at least two contradictory implications. On the one hand, because many parents have more than one younger child, they have better experience in childrearing and child development and can thus perform their parenting duties more effectively. On the other hand, there can be a trade-off between the quantity and quality of the children (Becker, 1960). Simply put, more children might lead to worse health outcomes for each child because parents' time, attention, and financial resources must be allocated among more children.

3.1. Measuring Children's Nutritional Status

To measure children's nutritional status, we employ the World Health Organization's (2006) approaches, which are internationally accepted and called Height-For-Age (HFA) and Weight-For-Age (WFA). HFA is a measurement of a child's long-term nutritional history and reflects recurrent and chronic illness; it is little affected by any short-lived disruption or recent food or nutritional intake. On the other hand, WFA is a composite indicator that measures both acute and chronic undernutrition, and we use it as a robustness check to validate the HFA result. It is worth noting that to obtain HFA and WFA Z-scores, information on a child's age in months

or days, sex, height, weight, and whether height is measured by standing up or lying down are required; fortunately, they are available in the DHS 2014. The formula to calculate a Z-score is

$$y = \frac{\left[\left(\frac{Y}{M}\right)^{L} - 1\right]}{(S * L)}$$

where y denotes a HFA or WFA Z-Score; Y is the child's height or weight; M is the benchmark obtained from WHO's (2006) Child Growth Standards table; L is the value of Box-Cox power transformation for normal distribution, which smooths centile curves for skew and kurtotic data; and S is the coefficient of variation available in the WHO guidelines (Chea & Wongboonsin, 2019). Moreover, we follow the WHO's recommendation to recompute and adjust for children whose initial Z-score lies beyond three Standard Deviations (SD) because such extreme values might derive from an error during measurement or data input. To facilitate the computation process, we used R programming and the WHO package for anthropometric calculation called "Anthro" authored by Dirk Schumacher, Elaine Borghi, Jonathan Polonsky, and the World Health Organization. With that said, Croft et al. (2018) and their DHS Statistics team still suggested removing children with height-for-age Z-scores below -6 SD or above +6 SD, with weight-for-age Z-scores below -6 SD or above +5 SD, or with weight for height Z-scores below -5 SD or above +5 SD after the readjustment since it is likely that such very high or low Z-score results from invalid data due to mismeasurement or input error.

[Figure 1 here]

Figure 1 illustrates the distribution of anthropometric indicators, namely height for age and weight for age. The mean value of height-for-age is -1.4 SD, indicating that Cambodian children are shorter, on average, compared with the international standard. However, they can only be considered stunted if the figure goes below -2 SD and severely stunted if below -3 SD. The average weight-for-age, a measurement for being underweight, for Cambodian children is -1.24 SD.

3.2. Measuring Women Empowerment

Woman empowerment is our main independent variable of interest, yet it is difficult to measure due to its comprehensive and multidimensional nature. In fact, it has never had any crystal-clear concept or consensus method for how it should be measured. Some approaches have been proposed and used in different studies, including those of Tadesse et al. (2013) and Upadhyay & Karasek (2012). However, they encompass limitations, such as that the weightings employed for the items used in the construction process were chosen subjectively. Furthermore, these indices are specifically designed for particular countries, especially those in Africa, where DHS is largely available, but they might not be appropriate for an Asian context without testing for external validity.

Given these limitations, we propose to measure women's empowerment in Cambodia with SWPER (Survey-Based Women's emPowERment index), a recently developed cross-

cultural validated standard indicator that requires DHS data to operationalize (Ewerling et al., 2017). It allows for cross-country comparison over time and can be calculated at an individual level. SWPER (pronounced "Super") comprises three universally recognized dimensions of women's empowerment: attitude towards violence, social independence, and decision-making, all of which encompass 15 items. These variables are regarded as important yardsticks for women's empowerment because they provide insight into the degree of autonomy, gender role, and bargaining power within a household.

[Table 2 here]

Table 2 presents the variables used in the construction of SWPER. The first five items are classified as attitudes toward violence in the household (att), while the next six variables are categorized into social independence/autonomy (aut). The last four items are deemed decision-making within the household (dec). Once the value of all 15 variables is coded accordingly, we employ the SWPER equation to calculate the individual score for the three SWPER dimensions as follows:

$$att_i = \frac{-(\sum_{v=1}^{15} \lambda_{v1}\bar{x}_v) + \sum_{v=1}^{15} \lambda_{v1}x_{vi}}{\sigma_1} = \frac{-0.95 + \sum_{v=1}^{15} \lambda_{v1}x_{vi}}{1.818}$$

$$aut_i = \frac{-(\sum_{v=1}^{15} \lambda_{v2}\bar{x}_v) + \sum_{v=1}^{15} \lambda_{v2}x_{vi}}{\sigma_2} = \frac{-5.36 + \sum_{v=1}^{15} \lambda_{v2}x_{vi}}{1.475}$$

$$dec_i = \frac{-(\sum_{v=1}^{15} \lambda_{v3}\bar{x}_v) + \sum_{v=1}^{15} \lambda_{v3}x_{vi}}{\sigma_3} = \frac{0.857 + \sum_{v=1}^{15} \lambda_{v3}x_{vi}}{1.417}$$

where x is the individual value for each of the 15 variables, and λ_{v1} is the output by dividing Principal Component Analysis loading for each variable v in the first dimension by the standard deviation of each variable v in the dataset. It is worth noting that the denominator in each of the equations above, σ_j, is the standard deviation of predicted scores for each dimension. Therefore, a positive score means the value is above the mean, or they perform better than the average individual. The calculation method is not new; a similar approach was used by Smits & Steendijk (2015) to develop the International Wealth Index (IWI), which is the first comparable asset-based wealth index covering the entire developing world. Ewerling et al. (2017) also assess SWPER's external validity by aggregating individual scores and correlating them with the Gender Development Index, another widely-used measurement for gender equality in income, education, and health at the country level. The results showed that they are strongly associated, substantiating SWPER's internal and external validity. Nevertheless, it is not without limitations. Since constructing the indices requires information about the husband, such as current age and years of education, women who are unmarried or living with a partner are excluded from the data analysis process.

3.3. Model and Econometric Specification

This subsection lays out the econometric specification for data analysis. We begin with Skoufias' household utility function (Skoufias, 1999), which assumes that a household chooses among spending on child health *H*, leisure *L*, and consumption of other types of goods and services as denoted by *C*. In addition, we would extend his assumption to suppose that the household would try to maximize its own welfare subject to budget constraints. Skoufias's utility function is written as follows:

$$U = U(H, L, C, X_h)$$

where X_h is a vector of a household's characteristics, including women's decision-making power within the household, and the age, sex, and education of the household head. Child health, *H*, can be written as a household's production function, or simply put, as a result of the household's decision, preference, and investment. Such production function can be formulated as follows:

$$H = F(Y, X_i, X_h, X_c, \epsilon)$$

where *Y* is a vector of health input, including health care investment, childcare, and food intake; X_i is a vector of the child's characteristics such as age, gender, and birth order; X_h is a vector of household characteristics similar to that mentioned earlier; X_c is a vector of community characteristics likely to influence child health including whether the household is in an urban or rural area. The latter indicates that the household finds it difficult to access healthcare, and the quality of the care is questionable; ϵ is the error term. In practical econometric analysis, this production function can be approximated by a simple linear model. To be more specific, we use Ordinary Least Square (OLS) regression of a child's anthropometric measurement on women empowerment indices and other control variables, using the formula below:

$$Y = \alpha + \beta_1 X_i + \beta_2 M_i + \beta_3 (HH)_h + \beta_4 Head_h + \beta_5 R_h + \epsilon \qquad (1)$$

where the subscript i and h index the individual *i* and household *h*, respectively; Y is the dependent variable, including height-for-age and weight-for-age; X includes a variable indicating the birth order of the child; M is a vector of the mother's characteristics, namely SWPER women empowerment indices; HH is a vector of household characteristics, such as the total number of household members and children under five and household wealth quintile (poorer, poor, middle, rich, and richer); Head is a vector of household head characteristics consisting of the head's education, age, and sex; and R is a vector of regional characteristics likely to influence child health; ϵ is the error term representing unobserved variables. The children's age and sex go unmentioned as they were taken into account when calculating height-for-age and weight-for-age. It makes no sense to include them in the regression model because the coefficient will not be significant. Ramsey's Regression Specification Error Test (RESET) was also conducted under the null hypothesis that equation (1) above is correctly specified. The result shows an insignificant F Statistic (p-value = 0.5714), suggesting no evidence of a functional form problem.

4. Results and Discussion

Now that we have shown our regression model, we are in the position to present the findings and begin our discussion by paying very close attention to Table 3, model (1), which is the main result of our interest in this study.

[Table 3 here]

Table 3 demonstrates the regression output of child anthropometric measurement on all three SWPER women's empowerment indexes. As expected and clearly seen in the table, women empowerment scores (attitude towards violence and social independence/autonomy) are strongly associated with both indicators of children's better health outcomes. Since the score is standardized, a positive value means they are more empowered than an average woman in comparable low- and lower-middle-income countries. This finding adds new empirical evidence not only to the Cambodian but also to general literature, which is lacking due to the absence of data even though, theoretically speaking, women empowerment is believed to be critical for children's first 1,000 days of life (Santoso et al., 2019). It should be highlighted that most previous studies found no correlation between women empowerment and child's nutrition (Cunningham et al., 2015; Santoso et al., 2019 and references therein) despite such an intuitive relationship that can be seen clearly in daily life. This seeming contradiction likely stems from limitations in the literature given that the concept of women empowerment broadly encompasses multiple dimensions and domains, and that some studies might have missed certain aspects of specific countries.

This study shows that when a woman has higher indices, she is likely to have a higher education level, which can result in her child enjoying better health. Education enhances mothers' knowledge about nutrition, the vigilance of their children's growth in the long term, and their income through a better job, which allows them to afford a healthy diet, nutritional intake, better healthcare, and/or nurturing environment for their children. A similar finding was discovered in Mozambique (Burchi, 2010) and Ethiopia (Kassie & Workie, 2021; Shaka et al., 2020). The former used the Instrumental Variable approach, providing strong evidence substantiating the direct and large effect of a mother's schooling. Employing the Demographic and Health Survey data of 22 developing countries, Desai & Alva (1998) have also demonstrated a positive effect of maternal education on various indicators of children's health status. In Cambodia, Miller & Rodgers (2009) and Zanello et al. (2016) also indicate that maternal education and best practices in childrearing are the most promising factors in improving child health and reducing stunting, wasting, and small birth size in rural areas. In contrast, wealth seems to be an important determinant of child nutrition in urban areas. Additionally, when women can obtain a high level of education, they are more likely to have greater options and competence in thinking and choosing a better spouse and their own hygiene practices (Fujii & Ear, 2002). In addition, women with schooling have played an important role in generating income for the family and had higher bargaining power regarding priorities for household purchases and spending levels (Glewwe, 1999; Schultz, 1984).

No positive correlation was seen in the decision-making variable, which should signal women's empowerment. This may seem contradictory; after all, allowing a woman to have the final say in decision-making should influence how a household allocates resources and, therefore, lead to increased investment in her children (Porter, 2016). However, households can also have

unanimity in preference, in which case all household members have identical or similar preferences in consumption, thus tending to maximize the same unitary function (Duflo, 2003). In these cases, it does not matter whether the father or mother makes decisions due to the assortative matching nature within such households: the husband and wife usually hold mutual ways of thinking, perceptions, and cognizance in preparing for what is considered good for their children's well-being.

Some other control variables also appear to be significant determinants of a child's nutrition, including higher birth order and age of household head as well as wealth quintile. A lower birth order significantly and negatively affects an individual child's health, a finding in line with Chea & Wongboonsin (2020), who found that older children in Cambodia are in a much more favorable situation relative to their younger siblings; the first-born child tends to receive more parental input and attention than those who are born later into an increasing large family. In addition, the regression result has demonstrated that an increase in the household head's age also ensures child growth and health status, albeit the magnitude is very small. It should be noted that the household head might not be the mother's husband or the child's father. Apart from that, the wealth index implies an anticipated effect on children's height for age. Furthermore, the other independent variables shown in the table, including the number of household members and of children under the age of 5, do not necessarily manifest any remarkable relationship with the nutrition of children. This can be attributed to the positive effect of accumulative parenting experience and the negative impact of having many young children, in which case the resources are constrained and cancel each other.

Looking at column (2) for a robustness check, we can generally see that many independent variables, particularly the SWPER women empowerment indices, have a similar effect on both the long-term and short-term stock of health in terms of the direction of relationship and significance. The coefficient of household head's education is significant at 10 percent, suggesting that education matters for children's acute and chronic under-nutritional status. At the same time, women's empowerment can be important for the long-term quality of health.

5. Concluding Remark

This study investigates the relationship between a child's nutrition and women's empowerment in Cambodia. We use nationally representative data known as the Demographic and Health Survey 2014, the latest available survey in the country. To measure a child's nutritional status, we employ the WHO's height-for-age and weight-for-age international measurements. In addition, we use a newly developed approach to gauge women's empowerment, the focus of this empirical research. Regression results show that women's empowerment indices are significantly and positively associated with children's better health and nutritional intake. Although not attempting a serious causal impact evaluation using advanced econometric methods such as Propensity Score Matching, Two-Stage Least Square or an advanced experimental design such as a Randomized Controlled Trial, this study incorporated and applied a new theoretical method onto data and added new empirical evidence to the general literature. The findings also provide a unique insight to improve public awareness of how important women's decision-making power is in relation to children's growth and nutrition in the long run.

A limitation of the study stems from an unknown, i.e., a women's empowerment might be correlated with a confounding factor, such as her own ability or natural aptitude, which has gone unobserved by the DHS and most known surveys globally because the ability is very difficult, if not impossible, to measure. It is possible that husband and wife have decided jointly that the wife can make decisions independently because she has shown better leadership, wisdom, and/or knowledge of particular topics, such as nutrition or household financial management, and that her husband trusts her decisions, whereas a less able wife relies on her husband for such matters. If this is the case, then the coefficient of the women empowerment index seen in Table 3 is much more likely to suffer from upward bias, meaning the coefficient itself is larger than it should be.

In terms of policy implications, keeping an eye on the potential benefits and tracking the development of mothers' education and women empowerment through conducting regular surveys is highly recommended and should be a top priority for potential economic growth and to deal with the serious challenges children will face such as those in health, employment, livelihood. In addition, quantitative research on the role of women empowerment is inadequate to support government policy recommendations because empowerment is a vague and obscure concept, making it difficult to provide any useful research evidence. Therefore, many people tend to discount women's ability to make independent decisions. As a result, we would suggest future studies that attempt to create a new and more comprehensive measurement for women empowerment in Cambodia and then use it as a baseline to monitor the improvement of gender equality (SDG goal 5). Such as index can also be employed to understand the benefits of such empowerment, such as poverty reduction, distribution of income, or equality in opportunities.

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Table 1: Descriptive Statistics of Sample

Variable	Mean	SD
Mother's Age	28.6	6.0
Mother's Years of Education	5.3	3.9
Husband/partner's Age	31.9	7.0
Husband/partner's Education	6.5	4.4
Woman's Age at First Cohabitation	20.1	4.0
Woman's Age at First Birth	21.8	4.0
Household Head's Age	40.1	13.8
Household Head's Sex is Male	0.8	0.4
Household Head's Years of Education	5.3	4.0
Total Household Members	5.7	2.3
Total Number of Children under five years old	1.5	0.7
The proportion of Household in Urban Area	0.27	0.4
n	4,118	

Source: Authors

Table 2: Variables Used in the Construction of SWPER

N	Variable	Code or Unit
1	Beating is justified if the wife goes out without telling her husband	Yes= –1; don't know=0; no =1
2	Beating justified if wife neglects the children	Yes= –1; don't know=0; no =1
3	Beating justified if wife argues with husband	Yes= –1; don't know=0; no =1
4	Beating justified if wife refuses to have sex with husband	Yes= –1; don't know=0; no =1
5	Beating justified if wife burns the food	Yes= –1; don't know=0; no =1
6	Frequency of reading newspapers or magazines	Not at all=0; <once a week=1; ≥once a week=2
7	Woman's education in completed years of schooling	Years
8	Education difference: woman's minus husband's completed years of schooling	Years
9	Age difference: woman's age minus husband's age	Years
10	Woman's Age at First Cohabitation	Years
11	Woman's Age at First Birth	Years
12	Respondent worked in past 12 months	No=0; in the past year=1; have a job, but on leave past 7 days=2; currently working=2
13	Who usually decides the respondent's health care	Husband or other alone=–1; joint decision with women=0; respondent alone=1
14	Who usually decides large household purchases	Husband or other alone=–1; joint decision with women=0; respondent alone=1
15	Who usually decides visits to family or relatives	Husband or other alone=–1; joint decision with women=0; respondent alone=1

Source: Ewerling et al. (2017)

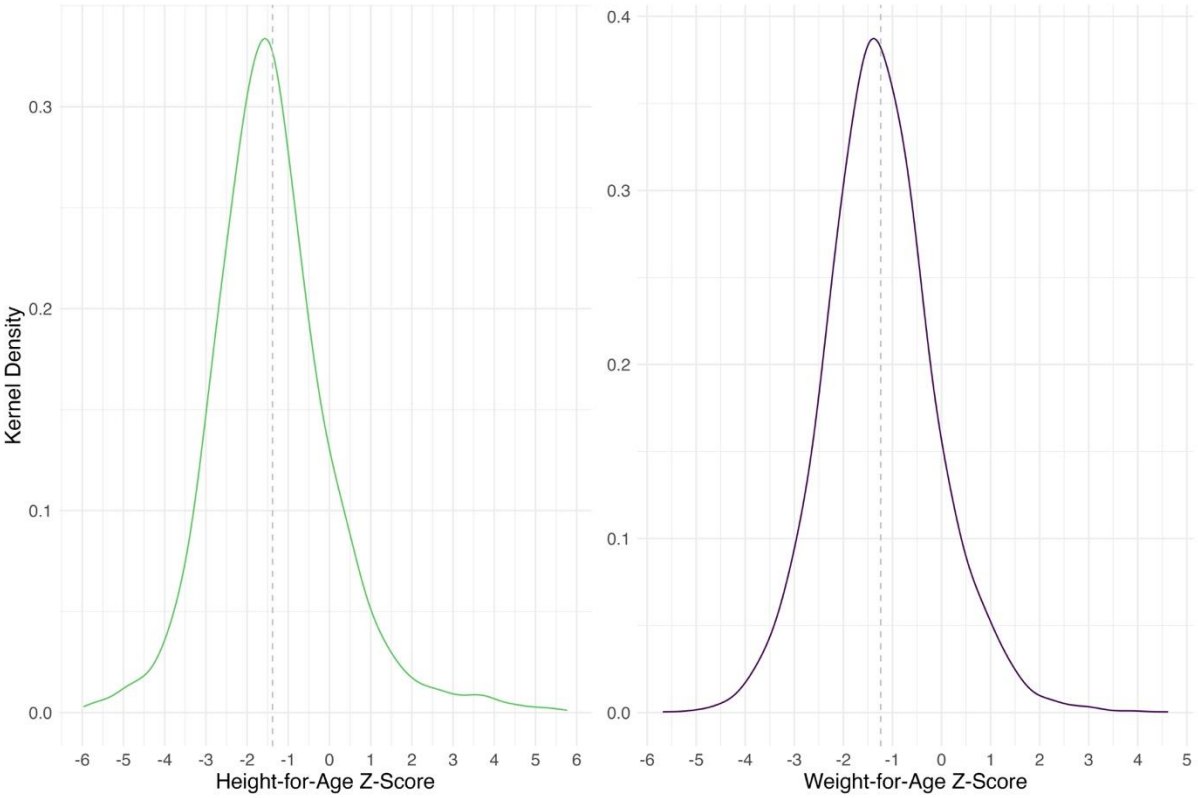
Table 3: Regression of Child Anthropometric Measurement

Variables	Dependent Variable	
	HFA (1)	WFA (2)
Birth Order (1st order is the reference)		
2nd order	0.064 (0.055)	0.022 (0.043)
3rd order	0.001 (0.068)	0.002 (0.051)
4th or younger order	-0.155** (0.074)	-0.17*** (0.055)
Attitude towards violence Score	0.069** (0.028)	0.043** (0.022)
Social Independence Score	0.061** (0.028)	0.04** (0.021)
Decision Making Score	-0.016 (0.041)	0.007 (0.028)
Household Head's Age	0.0004** (0.0002)	0.001 (0.001)
Household Head's Sex is Male	-0.014 (0.061)	0.0029 (0.046)
Household Head's Years of Education	0.007 (0.006)	0.01* (0.0054)
Total Household Members	-0.003 (0.013)	0.023** (0.011)
Total Number of Children under five years old	0.029 (0.039)	-0.048* (0.029)
Wealth Quintile (Poorest is the reference)		
Poorer	0.04 (0.07)	0.069 (0.056)
Middle	0.158** (0.074)	0.125** (0.058)
Rich	0.324*** (0.079)	0.16*** (0.06)
Richer	0.627*** (0.096)	0.461*** (0.074)

Dummy Variable for Each Province	Yes	Yes
Dummy Variable for Urban/Rural	Yes	Yes
Constant	-1.80*** (0.16)	-1.50*** (0.128)
Observations	4,118	4,118
Adjusted R^2	0.05	0.05

Source: Authors
Note: Robust standard error in parenthesis. *p < 0.1; **p <0.05; ***p < 0.01

Figure 1: Distribution of Anthropometric Indicators



Source: Authors
Note: The bandwidth for Kernel estimation is 0.5.