# Prevalence and predictor stunting, wasting and underweight in Timor Leste children under five years: An analysis of DHS data in 2016

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## Abstract

Stunting, wasting, and being underweight are indicators of malnutrition in a country. The high status reflects the poor nutritional and health status of children under five. We analyzed data from the Demographic and Health Survey conducted in Timor Leste from 2009 to 2016 to identify the prevalence and predictor stunting, wasting, and underweight. The variables analyzed were the mother's education, mother's age, mother BMI, mother's height, number of ANC visits, birth weight, sex of a child, sex of head household, type of residence, wealth index, toilet facility, source of drinking water and province. The sample in this study was 3,723 toddlers**.** Prevalence of stunting (44.4%), underweight (37.5%) and wasting (25.3%). In the bivariate analysis, the variables statistically significantly associated with stunting, underweight, and wasting was mother's education, sex of a child, type of residence, wealth index, and province. Improving the nutritional status of children in Timor Leste requires various nutrition and health interventions.

## Introduction

Malnutrition is crucial public health trouble among kids under five years in growing nations, such as Timor Leste. Several factors that motivate malnutrition are interrelated and feature destructive short-term and long-term fitness outcomes.[1,2] Malnutrition is divided into malnutrition with direct causes and underlying causes. Factors that include immediate causes are inadequate food intake and recurrent diseases, while underlying causes include lack of access to health facilities, inadequate maternal care, food insecurity and poverty.[3]

The indicators of children's nutritional status that have been widely defined are stunting, wasting, and being underweight. Stunting is caused by inadequate nutritional intake in the long term and is also caused by repeated infections; wasting results from acute food shortages and disease. The impact of stunting is impaired cognitive development and motor development delays, and most of them are irreversible. On the other hand, wasting is a strong predictor of mortality and requires an immediate response. Underweight combines information on linear growth retardation and weight for length/height.[4] Nutritional deficits also hinder children's long-term physical, mental, and emotional development and limit the country's economic and social growth and prosperity.[5] In addition, nutritional deficits also affect children's cognitive and physical development, increase the risk of infection, and significantly contribute to child morbidity and mortality.[6,7]

However, diverse varieties of malnutrition can also coincide in children.[6] Malnutrition contributes appreciably to the worldwide burden of several diseases. Globally, malnutrition bills for at least half of all deaths in children under five.[8] In 2016, according to the World Health Organization (WHO), a minimum of 155, 52, and 99 million children under the age of 5 in the world were stunted, wasted, and underweight, respectively [9,10]

In Timor Leste, significantly, more than half (50.2%) of all children beneath five were found to be stunted in 2013, well above the regional common of 11.3% for East Pacific Asia. Nearly 38% of all kids beneath five are underweight. The prevalence of underweight was higher amongst boys (39.0 %) than girls (36.3%), but not substantially. Amongst children 0-59 months, the prevalence of overall losing (weight for height, WHZ<-2) decreased from 18.6% in 2009-10 to 11% in 2013. An extreme drop was noted between 2010 and 2013, from 7.0 % to 1.9%, while wasting reduced from 18.6% to 9.1%. Wasting was better amongst children living in the city (14.3%) compared to children living in rural areas (9.8%) and improved to degrees seen in emergencies in Covalima (17.4%) and Oecusse (19.8%).[11]

The significance of the three indicators of malnutrition displays the negative dietary reputation and health of children under five

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Key words: Prevalence; predictor stunting; underweight; wasting; DHS in Timor Leste.

Acknowledgments: This research is from DHS data. The authors would also like to acknowledge the support of all those who voluntarily enrolled in this DHS data collection.

Contributions: RM: early conception of the work; MBQ: design of the work, revised it for important intellectual content; AF: responsible for all aspects of research integrity; AWK: preparation of the manuscript and literature review; EA: data analysis. All the authors have read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Conflict of interest: The authors declare no conflict of interest.

Availability of data and materials: All data generated or analyzed during this research are included in this published article.

Ethical approval and consent to participate: The facts sets used in this examination had been derived from 2016 surveys. The IDHS statistics set consists of a total of 3,723 children. In addition, the sampling techniques, survey layout, survey units, measuring gadgets were mentioned (IDHS information source: https://dhsprogram.com/ data/dataset/ Timor-Leste_Standard-DHS_ 2016.cfm?flag=1).This study uses publicly available secondary data analysis; researchers obtained data from the MEASURE DHS website (URL: https://www.dhsprogram.com/) by following the procedures for obtaining data set by the DHS formal ethical approval and written.

Informed consent: The manuscript does not contain any individual person's data in any form.

Received for publication: 3 January 2022.
Accepted for publication: 2 May 2022.


*Journal of Public Health in Africa 2022; 13:2116*
*doi:10.4081/jphia.2022.2116*

years, so it is necessary to conduct this research to discover the factors associated with malnutrition in kids in Timor Leste. But this research, which has mentioned national-stage statistics, is restricted to stunting determinants. In addition, there is a lack of literature on the correlation of the three indicators of adolescent malnutrition based on nationally representative information units. Consequently, this observation used national 2016 Timor Leste Demographic and Fitness Survey (DHS) records to look at factors related to malnutrition among children aged 0-59 months.

Reducing malnutrition in children is significant for a country's economic and social development.[12] Undernutrition of children is associated with higher mortality and morbidity, and, therefore, should be one of the priority areas for policymakers to take immediate and appropriate action, especially where the burden is high.[13–15]

## Materials and Methods

### Input IDHS data

The facts sets used in this examination had been derived from 2016 surveys. The IDHS statistics set consisted of a total of 3.723 children. In addition, the sampling techniques, survey layout, survey units, measuring gadgets were mentioned (IDHS information source: https://dhsprogram.com/data/dataset/Timor-Leste_Standard-DHS_2016.cfm?flag=1). It was based on an evaluation of present public domain survey information units freely to be had online with all identifier facts eliminated. The Ethics Committee in DHS permitted the survey.

This study used a cross-sectional method. The secondary analysis used 2016 DHS data. This survey collected information on Timor Leste households related to maternal and child health socio-demographic indicators. The survey covers both rural and urban populations from thirteen provinces in Timor Leste.

Samples of children (n=3,723, age 0-59 months) had whole anthropometric measurements. Evaluation of the nutritional status of children <5 years used three internationally recognized anthropometric indices (height for age, weight for height, and weight for age) to assess the nutritional status of children under five in the 2016 DHS data set. The WHO Multicenter Growth Reference Study was used to calculate the triple anthropometric index to evaluate nutritional status. The three indices are expressed in standard deviation units (S.D.) from the median of the reference population. Children with Z-scores, below -2SD of the median WHO reference population, for height for age (HAZ), weight for height (WHZ), and weight for age (WAZ), considered stunted, underweight, and wasting.[16]

The dependent variable was expressed as a dichotomous variable to examine the factors associated with the nutritional status of children less than five years of age. These variables include category 0, not stunting (>−2SD), and category 1, stunting (<−2SD), average weight (<−2SD) and underweight (<−2SD), not wasted (>−2SD to +2SD) and wasted (<−2SD).

The selected independent variables were divided into two factors, including sociodemographic-mother and child factors. The selected socio-demographic factors were maternal education, maternal age, maternal body mass index, maternal height, head of household, type of residence, household wealth index, toilet facilities, drinking water sources, and home province. Child-level factors were the sex of the child, the child's weight at birth, and antenatal clinic visits.

The analysis was performed using descriptive statistics and logistic regression with STATA 13.0 software. Descriptive statistics are used to describe the frequency of research variables. In addition, univariate and multivariate binary logistic regression was used to examine the determinants of the three indices of children's nutritional status. Results are given as odds ratio (OR) with 95% confidence interval (CI), and if $p<0.05$, it is considered statistically significant.

## Results and Discussion

A total of 3,723 children under 0-59 months were included in this research. Stunting (44.4%) became the most frequent dietary sickness located in this research, accompanied by underweight status (37.5%) and wasting (25.3%; Table 1).

The background characteristics of the children studied are presented in Table 2. Briefly, most of the children are male (50.6%), living in rural areas (68.9%), and have mothers with moderate education ( 48.9%). Only 8.3% of children had mothers with higher education and 44.2% mothers aged 20-29 years. Around 18.2% of children come from the poorest households, while 18.6% are the wealthiest. According to the mother's characteristics, 20.8% of children had a low BMI, and 10.1% of mothers had short height (<145 cm). Around 12.7% of children had mothers who visited antenatal clinics during pregnancy <4 times, 89.4% of household heads were husbands, 36.8% of children had unimproved toilet facilities, and 19% of the source of drinking water was not feasible (Table 3). A total of 11.5% of children live in Dili.

### Determinant of stunting

Bivariate and multivariate analysis showed that children born to mothers with low levels of education (OR=0.8,95%CI 0.67-0.96) had the most secondary wealth index (OR=0.61, 95%CI 0, 44-0.86), toilet facility (OR=0.8 95% CI 0.65-0.988) and source of drinking water (OR=1.41 95%CI 1.11-1.788) not feasible, are at risk of stunting. In addition, the mother's height was significantly related to child stunting because children whose mothers were short (<145 cm) were more likely to experience stunting (OR=0.72, 95% CI 0.56-0.93. Boys (OR=0.67 95% CI 0.57-0.78)) and children born smaller than the average (OR=1.66 95% CI 1.15-2.40)) were at risk of stunting.

### Determinant of underweight

Univariate analysis showed that children born to mothers with low levels of education (OR=0.91 0.95% CI 0.77-1.10), maternal age <20 years (OR=0.89 95%CI 0.55 -1.43), mothers with abnormal BMI (OR=0.67 95%CI 0.55-0.81), maternal height <150 cm (OR=0.79 95%CI 0.6-1, 04) having the poorest wealth index

**Table 1. Prevalence of malnutrition in Timor Leste.**

| Variables of malnutrition | f | % |
|---|---|---|
| Stunting (HAZ) | | |
| -2SD and above (normal/non-stunted) | 2.070 | 55.6 |
| <-2SD (stunted) | 1.653 | 44.4 |
| Wasting (WHZ) | | |
| -2SD to +2 S.D. (normal/not wasted) | 2.782 | 74.7 |
| Below -2SD (wasted) | 941 | 25.3 |
| Underweight (WAZ) | | |
| -2SD and above (normal/non-underweight) | 2.328 | 62.5 |
| Below -2SD (Underweight) | 1.395 | 37.5 |

(OR=0.66 95%CI 0.46-0.96), and unimproved source of drinking water (OR=1.37 95%CI 1.09 -1.74) are at risk of being underweight, especially if the child's age is low. Multivariate analysis of child factors showed that children with male sex (OR = 0.67 95% CI 0.57-0.78)) and children born were smaller than the mean size (OR=1 ,66 95% CI 1.15-2.40), children living in urban areas (OR=1.12 95% CI 0.92-1.37), having an unimproved toilet facility (OR=0.91 95% CI 0 .75-1.10) and source of drinking (OR=1.37 95% CI 1.09-1.74) tended to be underweight.

**Table 2. Socio-demographic characteristics of Timor Leste children.**

| Variable independent | Total | | Stunted | Underweight | Wasted |
|---|---|---|---|---|---|
| | n | % | | | |
| Educational'mother level | | | | | |
| Low | 1.594 | 42.8 | 47 | 49.5 | 48.5 |
| Middle | 1.819 | 48.9 | 46.8 | 46.1 | 45.9 |
| High | 310 | 8.3 | 6.2 | 4.4 | 5.6 |
| Mother's age | | | | | |
| <20 year | 97 | 2.6 | 2.6 | 2.8 | 3 |
| 20-29 year | 1.646 | 44.2 | 43.6 | 40.7 | 41.5 |
| 30-39 year | 1.492 | 40.1 | 40.2 | 42.2 | 44 |
| >40 year | 488 | 13.1 | 13.6 | 14.3 | 11.5 |
| Mother's BMI | | | | | |
| Thin | 774 | 20.8 | 20.6 | 25.4 | 25.1 |
| Normal | 2.453 | 65.9 | 66.4 | 65.1 | 66 |
| Overweight | 496 | 13.3 | 13 | 9.5 | 8.9 |
| Mother's height | | | | | |
| Short | 343 | 10.1 | 12 | 11.5 | 9.7 |
| Normal | 3.380 | 89.9 | 88 | 88.5 | 90.3 |
| Number of ANC visits during pregnancy | | | | | |
| <4 times | 472 | 12.7 | 12.5 | 12.8 | 14 |
| ≥4 times | 3.251 | 87.3 | 87.5 | 87.2 | 86 |
| Birth weight | | | | | |
| <2500 gr | 725 | 19.5 | 17.3 | 17.7 | 18.7 |
| 2500–4000 gr | 2.619 | 70.4 | 71.1 | 69.5 | 71 |
| >4000 gr | 379 | 10.1 | 11.6 | 12.8 | 10.3 |
| Sex of child | | | | | |
| Male | 1.884 | 50.6 | 54.5 | 53.3 | 53.8 |
| Female | 1.839 | 49.4 | 45.5 | 46.7 | 46.2 |
| Sex of head of household | | | | | |
| Male | 3.328 | 89.4 | 90.3 | 90.3 | 89.2 |
| Female | 395 | 10.6 | 9.6 | 9.7 | 10.8 |
| Type of place of residence | | | | | |
| Urban | 1.157 | 31.1 | 28.5 | 27.6 | 27.8 |
| Rural | 2.566 | 68.9 | 71.5 | 72.4 | 72.2 |
| Wealth index | | | | | |
| Kuantil 0 | 692 | 18.6 | 20.5 | 22.4 | 21.7 |
| Kuantil 1 | 736 | 19.8 | 20.7 | 20.6 | 22.3 |
| Kuantil 2 | 760 | 20.4 | 21.4 | 20.9 | 19.4 |
| Kuantil 3 | 856 | 23 | 22.8 | 23.2 | 21.8 |
| Kuantil 4 | 679 | 18.2 | 14.8 | 12.9 | 14.8 |
| Toilet facility | | | | | |
| Improved | 2.353 | 63.2 | 62.5 | 60.8 | 62.4 |
| Unimproved | 1.370 | 36.8 | 37.5 | 39.2 | 37.6 |
| Source of drinking water | | | | | |
| Improved | 3.017 | 81 | 79.1 | 78.5 | 81 |
| Unimproved | 706 | 19 | 20.9 | 21.5 | 19 |
| Province | | | | | |
| Aileu | 270 | 7.3 | 8.1 | 7.1 | 7.4 |
| Ainaro | 224 | 6 | 7.9 | 6.2 | 4.5 |
| Baucau | 265 | 7.1 | 7.4 | 6 | 4.3 |
| Bobonaro | 320 | 8.6 | 9.9 | 11.8 | 9.3 |
| Covalima | 277 | 7.4 | 8.1 | 8.3 | 6.4 |
| Dili | 428 | 11.5 | 10.7 | 9.4 | 10.2 |
| Ermera | 229 | 6.2 | 4.4 | 5.8 | 9.8 |
| Lautem | 262 | 7 | 6 | 5.2 | 6.4 |
| Liqui | 266 | 7.1 | 7.3 | 7.8 | 9 |
| Manatuto | 290 | 7.8 | 7.4 | 7 | 5 |
| Manufahi | 324 | 8.7 | 7.4 | 7.7 | 10.1 |
| Oecussi | 268 | 7.2 | 7.1 | 10.5 | 10.9 |
| Viqueque | 300 | 8.1 | 8.4 | 7.2 | 6.7 |

### Determinant of wasting

Multivariate analysis showed that children whose mothers had no education (OR=0.85, 95% CI 0.69-1.05), and maternal age <20 years (OR=0.80 95% CI 0 .49-1.33) were more at risk of being underweight. Similarly, children whose mothers had a BMI <18.5 were more likely to be underweight than children of obese and normal mothers (OR=0.73, 95% CI 0.59-0.92). Boys were more at risk of being underweight (OR=0.86 95% CI 0.726-1.02). Children living in urban areas were more likely to be underweight than children living in rural areas (OR=1.12 95% CI 0.88-

**Table 3. Univariate and multivariate analysis of stunting. underweight and stunting.**

| Variable Independent | Stunted | | Underweight | | Wasted | |
|---|---|---|---|---|---|---|
| | OR | p value | OR | p value | OR | p value |
| Mother's educational level | | 0.000 | | 0.000 | | 0.000 |
| Low | 0.8 (0.67-0.96) | | 0.91 (0.77-1.10) | | 0.85 (0.69-1.05) | |
| Middle | 0.7 (0.47-1.002) | | 0.50 (0.34-0.74) | | 0.55 (0.39-0.78) | |
| High | - | | - | | - | |
| Mother's age | | 0.830 | | 0.01 | | 0.014 |
| < 20 year | 0.95 (0.6-1.49) | | 0.89 (0.55-1.43) | | 0.80 0.49-1.33) | |
| 20-29 year | 0.86 (0.54-1.37) | | 1.16 (0.70-1.90) | | 1.082 (0.63-1.85) | |
| 30-39 year | 0.85 (0.52-1.38) | | 1.03 (0.61-1.75) | | 0.83 (0.46-1.52) | |
| > 40 year | - | | - | | - | |
| Mother's BMI | | 0.839 | | 0.000 | | 0.000 |
| Thin | 1.07 (0.87-1.31) | | 0.67 (0.55-0.81) | | 0.73 (0.59-0.92) | |
| Normal | - | | - | | - | |
| Overweight | 1.06 (0.79-1.42) | | 0.47 (0.35-0.65) | | 0.59 (0.42-0.84) | |
| Mothers height | | 0.000 | | 0.028 | | 0.696 |
| Short | 0.72 (0.56-0.933) | | 0.79 (0.6-1.04) | | 1.09 (0.8-1.49) | |
| Normal | - | | - | | - | |
| Number of ANC visits during pregnancy | | 0.799 | | 0.827 | | 0.150 |
| <4 times | 1.12 (0.89-1.43) | | 1.24 (0.95-1.63) | | 0.98 (0.77-1.26) | |
| ≥4 times | - | | - | | - | |
| Birth weight | | 0.001 | | 0.000 | | 0.788 |
| <2500 gr | - | | - | | - | |
| 2500–4000 gr | 1.28 (1.033-1.59) | | 1.11 (0.90-1.36) | | 0.99 (0.77-1.25) | |
| >4000 gr | 1.66 (1.15-2.40) | | 1.67 (1.15-2.41) | | 0.93 (0.62-1.38) | |
| Sex of child | | 0.000 | | 0.01 | | 0.025 |
| Male | 0.67 (0.57-0.78) | | 0.79 (0.67-0.94) | | 0.86 (0.726-1.02) | |
| Female | - | | - | | - | |
| Sex of head of household | | 0.1 | | 0.187 | | 0.791 |
| Male | 0.92 (0.73-1.16) | | 1.12 (0.87-1.44) | | 1.23 (0.91-1.6550 | |
| Female | - | | - | | - | |
| Type of place of residence | | 0.003 | | 0.000 | | 0.013 |
| Urban | 1.036 (0.85-1.26) | | 1.12 (0.92-1.37) | | 1.12 (0.88-1.43) | |
| Rural | - | | - | | - | |
| Wealth index | | 0.000 | | 0.000 | | 0.000 |
| Kuantil 0 | - | | - | | - | |
| Kuantil 1 | 1.04 (0.81-1.34) | | 0.99 (0.76-1.29) | | 1.005 (0.76-1.32) | |
| Kuantil 2 | 0.98 (0.74-1.30) | | 0.80 (0.62-1.05) | | 0.79 (0.58-1.06) | |
| Kuantil 3 | 0.89 (0.67-1.170) | | 0.99 (0.72-1.37) | | 0.95 (0.66-1.36) | |
| Kuantil 4 | 0.61 (0.44-0.86) | | 0.66 (0.46-0.96) | | 0.94 (0.62-1.44) | |
| Toilet facility | | 0.463 | | 0.018 | | 0.546 |
| Improved | - | | - | | - | |
| Unimproved | 0.8 (0.65-0.988) | | 0.91 (0.75-1.10) | | 1.005 (0.8-1.26) | |
| Source of drinking water | | 0.006 | | 0.002 | | 0.957 |
| Improved | - | | - | | - | |
| Unimproved | 1.41 (1.11-1.788) | | 1.37 (1.09-1.74) | | 0.84 (0.66-1.07) | |
| Province | | 0.000 | | 0.000 | | 0.000 |
| Aileu | - | | - | | - | |
| Ainaro | 1.45 (0.95-2.23) | | 1.07 9 (0.74-1 .55) | | 0.56 (0.36-0.87) | |
| Baucau | 1.037 (0.71-1.52) | | 0.9 90.62-1.31) | | 0.53 (0.32-0.86) | |
| Bobonaro | 1.23 (0.85-1.78) | | 2.07 (1.44-2.99) | | 0.94 (0.6-1.45) | |
| Covalima | 1.06 (0.70-1.58) | | 1.37 (0.89-2.10) | | 0.74 (0.45-1.20) | |
| Dili | 1.28 (0.86-1.90) | | 1.33 ((0.90-1.95) | | 0.83 (0.51-1.35) | |
| Ermera | 0.39 (0.24-0.619) | | 0.88 (0.61-1.28) | | 2.10 (1.29-3.42) | |
| Lautem | 0.7 (0.48-1.051) | | 0.68 (0.46-1.01) | | 0.83 (0.53-1.29) | |
| Liqui | 0.96 (0.635-1.437) | | 1.21 (0.85-1.73) | | 1.26 (0.83-1.92) | |
| Manatuto | 0.99 (0.69-1.41) | | 0.97 (0.63-1.49) | | 0.46 (0.25-0.86) | |
| Manufahi | 0.66 (0.44-0.989) | | 0.97 (0.67-1.41) | | 1.25 (0.82-1.93) | |
| Oecussi | 0.89 (0.592-1.335) | | 2.10 (1.40-3.13) | | 1.44 (0.95-2.19) | |
| Viqueque | 0.99 (0.658-1.506) | | 0.98 (0.69-1.39) | | 0.66 (0.42-1.04) | |

1.43), had the poorest wealth index (OR=0.94 95% CI 0.62- 1,44)

This study presents risk factors associated with child malnutrition in terms of stunting, being underweight, and wasting in children under five in Timor Leste by using DHS 2016 data. Our study shows that maternal education, wealth index, maternal BMI, child size at birth, child gender, source of drinking water have a significant relationship with the nutritional status of children. The magnitude of the malnutrition observed in this study reinforces the need to improve the nutritional quality of children in Timor Leste. The most common form of malnutrition among the studied population (n=3,723) was stunting (44.4%), followed by underweight (37.5%) and wasting (24.3%).

This observation affords chance elements related to infant malnutrition in terms of stunting, being underweight, and wasting in kids beneath five in Timor Leste through the usage of DHS 2016 statistics. Our observation suggests that maternal schooling, wealth index, maternal BMI, child-length at the start, child gender, supply of ingesting water have an extensive relationship with the dietary frame of kids. The value of malnutrition in this study reinforces the want to improve the nutritional quality of children in Timor Leste. The most common shape of malnutrition in the study population (n=3,723) was stunting (44.4%), followed by being underweight (37.5%) and losing (24.3%).

It highlights maternal, child, and socio-demographic elements related to stunting, which should be investigated thoroughly to implement appropriate interventions to reduce the stunting burden in Timor Leste.

Based on 2016 DHS data and our analysis, children of mothers with low education are more prone to malnutrition (stunting, wasted and underweight) than children of educated mothers. The associations found in this study between maternal education, stunting, underweight and underweight in children are consistent with several previous studies.[17,18]

Mothers with a better education could be well informed about their children's dietary and health needs and therefore opt to use higher hygiene and sanitation facilities. similarly, they made comparisons of available health care alternatives over conventional practices to improve the health of their kids.[19]

Many studies have confirmed the significance of maternal dietary status, particularly for the duration of the perinatal period, on toddler dietary status (first one thousand days of life).[20–22] This relationship has been investigated in studies in which BMI before pregnancy undoubtedly correlated with start weight, duration, and head circumference (β=0.274, 0.094, and 0,101, respectively; p<0.05 in all instances.[23] Additionally, maternal nutritional status can be used to predict malnutrition in toddlers at the age of 6 to 12 months.[24]

Sources of drinking water are independently associated with diarrhea in children. Children who drink from unfeasible water sources are three. Seven instances [AOR=15,419.95% CI= 2.02.117.78] are more likely to have diarrhea than those who use clean water sources. These data coincide with those obtained by Abdiwahabetal et al.[25] The broader confidence c programming language is because fewer households have to get entry to feasible water sources (23%) than the ones without (77%).

The high incidence of nutritional problems is also due to the excessive poverty rate. The excessive poverty rate in the Timor Leste area causes children to lack vitamins due to insufficient meals intake, making them susceptible to physical growth disorders because of lack of proper care.[25]

Our results display that boys are more likely to be stunted than girls. This finding is coherent with previous research, which pronounced that boys are at risk of malnutrition because they require more calories for growth and development.[26,27] One of the motives for the low caloric intake in children is the low socioeconomic repute, as found in our research. That may result in improved susceptibility to stunting amongst boys.

The children's size at birth extensively determines their nutritional status, as low starting weight is taken into consideration as a trademark of limited intrauterine growth.[28] Our research observed that children born with a lower-than-average weight were much more likely to be underweight. Whereas people with a larger-than-average weight have a lower possibility to be stunted. This finding is constant with preceding research showing that low starting weight children have an extensively higher likelihood of becoming stunted and underweight later in existence because of inadequate fetal nutrients.[29–31]

The strengths of our study include the use of nutritional data from a recent representative population-based survey (DHS 2016) to assess nutritional malnutrition in children aged 0-59 months in Timor Leste. In addition, this survey has a large sample size and a high response rate. However, this study also has limitations. Namely, this study used a cross-sectional research design, making it challenging to see causal relationships between different variables. In addition, this study did not look at the direct causal factors of nutritional status, namely food intake, including micronutrients and other food factors that are directly related to nutritional status, because these data were not included in this survey.

## Conclusions

In this study, it can be concluded that the factors that influence malnutrition in children in Timor Leste are maternal factors and child factors. These two factors are largely preventable. Strategies that can reduce the burden of early malnutrition in this country are increasing education, improving maternal nutrition, starting in adolescence, and focusing on alleviating poverty. Interventions that can be used are community-based education and nutrition interventions to overcome malnutrition in children.

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