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THE ROLE OF HUMAN DEVELOPMENT INDEX FOR WOMEN AND WAGES IN CHILDREN'S MALNUTRITION

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ABSTRACT

The issues regarding malnutrition in children, including wasting, stunting, and underweight, have raised serious concerns in global public health and economics, particularly in developing countries. This study examined the relationship between women's human development index and regional minimum wage concerning wasting, stunting, and underweight. It utilized secondary data obtained from BPS (Central Statistics Agency) and used thirty-three provinces in Indonesia from 2018 to 2022, employing panel data regression. The results indicate that the women's human development index significantly negatively affects stunting and underweight. Additionally, regional minimum wage significantly negatively impacts wasting, stunting, and underweight. These findings underscore the importance of policies supporting improving the Human Development Index for women and establishing a fair regional minimum wage to combat malnutrition issues. Interventions could include preventing anemia in adolescent girls by providing iron supplements, facilitating pregnancy check-ups, providing supplementary food for pregnant women, and offering social assistance for constructing latrines and meeting the nutritional needs of toddlers.

Keywords: *Human Development Index, Regional Minimum Wage, Wasting, Stunting, Underweight*

ABSTRAK

Permasalahan mengenai gizi buruk pada anak seperti wasting, stunting, dan underweight yang menyebabkan kekhawatiran serius pada kesehatan masyarakat dan perekonomian global, biasanya terjadi di negara berkembang. Tujuan dari penelitian ini, untuk melihat apakah terdapat hubungan antara indeks pembangunan manusia pada perempuan dan upah minimum regional terhadap wasting, stunting, dan underweight. Data sekunder yang diperoleh dari BPS (Badan Pusat Statistika) dan menggunakan tiga puluh tiga provinsi di Indonesia dari tahun 2018-2022. Meode yang digunakan dalam penelitian ini adalah regresi data panel. Hasil yang diperoleh adalah indeks pembangunan manusia pada perempuan memiliki pengaruh negatif signifikan terhadap stunting dan underweight. Selain itu upah minimum regional memiliki pengaruh negatif signifikan terhadap wasting, stunting, dan underweight. Penemuan ini, menggarisbawahi mengenai pentingnya kebijakan yang dapat memberikan dukungan dalam meningkatkan indeks pembangunan manusia pada perempuan dan penetapan upah minimum regional yang layak supaya

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dapat mengatasi permasalahan gizi buruk seperti melakukan pencegahan anemia untuk remaja putri dengan pemberian Tablet Tambah Darah, sarana pemeriksaan kehamilan dan pemberian makanan tambahan pada ibu hamil, serta bantuan sosial untuk pembuatan jamban dan kebutuhan gizi balita.

Kata Kunci: *Indek Pembangunan Manusia, Upah Minimum Regional, Wasting, Stunting, Underweight*

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Introduction

The issues surrounding malnutrition in children, including wasting, stunting, and underweight, have raised serious concerns in global public health, particularly in developing countries. According to the World Health Organization (WHO), an estimated 149 million children under five years old suffer from stunting, while 45 million face wasting (WHO, 2021). These problems affect children's physical health and influence their cognitive development and future productivity. Therefore, understanding the factors affecting the prevalence of malnutrition is crucial.

The Human Development Index (HDI) measures human development in terms of health, education, and living standards. Research indicates that a higher HDI is linked with lower malnutrition rates. A study by Alkire & Foster (2011) found that countries with higher HDI provide better access to healthcare and education, improving child nutrition status. Investment in education and healthcare can serve as an effective strategy to reduce the prevalence of wasting and stunting.

In addition to the overall HDI, specific HDI indexes relating to gender also significantly influence child nutrition. The mother is a key figure with a strong bond with her children. When women have improved access to education and economic resources, they are more likely to make informed decisions regarding family nutrition and health (Mondal et al., 2014). Research by the McKinsey Global Institute (2015) indicates that enhancing women's education and workforce participation can lower child malnutrition rates. Educated women tend to understand nutritional information better, enabling them to make healthier decisions regarding the food their families consume. Studies show that higher-educated women often choose more nutritious and balanced foods, such as fresh vegetables, fruits, and whole grains, over less nutritious processed options (Smith & Haddad, 2015). Furthermore, education improves women's ability to engage in household decision-making, including food purchasing and preparation, leading to healthier dietary patterns for all family members (FAO, 2011).

Alongside the human development index, regional minimum wages can significantly influence children's nutritional status. Higher minimum wages can enhance families' purchasing power, allowing them to access nutritious food and necessary healthcare services (Lenhart, 2017). Research by Ponce et al. (2018) demonstrated that increases in minimum wage levels are associated with reductions in stunting and underweight rates among children. Thus, policies promoting minimum wage increases can be vital in addressing malnutrition issues. Accordingly, the alternative hypothesis applicable to this research is that the women's Human Development Index has a negative and significant impact on the prevalence of wasting, stunting, and underweight. Additionally, the regional minimum wage also negatively and significantly influences the prevalence of wasting, stunting, and underweight, which is the foundation for this study.

The interplay between women's human development index and regional minimum wages offers a more comprehensive understanding of the prevalence of wasting, stunting,

and underweight among children. Research by Pellett (1981) showed that regions with higher human development index and better minimum wages tend to have lower malnutrition rates. Therefore, policymakers must adopt a comprehensive approach, focusing on improving the human development index and regulating minimum wages as strategic measures to reduce the prevalence of malnutrition in children.

Literature Review

This literature review aims to provide a comprehensive overview of relevant research. This review will explore existing findings and perspectives and how previous research contributes to a better understanding of the issues raised. There are three points in this research literature review.

Human Capital Theory

Human Capital Theory posits that investments in education and health yield significant economic returns. According to Becker (1975), individuals with higher education levels tend to have better job prospects and higher incomes, leading to improved living conditions and greater access to nutritious food. This theory is particularly relevant for understanding child malnutrition, as educated parents are more likely to prioritize their children's health and nutrition (Schultz, 2004). Education equips parents with the knowledge necessary to make informed dietary choices. Studies indicate that maternal education is directly linked to child nutritional status, with educated mothers more likely to understand the importance of a balanced diet (Fadare et al., 2019; Fatima et al., 2024; Makoka, 2013). This knowledge translates into better food choices, lowering children 's malnutrition rates (Roberts, 2015).

Higher levels of education often correlate with increased family income. As Mincer (1974) noted, education enhances productivity, leading to better wages. Families with higher incomes can afford healthier food options and healthcare services, reducing children's risk of malnutrition (Meerman & Aphane, 2012). Consequently, the economic benefits of education extend beyond individual gains to societal well-being. Investing in education and health can yield long-term benefits for society. Programs aimed at improving educational access for women have shown promise in enhancing child nutrition outcomes (World Bank, 2007). Policymakers should prioritize educational initiatives to combat child malnutrition, recognizing the interconnectedness of education and health (UNICEF, 2013).

Human Capital Theory provides a compelling framework for understanding the relationship between education, income, and child malnutrition. By fostering educational opportunities, particularly for women, societies can improve nutritional outcomes for future generations (Adediran, 2024; Santoso et al., 2019). The evidence suggests that enhancing human capital is essential for effectively addressing child malnutrition.

Social Determinants of Health Frameworks

The Social Determinants of Health Framework emphasizes that health outcomes are shaped by various social factors, including socioeconomic status, education, and the environment (Marmot, 2005). This framework is essential for understanding child malnutrition as it highlights how disparities in income and education impact access to nutritious food and healthcare (Solar & Irwin, 2010). Wages are a crucial determinant of food security and nutrition. Families with higher incomes can afford a varied and nutritious diet, while lower-wage families often resort to cheaper, less nutritious options (Drewnowski & Almiron-Roig, 2010). Research suggests that increased household income correlates with improved child nutritional status (Chen et al., 2017; Kirk et al., 2015).

The environment in which children live also significantly impacts their nutritional outcomes. Poor living conditions, restricted access to clean water, and inadequate sanitation can worsen malnutrition (Victora et al., 2010). Tackling these environmental factors is

vital for enhancing child health and nutrition, especially in low-income settings (Kramer & Kakuma, 2003). To combat child malnutrition effectively, policies must address the broader social determinants of health. This includes raising wages, improving access to education, and upgrading living conditions. By adopting a holistic approach that considers these factors, policymakers can create environments that foster better nutritional outcomes for children.

In conclusion, the Social Determinants of Health Framework offers a comprehensive understanding of the factors influencing child malnutrition. By acknowledging the interplay between wages, education, and environmental conditions, stakeholders can implement targeted interventions to enhance child health (Berkman & Glass, 2000). Addressing these determinants is crucial for achieving sustainable improvements in child nutrition.

Economics Development Theory

Economic Development Theory examines the relationship between economic growth and social indicators, such as health and nutrition. As economies expand, they generally experience improved living standards, positively affecting child nutrition outcomes (Todaro & Smith, 2015). Understanding this relationship is crucial for addressing child malnutrition in developing countries. Research indicates that economic growth leads to greater availability and accessibility of food, vital for enhancing child nutrition (Smith, 2020). Higher national income frequently results in improved infrastructure and healthcare services, further supporting nutritional outcomes (FAO, 2015). Thus, economic development plays a pivotal role in reducing child malnutrition rates.

Wages are a key component of economic development, influencing household purchasing power and food security (Adams, 2003). Increased wages enable families to purchase more nutritious food, thereby improving the nutritional status of children (Deaton, 2013). The connection between wages and child malnutrition underscores the importance of economic policies that promote wage growth. To combat child malnutrition effectively, policymakers must focus on economic development strategies, prioritizing wage increases and job creation (World Bank, 2016). Agriculture, education, and healthcare investments are essential for fostering sustainable economic growth and enhancing child nutrition outcomes (UNICEF, 2019).

In conclusion, the Economic Development Theory provides valuable insights into the factors influencing child malnutrition. By recognizing the significance of economic growth, wages, and investments in social infrastructure, stakeholders can develop effective strategies to improve child health and nutrition (Benson et al., 2008). Addressing these issues holistically is crucial for achieving sustainable development.

Prevalence of Wasting, Stunting, and Underweight

Wasting, stunting, and underweight are terms that reveal malnutrition problems in children. These three terms are the main malnutrition problems that significantly impact children's overall development and growth, especially in developing countries (Budzulak et al., 2022). Based on Bahar et al. (2023) and Leal et al. (2020), the three terms of malnutrition, such as wasting, are problems that occur in children's weight that are disproportionate to the child's height caused by short-term nutritional deficiencies or caused by disease. Stunting is usually caused by height that is below the standard for the child's age due to chronic malnutrition in the long term. The last indicator is underweight, a child's weight that is not low due to chronic malnutrition.

Research on malnutrition conditions that occur in children, such as stunting, wasting, and being underweight, is still limited. Still, according to Chai et al. (2022), continuous malnutrition affects the quality of life from childhood to adulthood. In addition, according to several other studies, the prevalence of wasting, stunting, and underweight among children under five varies significantly across different regions, influenced by various maternal and

socio-economic factors in many other countries such as China, Timor-Leste, and the Republic of Congo (Geng & Xavier, 2022; Maulina et al., 2022; Siddiqa et al., 2023; Luzingu et al., 2022). These disparities highlight the influence of maternal conditions and socio-economic factors on child nutrition.

Data and Research Methods

This study uses secondary data from the Central Statistics Agency to perceive the relationship between Women's HDI and regional minimum wage on the prevalence of wasting, stunting, and underweight. The data used is panel data from 33 provinces in Indonesia from 2018 to 2022. The data variables used in this study are as follows:

Table 1: Summary Statistics

Variable	Obs	Mean	SD	Min	Max	Definition
Dependent Variables						
Prevalence of Wasting	170	8.478235	2.629227	1.8	15.8	Percentage of wasting children in the province
Prevalence of Stunting	170	24.44259	7.718037	5.6	43.7	Percentage of stunting children in the province
Prevalence of Underweight	170	16.92176	5.452522	3.4	29.6	Percentage of underweight children in the province
Interest Variables						
Women's Human Development Index	170	68.11041	4.814095	52.4	80.1	Women's Human Development Index of the province
Regional Minimum Wage	170	2,602,855	560,120.5	1,454,154	4,641,854	Real minimum monthly wage (by province)
Independent Variables						
Women Head of Household						The percentage of women who are head of household is based on the number of family members.
1 Person	170	26.31641	6.759735	13.8	50.1	
2-3 People	170	43.87806	4.819485	31.3	59.0	
4-5 People	170	21.38041	4.296543	9.8	32.6	
≥6 People	170	8.424412	4.299082	1.9	22.7	
Working Women						Percentage of women as head of household who work based on place of residence
Urban	170	57.32224	6.542723	44.5	77.8	
Rural	170	67.28559	8.820977	39.2	89.3	
Women Internet User						Percentage of women who have internet access by age
Age 13-15	170	50.58918	2.396675	44.9	60.7	
Age 16-18	170	49.45282	1.726642	43.2	57.3	
Age 19-24	170	48.11835	1.934746	38.7	53.2	
≥ Age 25	170	45.52276	2.261029	40.5	51.8	
Special Index for Handling Stunting	170	67.83059	6.717513	46.4	84.3	Special Index for Handling Stunting of the Province
Economics Growth	170	3.817235	4.258891	-15.74	22.94	GDP of the province

From the summary statistics table above, the data will be processed using the panel data regression method to analyse the relationship between the existing variables. This

method allows us to consider variations between individuals and time to provide a more accurate estimate of the influence of independent variables on dependent variables (Baltagi, 2005).

Common Effect Model

The Common Effect Model is the most straightforward, operating under the premise that the interception and slope remain consistent across different individuals and periods. The equation for this model can be expressed (Chudik et al., 2013):

$$Y_{it} = \beta_0 + \sum_{k=1}^{n} \beta_k X_{kit} + \varepsilon_{it} \quad (1)$$

Fixed Effect Model

Every object is subject to varying conditions, leading to potential discrepancies during analysis. An object may exhibit significantly different situations over time. Consequently, regression outcomes should reflect differences in constants across objects, even if the coefficients remain identical. The Fixed Effect Model is a type of regression incorporating a fixed effect, indicating that the constant for a particular observation remains unchanged across different periods. Thus, the equation can be expressed as follows (Hilpert & Blasi, 2020):

$$Y_{it} = \beta_0 + \sum_{k=1}^{n} \beta_k X_{kit} + \varepsilon_{it} \quad (2)$$

Random Effect Model

Residuals and random differences between units and periods influence the assumptions regarding the variations in intercepts and constants. This model has one requirement. The cross-section data must be better than the number of coefficients. The equation of this model is (Gujarati, 2015):

$$Y_{it} = \beta_{0i} + \sum_{i=1}^{m} \sum_{k=1}^{n} \beta_{ki} X_{kit} + \varepsilon_{it} \quad (3)$$

The explanation of all the formulas above is that *i* refers to the number of observations, which can be a number from 1 to *n*, where n is the total analysis units observed. Furthermore, *t* indicates the amount of time, expressed in numbers from 1 to *t*, where *t* is the observation period for each unit. Therefore, the combination of *n x t* reflects the total amount of panel data obtained from observations of *n* units at *t* different times. In addition, the symbol ε represents the residual, which is the difference between the observed value and the value predicted by the model.

Based on the regression methods used in panel data analysis, specifically the Common Effects Model (CEM), Fixed Effects Model (FEM), and Random Effects Model (REM), we formulate our hypotheses regarding the variables of interest. The null hypothesis (H0) posits that the Women's Human Development Index does not negatively impact the prevalence of wasting, stunting, and underweight among children. Similarly, H0 asserts that the Regional Minimum Wage does not adversely influence these health outcomes. By establishing these null hypotheses, we aim to assess whether there is a significant relationship between these socio-economic indicators and child malnutrition rates. Conversely, the alternative hypotheses (H1) suggest that a negative relationship exists. Specifically, H1 states that the Women's Human Development Index negatively affects the prevalence of wasting, stunting, and underweight, highlighting the potential consequences of gender disparities in development on child health. Additionally, H1 indicates that the Regional Minimum Wage adversely influences these health

metrics, suggesting that inadequate wages may contribute to poor nutritional outcomes. We can better understand the dynamics by testing these hypotheses through regression analysis and providing evidence-based recommendations for policy interventions to improve child health outcomes (UNDP, 2020; UNICEF, 2019).

Regression Model Selection

The Hausman test is a statistical method used in panel regression analysis to determine which model is more appropriate: the Fixed Effects Model (FEM) or the Random Effects Model (REM). This method is crucial because selecting the correct model can significantly affect the analysis results and data interpretation. According to Hausman (1978), the test evaluates the null hypothesis that the parameter estimates from the random effects model are not significantly different from those obtained using the fixed effects model. If the null hypothesis is rejected, the fixed effects model is considered more suitable.

In the context of panel regression, data analysis often involves both cross-sectional and time-series variables. The Hausman test assists researchers in deciding whether unobserved individual effects in the random effects model may bias the estimates. Several studies indicate that using the random effects model can yield biased results if there is a correlation between the independent variables and the unobserved individual effects (Wooldridge, 2010).

The Hausman test is utilized to compare the estimates of the Fixed Effects Model (FEM) and the Random Effects Model (REM). The formula for the Hausman test statistic is given by:

$$H = (b_{FEM} - b_{REM})^{1}[Var(b_{FEM}) - Var(b_{REM})]^{-1}(b_{FEM} - b_{REM}) \quad (4)$$

The Hausman test statistic, denoted as *H*, is calculated to determine whether the Fixed Effects Model (FEM) or the Random Effects Model (REM) is more appropriate for a given dataset. It is defined as the difference between the estimated coefficients from the Fixed Effects Model, represented by b_{FEM}, and those from the Random Effects Model, denoted as b_{REM}. The formula for the Hausman test statistic incorporates the variance-covariance matrices of the estimates from both models, specifically $Var(b_{FEM})$ and $Var(b_{REM})$. This comparison helps assess the consistency of the estimators under the two models, guiding researchers in selecting the model that best fits their data.

According to Bertaccini & Varriale (2013) and Cabral et al. (2024), the paper discusses how random effects and fixed effects analyses benefit from robustness checks, which assess the sensitivity of results to assumptions like latent Gaussianity in hierarchical models. Important discrepancies may be overlooked without these checks, leading to incorrect conclusions. The proposed workflow integrates model checking with robustness analysis to validate assumptions and ensure reliable results. It also emphasizes that robustness checks can detect outliers, improving the assessment of their impact on variance. The Robust Forward Likelihood-Ratio Test (LRT) is used for statistical evaluation. Additionally, the Hausman test is crucial for comparing the consistency of estimators in both models, indicating potential bias in the random effects model and underscoring the need for robustness checks to ensure accurate inferences.

Findings and Discussion

In this section, we present the results of the panel data regression using the Random Effects Model (REM). The selection of REM is based on the outcome of the Hausman test, which assesses the consistency of estimators between fixed and random effects models. Specifically, the Hausman test yielded a p-value of 0.0546. Since this value exceeds the significance level of 0.05, we conclude that the random effects model is suitable for our analysis. This indicates that the differences between the fixed and random effects estimators are not statistically significant, allowing us to proceed with REM for our regression analysis.

The results obtained from the REM, detailed below, have undergone rigorous robustness checks. These checks are essential to validate the model's assumptions and ensure outliers or deviations from the model specifications do not unduly influence the findings. By conducting these robustness checks, we can confidently assert that the results reflect a reliable relationship between the variables in our study. The subsequent tables and figures will illustrate the key findings from the REM analysis, highlighting the estimated coefficients, significance levels, and overall model fit.

Table 2: Result of Panel Data Regression (Random Effects Model)

Variables	*(Y_W)*	*(Y_S)*	*(Y_U)*
	Wasting	***Stunting***	***Underweight***
Women's Human Development Index	-0.102	-0.830***	-0.432***
	(0.0708)	(0.197)	(0.156)
Regional Minimum Wage	-1.57e-06***	-2.04e-06	-1.85e-06*
	(4.64e-07)	(1.28e-06)	(9.63e-07)
Women Head of Household			
1 Person	16.53	18.47	38.20
	(25.50)	(67.27)	(43.78)
2-3 People	16.64	18.56	38.54
	(25.51)	(67.27)	(43.78)
4-5 People	16.61	18.48	38.21
	(25.50)	(67.27)	(43.78)
≥6 People	16.71	18.80	38.46
	(25.50)	(67.27)	(43.78)
Working Women			
Urban	0.0264	0.0263	-0.00790
	(0.0299)	(0.0805)	(0.0555)
Rural	-0.0296	0.0261	0.0479
	(0.0281)	(0.0761)	(0.0534)
Women Internet User			
Age 13-15	0.0461	0.0739	-0.0884
	(0.0680)	(0.180)	(0.118)
Age 16-18	0.193**	0.574**	0.00823
	(0.0915)	(0.243)	(0.161)
Age 19-24	0.320***	0.895***	0.641***
	(0.112)	(0.297)	(0.196)
≥ Age 25	-0.157	-1.060***	-0.0961
	(0.108)	(0.295)	(0.215)
Special Index for Handling Stunting	-0.122**	0.237*	0.0361
	(0.0502)	(0.140)	(0.108)
Economics Growth	0.0863**	0.785***	0.441***
	(0.0378)	(0.1000)	(0.0657)
Constant	-1,653	-1,817	-3,815
	(2,550)	(6,727)	(4,378)

Variables	*(Y_W)*	*(Y_S)*	*(Y_U)*
	Wasting	*Stunting*	*Underweight*
Observations	170	170	170
Number of provinsi	34	34	34

Note: Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

The panel data regression analysis results indicate that women's HDI has a significantly adverse effect with a coefficient of -0.102; however, this result is not significant regarding wasting. Additionally, the analysis shows that the regional minimum wage significantly negatively affects wasting. Assuming ceteris paribus, if the regional minimum wage decreases by Rp 1, wasting will increase by 1.57e-06 percent.

Furthermore, the women's human development index indicates a significant negative result for stunting. The result describes that the women's human development index decreases by 1 point. Stunting will be increased by 0.83 percent with the assumption of ceteris paribus. The results above also explain that the regional minimum wage indicates a significant negative result for stunting. If the regional minimum wage decreases by Rp 1, stunting will be enhanced by 2.04e-06 percent with the ceteris paribus assumption.

The women's human development index also shows a significant negative result against underweight. If the index decreases by 1 point, the underweight category will be enhanced by 0.432 percent, assuming ceteris paribus. The last thing about the result above explains that the regional minimum wage also shows a significant negative result against underweight. If the regional minimum wage decreases by Rp 1, underweight will be increased by 1.85e-06 percent, assuming ceteris paribus.

The relationship between the Human Development Index (HDI) for women and child nutrition statuses- specifically stunting and underweight- is significant, while it is not significant with wasting, presenting an intriguing dynamic in nutritional analysis. The results regarding the relationship between women' s HDI and child nutrition statuses, which include wasting, stunting, and underweight, indicate that there is no significant correlation with wasting, as explained in Victora et al. (2010); UNICEF (2019); Briend et al. (2015); WHO (2019); Sen (1999); and Gonzalez & Lentz (2017). This may be due to various conditions, since stunting and underweight are often linked with long-term malnutrition, influenced by factors such as maternal education, access to healthcare services, and family economic conditions. Women's HDI, encompassing facets of education and health, might be more relevant in this context, as these elements contribute to improved caregiving practices and nutritional decisions.

On the other hand, wasting represents a more acute condition, often influenced by temporary factors such as infectious diseases or food crises. In situations where a child is experiencing an infection or illness, immediate factors, including access to medical care and nutritional interventions, may become more critical than the broader context of women's HDI. Thus, while women's HDI can offer a general overview of health and education potential, it may not adequately capture the more complex dynamics of wasting. Moreover, differing social and cultural contexts can influence how women's HDI interacts with child nutrition statuses. For instance, in some societies, despite a high women's HDI, cultural norms and practices may restrict access to proper nutrition or healthcare. This could explain why women's HDI shows a significant relationship with stunting and underweight but not with wasting. Further research is necessary to explore these factors and understand how the interaction between women's HDI and child nutrition conditions varies across different contexts.

The Correlation of Women's Human Development Index to Stunting and Underweight in Children

The analysis above showed that the women's human development index significantly negatively affects stunting and underweight in children. The results of this research align with the survey by Eom et al. (2024), which shows that women's empowerment has been shown to reduce the prevalence of stunting, underweight, and wasting in children. The index uses calculations that include health, education, and living standards to reflect women's welfare. This is also in line with Singh et al. (2019) and Singh et al. (2020), who stated that women with higher education levels are associated with improved child nutritional status, which is one of the indicators in calculating the human development index. Low levels of the women's human development index are often associated with stunting or underweight children due to a mother's lack of power and ability to support the quality of life for her children.

As we know, stunting is a condition in children due to chronic malnutrition. The impacts of stunting vary and have long-term health effects, such as impaired brain development. The results of this study are in line with the World Health Organization (2022), which states that what happens when a woman has a low human development index is a tendency to be less able to access adequate information and health services and to meet daily needs. Become a high number in the contribution of stunting.

While underweight conditions are a critical issue for children, according to UNICEF (2021), if women lack access to education and nutrition, many children will be born with low birth weight. This situation creates a cycle of poverty, along with other risks for children. Therefore, the results of this study indicate that women often have inadequate knowledge about nutrition and health, which leads to poor diets and insufficient attention to children's health (UNDP, 2020). This has a significant negative impact on child development. Furthermore, it is essential to acknowledge and discuss potential endogeneity issues in this analysis. For example, child malnutrition may also influence female HDI. In this context, human capital theory applies, positing that investments in an individual's education and health can enhance productivity and well-being (Becker, 1975; Schultz, 1961; Adediran, 2024; Santoso et al., 2019). If children experience malnutrition, they may not reach their full potential in education and health, which can hinder their ability to become better parents and support their family's well-being in the future. This cycle can perpetuate low HDI among women, as poorly nourished children may struggle academically and socially, limiting their future opportunities.

Future research that adopts a more comprehensive approach to analyzing the relationship between female HDI and child malnutrition could refine this study's findings. For instance, further studies might explore additional variables influencing both factors, such as access to healthcare services, education, and women's empowerment programs. By addressing these variables, future research can provide a more nuanced understanding of the interplay between female HDI and child malnutrition, ultimately leading to more effective interventions and policies.

The Correlation of Regional Minimum Wage to Wasting, Stunting, and Underweight in Children

The regional minimum wage is a crucial indicator of economic welfare for communities in meeting basic needs (Ramdhansya & Indrawati, 2022). This research finds that the regional minimum wage significantly negatively affects wasting, stunting, and underweight in children. The results of this study align with the findings of Caleyachetty et al. (2023) and Islam et

al. (2020), which indicate that children from low-income families and those whose mothers have lower levels of education face a higher risk of experiencing stunting and underweight. This suggests the potential for variations in wasting, stunting, and underweight rates related to regional minimum wage conditions and their impact on children's nutrition (Majid et al., 2016). Similarly, research by Ayuningtyas et al. (2022) in Indonesia revealed substantial disparities in child undernutrition across different districts, with the highest prevalence of underweight, wasting, and stunting observed in the most economically disadvantaged areas. When the regional minimum wage decreases, it leads directly to a reduction in household income. According to the World Health Organization (2022), this results in unmet basic needs, including access to nutritious food. This study concludes that families with low incomes (low regional minimum wage) tend to consume less healthy food because they cannot meet their basic needs. Therefore, a decrease in the regional minimum wage can exacerbate wasting, stunting, and underweight rates among children.

A significant negative correlation exists between the regional minimum wage and rates of child wasting, stunting, and underweight (Ponce et al., 2018). A decrease in the regional minimum wage can potentially increase the prevalence of nutritional problems in children, negatively impacting their health. Hence, the government should consider policies that support an increase in the regional minimum wage for the welfare of children and society. This is consistent with economic development theory, which emphasizes improving living standards and reducing poverty to promote sustainable economic growth (Todaro & Smith, 2015). By addressing these issues, policies can foster a healthier, more productive population that positively contributes to the economy.

It is also beneficial to acknowledge and discuss potential endogeneity issues. For instance, child malnutrition might also influence the regional minimum wage. This relationship can be understood through human capital theory, which posits that investments in health and education enhance productivity and economic growth (Becker, 1975; Schultz, 1961; Adediran, 2024; Santoso et al., 2019). Poor child nutrition can lower educational attainment and health issues, affecting workforce productivity and regional economic conditions, including wage levels.

Conclusion

This study explains the relationship between the women's human development index and regional minimum wage in the context of malnutrition issues, specifically wasting, stunting, and underweight. The analysis results indicate that the women's human development index significantly negatively affects stunting and underweight, implying that increasing the index can reduce the prevalence of these two nutritional challenges. The regional minimum wage also negatively impacts all three nutritional issues, namely wasting, stunting, and underweight, suggesting that raising the minimum wage can enhance the community's nutritional status.

These findings underscore the importance of policies that promote an increase in the women's human development index and the establishment of a fair regional minimum wage to tackle malnutrition issues. Improving women's quality of life through education, health, and access to resources is expected to mitigate the adverse effects of wasting, stunting, and underweight in children. Additionally, establishing an adequate minimum wage can provide economic support for families to meet their nutritional needs better. Therefore, integrating women's human development and social protection policies is essential to create an environment conducive to children's health and well-being. Interventions could include preventing anemia in adolescent girls by providing iron supplements, facilitating pregnancy

check-ups, supplying supplementary food for pregnant women, and offering social assistance for building latrines while addressing the nutritional needs of toddlers.

Acknowledging and discussing potential endogeneity issues would also be beneficial, as child malnutrition could influence women's HDI and regional minimum wage. Understanding these dynamics can enhance future research, allowing for more comprehensive models of these interrelationships. This approach can lead to more effective policy recommendations and interventions to improve health outcomes for women and children.

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