



## The Influence of Life Expectancy and Education Level on the Economic Welfare of Women in Indonesia

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### Info Article

History Article:

Submitted: May 20<sup>th</sup>, 2025

Revised: June 23<sup>rd</sup>, 2025

Accepted: June 24<sup>th</sup>, 2025

Keywords:

*Life Expectancy, Average Years of Schooling, Women's Economic Well-Being, Gender Development Index.*

### Abstract

*This study investigates the impact of life expectancy and education on women's economic welfare in Indonesia, measured by the Gender Development Index (GDI), using BPS data (2009–2023). Through quantitative analysis and multiple linear regression (SPSS 27), we find life expectancy significantly boosts GDI (coefficient = 8.558,  $p^* < 0.001$ ), while education exhibits a paradoxical negative effect (coefficient = -11.312,  $p^* < 0.001$ ), suggesting structural labor market barriers despite educational gains. The model explains 98.3% of GDI variation ( $R^2 = 0.983$ ), underscoring its robustness. Aligned with Human Capital Theory and SDGs 5 (gender equality) and 8 (decent work), the results highlight the need for policies that bridge education-to-employment gaps and enhance healthcare access. From an Islamic perspective, the findings resonate with maqasid al-sharia, emphasizing education and health as rights to achieve societal justice. This study contributes to development economics by revealing context-specific disparities in Indonesia's gender welfare trajectory.*

## INTRODUCTION

Gender equality and women's empowerment have become a global focus, as reflected in the fifth Sustainable Development Goal (SDG) (Walsh et al., 2022). In Indonesia, the role of women in economic development is increasingly significant, particularly through their participation in the labor force, micro, small, and medium enterprises (MSMEs), and the informal sector (Ummah, 2019). However, despite the continuous increase in women's life expectancy in Indonesia, reaching 73.6 years in 2021 (Baker & Saren, 2015), and advancements in women's education, with the average years of schooling for women reaching 8.6 years (Ummah, 2019), women's economic well-being still faces significant challenges. Gender disparities in economic access and employment opportunities remain evident, with women often limited to low-wage and insecure jobs ("World Employ. Soc. Outlook," 2024). For instance, Schultz's research (Schultz, 2001) has shown a positive correlation between education and labor force participation, while Undji et al. (2021) have linked life expectancy to economic productivity. However, a significant research gap remains, particularly in the Indonesian context, where the interaction between life expectancy and education level as determinants of women's economic well-being has not been widely explored (Jones & Klenow, 2016).

This study is based on several key theories, including the Human Development Theory by Amartya Sen (Ummah, 2019), which emphasizes the importance of education and health in enhancing individual capabilities; the Human Capital Theory by Gary Becker (Speller, 2016), which explains how

investment in education and health can increase economic productivity; and the Feminist Economics Theory by Folbre (Dex et al., 1995), which provides a gender perspective in economic analysis. The combination of these theories provides a comprehensive conceptual framework for examining the impact of life expectancy and educational level on women's economic well-being. Furthermore, this study is also relevant to the global agenda, particularly SDG 5 (gender equality) and SDG 8 (decent work and economic growth), as well as the local Indonesian context, where gender inequality in the economy remains a significant challenge.

Academically, this study contributes to the existing literature by integrating multidisciplinary perspectives on health, education, and economics to enhance understanding of women's economic well-being. This approach aligns with current trends in development research that emphasize the importance of holistic analysis (Dex et al., 1995). The findings of this study are expected to provide more inclusive and gender-equitable policy recommendations, particularly in the Indonesian context. By utilizing up-to-date data and a comprehensive analytical methodology, this study aims to fill the literature gap by analyzing the interaction between life expectancy and education level in influencing women's economic well-being, as well as its implications for sustainable development.

In the view of Islam, women have equal rights in obtaining education and maintaining health as part of efforts to achieve well-being. Islam places education as an obligation for every Muslim, regardless of gender, and views health as part of the protection of life, which is one of the main objectives of Sharia (maqasid sharia). Therefore, improving women's life expectancy and education levels is seen as an important step in Islam to empower women economically and socially, while also reflecting justice and respect for women's roles in community development.

In the view of Islam, women have equal rights to education and healthcare as part of efforts to achieve overall well-being. Islam places education as an obligation for every Muslim, regardless of gender, and views health as part of the protection of life, which is one of the main objectives of Sharia (maqasid Sharia). Therefore, improving women's life expectancy and education levels is seen as an important step in Islam to empower women economically and socially while also reflecting justice and respect for women's roles in community development.

Education level refers to the highest level of formal education an individual has attained. In this study, indicators such as the average years of schooling or the completion rate of formal education are used. Education plays a crucial role in empowering women, providing access to better employment opportunities, and enhancing the economic capacity of individuals and families. According to Todaro and Smith (Undji et al., 2021), education not only enhances the skills and productivity of the workforce but also strengthens women's bargaining position in the labor market, which directly impacts their economic well-being. Women's economic well-being in this context is defined as the condition in which women have adequate access to income, decent employment, and purchasing power that supports a dignified life. Indicators of economic well-being can be observed through women's income levels, household expenditures controlled by women, or other indicators such as women's poverty rates and asset ownership. According to UN Women (United Nations, 2020), women's economic well-being is significantly influenced by structural factors, including education, health, access to employment, and social protection. This well-being not only impacts women individually but also contributes to family advancement and overall national economic development.

**Table 1.** Data Statistics Indonesia 2009-2023

No	Year	Women Life Expectancy rate (years) X1	Average Years of Schooling (years) X2	Gender Development Index (GDI) (%) Y
1	2009	69.21	7.3	66.77
2	2010	71.83	7.46	89.42

3	2011	72.02	7.52	89.52
4	2012	72.22	7.59	90.07
5	2013	72.41	7.61	90.19
6	2014	72.59	7.73	90.34
7	2015	72.78	7.84	91.03
8	2016	72.8	7.95	90.82
9	2017	73.06	8.1	90.96
10	2018	73.19	8.17	90.99
11	2019	73.33	8.34	91.07
12	2020	73.46	8.48	91.06
13	2021	73.55	8.54	91.27
14	2022	73.83	8.69	91.63
15	2023	74.18	8.77	91.85

Source; Statistics Indonesia

The data above shows the development of Women's Life Expectancy (X1), Average Years of Schooling (X2), and the Gender Development Index (GDI) (Y) in Indonesia over the past 15 years, from 2009 to 2023. Women's Life Expectancy has consistently increased from 69.21 years in 2009 to 74.18 years in 2023, reflecting improvements in healthcare services and women's well-being. Meanwhile, the Average Years of Schooling has also shown a positive trend, rising from 7.3 years in 2009 to 8.77 years in 2023, indicating better access to and quality of education for women.

The Gender Development Index (GDI), which measures gender equality in human development, has also seen a significant rise from 66.77% in 2009 to 91.85% in 2023. This increase aligns with the improvements in Women's Life Expectancy and Average Years of Schooling, indicating that inclusive and gender-focused development efforts have had a positive impact. Although the GDI increase was not perfectly linear from year to year, the overall trend demonstrates steady and sustainable progress.

Overall, the data illustrates significant progress in improving the quality of life for women in Indonesia over the past 15 years. The increases in Women's Life Expectancy, Average Years of Schooling, and the Gender Development Index reflect the success of development programs focused on health, education, and gender equality. However, continuous efforts are still needed to ensure that this progress is maintained and further enhanced in the future, particularly in the face of global challenges that may impact these achievements.

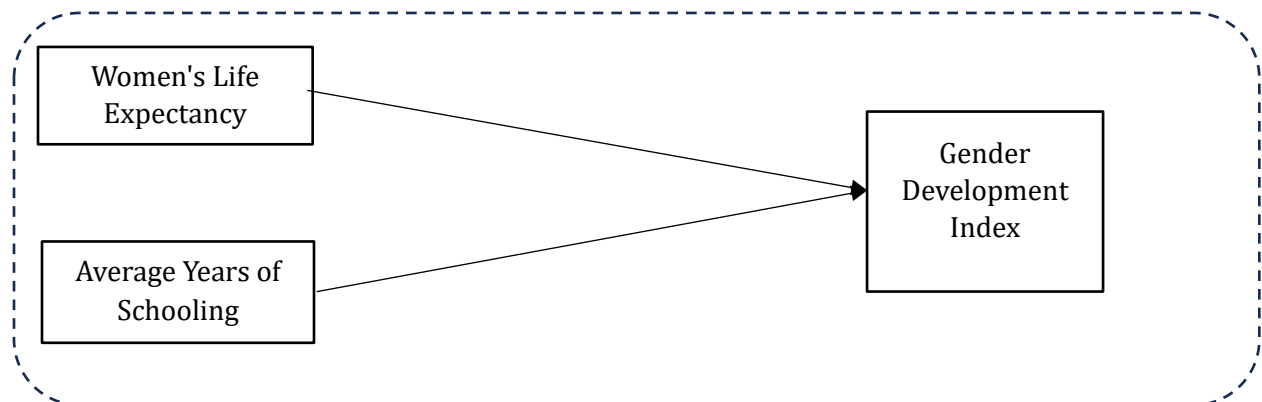


Figure 1. Framework

**METHOD**

This study aims to examine the impact of women's life expectancy and average years of schooling on women's economic well-being in Indonesia. The data used are secondary data obtained from the Central Statistics Agency (BPS) for the period 2009-2023. The variables in this study consist of women's life expectancy (X1), the average years of schooling for women (X2), and the Gender Development Index (Y), which serve as indicators of women's economic well-being. The analytical techniques employed include descriptive statistical tests, classical assumption tests (normality test, multicollinearity, autocorrelation, and heteroscedasticity tests), and multiple linear regression analysis. All data processing and analysis were conducted using SPSS software version 27 to ensure the validity and reliability of the research results.

**RESULTS AND DISCUSSION****RESULTS****Table 2.** Descriptive Statistics Test

	N	Minimum	Maximum	Mean	Std. Deviation
Women life expectancy rate	15	69.21	74.18	72.6973	1.17340
Average Years of Schooling	15	7.30	8.77	8.0060	.47646
Gender Development Index	15	66.77	91.85	89.1327	6.22591
Valid N (listwise)	15				

Source: Data Processed (2025).

Based on the results of the descriptive statistical test for 15 data points, it was found that the average Women's Life Expectancy is 72.6973 years, with a minimum value of 69.21 and a maximum of 74.18, and a standard deviation of 1.17340, indicating a relatively small spread of data across regions. The Average Years of schooling have a mean value of 8.0060 years, with a lowest value of 7.30, a highest value of 8.77, and a standard deviation of 0.47646, indicating that the differences in years of schooling across regions tend to be relatively small. Meanwhile, the Gender Development Index has an average of 89.1327, with a minimum of 66.77, a maximum of 91.85, and a standard deviation of 6.22591, indicating greater variation across regions in terms of gender development. These results provide an initial overview of the social and development conditions in the studied regions.

**Table 3.** Normality Test

One-Sample Kolmogorov-Smirnov Test		Standardized Residual	
N		15	
Normal Parameters <sup>a,b</sup>	Mean	.000000	
	Std. Deviation	.92582010	
Most Extreme Differences	Absolute	.131	
	Positive	.131	
	Negative	-.118	
Test Statistic		.131	
Asymp. Sig. (2-tailed) <sup>c</sup>		.200 <sup>d</sup>	
Monte Carlo Sig. (2-tailed) <sup>e</sup>	Sig.	.697	
	99% Confidence Interval	Lower Bound	.685
		Upper Bound	.709

a. Test distribution is Normal.

b. Calculated from data.

e. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 926214481.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Source: Data processed (2025).

Based on the results of the normality test using the One-Sample Kolmogorov-Smirnov method, the obtained significance value (Asymp. Sig. (2-tailed)) was 0.200. Since this value is greater than 0.05, it can be concluded that the residual data follows a normal distribution. The Monte Carlo Simulation further supports this, with a result of 0.697, which also indicates no significant deviation from the normal distribution. Therefore, the normality assumption is satisfied, and the data is suitable for use in subsequent statistical analysis.

**Table 4.** Multicollinearity Test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-442.45	21.673		-20.415	0		
Women life expectancy rate	8.558	0.381	1.613	22.487	0	0.281	3.561
Average Years of Schooling	-11.312	0.937	-0.866	-12.069	0	0.281	3.561

Source: Data processed (2025).

Based on the results of the multicollinearity test on the regression model involving the independent variables Women's Life Expectancy and Average Years of Schooling with the dependent variable Gender Development Index, it was found that the Tolerance values for each variable were 0.281, and the Variance Inflation Factor (VIF) value was 3.561. Since the VIF value is below the threshold of 10 and the Tolerance value is greater than 0.1, it can be concluded that there is no multicollinearity issue. This means that the two independent variables do not strongly influence each other, making them suitable for use together in the regression analysis.

**Table 5.** Autocorrelation Test

Model Summary <sup>b</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.991 <sup>a</sup>	.983	.980	.88543	1.298

a. Predictors: (Constant), Average Years of Schooling, Women life expectancy rate  
b. Dependent Variable: Gender Development Index

Source: Data processed (2025).

Based on the results of the autocorrelation test, indicated by a Durbin-Watson value of 1.298, it can be concluded that there is no autocorrelation in this regression model. The ideal Durbin-Watson value is around 2; if it is too far below one or above 3, it indicates the presence of positive or negative autocorrelation. Since the obtained value still falls within the safe range (between 1 and 3), it means that the residuals or errors of the regression model are not correlated with each other. This satisfies the autocorrelation assumption, allowing the regression model to be considered valid and the analysis results to be reliable.

**Table 6.** Heteroscedasticity Test

Model	Coefficients <sup>a</sup>			t	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	-3.981	10.397		-0.383	0.7
Women life expectancy rate	0.084	0.183	0.249	0.462	0.7
Average Years of Schooling	-0.182	0.45	-0.218	-0.404	0.7

a. Dependent Variable: Abs\_RES

Source: Data processed (2025).

Based on the results of the heteroscedasticity test using the regression method on the absolute residual values (Abs\_RES), the significance (Sig.) values for the variable Life Expectancy for Women is 0.652, and for the variable Average Length of Schooling is 0.693. Since both significance values are greater than 0.05, it can be concluded that there is no sign of heteroscedasticity in this regression model. This means that the variance of the residuals is constant or homogenous, so the regression model satisfies the classical assumptions and is valid for use in the analysis.

**Table 7.** Multiple Linear Regression Test

Model	Coefficients <sup>a</sup>			t	Sig.	Collinearity Statistics	
	Unstandardized Coefficients		Standardized Coefficients			Tolerance	VIF
	B	Std. Error	Beta				
(Constant)	-442.446	21.673		-20.415	0		
Women life expectancy rate	8.558	0.381	1.613	22.487	0	0.281	3.561
Average Years of Schooling	-11.312	0.937	-0.866	-12.069	0	0.281	3.561

Source: Data processed (2025).

The results show that Life Expectancy for Women has a positive and significant effect on the dependent variable (coefficient = 8.558,  $p = 0.000$ ), while Average Length of Schooling has a negative and significant effect (coefficient = -11.312,  $p = 0.000$ ). Both variables have a VIF of 3.561, indicating no serious multicollinearity. These findings highlight the contrasting impacts of health and education factors within the model.

**Table 8.** Coefficient of Determination Test

Model Summary <sup>b</sup>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
1	.991 <sup>a</sup>	.983	.980	.88543	1.298	

a. Predictors: (Constant), Average Years of Schooling, Women life expectancy rate

b. Dependent Variable: Gender Development Index

Source: Data processed (2025).

Based on the results of the coefficient of determination test in the Model Summary table, the R Square value obtained is 0.983. This indicates that the independent variables, Average Length of

Schooling and Life Expectancy for Women, can explain 98.3% of the variation in the dependent variable, the Gender Development Index (GDI). In other words, almost all the variation in GDI can be explained by these two variables, while factors outside the model account for the remaining 1.7%. The Adjusted R-Square value, which is close to R-Square at 0.980, further strengthens the accuracy of the model in predicting GDI. Additionally, the Durbin-Watson value of 1.298 indicates that there is no strong autocorrelation in the data, making this model statistically sound.

**Table 9.** F-Test

	ANOVA <sup>a</sup>				
	Sum of Squares	df	Mean Square	F	Sig.
Regression	533.26	2	266.63	340.095	.000 <sup>b</sup>
Residual	9.408	12	0.784		
Total	542.668	14			

a. Dependent Variable: Gender Development Index

b. Predictors: (Constant), Average Years of Schooling, Women life expectancy rate

Source: Data processed (2025).

Based on the results of the F-test in the ANOVA table, the significance value obtained is 0.000, which is less than 0.05, along with an F-calculated value of 340.095. This indicates that, simultaneously, the variables of Average Length of Schooling and Life Expectancy for Women have a significant effect on the Gender Development Index. Therefore, the regression model used in this study is valid, as both independent variables together statistically significantly explain the variation in the dependent variable.

**Table10.** t-Test

Model	Coefficients <sup>a</sup>						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-	21.673		-	0		
Woman life expectancy rate	442.45			20.415			
	8.558	0.381	1.613	22.487	0	0.281	3.561
Average Years of Schooling	-	0.937	-0.866	-	0	0.281	3.561
	11.312			12.069			

a. Dependent Variable: Gender Development Index

Source: Data processed (2025).

Based on the results of the t-test in the table above, the variable "Life Expectancy for Women" has a significance value of 0.000 and a t-calculated value of 22.487, indicating that this variable has a significant effect on the Gender Development Index. Similarly, the variable Average Length of Schooling has a significance value of 0.000 and a t-calculated value of -12.069, which means this

variable also has a significant effect on the Gender Development Index, albeit with a negative direction. Therefore, both independent variables have a significant partial effect on the dependent variable in this regression model.

## **DISCUSSION**

The results of the study indicate that life expectancy has a positive and significant impact on women's economic welfare, as measured by the Gender Development Index (GDI), whereas the average years of schooling show a significant negative impact. This is evident from the multiple linear regression results, where life expectancy has a coefficient of 8.558 with a significance value of 0.000. In contrast, the average years of schooling have a coefficient of -11.312 with the same significance value of 0.000. The R-Square value of 0.983 indicates that these two variables can explain 98.3% of the variability in the GDI. These findings support previous studies by which state that increased life expectancy has a direct contribution to the economic productivity of individuals, including women. This is also supported by Mulyadi's view in Feriyan (Yusrya, 2023), which mentions that the higher the life expectancy, the greater the potential for women's participation in both household and public sector economic activities. On the other hand, the negative results from the education variable indicate that, although Indonesian women have higher levels of education, this has not been accompanied by equal job opportunities and access to strategic economic positions. This phenomenon aligns with Schultz's findings, which show that the impact of education on labor market participation highly depends on openness and equality in the labor market.

Theoretically, these findings are also consistent with Gary Becker's Human Capital Theory (Ii, 2020) and Amartya Sen's Human Development Theory (Indarti, 2017), which explain that education and health are key investments in human quality development. However, the effectiveness of education as human capital is highly influenced by structural factors, such as labor market policies and social norms. In the context of Indonesia, although the Gender Development Index (GDI) has shown a significant increase from 66.77% in 2009 to 91.85% in 2023, affirmative policies are needed that not only improve education but also ensure that the educational outcomes for women are fully utilized in the labor market. This aligns with the statement from UN Women that women's economic welfare is influenced by access to decent work and fair social protection.

## **CONCLUSION**

This study concludes that the life expectancy of women has a positive and significant effect on women's economic welfare in Indonesia, as measured by the Gender Development Index (GDI). In contrast, the average years of schooling show a negative and significant effect. The multiple linear regression analysis reveals that life expectancy has a positive coefficient of 8.558 and is significant at the 0.000 level. In contrast, the average years of schooling have a negative coefficient of -11.312 with the same significance. The coefficient of determination ( $R^2$ ) of 0.983 indicates that the independent variables explain 98.3% of the variation in the GDI. These findings suggest that improvements in life expectancy directly support women's productivity and economic participation, whereas equal access and opportunities in the labor market have not accompanied improvements in education. Therefore, affirmative policies are needed that not only improve the quality of education but also ensure the fair and sustainable utilization of women's educational outcomes in the economic sector. In the view of Islam, women have equal rights to education and healthcare as part of efforts to achieve overall well-being. Islam places education as an obligation for every Muslim, regardless of gender, and views health as part of the protection of life, which is one of the main objectives of Sharia. Therefore, improving women's life expectancy and education levels is seen as an important step in Islam to empower women economically and socially while also reflecting justice and respect for women's roles in community development. From an Islamic perspective, the findings reinforce the divine mandate to

prioritize women's health and education as pillars of community development, in line with *the maqasid al-sharia*. The negative impact of education on GDI calls for Islamic-based labor reforms, ensuring women's skills are utilized justly, as advocated by principles of '*adl* (justice) and *khalifa* (stewardship). Policymakers must integrate Islamic values of equity with empirical evidence to design interventions that fulfill both developmental and spiritual goals.

### ACKNOWLEDGEMENTS

The author would like to express their deepest gratitude to the lecturer of the Statistics course, Finantyo Eddy Wibowo, M.M., for the guidance, direction, and valuable knowledge provided throughout the process of this research. The support and input given have greatly helped the author in understanding the concepts and applications of statistical analysis in greater depth, particularly in using SPSS 27. The author also extends thanks to all those who have provided moral and material support during the preparation of this scholarly work, which has contributed to the successful completion of this research.

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