Pearson Correlation Between Education Level and Population Growth on Poverty in Central Java, 2019-2021

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Abstract

Poverty is still an issue for Indonesians. In Indonesia, several provinces still have poverty rates above 10%. Central Java is one of them. The human development index (HDI), the quality of education, the minimum salary, and population growth are all factors that contribute to the unemployment rate and poverty. During the years 2019–2021, the study aims to understand the relationship or correlation between education and population increase in poverty in central Java province. We acquired a value of r of as much as -0,648 for education level and a value of r of as much as 0.335 for population growth based on the analysis of using Pearson's correlation. The findings indicate that the level of education is strongly related to the level of poverty, whereas the relationship between population growth and poverty is weak. A negative value at r shows the relation, which is inversely. Based on the results of this study, it is also expected for the government to develop programs to improve the quality of education of its resident.

Keywords: poverty, education, population growth, Pearson correlation.

1. Introduction

Poverty is still a big job for the Indonesian government. Poverty is characterized by the low quality of life of the population, the limited adequacy and quality of food, the limited and low quality of health and child nutrition services, and the quality of education services (Purnomo, 2021).

Poverty is a multidimensional problem that cannot be solved only partially. Therefore poverty alleviation efforts are the responsibility of the central government and local governments along with all development components based on empowerment and the potential of available resources (Van de Walle & Cratty, 2004).

Factors that cause poverty include declining per capita income standards. The moving per capita income standard influences each other and is directly proportional to the productivity of a system. If productivity increases, then per capita income will increase, and vice versa. The second factor is the high cost of living. An increase in the cost of living in an area is the impact of income inequality or people's salaries. Furthermore, the third factor is the uneven distribution of government revenue subsidies. This causes difficulties in fulfilling basic needs and guaranteeing security, especially for the poor, and has the potential to kill residents' sources of income. The implication is to increasingly burden the poor with taxes collected by the state.

Apart from being a problem for the country, poverty is also a problem for several provinces in Indonesia, one of which is Central Java Province. Looking at data from BPS, the poverty rate in Central Java for the period September 2018 and September 2019 is still above 10%, namely 12.48% and 12.26% respectively (tnp2k.go.id). This figure is quite a big difference when compared to Banten province which is at 7% and DKI Jakarta province which is at 9%. The poverty rate in Central Java is influenced by several factors including the number of unemployed, the minimum wage, the population of districts/cities and the quality of education (Sutikno & Suliswanto, 2017).

An increase in the population growth rate will have an effect on an increase in the number of workers and the workforce. The labor force requires greater employment. This requires the availability of jobs in the hope that the workforce can get jobs and reduce unemployment.

Another factor that can affect the poverty rate of an area is education. In an effort to achieve sustainable economic development, the education sector plays a very strategic role in supporting production processes and economic activity. The higher the education level of a person, the higher the productivity of that person. The next factor is population growth. The population size in economic development is a fundamental issue, because the population size can affect the level of poverty in an area. In fact, an uncontrolled population will hinder economic development.

Education is widely recognized as having a role as a conductor in the instrumentation of economic growth. Therefore education should be further developed. This is done because education can improve welfare and reduce poverty (Bloom et al., 2006). According to Gunawan (2021). increasing people's income can be increased directly, namely by training residents in order to improve skills as an effort to increase productivity.

From the factors that cause poverty that have been reviewed, two factors are taken, namely the level of education and population growth to determine the relationship between these two factors and poverty in Central Java. The formulation of the problem that will be discussed in this article is how close is the relationship between education and population growth to the poverty rate in Central Java Province in 2019-2021? The purpose of writing this article is to find out the relationship or correlation between education level and population growth on poverty in Central Java Province in 2019-2021.

2. Literature Review

2.1. Poverty

The definition of poverty has been given by the World Bank in different ways over the last few years. Defines poverty as a state of life that is detached from feasibility. This eligibility includes the availability of food, clothing, shelter, and education. Redefines the notion of poverty, namely someone living with a family who consumes less than $1 or $2 per day, or less than the standard of living set in each country. According to Shalihah, et al., 2021), poverty is a condition in which a person is unable to meet food and non-food needs by looking at the expenditure aspect.

Dowling and Valenzuela (Connor et al., 2019) state that poverty is caused by a lack of quality human resources including education level, building ability, skills possessed, and low physical capital. Meanwhile, according to Putri & Prasetyanto, (2021) there are many factors that influence poverty both directly and indirectly, including employment opportunities, type of work and number of hours worked, labor productivity, economic growth, wage rate, inflation, number of household members , household consumption, clean water sources, transportation, health facilities, education and the number of years of schooling for all family members, access to capital, asset ownership, location of the area where people live with centers of economic growth, and so on.

If viewed in a broader scope, the problem of poverty is actually a multidimensional problem (Roring & Rondonuwu, 2022). Poverty covers various aspects of life such as economic, social, cultural, and others. Therefore, it is necessary to review and handle various aspects of life to alleviate the problem of poverty.

Suryawati (Khusaini et al., 2021) divides poverty which is seen as a multidimensional problem into four categories. The first is absolute poverty, which is a situation when a person's income is not sufficient for the basic needs of life (clothing, food, housing, health and education). The second is relative poverty which is a condition of poverty due to unequal distribution of income and development. The third is cultural poverty as a form of poverty due to attitudes and lifestyles of people who are not advanced or modern. Finally, structural poverty is caused by a lack of access to resources such as education and health.

2.2. Education

According to Ki Hajar Dewantara as the father of education, education is an activity that directs students to become human beings and members of society who are able to achieve safety and happiness in life. Poverty alleviation can be done one way or another by forming or developing quality human resources through the implementation and attainment of higher education. Higher education is expected to be able to increase the productivity of society with various knowledge and skills acquired during their education. This is in line with what was revealed by Todaro (Prayitno & Kusumawardani, 2022) that the educational structure that applies to an area affects the social and economic character of the people of that area. An increase in the education level of the population can also be used as an indicator that economic development has occurred in a region.

At this time, education has become a primary need. Research conducted by Prayitno & Kusumawardani, (2022) states that the average length of schooling has a negative and significant effect on the poverty rate in Central Java in 2011-2015. Meanwhile, JPEPA (2021), who examined the causes of poverty in Musi Regency, found that the education level of the head of the family significantly affects the level of poverty because the income earned depends on the extent to which the head of the family has an education. Similar results were also obtained by Effen JPEPA, (2021). that the average length of school representing the level of education had a dominant influence on reducing poverty in Central Java in 2010-2015. Based on some of the research above, it can be concluded that the level of education does have an influence on the level of poverty. Therefore, to find out how close the relationship between education level and poverty is, a study of the relationship between the two factors is carried out.

2.3. Population growth

Population growth is the change in the number of residents in an area in a certain period of time. Factors affecting population growth include births, deaths, immigration and emigration. Nelson and Leibstein (Novianto, & Sudarsono, 2018) state that there is an influence between population growth on the level of community welfare. Still referring to

Nelson and Leibstein (Janah, et al., 2021), the rapid population growth in developing countries has resulted in the level of people's welfare not experiencing significant improvements. This situation in the long term actually causes a decline in welfare and increases the number of poor people.

Ummah & Rahani, (2021) states that population has a significant and positive effect on poverty in Central Java Province. The uncontrolled increase in population can hinder the process of economic development. In addition, if the increase in population is not followed by an increase in the quality of human resources and the quantity of food, the number of poor people will also increase. Furthermore, in order to determine the close relationship between population growth and poverty, population growth is used as a factor studied in this article.

3. Materials and Methods

3.1. Research Variables and Data

This study uses secondary data, namely data obtained through the Central Java Statistics Agency website. The type of data is in the form of quantitative data in the form of panel data collected in the 2019-2021 range and grouped based on 35 districts/cities in Central Java. The dependent variable in this study is poverty in Central Java, which is represented by the percentage of poor people. Meanwhile, the independent variables consist of two, namely the level of education represented by the average length of schooling for each resident in each district/city and the rate of population growth between years.

The data used in this study was downloaded from https://jateng.bps.go.id/. The data consists of: (1) Data on the average length of schooling in Central Java for 2019-2021; (2) Data on the Total Population of Central Java for 2019-2021; and (3) Data on the Percentage of Poor Population in Central Java for 2019-2021. All data is extracted based on the geographical district/city level, for all districts/cities in Central Java Province. Based on data on the Population of Central Java for 2019-2021, it can be determined the rate of population growth in Central Java Province in 2019-2021. Data snippets are provided in Table 1, Table 2 and Table 3, which can be accessed at https://jateng.bps.go.id.

Table 1: Data snippet of average length of schooling in Central Java province 2019-2021

Regency/City	Average Length Of School					
	Man			Woman		
	2019	2020	2021	2019	2020	2021
Province Of Central Java	8.06	8.16	8.17	7.03	7.24	7.34
District Cilacap	7.42	7.46	7.47	6.47	6.49	6.76
District Banyumas	7.95	7.97	7.98	7.14	7.24	7.35
District Purbalingga	7.47	7.48	7.49	6.76	6.87	6.95
District Banjarnegara	6.66	6.90	6.93	6.32	6.57	6.58
District Kebumen	7.97	7.98	7.99	7.09	7.10	7.11
District Purworejo	8.64	8.85	8.85	7.49	7.70	7.89
District Wonosobo	7.01	7.02	7.03	6.51	6.61	6.62

Table 2: Data snippet of population in Central Java Province for 2019-2021

Regency/City	Population By Sex (People)					
	Man			Woman		
	2019	2020	2021	2019	2020	2021
Province Of Central Java	17101806.00	17212455.00	18362143.00	17389029.00	17505749.00	18153892.00
District Cilacap	861266.00	865031.00	98099.00	858239.00	862067.00	963858.00
District Banyumas	838798.00	845612.00	894695.00	840326.00	847394.00	882223.00
District Purbalingga	456972.00	461281.00	505281.00	468221.00	472708.00	493280.00
District Banjarnegara	459903.00	462405.00	517056.00	458316.00	460787.00	500711.00
District Kebumen	595003.00	596388.00	684346.00	600089.00	301594.00	666092.00
District Purworejo	353298.00	354084.00	385266.00	363179.00	364232.00	384614.00
District Wonosobo	399115.00	400612.00	448152.00	388269.00	389892.00	430972.00

Table 3: Data on the Percentage of Poor Population in Central Java Province 2019-2021

Regency/City	Poverty Line (Rupiah/Capita/Month)		Number Of Poor People (Thousands)		Percentage Of Poor People (Thousands)	
	2020	2021	2020	2021	2020	2021
District/Regeancy						
Cilacap	351,735.00	364,367.00	190.60	201.71	11.46	11.67
Banyumas	406,250.00	417,006.00	225.04	232.91	27.26	17.66
Purbalingga	375,199.00	384,287.00	149.48	253.00	25.90	16.24
Banjarnegara	320,324.00	320,679.00	144.95	250.19	25.64	16.23
Kebumen	380,557.00	390,599.00	211.09	212.92	17.59	17.83
Purworejo	364,209.00	376,227.00	84.75	00.80	11.79	12.40
Wonosobo	362,607.00	373,474.00	137.64	139.67	17.36	17.67

3.2. Research Steps

This study measures whether or not the relationship between each independent variable and the dependent variable is strong. The technique used to measure it is by using Pearson correlation. To help calculate the Pearson correlation coefficient, Minitab software is used.

The steps taken in this research are:
1. collect data from the Central Java Statistics Agency website;
2. classifying data, tidying up data, calculating the average length of schooling between boys and girls each year and region, and calculating the rate of population growth;
3. inputting calculation results and data into Minitab;
4. perform a correlation analysis with Minitab;
5. Interpret Minitab output results; and
6. make a graphic illustration to clarify the interpretation.

4. Results And Discussion

Based on the results of data processing with Minitab, the value of the Pearson correlation coefficient was obtained. The results are given in Table 1. The Pearson correlation coefficient in Table 1 gives both positive and negative results. This indicates that there is a direct relationship (directly proportional) to the coefficients that are positive, and an inverse relationship (inversely proportional) to the coefficients that are negative. The relationship that occurs in the form of a direct or inverse relationship between the two factors that affect poverty can be seen from Figure 1 (inversely proportional) and Figure 2 (directly proportional).
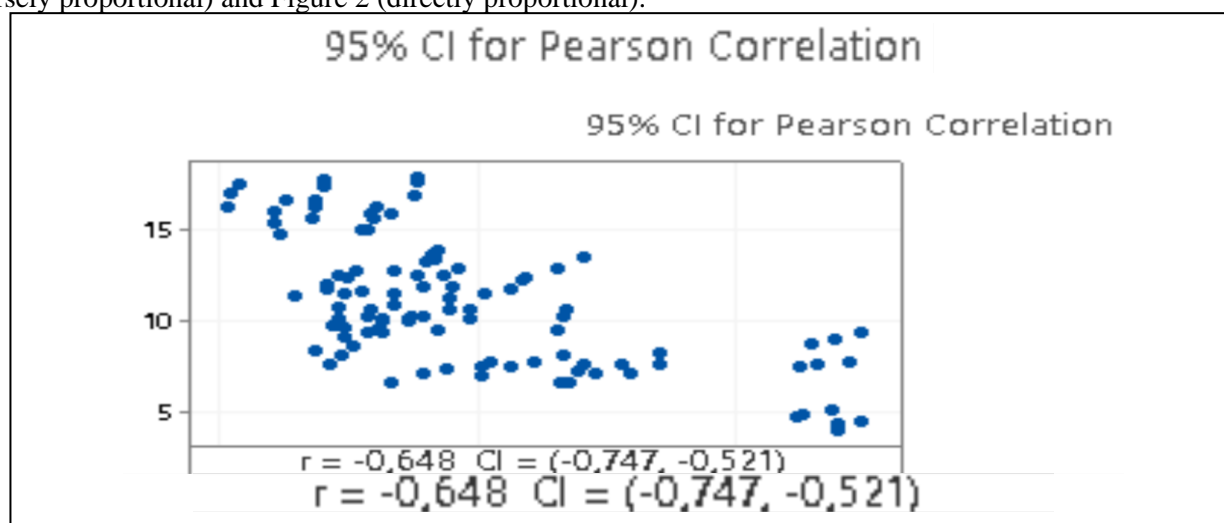

Figure 1: Plot of Education Level with Poverty Percentage

Based on Figure 1, a straight line (red color) with a negative slope can be drawn, starting from the top-left side to the bottom-right. This line shows an inverse relationship between education level and poverty. Whereas in Figure 2 a

horizontal straight line (zero slope) is obtained which explains that there is a direct relationship between the rate of population growth and poverty.
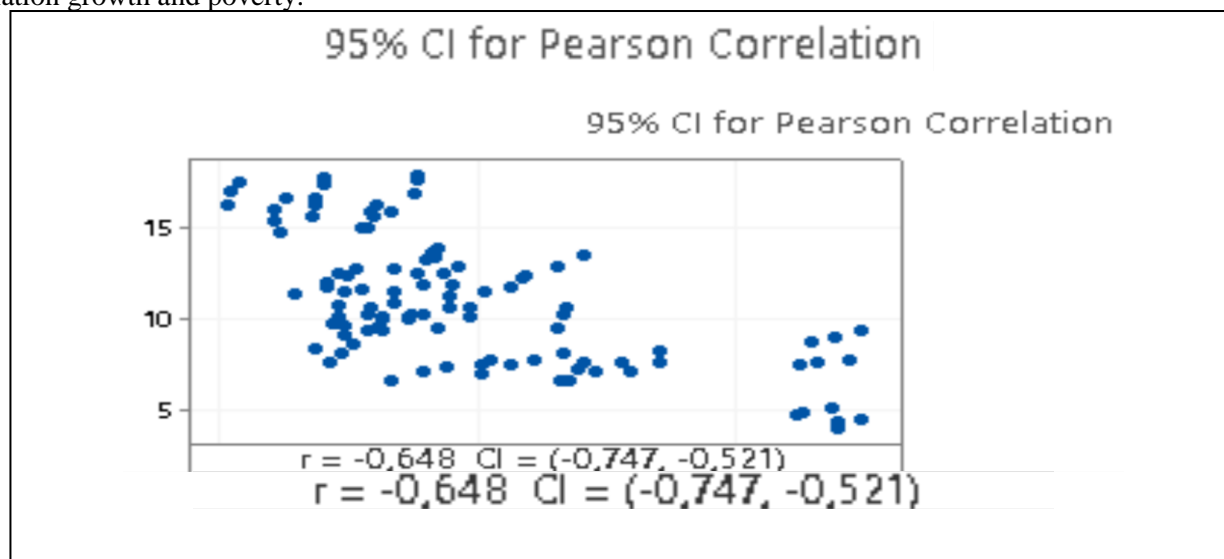

Figure 2: Plot of Population Growth Rate with Poverty Percentage

Then an analysis of Table 4 was carried out. The values in Table 4 which were obtained as Minitab output explained the strength of the relationship between the independent variable level of education represented by the average length of schooling and the poverty variable in Central Java.

Table 4: Analysis Results

Factor	Pearson Correlation Factor (R)	Relationship	Percentage (R^2 X 100%)
Average Length Of School	-0.648	Strong	41.99 %
Population Growth Rate	0.335	Low	11.23 %

Referring to the classification of the level of relationship between variables (Table 5), it can be concluded that a strong relationship is obtained between the education level variable and the poverty variable, namely at 0.648. The relationship between the two is expressed as an inverse relationship (inversely proportional). This result is consistent with Figure 1. The inverse relationship means that with higher levels of education, poverty will decrease. In other words, education is the key to success in becoming more financially prosperous.

Table 5: Interpretation of the Pearson Correlation Coefficient

Coefficient Interval	Relationship Level
0.8-1.0	Very Strong
0.6-0.79	Strong
0.4-0.59	Strong Enough
0.2-0.39	Low
0.0-0.19	Very Low

The results of this study, using 2019-2021 data, are still relevant to the conclusions of previous studies. One of them is research Pramono & Marsisno, (2018), that the average length of schooling has a negative and significant effect on the poverty rate in Central Java in 2011-2015. Research Franata, (2017) in Central Java Province. That is, the ability of education to improve welfare applies across geography and in different time periods.

By looking at the second row and rightmost column in Table 1, the level of education to poverty in Central Java contributes almost 50%, namely 41.99%. These results should be able to make the Central Java government make new policies or develop existing policies to increase the education level of the population in Central Java. This is because education is able to make people of higher quality both in terms of knowledge, skills, and mindset so that they are pushed forward to be free from the poverty trap.

The mutual influence between population growth rates has been confirmed in the results of Nelson and Leibstein's research (Ummah & Rahani, 2021). Based on Table 1, the results of the population growth rate are directly proportional to the poverty rate. This means that an increase in the rate of population growth has an effect on the occurrence of an increase in the poverty rate. This result is in line with the conclusions in Nelson and Leibstein's research (Ummah & Rahani, 2021), that the rapid population growth in developing countries in the long term actually results in a decrease in welfare and an increase in the number of poor people.

Even though in the long term there is a decrease in welfare and an increase in the number of poor people, the Pearson correlation coefficient in Table 1 illustrates that the relationship between the rate of population growth and

poverty is in the low category. That is, the decline in welfare occurs slowly, or in a relatively long (long) period of time.

The contribution of the population growth rate to poverty in Central Java is smaller than the level of education, which is 11.23%. These results can be used as an indication of the success of the Family Planning (KB) program which has succeeded in reducing the rate of population growth in Central Java. Data from BPS also shows a decrease in the population for the 2019-2020 and 2020-2021 periods, although previously there was an increase in population of 227,369 in 2018-2019. The findings of this study are that the average length of schooling has a greater effect on reducing poverty in Central Java, compared to the rate of population growth.

5. Conclusions And Suggestions

The Pearson correlation coefficient shows that there is a strong relationship between education level and poverty rate in Central Java. This correlation is negative or inversely proportional. Meanwhile, the rate of population growth has a low relationship to the level of poverty even though the correlation is positive or directly proportional. This shows the need for more attention from the Government of Central Java to the education sector. The findings of this study are that the average length of schooling has a higher influence (contribution) on reducing poverty in Central Java, compared to the rate of population growth.

Suggestions that can be raised from the results of this study are the need to review other factors that affect poverty, as reported by Kurniawan (2017), or analyze correlations with other methods. Furthermore, a regression model or other linear model can be made as a predictive tool.

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