



Typology analysis and correlation between poverty, health, and education in central kalimantan

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ABSTRACT

The poverty rate in Central Kalimantan in the last period has shown an increase in contrast to education and health data which show a positive trend. This is far from the Regional Action Plan that has been designed, so it is necessary to carry out an analysis to determine the relationship between several research variants. This study aims to analyze the correlation and mapping of the poverty quadrant region with district/city levels of education and health in the Province of Central Kalimantan in 2018 and 2021. This research is a type of quantitative research using secondary data which is analyzed through Cartesian diagrams and Pearson correlations. The population and research samples cover 14 districts/cities in the Province of Central Kalimantan. The results showed that there were four areas of poverty, education and health quadrants. A comparison of the mapping of the quadrant areas between poverty and education in 2018 and 2021 shows no difference, while the quadrant areas of poverty and health in 2018 and 2021 show a shift. The Pearson correlation test conducted on the variables of poverty, education, and health shows a negative relationship but low correlation or in other words there is no strong influence between variables. The implication of the findings of this study is that there is a need for policies from the government as policy makers to create educational programs that tend to increase skills. Not only that, special attention is needed to improve health quality in Central Kalimantan Province so that it can become a poverty alleviation tool.

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1. INTRODUCTION

The Sustainable Development Goals are a relevant topic that remains on the national development agenda globally until 2030 (Kroll et al., 2019)(Breuer et al., 2019). Since it was agreed in 2015, the SDGs cover 17 points of sustainable development into the development framework of the central and regional governments (Graute, 2016)(ElMassah & Mohieldin, 2020). The topic of poverty management is the first point to be achieved in the concept of sustainable development (Lélé, 1991). Poverty is multidimensional problem that welfare low-income families, low education, and limited acces to health facilities (Dewi & Rachmawatie, 2020; Firdauzi & Dewi, 2022). Poverty is seen as a serious problem and is widely experienced by all countries, so the goal of poverty alleviation is put as the first

goal of the SDGs (Harianja et al., 2018). This goal is not without reason, considering that poverty alleviation is closely related to achieving the goals of quality education, health, welfare, and a decent life (Ishatono & Raharjo, 2016).

The issue of poverty alleviation is also a Regional Medium-Term Development Plan (RMTDP) of Central Kalimantan Province. The Regional Action Plan for the Sustainable Development Goals of Central Kalimantan Province as stated in the Central Kalimantan Governor Regulation Number 58 of 2018 targets the provincial poverty rate at 5.02% and the 2021 target of 4.3%. However, this target has not been fully achieved considering that the poverty rate of Central Kalimantan province is still below the Regional Action Plan target.

Based on data from Central Bureau Statistic ((BPS), 2023) the rate of poverty development in Kalimantan shows an increase. In 2019 the percentage of poor people in this province was 4.90% but in 2020 it became 5.04%, increasing again until 2021 and 2022 with poverty rates of 5.16% and 5.25%. As stated in the Central Kalimantan Regional Action Plan, this data is not as expected. the actual poverty rate is still far above the set target. In 2018 the local government targeted provincial poverty of 5.02% but the actual was 5.17%, so also in 2021 which showed a figure of 5.16% far greater than the target set at 4.3%.

Efforts to control poverty can basically be suppressed using education as a strategic sector to supports the process of economic activity (Cahyo et al., 2022). Education and poverty are a series of circles that influence each other. Education become crucial main to achive SDGs, because it can make people acces opportunity out from their poverty (Arsani et al., 2020). Changes that occur at the education level have an influence on the development of the poverty level, on the contrary, the level of poverty can also affect the development of education (Indrawati et al., 2020). The role of education in reducing poverty can help improve the quality of skills, knowledge, and ways of thinking that will push a person to get out of the poverty trap (Cahyo et al., 2022). Education is even directly able to reduce inequality and reduce poverty through increased productivity and provide better employment opportunities for the poor (Zulyanto, 2022). In the long run, formal and non-formal education plays an important role in reducing poverty because it is indirectly able to create productivity and efficiency in general which in turn will increase income. Research (Cahyo et al., 2022) mentions that education has a strong correlation to poverty rates. A similar opinion was also expressed by (Susanto & Pangesti, 2019) which found the results of the influence of education on the level of poverty in DKI Jakarta. Increasing investment in education may lead a household out from the poverty (Majumder & Biswas, 2017).

Poverty management can be done through education and health, both of which are able to encourage the development of human capital (Hadi, 2019). According to (Bariyah, 2022) there is a link between education and health and poverty alleviation in supporting the achievement of the SDGs. Health is one of the factors to wellbeing alleviate poverty because good health increase productivity (Arsani et al., 2020). Health factors are able to intervene in poverty reduction because good health will encourage improved performance and productivity, so the correlation between the two shows a negative relationship (Tubaka, 2019). Life expentacy is one of the indicator captured quality of health, it is on of key metrics for assessing population health and hence, of primary interest in medical research (Aanegola et al., 2022). This statement is supported by (Azahari, 2020) that poverty has a negative correlation with public health, meaning that when poverty increases, it can reduce health, especially the life expectancy of an individual. Then education is positively correlated with public health, meaning that when educational indicators increase it can extend the life expectancy of an individual. Health improvement as seen from life expectancy is seen as an investment in the development of the quality of human resources that are able to support economic development (Anggadini, 2015). Research (Ginting et al., 2019) states that health proxied by the Life Expentacy has a significant negative effect on poverty. The opposite relationship shows that the higher the Life Expentancy, the lower the poverty rate.

Several studies have addressed the link between poverty, education, and health, but the results still show inconsistencies (Béné et al., 2016) (Donolato et al., 2022). The study (Nassar & Biltagy, 2017)

analyzed the variables investment, poverty, and education relationship in Egypt. The result study said there is negative relationship between level of education on poverty rate in Egypt. Similar results are also reflected in the study (Kevin & Syari'udin, 2022) testing the effect of GRDP, Living Expectancy, and Average School Length on poverty in Central Java district showing results that health is proxied by Life Expectancy and education as measured by Average Length of Schooling has a significant negative influence on the percentage of the number of poor people in Central Java.

Study (Aini & Islamy, 2021) examining unemployment, education, health, GRDP, and the Human Development Index on poverty actually found that education has no effect on poverty, while health has a significant influence on poverty in Indonesia. The results of this study show that education does not affect poverty in Indonesia, while the level of health negatively affects poverty. This result is also supported research by (Natari, 2022) that partially education does not significantly affect the Poverty Rate, while Health has a significant negative effect on District/City Poverty in West Kalimantan Province. The results of research (Salwa et al., 2016) explained that life expectancy has a negative effect on poverty in Aceh Province, while (Hatta & Khoirudin, 2020) also explained that education seen from the average length of schooling does not affect poverty in NTT.

The opposite result was explained by (Chairunnisa & Qintharah, 2022) that health factors have no effect, while education has a significant negative influence on poverty in West Java 2019-2020. Education as measured by ALS has a negative influence on poverty in Takalar District, while health as seen from the Life Expectancy Rate does not affect poverty. Study (Harianja et al., 2018) use The Average Length of Schooling is a representation of the level of education showed that negatively affects on poverty, but Life Expectancy has no effect on poverty in Papua. Result (Suryati & Syukri, 2019) partially Life Expectancy has no effect on the poverty rate in South Sulawesi.

Based on the background that has been explained that the target of reducing the poverty rate of Central Kalimantan Province is still far from the expectations of the Regional Action Plan SDGs, the author is interested in reviewing further related to the correlation between poverty, education, and health levels in the Central Kalimantan province. In addition, this study aims to describe the typological division of regency/city areas in Central Kalimantan Province which is based on poverty, education, and health levels in 2018 and 2021. The results of this study are expected to be used as material for consideration in achieving local government targets in overcoming poverty, education and health problems in Central Kalimantan Province. Not only that, this research is expected to become a reference material for future researchers and add to the ranks of the literature for future progress.

2. RESEARCH METHOD

This research is a descriptive quantitative that describes analysis based on numerical data through statistical methods. The data used in this study is in the form of secondary data, taken from the Central Statistics Agency and related agencies. The population and sample of this study are all districts or cities located in the Central Kalimantan Province as many as 14 cities / regencies consisting of Kotawaringin Barat, Kotawaringin Timur, Kapuas, Barito Selatan, Barito Utara, Sukamara, Lamandau, Seruyan, Katingan, Pulang Pisau, Gunung Mas, Barito Timur, Murung Raya, and Palangka Raya. The data period selected in 2018 and 2021 with consideration is that the two years are the beginning and end years of the establishment of the Regional Action Plan for the Sustainable Development Goals of Central Kalimantan Province as stated in the Central Kalimantan Governor Regulation Number 58 of 2018.

The variable of this study consists of the poverty rate proxied by the percentage of poor people. The education variable follows (Bariyah, 2022) using the Mean Years of Schooling or Average Length of Schooling proxy. MYS is the average number of years used to complete education (Bariyah, 2022). The health variable indicator refers to research (Hasanah et al., 2021) using a proxy for Life Expectancy (LE). Life expectancy is number of years a person can expect to live. The short life expectancy in an area indicates that health development has not been successful, and the higher the life expectancy, the more successful health development in the region will be (Kevin & Syari'udin, 2022).

The data analysis used is Pearson's correlation analysis using Stata Software. This correlation technique is used to find relationships and prove the hypothesis of the relationship between two

variables when the data of the two variables are in the form of intervals or ratios and the data source of the two or more variables is the same (Bariyah, 2022). The formula for finding Pearson correlation can use equation 1. The interpretation of the results of the correlation coefficient is guided by the following criteria of Table 1:

$$r = \frac{n\sum xiyi - \sum xi\sum yi}{\sqrt{(n\sum xi^2 - (\sum x)^2)(n\sum yi^2 - (\sum y)^2)}} \tag{1}$$

Information:

- r : Correlation Coefficient
- $\sum x$: Total sum variable x
- $\sum y$: Total sum variable y
- $\sum x\sum y$: Total multiplication of variable x and y

Table 1. Coefficient Clasification of Pearson

Coefficient Range	Correlation Categories
0,00 – 0,199	Very Low
0,20 – 0,399	Low
0,40 – 0,599	Medium
0,60 – 0,799	Strong
0,80 – 1,000	Very Strong

Source : (Bariyah, 2022)

This study also used a cartesian diagram analysis aimed at looking at typological groupings of poverty, education, and health areas in the Central Kalimantan region. Cartesian diagrams serve to map poverty, education and health levels. The flat axis (Y) is filled by the poverty rate, while the upright axis (X) is filled with health variables and education/health variables. The position of the point on the Cartesian coordinate plane is divided into 4 parts, namely: quadrant I, quadrant II, quadrant III, and quadrant IV, with the criteria:

Table 2. Mapping Typology Areas

Poverty	Education/Health	
	($y_i > y$)	($y_i < y$)
($r_i > r$)	Quadrant I Poverty Rate Low & Education or Health High	Quadrant II Poverty Rate High & Education or Health High
($r_i < r$)	Quadrant III Poverty Rate Low & Education or Health Low	Quadrant IV Poverty Rate High & Education or Health Low

Source : (Bariyah, 2022)

3. RESULTS AND DISCUSSIONS

3.1. Typology of poverty and education in central kalimantan

Education is a critical means of interrupting the intergenerational transfer of poverty and has a long-term impact on lifting poor people out of poverty (Ju et al., 2021). Education is also an important dimension in calculating the Human Development Index (HDI), as measured by Expected Years of Schooling (EYS) and Mean Years of Schooling (MYS) (Bariyah, 2022). Study (Hadi, 2019) confirms that there is a very strong negative relationship between education and poverty. This means that the higher the Mean Years of Schooling or Length of Schooling number, the lower the percentage of poor people. MYS can be use to capture the equitable of education development in Indonesia (Putria et al., 2023). From some of these studies, the relationship between poverty and education will be opposite. The results of the mapping of the area using a cartesian diagram between poverty and education levels in Figure 1 and Figure 2 are divided into four quadrant regions. Quadrant I indicates that the poverty rate is low and higher education, Kudaran II is high poverty and higher education, Quadrant III is low poverty rate and low education, Quadrant IV is high poverty rate and low education.

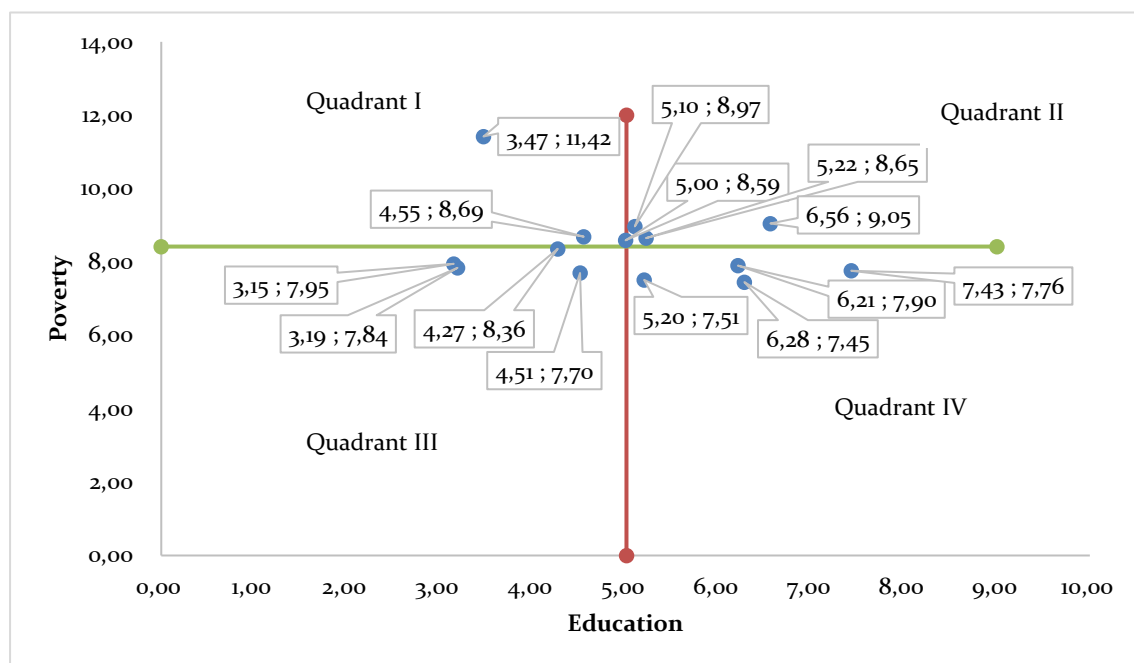


Figure 1. Cartesian Diagram of Poverty and Education 2018

The results of the 2018 regional typology described in Figure 1 describe that klasen I has a low poverty rate and higher education is in the districts/cities of Palangka Raya and South Barito. The poverty rate in Central Kalimantan in 2018 was 5.17% and the average length of schooling was 8.37, while the poverty rate and the average length of schooling in Palangka Raya and South Barito were 3.47%;11.42 and 4.55%;8.69, respectively. Thus, the poverty rate in Palangka Raya and South Barito is below the poverty level of Central Kalimantan province, while the education level of the two cities shows higher than the Average School Length of Central Kalimantan province in 2018.

Quadrant II indicates areas that have high poverty and a high level of education. This quadrant is filled by the Cities/Regencies of North Barito, Katingan, Gunung Mas, and East Barito. The poverty rate in these four cities shows a figure above 5%, even in Katingan City and East Barito, the poverty rate is recorded to exceed the poverty rate of Central Kalimantan Province. However, the level of education in these 4 cities is relatively high because the average length of schooling owned is far above the average length of provincial schools. The contrast value can be seen from East Barito City which shows that the high poverty rate of 6.56% has the highest education level of 9.0 and even became the highest average length of schooling in Central Kalimantan Province in 2018.

Quadrant III consists of the cities/districts of Kotawaringin Barat, Sukamara, Lamandau, and Pulang Pisau. These four cities/districts have low poverty rates as well as low education levels. This can be seen from the city/regency poverty rate is below the provincial poverty rate, but the average length of schooling owned is also lower than the average length of schooling in Central Kalimantan province in 2018. Lamandau Regency has a poverty rate of 3.15% so that it became the city with the lowest poverty rate in Central Kalimantan Province in 2018.

Quadrant IV as an area with a high level of poverty and low education consists of the cities/districts of East Kotawaringin, Kapuas, Seruyan, and Murung Raya. It can be said that quadrant IV is an area that has complex problems because the poverty rate is above the provincial poverty rate and low education where the average length of schooling is below the average length of schooling in Central Kalimantan province in 2018. In this quadrant, it is filled by the regency/city with the highest poverty rate in Central Kalimantan province, namely Seruyan Regency. The lowest level of education

in Central Kalimantan Province in 2018 was Murung Raya Regency, where this district was included in quadrant IV.

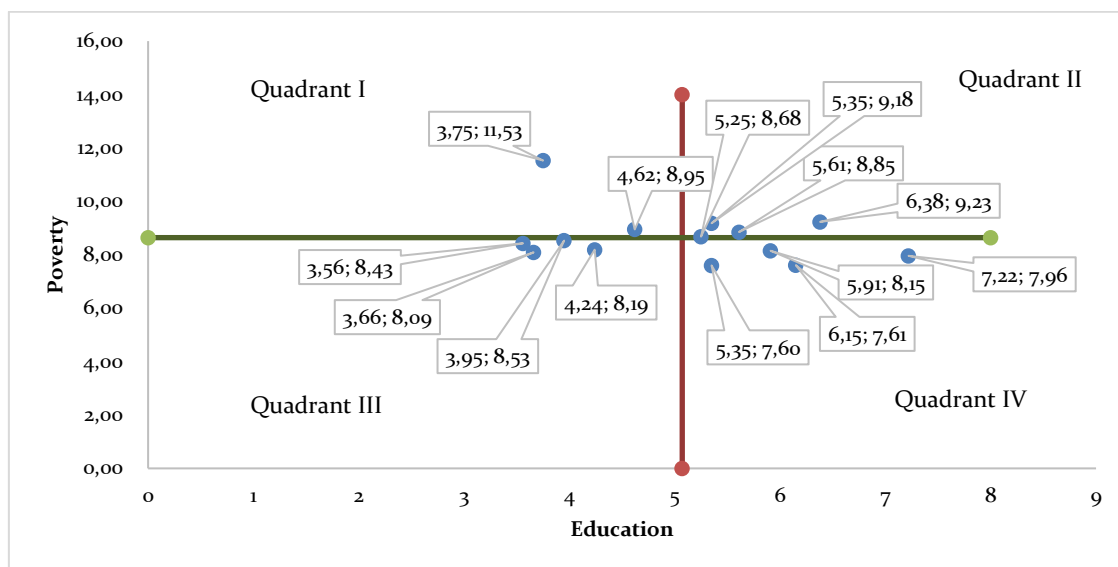


Figure 2. Cartesian Diagram of Poverty and Education 2021

The results of mapping quadrant areas using a cartesian diagram Figure 2, poverty and education levels in Central Kalimantan Province in 2021 are not much different from the results of regional mapping in 2018. Figure 2 shows that quadrant I consists of 2 districts/cities, namely Palangka Raya and South Barito as areas with low poverty levels and high education. Quadrant II is high in poverty, but the level of education is high, consisting of four districts/cities of Barito Barat, Katingan, Gunung Mas, and Barito Timur. Quadrant III with details of poverty and low education levels is divided into the cities/districts of Pulang Pisau, Kotawaringin Barat, Sukamara, and Lamandau. Quadrant IV is divided into cities/districts of Kotawaringin Timur, Kapuas, Seroyan, and Murung Raya into wilayah which has a high poverty rate and a low level of education.

In general, the poverty rate of Central Kalimantan province in 2021 of 5.16% is much smaller when compared to 2018 of 5.17%. In other words, efforts to overcome poverty in Central Kalimantan province are said to be good because they are able to reduce poverty growth. This is different from the city/regency poverty rate, where as many as 8 cities/regencies showed an increase in the poverty rate in 2021 when compared to 2018, while the other 6 cities/districts were able to reduce the percentage of poverty rate. In 2018 Lamandau City became the city/regency with the lowest poverty rate in Central Kalimantan Province at 3.15%, but in 2021 poverty in this district increased by 13% to 3.56%. Different conditions can be seen from Seruyan Regency, as the district with the highest poverty rate in Central Kalimantan province in 2018 of 7.43% actually decreased in 2021 to 7.22%, meaning that there was a decrease in poverty in this district by 2.8%.

On the education side, as seen from the Average School Length (ASL) of Central Kalimantan Province, it showed an increase. In 2018 the provincial RLS was 8.37 to 8.64 in 2021. This is in line with the increase in RLS in regencies/cities in Central Kalimantan Province. Overall, the district or city's Mean Years School showed an increase. Lamandau Regency had a 2018 RLS of 7.95, rising to 8.43 in 2021, thus becoming the district with the highest MYS increase in the province of 6.04%. In 2018 Murung Raya City had the lowest RLS of 7.45 but in 2021 the lowest MYS moved to Kapuas Regency of 7.60. The highest level of education is still held by Palangka Raya, where in 2018 the MYS of 11.42 increased to 11.53 in 2021 or in other words a percentage increase of 0.96%.

3.2. Typology of poverty and health in central kalimantan.

Life expectancy is an important indicator and is closely related to the health of a region's population, which in turn will also reflect social welfare and economic development in that region (Bariyah, 2022). According to (Arsani et al., 2020) Health characteristics that interact with poverty components: Income poverty, nutrition, and health; shelter and health; work settings and health; income poverty and health care expenditures; ill health and erodive livelihood options; and coping with vulnerability to ill health are all topics covered. Study (Ginting et al., 2019; Hasanah et al., 2021) explained that there is a significant negative relationship between poverty and health as measured by Life Expectancy (LE). The opposite relationship means that when poverty is high then health will be low, and vice versa. Health indicators in this study used Life Expectancy (LE). Poverty and health mapping in Central Kalimantan province is divided into four quadrants. Quadrant I of the region has a low poverty rate and high to life expentancy, Quadrant II has a high poverty rate while the Life Expectancy rate is high, Quadrant III has a low poverty rate and low Life Expectancy, and Quadrant IV has a high poverty rate and a low life expentancy. The results of the 2018 and 2021 regional mapping studies are depicted in the following figure 3 and 4 images:

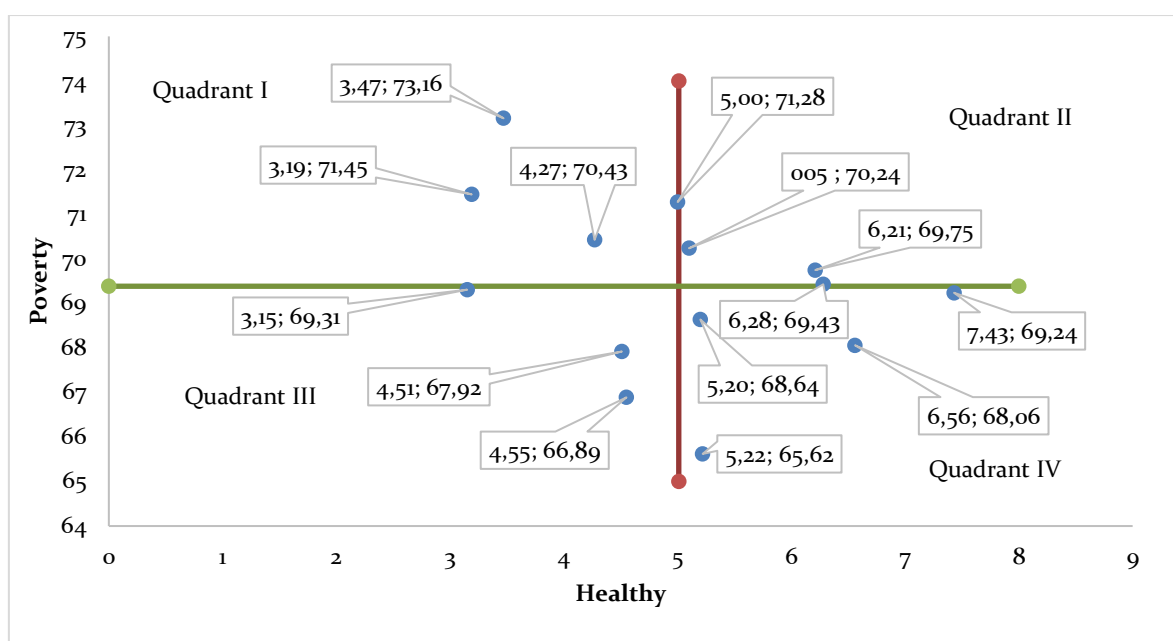


Figure 3. Cartesian Diagram of Poverty and Health 2018

Based on Figure 3 Quadrant I consists of four regencies/cities namely Palangka Raya, Sukamara, North Barito, and West Kotawaringin. These four cities have a poverty rate below the poverty of Central Kalimantan Province in 2018 which was recorded at 5.17%. On the health side, the to life expentancy of each city/district of quadrant I exceeds the provincial to life expentancy of 69.64. Thus, these four cities can be said to be developed regions because they have low poverty rates and high Life Expectancy (LE). Quadrant II of education and health of Central Kalimantan Province is filled by two regencies/cities, namely Kotawaringin Timur and Gunung Mas. The to life expentancy values of these two cities are 69.75 and 70.24 respectively, which is much greater than the provincial LE of 69.64. However, the poverty rate of these two districts is still relatively high, namely 6.21 and 5.1, which is much higher than the provincial poverty rate so that these two districts are included in quadrant II. Quadrant III with low poverty rate and low to life expentancy is South Barito, Lamandau, and Pulang Pisau districts. The poverty rate in these three districts shows a figure below the provincial poverty rate, but unfortunately the Life Expectancy recorded is also still below the provincial LE figure. Quadrant IV covers the districts/cities of Murung Raya, Kapuas, Seruyan, Katingan, and Barito Timur.

This region describes that the poverty rate in the district/city is relatively high and has a low Life Expectancy value. This is a complex problem in regional development, because high poverty indicates high unmet basic needs of the community, while low LE indicates that the level of public health is also low.

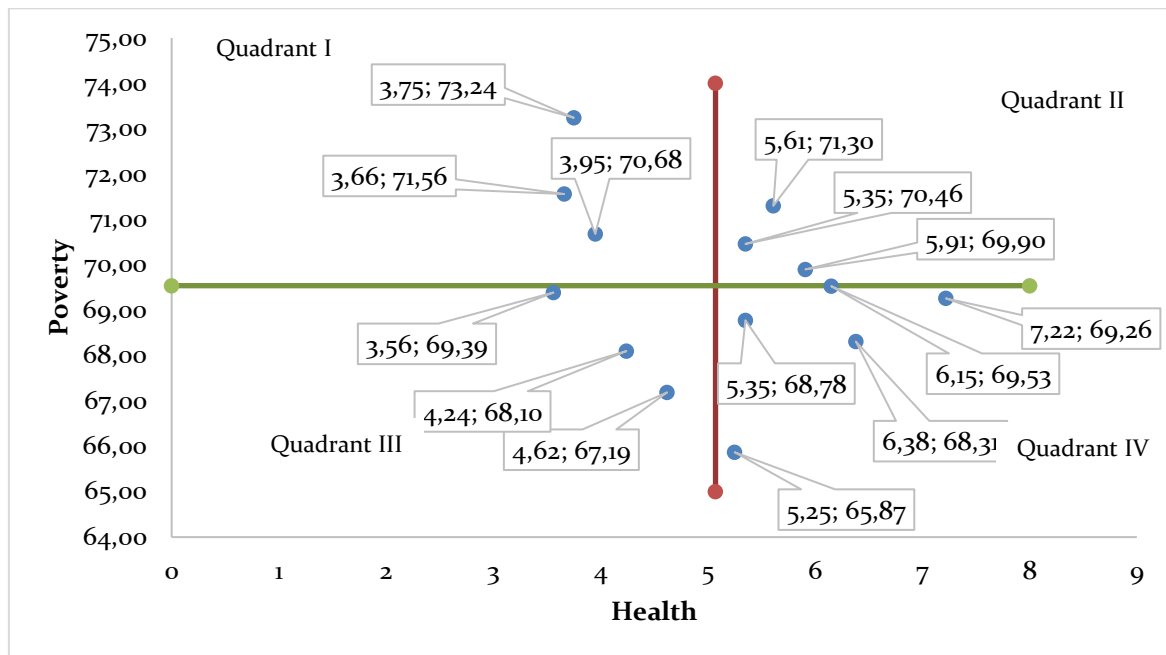


Figure 4. Cartesian Diagram of Poverty and Health 2021

The results of the 2021 quadrant mapping in Figure 4 between poverty and health show differences with the mapping results in 2018. Based on Figure 4, it shows three regencies/cities included in quadrant I, namely Palangka Raya, Sukamara, and Kotawaringin Barat. In 2018 Quadrant I had 4 regencies/cities, but in 2021 it was reduced to 3 regencies/cities. In 2018 quadrant II consisted of 2 districts, but there was a shift in 2021, where North Barito Regency was included in the mapping of this area. Barito Utara's poverty rate in 2021 of 5.61% increased from 2018 which was only 5% but the AHH value it had increased from 71.28 to 71.30, making the district shift from quadrant I to quadrant II. Not much different from 2018, Quadrant III in 2021 is still occupied by Barito Selatan, Lamandau, and Pulang Pisau Regencies. In Quadrant IV, five districts are still recorded, namely Murung Raya, Kapuas, Seruyan, Katingan, and Barito Timur. The Life Expectancy value in 2021 showed improvement compared to life expectancy in 2018, even overall the to life expentancy value of 14 cities/regencies in Central Kalimantan Province showed a positive increase even though this increase did not reach 1%.

3.3. Result correlation test.

This test was carried out to find out how the level of correlation that occurs between poverty and education and health. The results of the correlation test of this study are described in Table below:

Tabel 3. Pearson Correlation Test

	Poverty	Education	Health
Poverty	10.000		
Education	-0.08999	10.000	
Health	-0.0207	0.4002*	10.000

Source : Stata procced

Based on Table 3, the correlation test conducted on poverty with education showed a value of -0.089 meaning that the correlation value was low or there was no correlation. A negative sign indicates that

the correlation between the two indicates the opposite direction, when the poverty rate is high then the education level is low, and vice versa. The results of this study are in line with research (Bariyah, 2022) which explains that there is no correlation between the level of poverty and education as measured by Expected Years of Schooling (EYS) and Average Length of School in West Kalimantan Province. Relevant study by (Putria et al., 2023) has same result that education and poverty is not correlation. Same result explained by (Mansi et al., 2020) Education has a negative impact on poverty in the EU and the Western Balkans, though not significantly. The research of (Hasanah et al., 2021) also explained that the Average School Duration does not affect the poverty rate in Jambi Province. There is no correlation between poverty and the average length of schooling due to the low MYS of cities/districts that are still under 12 years old (Hasanah et al., 2021). Other statement said that high education can't ensure decreased poverty if they not upgrade the skill for productivity (Prasojo & Khorunisa, 2020).

The results of the poverty correlation test with health showed correlation values of -0.0207. This value means that the correlation that occurs falls into the category of low or no correlation, while the direction of the relationship indicates negative or opposite. It means that when poverty is high, life expectancy district or city in Central Kalimantan Province actually decrease, and vice versa. The results of this study support (Azahari, 2020) that poverty shows a negative relationship to health, but statistically insignificant, thus there is no effect of poverty on the health of the people of Bangka Belitung Islands Province. Similar results were described by (Bariyah, 2022) who found that there was no correlation between poverty and life expectancy (LE) in West Kalimantan Province. In line with (Aprilia & Sugiharti, 2022) found that in the short and long term education and health have no effect on poverty in Bali Province. Research by (Bancin & Usman, 2020) also stated that life expectancy has no effect or is not related to the number of poor people in Aceh.

4. CONCLUSION

Based on regional mapping using a cartesian diagram, it was found that the typology of poverty with education in 2018 and 2021 quadrant I includes 2 districts/cities with low poverty levels and higher education levels. Quadrant II of 4 districts has a high level of poverty and education. Quadrant III is 4 districts with low poverty rates but low education levels. Quadrant IV is 4 districts/cities that have high poverty rates and low education. The comparison results between 2018 and 2021 do not show a shift in quadrant regions. The results of poverty and health mapping in 2018 and 2021 show a shift in quadrant areas. In 2018 Quadrant I was 4 districts/cities with low poverty and high health, changing to 3 districts or cities in 2021 as one district shifted to kudarant II. Quadrant II was recorded to have 2 districts in 2018, changing to 3 districts in 2021. Quadrant III as an area with a high level of poverty and health as many as 3 districts/cities, while in quadrant IV there are 5 districts/cities with high poverty rates and low health levels. Based on pearson correlation tests, all variables show a negative but low correlation or in other words there is no strong influence between poverty, education, and health in Central Kalimantan Province. The results of the findings of this study can be used as material for consideration by the Central Kalimantan regional government in overcoming the increase in the poverty rate. The results of the mapping in this study can also provide an illustration that there is a need for local government efforts to pay more attention to regencies/cities that have high poverty rates and low levels of education and health. This research is limited to area mapping efforts based on available data, and only examines the relationship between several variables. For future researchers, it is hoped that this will broaden the object of research and provide a chronicle idea for poverty alleviation efforts in Central Kalimantan.

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