*The Effect of Educational Cash Transfer for Students From Low-Income Families on Students' Dropout Rate in Indonesia*

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**Abstract**
The Indonesian government provides an educational cash transfer program for low-income families with children aged 6-21 so that the children can complete their education up to secondary level (*Program Indonesia Pintar – PIP program*). The Covid-19 pandemic from 2020 to 2022 might hamper the success of this program. Hence, this study aims to see how the PIP program affects the dropout rate of students from low-income families at the primary, junior, and senior secondary levels before and during the Covid-19 pandemic. This study uses cross-sectional data from the National Socioeconomic Survey (SUSENAS) of 2019 and 2021 and applies the propensity score matching (PSM) method. The results show that before the pandemic in 2019, the PIP program decreased the probability of dropping out for students from low-income families at primary and junior secondary schools but not for students at senior secondary schools. However, during the pandemic in 2021, the PIP program decreased the probability of dropping out for students in junior secondary and senior secondary schools but not for students in primary schools. The PIP program only significantly reduces the probability of dropping out for junior secondary students, both before and during the Covid-19 pandemic.


Keywords: PIP, Educational Cash Transfer, Dropout Rate, Low-Income Students, Propensity Score Matching

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**Introduction**

Education represents an investment in the future and a cornerstone for creating high-quality human resources. Inclusive education that fosters skills development is obligatory for every child, regardless of legal status, nationality, or citizenship (UNESCO, 2019). Education is advocated through Sustainable Development Goal 4 to achieve accessible, equitable, and quality primary and secondary education by 2030. To achieve this goal, every child must complete their education without dropping out (UNICEF, 2017). Despite education being a top priority on the global agenda, the dropout rate is still relatively high. According to UNESCO (2019), the total number of dropout children in 2018 amounted to 258.4 million. The dropout probability for high school students is four times higher than for elementary and twice as high as for junior high school students due to lack of early schooling opportunities, non-compulsory upper secondary education, and high school-aged children opting to work rather than continue their education (UNESCO, 2019).

Indonesia is among the countries facing the challenge of student dropout. According to the Ministry of Education, Culture, Research, and Technology of Indonesia (MoECRT), in the 2021/2022 academic year, there were 75,303 school dropouts in the country, with the highest number of dropouts being at the elementary school level (Figure 1). There was an increase in dropout rates at all levels of education during the 2019/2020 academic year due to the outbreak and spread risk of Covid-19. The number of dropout students has been relatively higher at the elementary school level since 2018/2019. However, the dropout rate was the lowest at elementary schools, with 0.24%. The dropout rate of junior high school students was 0.39%, senior high school was 0.55%, and vocational high schools was 0.65%.
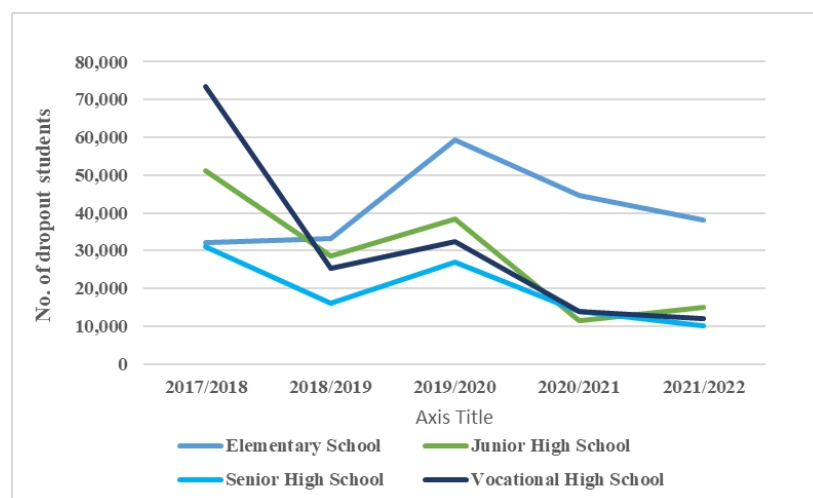


*Source: MoECRT (2021), https://databoks.katadata.co.id (2022)*

Figure 1: The number of school dropouts in Indonesia from 2017/2018 to 2021/2022

One of the main factors contributing to the increase in dropout rates in Indonesia is poverty. Most families (76%) stated that their children dropped out of school due to economic factors, with 67% unable to afford school fees and 8.7% needed their children to help support the family financially (Ali, 2009). According to UNICEF, 938 school-aged children in Indonesia dropped out due to the pandemic, with 74% due to lack of funds (https://databoks.katadata.co.id, 2021).

From 2018 to 2020, the population living below the national poverty line in Indonesia was at its highest in 2020. Figure 2 shows a significant increase of 11.13% of the population living below the poverty line from 2019 to 2020. In 2022, nearly 26.4 million people were living below the poverty line. The number of child workers aged 10-17 also reached 1.17 million, an increase of 320,000 compared to 2019 (https://databoks.katadata.co.id, 2021). Children face a trade-off between working or going to school.
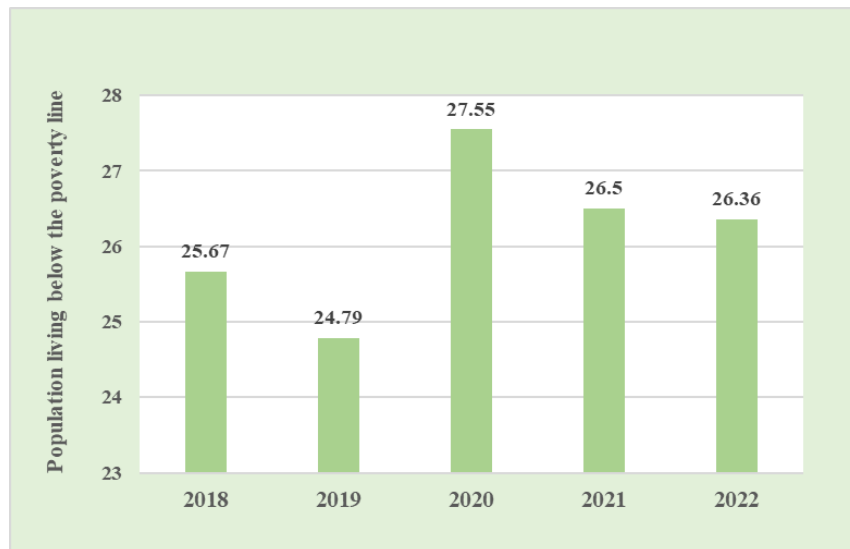


*Source: BPS-Statistics Indonesia (2022)*

Figure 2: The number of poor people in Indonesia, 2017/2018 to 2021/2022 (in millions)

One strategy for reducing dropout rates is the implementation of a conditional cash transfer program (CCT), which aims to improve the welfare and human capital investment to alleviate poverty (Edo & Marchionni, 2019; Glewwe & Kassouf, 2012; Mo et al., 2013; Azevedo & Robles, 2013). The Indonesian government provides conditional cash assistance to school-aged children (6-21 years old) from low-income families who can not access education named *Program Indonesia Pintar* (PIP program). The program provides assistance to the respective families so their children can complete their secondary education. It is interesting to examine the impact of the PIP program on dropout rates for students from low-income families, especially during the pandemic.

Several quantitative studies have discussed the impact of conditional cash assistance on child education in Indonesia (Anindita & Sahadewo, 2018; Listiyanto & Qibthiyyah, 2022; Purba, 2018; Setyadharma, 2018; Sihombing et al., 2022; Yulianti et al., 2015). Moreover, there were some qualitative studies have evaluated the effectiveness of the PIP program in several schools in Indonesia (Hafrienda et al., 2023; Kaidah & Ruslan, 2021; Uriyalita et al., 2020; Zahimu, 2019). Most of the studies found that the PIP program can support the education of children from low-income families. Still, there was limited evidence on how the program affects dropout rates, especially during the Covid-19 pandemic. Hence, how the PIP program affects the probability of student dropouts from low-income families needs to be further elaborated, especially during the pandemic. This study contributes to understanding how the PIP program prevents school dropout among students from low-income families, both before and during the Covid-19 pandemic.

**Briefly on the *Program Indonesia Pintar* (PIP) Program**

Cash transfer is one policy to enhance educational demand by providing cash assistance to support children in low-income families to attend schools. Unconditional cash transfer (UCT) assists low-income families without specific conditions, whereas the cash conditional transfers (CCT) assist with predefined requirements. *Program Indonesia Pintar* (PIP program) is one of Indonesia's conditional cash transfer (CCT) programs that ensures students from low-income families attend schools and can finish their education up to the secondary level. The PIP program is targeted at children aged 6-21 from poor and vulnerable families.

The PIP program was the enhancement of the previous program called the Poor Student Assistance (*Bantuan Siswa Miskin-BSM* program) in 2014. The PIP program allocates a fixed amount of cash for eligible students. Elementary students receive the assistance of IDR 450,000/year (approx. USD 28), junior high school students receive IDR 750,000/year (approx. USD 47), and senior/vocational high school students receive IDR 1,000,000/year (approx. USD 63) (MoECRT, 2020). The students can use cash from the PIP program to purchase books and stationery, school uniforms, school supplies, transportation to school, students' pocket money, additional course fees for formal education participants, as well as additional practice and internship fees or work placements (MoECRT, 2023).

The highest number of PIP program recipients was in 2018, with 18,699,376 students (Table 1). During the pandemic in 2020, the total number of PIP recipients decreased. However, while the recipients at other school levels decreased, the number of program recipients at the elementary school increased.

| School Level | Year | | | | |
|---|---|---|---|---|---|
| | **2018** | **2019** | **2020** | **2021** | **2022** |
| Elementary School | 10,379,253 | 10,364,266 | 10,434,330 | 10,411,608 | 10,360,614 |
| Junior High School | 4,751,246 | 4,562,347 | 4,411,680 | 4,401,653 | 4,369,968 |
| Senior High School | 1,516,701 | 1,464,712 | 1,412,212 | 1,419,438 | 1,393,519 |
| Vocational High School | 2,052,176 | 2,007,074 | 1,834,669 | 1,852,279 | 1,829,167 |
| **Total** | **18,699,376** | **18,398,399** | **18,092,891** | **18,084,978** | **17,953,268** |

*Source: MoECRT (2022)*

Table 1: Number of PIP recipients from 2018 to 2022

There are challenges in the implementation of the PIP program. The delayed disbursement of the funds resulted in the students being unable to utilize the transferred funds (Zamjani et al., 2019). There are also some deviations in the utilization of the PIP funds. The cash was used for non-educational purposes, such as buying food supplies and paying family debts (MoECRT, 2017). Since 2021, the government has implemented the classification of students who are eligible to receive PIP. The students from households with family incomes in the lowest income categories, including very poor, poor, nearly poor, and vulnerable poor (decile classification of 1 to 4), and who are both recorded and not recorded in the Integrated Social Welfare Data (DTKS) of the Ministry of Social Affairs are eligible for the PIP program.

**Literature Review**

A number of previous studies have investigated the impact of conditional cash transfers (CCT) on dropout rates. For instance, Brazil's Bolsa Escola/Familia program has been shown to increase school participation and reduce the number of children working long-term (Peruffo & Ferreira, 2017; Glewwe et al., 2020). Similarly, Mo et al. (2013) confirmed the

positive impact of CCTs on dropout rates in rural China. In contrast, Churchill et al. (2021) found that Pakistan's Benazir Income Support Programme (BISP) positively and significantly impacted school enrollment and grade progression but did not affect dropout rates in the short term. In contrast to these findings, Canelas & Niño-Zarazúa (2019) found different results for Bolivia's Bono Juancito Pinto education assistance program, where the program successfully increased school participation rates.

Several studies in Indonesia have also examined the impact of educational assistance on low-income families. Applying data from the Indonesian Family Life Survey (IFLS) and Intention-to-Treat (ITT) analysis methods, Kharisma et al. (2017) found that JPS scholarships were effective in reducing dropout rates in primary education. However, they concluded that the impact of these scholarships could be further enhanced. The PIP program significantly increased educational expenditure. In this case, government cash assistance can reduce the likelihood of these students dropping out (Setyadharma, 2018). The BSM program can reduce dropout rates at every educational level for children from poor households (Yulianti et al., 2015). Other studies have indicated that PIP is more effective than BSM in reducing dropout rates, with the most significant impact occurring at the junior high level (Listiyanto & Qibthiyyah, 2022). Despite the diverse results of the impact of CCT on educational outputs, the most recent studies prove that educational assistance can reduce dropout rates.

Previous studies also show that the primary factors driving children's failure to complete their education can be attributed to the characteristics of the households in which they reside (Khiem et al., 2020; Mo et al., 2013; Wils et al., 2019). In these households, the role of parents, especially the household head (KRT), is of particular significance as the KRT is the primary decision-maker in every household decision, including education. A higher level of parental education is associated with a lower likelihood of children dropping out of school (Alcaraz, 2020). Households with higher poverty levels are more likely to be in households with primary employment status in the informal sector, where economic shocks are more prevalent compared to the formal sector. Moreover, the economic condition of a household can be gauged by the household per capita expenditure, with lower per capita expenditure indicating a smaller family needs fulfillment capacity. Another crucial aspect of a household's background is the number of children, which has a negative or inverse relationship with the availability of household resources to be distributed (Al-Samarrai & Peasgood, 1998).

**Methods and Data**

The theoretical framework used in this study is the education production function, which describes how educational outcomes, such as cognitive abilities and knowledge, are generated from "raw inputs." It is a framework for understanding how various education policies can influence student achievement. Children's knowledge and skills are not only "produced" by school inputs and educational policies but also by other factors outside schools (Hanushek, 1979; Lovenheim & Turner, 2018). Hanushek (1979) formulated a model by considering several factors affecting the educational achievement of students as follows:

$$A_{it} = f(B_{it}, P_{it}, S_{it}, I_i) \tag{1}$$

$A_{it}$ represents the achievement of student $i$ at a given time, $B_{it}$ is the vector of the family background of student $i$ at a given time, $P_{it}$ is the vector of peer influences of student $i$ at a

given time, $S_{it}$ is the vector of school inputs at a given time, and $I_i$ is the vector of student characteristics.

This study employs quantitative analysis using the Propensity Score Matching (PSM) method to mitigate selection bias caused by non-random controls. PSM will find similarities in the characteristics of two populations:
   – the treatment group, which is students who received the PIP program;
   – the control group, which is students who did not PIP program.

Randomization will be conducted on both populations by PSM by considering the similar characteristics of the two groups and hence allowing for a direct comparison between the groups. The sample in this study is divided into two groups, the treatment group and the control group, which exhibit similar characteristics, as illustrated in Figure 3.
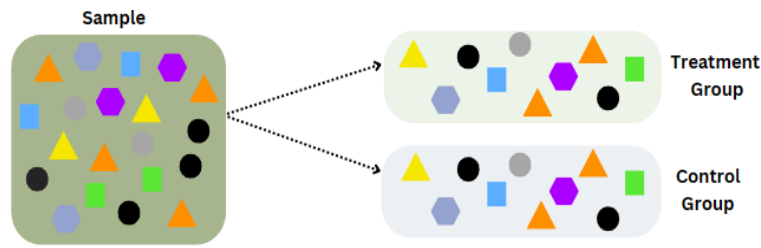


Source: Authors

Figure 3: Design of Propensity Score Matching (PSM) Method

First, the test for differences in mean covariates is conducted to check the imbalances between treatment and control groups. Second, the PSM method will estimate probability scores for PIP acceptance to each individual in the sample based on a logit regression as follows:

$$\ln\left(\frac{P_i}{1-P_i}\right)PIP_i = \alpha + \beta_1 \Sigma H_{ij} + \beta_2 \Sigma X_j + \varepsilon_{ij}$$

(2)

where,

$\ln\left(\frac{P_i}{1-P_i}\right)$ : Probability of PIP acceptance of the individual $i$

$H_{ij}$ : Confounding variables in the form of household background of the individual $i$ in household $j$ consisting of household expenditure per capita, head of household education, leading occupation status of head of household, and number of children in the household

$X_j$ : Control variables considered for PIP acceptance in household $j$

Based on the education production function, this study focuses on the household background as the primary factor that might affect students' dropout. Therefore, the variables included in the logit estimations consist of household backgrounds, such as the education level and employment status of the head of the family, per capita household income, and the number of children in the households. In addition to PIP, low-income families also receive other government transfers of *Program Keluarga Harapan* (PKH) and *Kartu Keluarga Sejahtera* (KKS). Hence, other government transfers are also included in the logit estimation. The logit estimation will provide the common characteristics of the recipient of PIP.

Third, following the logit estimation, the subsequent steps are to verify the presence of common support by implementing the matching method. Common support refers to the overlap in the distribution among treatment and control groups to ensure both have similar propensities for treatment. The matching method using the Nearest Neighbor (NN) with the caliper is applied because the number of observations for the treatment group was significantly lower than the control group.

Lastly, the outcome of this study is the Average Treatment Effects on Treated (ATT) value as the following equation:

$$ATT = E[E\{Y^T|T = 1, p(X_i)\} - E\{Y^C|T = 0, p(X_i)\}|T = 1]$$ (3)

Where ATT is the value of the effect of PIP on the probability of dropping out of school, T=1 represents program participants (recipients of PIP), and $Y^T$ is the outcome of program participants. Meanwhile, T=0 represents non-program participants (non-recipients of PIP), and $Y^C$ is the outcome of those who are not program recipients. Figure 4 summarizes the steps in applying the PSM method in this study.
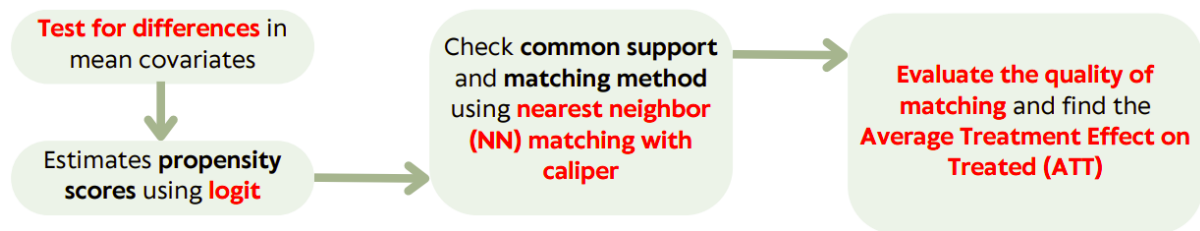


Source: Authors

Figure 4: Steps in Applying the PSM Method

This study utilizes secondary data from the National Socioeconomic Survey (SUSENAS) of 2019 and 2021 with a cross-sectional approach. The sample consists of school-aged children, 6-21 years old, from poor and vulnerable households based on expenditures per capita. In 2019, 112,004 individuals were identified as the sample, with 63,204 in elementary school, 29,248 in junior high school, and 19,552 in senior high school. Meanwhile, 121,163 individuals were identified as the sample in 2021, with 66,177 in elementary school, 30,458 in junior high school, and 24,528 in senior high school. Summary statistics of the characteristics of the sample are presented in the Appendices.

**Results and Discussion**

Table 2 presents the dropout status of students from low-income families who were recipients and non-recipients of the PIP program in 2019 based on their education level. In general, the dropout rate was higher among poor and vulnerable students who did not receive PIP. It can be seen that the percentage of students who dropped out in both sample groups (recipients of PIP and non-recipients of PIP) was significantly low. However, the dropout rate of the sample who received PIP is relatively lower (0.61%) compared to the ones who did not receive PIP (0.91%). This trend is consistent in 2021, as depicted in Table 3. The dropout rate of the sample who received PIP is relatively lower (0.71%) compared to the ones who did not receive PIP (1.01%). A summary descriptive of the sample can be seen in the Appendices.

| Education Level | Total Sample | 2019 Recipients of PIP (Treatment Group) | | | 2019 Non-Recipients of PIP (Control Group) | | |
|---|---|---|---|---|---|---|---|
| | | Dropout | Not Dropout | Total | Dropout | Not Dropout | Total |
| Elementary School | 63,204 | 34 | 17,883 | 17,917 | 177 | 45,110 | 45,287 |
| | | 0.19% | 99.81% | 100% | 0.39% | 99.61% | 100% |
| Junior High School | 29,248 | 78 | 8,243 | 8,321 | 281 | 20,646 | 20,927 |
| | | 0.94% | 99.06% | 100% | 1.34% | 98.66% | 100% |
| Senior High School | 19,552 | 78 | 4,636 | 4,714 | 281 | 14,557 | 14,838 |
| | | 1.65% | 98.35% | 100% | 1.89% | 98.11% | 100% |
| Total | 112,004 | 190 | 30,762 | 30,952 | 739 | 80,313 | 81,052 |
| | | 0.61% | 99.39% | 100% | 0.91% | 99.09% | 100% |

*Source: National Socioeconomic Survey 2019 (processed by authors)*

Table 2: The Number of Dropouts of Students from Low-Income Families, 2019

| Education Level | Total Sample | 2019 Recipients of PIP (Treatment Group) | | | 2019 Non-Recipients of PIP (Control Group) | | |
|---|---|---|---|---|---|---|---|
| | | Dropout | Not Dropout | Total | Dropout | Not Dropout | Total |
| Elementary School | 66,177 | 32 | 15,576 | 15,608 | 156 | 50,413 | 50,569 |
| | | 0.21% | 99.79% | 100% | 0.31% | 99.69% | 100% |
| Junior High School | 30,458 | 90 | 7,885 | 7,975 | 360 | 22,123 | 22,483 |
| | | 1.13% | 98.87% | 100% | 1.60% | 98.40% | 100% |
| Senior High School | 24,528 | 84 | 5,212 | 5,296 | 414 | 18,818 | 19,232 |
| | | 1.59% | 98.41% | 100% | 2.15% | 97.85% | 100% |
| Total | 121,163 | 206 | 28,673 | 28,879 | 930 | 91,354 | 92,284 |
| | | 0.71% | 99.29% | 100% | 1.01% | 98.99% | 100% |

*Source: National Socioeconomic Survey 2021 (processed by authors)*

Table 3: The Number of Dropouts of Students from Low-Income Families, 2021

The subsequent step is to estimate probability scores for PIP by applying the logit regression as outlined in equation (2). The estimation of the PSM model using logit is presented in Table 4, which indicates that, for all education levels, certain characteristics are associated with an increased likelihood of receiving PIP. The characteristics include the low education level of the household head (lower than senior high school level), having a lower number of children, and being recipients of other government transfers of *Program Keluarga Harapan* (PKH) and *Kartu Keluarga Sejahtera* (KKS).

|  | Elementary School 2019 (1) | Elementary School 2021 (2) | Junior High School 2019 (3) | Junior High School 2021 (4) | Senior High School 2019 (5) | Senior High School 2021 (6) |
|---|---|---|---|---|---|---|
|  | PIP | PIP | PIP | PIP | PIP | PIP |
| cap | -0.099*** | 0.018 | -0.049 | -0.015 | -0.143** | -0.027 |
|  | (0.032) | (0.032) | (0.048) | (0.047) | (0.065) | (0.057) |
| educ_KRT | -0.265*** | -0.104*** | -0.22*** | -0.087*** | -0.237*** | -0.133*** |
|  | (0.023) | (0.022) | (0.035) | (0.032) | (0.045) | (0.039) |
| work_KRT | -0.016 | 0.027 | 0.002 | 0.009 | 0.018 | -0.03 |
|  | (0.022) | (0.021) | (0.033) | (0.032) | (0.042) | (0.038) |
| totalchild | -0.076*** | -0.093*** | -0.035*** | -0.05*** | -0.066*** | -0.023* |
|  | (0.007) | (0.007) | (0.01) | (0.01) | (0.013) | (0.012) |
| PKH | 1.292*** | 1.055*** | 1.337*** | 1.149*** | 1.352*** | 1.223*** |
|  | (0.023) | (0.024) | (0.033) | (0.033) | (0.043) | (0.039) |
| KKS | 0.827*** | 0.659*** | 0.8*** | 0.701*** | 0.928*** | 0.72*** |
|  | (0.023) | (0.024) | (0.033) | (0.033) | (0.042) | (0.039) |
| _cons | -0.106 | -1.719*** | -1.021 | -1.432** | 0.037 | -1.679** |
|  | (0.422) | (0.433) | (0.637) | (0.636) | (0.868) | (0.77) |
| Observations | 63204 | 66177 | 29248 | 30458 | 19552 | 24528 |
| Pseudo $R^2$ | 0.135 | 0.085 | 0.14 | 0.103 | 0.152 | 0.112 |

*Standard errors are in parentheses*
*\*\*\* p<.01, \*\* p<.05, \* p<.1*
*Source: calculated by authors*

Table 4: Results of the Propensity Score Estimation

Finally, the study employs the Nearest Neighbor oversampling (2-NN) matching method to address the imbalance between treatment and control groups. A caliper matching method is combined with NN oversampling as it can decrease the percentage bias by setting a maximum tolerance level for propensity score distance (Gertler et al., 2016). Consequently, for all models of this study, the matching method has small bias percentages of 1% to 3%. The Average Treatment Effect on Treated (ATT) value, as in equation (3), represents the average difference between the treatment and control groups, often called risk difference (Austin & Stuart, 2017). It is expected that there is a significant average difference between the treatment group (receiving the PIP program) and the control group (not receiving the PIP program). The results of ATT are presented in Table 5.

| Education Level | Treatment | Mean of Matched Treated | Mean of Matched Controls | ATT | Standard Error | t-stat |
|---|---|---|---|---|---|---|
| Elementary School 2019 |  | 0.002 | 0.004 | -0.002 | 0.001 | **-3.17*** |
| Elementary School 2021 |  | 0.002 | 0.003 | -0.001 | 0.001 | -1.64 |
| Junior High School 2019 |  | 0.009 | 0.017 | -0.007 | 0.002 | **-3.60*** |
| Junior High School 2021 | PIP | 0.011 | 0.02 | -0.008 | 0.002 | **-4.09*** |
| Senior High School 2019 |  | 0.016 | 0.021 | -0.005 | 0.003 | -1.56 |
| Senior High School 2021 |  | 0.016 | 0.022 | -0.006 | 0.003 | **-2.13** |

*\*\*\* p<0.01 \*\*p<0.05, \*p<0.1*
*Source: calculated by authors*

Table 5: Results of the Average Treatment on Treated (ATT)

Table 5 shows that at the elementary school level, the PIP program significantly affected the probability of dropping out in 2019. However, the program did not exert the same effect in 2021. At the junior high school level, the PIP program affected the probability of dropping out both in 2019 and 2021. In contrast, for the senior high school level, the PIP program did not affect the dropout probability in 2019 but significantly affected the dropout probability in 2021. Notably, the PIP program exerted its strongest influence on dropping out at the junior high school level, persisting before and during the pandemic.

The dropout probability varies by student's educational level. One of the main factors influencing dropping out is educational expenses. High educational expenses are associated with an increased likelihood of dropout, particularly at higher educational levels. The lowest educational expenses are observed among elementary students, while the highest are among senior/vocational high school students. In 2019, the estimated personal cost for elementary students in Indonesia was IDR 3,147,000 (approximately USD 197), for junior high students was IDR 4,245,000 (approximately USD 265), and for senior high students was IDR 7,457,000 (approximately USD 466) (Zamjani et al., 2020).

The PIP program is government education assistance from the demand side to lower personal educational expenses. In addition to the PIP program, the government provides educational assistance from the supply side through the School Operational Assistance (BOS). This program provides support to all-level public schools with operational expenses, including maintaining school facilities, purchasing teaching aids, the payment of honorariums for non-permanent teachers and staff, and other school operational expenses. However, according to Zamjani et al. (2020), the allocated operational assistance was insufficient to cover the school's non-personnel operational expenses. For instance, in 2019, the government allocated IDR 800,000 per student (approximately USD 50) for elementary schools. However, the average school non-personnel operational expenses were IDR 996,000 per student (approximately USD 62). A similar discrepancy is observed in the case of junior high schools. While the allocated operational assistance was IDR 1,000,000 per student (approximately USD 63), the average operational expenses were IDR 1,539,000 per student (approximately USD 96). For senior high school, the allocated operational assistance was IDR 1,400,000 per student (approximately USD 88), while the average operational expenses were IDR 1,651,000 per student (approximately USD 197). This suggests that both PIP and BOS may not fully cover the expenses incurred by students.

The PIP program affects differently to the probability of dropout rate at every educational level. At elementary school, the dropout rate was generally relatively low, at 0.37% in 2019 and 0.12% in 2021, due to several reasons (*Direktorat Statistik Kesejahteraan Rakyat*, 2021; *Statistik*, 2019). First, the government has implemented a mandatory education program for children aged 7-12. Second, the number of elementary schools is relatively higher compared to junior and senior high schools, and hence, it is easier to access elementary schools. Third, the personal unit costs for elementary school students are relatively low compared to other educational levels, so there was less barrier for low-income families to send their children to school. According to the Directorate of Population's Welfare Statistics (*Direktorat Statistik Kesejahteraan Rakyat*), there was no significant change in school participation rates at the elementary schools during the pandemic, which indicates the community's awareness that elementary education is fundamental (*Direktorat Statistik Kesejahteraan Rakyat*, 2021). Therefore, the PIP program has no impact on the probability of dropping out of elementary school during the pandemic in 2021.

At the junior high school level, the PIP program affected the probability of dropping out both in 2019 and 2021. In general, students at junior high schools were vulnerable to student dropout, as this is a transition phase to high school education (Cameron, 2009). The dropout rate at the junior high schools was higher compared to the elementary school level, with 1.07% in 2019 and 0.90% in 2021. Access to junior high school is more challenging than elementary school due to the smaller number of junior high schools. Students from low-income families are less likely to continue to high school (*Direktorat Statistik Kesejahteraan Rakyat*, 2021; *Statistik*, 2019). The PIP program can alleviate the school expenses for students from low-income families at the junior high school level, thereby reducing dropouts before and during the pandemic. These findings are consistent with previous studies that found educational assistance significantly affects dropout rates at the junior high school level and has a more significant impact compared to the elementary school level (Cameron, 2009; Yulianti et al., 2015; Listiyanto & Qibthiyyah, 2022).

At the senior high school level, the PIP program did not affect the dropout probability in 2019. However, it significantly affected the dropout probability in 2021. The dropout rate at the high school level was higher than at the elementary and junior high school levels. In 2019, it was 1.76%, while in 2021 it was 1.12% (*Direktorat Statistik Kesejahteraan Rakyat*, 2021; *Statistik*, 2019). It is more challenging to access senior high school education than it is to access elementary and junior high school education. The availability of senior high schools is not uniform across Indonesia. There is an uneven distribution of high schools among regions in Indonesia. The costs associated with attending senior high school extend beyond the purchase of school equipment. Student personal expenses for senior high school are not only for school equipment but also for transportation and boarding costs for students living far from the schools (Baird et al., 2014). The transportation cost tends to increase as students' education level is higher, and the location of schools for higher levels tends to be farther away (Zamjani et al., 2020). The additional educational and transportation expenses costs can cause negative school participation due to financial and non-financial access barriers (Corrales-Herrero et al., 2021).

Although the PIP cash transfer is higher for senior high school students, the amount is insufficient to cover the majority of high school education expenses. Furthermore, the transferred cash for senior high school students does not guarantee that students will remain in school (Churchill et al., 2021). The higher personal educational expenses, the location of the schools, and the limited transferred cash for the PIP program may have resulted in an insignificant influence of the PIP on the dropout probability among poor and vulnerable high school students prior to the pandemic in 2019. However, during the pandemic in 2020, the PIP program was significant in influencing the dropout probability among poor and vulnerable high school students. High school students have a more significant opportunity to attend school during the pandemic because there are no travel constraints compared to before the pandemic in 2019. During the pandemic, students did not need to spend on transportation, practical fees, excursions, and some additional costs related to face-to-face extracurricular activities, thus reducing the financial burdens that students must meet. Consequently, PIP assistance can markedly diminish the probability of students dropping out of high school or vocational high school during a pandemic.

**Conclusions**

The findings of this study indicate that the PIP program can reduce the probability of school dropout among recipients at each educational level. This study finds that there is a significant

negative relationship between the PIP program and the probability of school dropout among students from low-income families at the elementary school in 2019, junior high school in 2019 and 2021, and senior high school in 2021. However, the results were found to be insignificant at the elementary school in 2021 and at the senior high school in 2019. The impact of PIP on the probability of school dropout among students from low-income families varies across educational levels and periods. PIP has the most significant impact at the junior high school level. The varying significance of results at elementary school may be attributed to the relatively low dropout rates, both before and during the pandemic. In contrast, the differing results at the senior high school level may be attributed to the considerable difficulty in accessing education, higher education costs, and insufficient education assistance to meet the needs of senior high school students, which may lead to a higher likelihood of dropout among students. Consequently, the provision of PIP at the senior high school in 2019 did not result in a significant reduction in the dropout rate.

This study is limited by its cross-sectional design, which precludes direct comparisons with data from the same individuals in 2019 and 2021. A longitudinal analysis would be preferable to determine the extent of the program's impact over a certain period. Furthermore, the PSM method may lack specificity in determining propensity scores, making the resulting ATT values sensitive to the covariates used in score determination. Accordingly, the authors should consider the covariates utilized in the model, ensuring that confounding variables and other controls are more representative. Moreover, this study was unable to encompass variables from the supply side of education because the confounding variables that can link treatment and outcome studied are limited to family background characteristics on the demand side. Future research can combine variables from education's demand and supply sides to obtain a comprehensive analysis.

# Appendices

| Variable | Observation | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **2019** | | | | | |
| **Dropout (1=school dropout)** | **63,204** | **0.003** | **0.058** | **0** | **1** |
| **PIP (1=receiving PIP)** | **63,204** | **0.283** | **0.451** | **0** | **1** |
| Cap (per capita expenditure) | 63,204 | 13.116 | 0.317 | 11.706 | 13.572 |
| educ KRT (1=senior high school & college) | 63,204 | 0.291 | 0.454 | 0 | 1 |
| work KRT (1=formal) | 63,204 | 0.297 | 0.457 | 0 | 1 |
| Totalchild | 63,204 | 3.131 | 1.446 | 1 | 18 |
| PKH (1=receiving PKH) | 63,204 | 0.328 | 0.469 | 0 | 1 |
| KKS (1=having KKS) | 63,204 | 0.269 | 0.444 | 0 | 1 |
| **2021** | | | | | |
| **Dropout (1=school dropout)** | **66,177** | **0.003** | **0.053** | **0** | **1** |
| **PIP (1=receiving PIP)** | **66,177** | **0.236** | **0.425** | **0** | **1** |
| Cap (per capita expenditure) | 66,177 | 13.201 | 0.311 | 11.668 | 13.65 |
| educ KRT (1=senior high school & college) | 66,177 | 0.325 | 0.469 | 0 | 1 |
| work KRT (1=formal) | 66,177 | 0.313 | 0.464 | 0 | 1 |
| Totalchild | 66,177 | 3.056 | 1.404 | 1 | 15 |
| PKH (1=receiving PKH) | 66,177 | 0.32 | 0.466 | 0 | 1 |
| KKS (1=having KKS) | 66,177 | 0.234 | 0.423 | 0 | 1 |

*Source: National Socioeconomic Survey (SUSENAS) 2019 and 2021, processed by authors*

Appendix A: Summary Statistics for Elementary School

| Variable | Observation | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **2019** | | | | | |
| **Dropout (1=school dropout)** | **29,248** | **0.012** | **0.11** | **0** | **1** |
| **PIP (1=receiving PIP)** | **29,248** | **0.284** | **0.451** | **0** | **1** |
| Cap (per capita expenditure) | 29,248 | 13.135 | 0.306 | 11.706 | 13.572 |
| educ KRT (1=senior high school & college) | 29,248 | 0.261 | 0.439 | 0 | 1 |
| work KRT (1=formal) | 29,248 | 0.276 | 0.447 | 0 | 1 |
| Totalchild | 29,248 | 3.184 | 1.447 | 1 | 12 |
| PKH (1=receiving PKH) | 29,248 | 0.372 | 0.483 | 0 | 1 |
| KKS (1=having KKS) | 29,248 | 0.301 | 0.459 | 0 | 1 |
| **2021** | | | | | |
| **Dropout (1=school dropout)** | **30,458** | **0.015** | **0.121** | **0** | **1** |
| **PIP (1=receiving PIP)** | **30,458** | **0.262** | **0.44** | **0** | **1** |
| Cap (per capita expenditure) | 30,458 | 13.217 | 0.303 | 11.884 | 13.65 |
| educ KRT (1=senior high school & college) | 30,458 | 0.302 | 0.459 | 0 | 1 |
| work KRT (1=formal) | 30,458 | 0.286 | 0.452 | 0 | 1 |
| Totalchild | 30,458 | 3.181 | 1.446 | 1 | 15 |
| PKH (1=receiving PKH) | 30,458 | 0.384 | 0.486 | 0 | 1 |
| KKS (1=having KKS) | 30,458 | 0.28 | 0.449 | 0 | 1 |

*Source: National Socioeconomic Survey (SUSENAS) 2019 and 2021, processed by authors*

Appendix B: Summary Statistics for Junior High School

| Variable | Observation | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| **2019** | | | | | |
| **Dropout (1=school dropout)** | **19,552** | **0.018** | **0.134** | **0** | **1** |
| **PIP (1=receiving PIP)** | **19,552** | **0.241** | **0.428** | **0** | **1** |
| Cap (per capita expenditure) | 19,552 | 13.177 | 0.291 | 11.787 | 13.572 |
| educ KRT (1=senior high school & college) | 19,552 | 0.278 | 0.448 | 0 | 1 |
| work KRT (1=formal) | 19,552 | 0.281 | 0.45 | 0 | 1 |
| Totalchild | 19,552 | 3.18 | 1.437 | 1 | 12 |
| PKH (1=receiving PKH) | 19,552 | 0.352 | 0.478 | 0 | 1 |
| KKS (1=having KKS) | 19,552 | 0.291 | 0.454 | 0 | 1 |
| **2021** | | | | | |
| **Dropout (1=school dropout)** | **24,528** | **0.02** | **0.141** | **0** | **1** |
| **PIP (1=receiving PIP)** | **24,528** | **0.216** | **0.411** | **0** | **1** |
| Cap (per capita expenditure) | 24,528 | 13.243 | 0.295 | 11.846 | 13.65 |
| educ KRT (1=senior high school & college) | 24,528 | 0.308 | 0.462 | 0 | 1 |
| work KRT (1=formal) | 24,528 | 0.275 | 0.447 | 0 | 1 |
| Totalchild | 24,528 | 3.169 | 1.441 | 1 | 12 |
| PKH (1=receiving PKH) | 24,528 | 0.383 | 0.486 | 0 | 1 |
| KKS (1=having KKS) | 24,528 | 0.285 | 0.451 | 0 | 1 |

*Source: National Socioeconomic Survey (SUSENAS) 2019 and 2021, processed by authors*

Appendix C: Summary Statistics for Senior High School

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