



Research article

Impact of COVID-19 on school attendance in South Africa. Analysis of sociodemographic characteristics of learners

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ABSTRACT

The outbreak of COVID-19 had resulted in the complete closure of schools in nearly all countries across the globe. However, reopening after prolonged closure may adversely affect the school attendance of learners, with long-term implications for life outcomes. Given the limited studies on the subject, this study aims at examining the impact of COVID-19 on the school attendance of learners in South Africa and how this outcome is exacerbated by underlying socioeconomic factors using National Income Dynamics Study-Coronavirus Rapid Mobile Survey data (NIDS-CRAM). The findings reveal that COVID-19 has led to a sharp drop of 48.2% in the school attendance of learners following the reopening of schools after the state of national disaster-based lockdown. The study has demonstrated that the impact of COVID-19 on the school attendance of learners varies according to socioeconomic factors such as gender, race, geographical area, family size, and the economic status of the learners' parents and provincial location. Sociodemographic characteristics such as African race, coloured race, Asian race, female gender, rural location, large household size, and Eastern Cape are associated with lower school attendance among learners. Based on these findings, educational-based policy needs to include these sociodemographic factors to promote a high school attendance rate among learners. This may include a shift from a blanket approach to geographical, racial, family, and gender-based interventions.

1. Introduction

Following the COVID-19 outbreak and its restrictions, it was projected that over 1.6 billion students, constituting about 91.3% of all the learners across the globe, have been affected by the pandemic [1]. COVID-19 disrupted education systems in many nations throughout the world, limiting opportunities for many students at all levels, particularly poor students and the disadvantaged [2]. Due to the limited choice to contain the rapid spread of the deadly virus, governments in different parts of the globe resorted to nationwide lockdowns, which included complete school closures. The United Nations reported that closures of schools and other learning places have affected 94% of the world's population, with rates as high as 99% in low and lower-middle countries [1]. For instance, during the COVID-19 school closure period, Germany performed a poll of parents of students, which revealed that the amount of time students spend on school-related activities per day was cut in half, from 7.4 to 3.6 h [3]. The report by Ref. [4] added that only 38% of students spent more than 2 h each day studying for school, and 74% spent no more than 4 h. This suggests that the reduction in school activities for children whose parents were better educated was similar to that of other children, while the increase in passive activities was slightly smaller and that low-achieving students substituted these passive activities for learning.

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The potential impact of COVID-19 on education has received significant attention, especially in research. Consequently, voluminous studies exist in the literature, focusing mainly on students in colleges and universities in various countries. Most of the existing studies are limited to issues related to the academic work and life of students ([5–7]), coping strategies, a student's mental health ([8, 9]), or a combination of them [10], and higher education ([11,12]). Furthermore, several studies ([13–15]) documented that COVID-19 affects students differently and at different levels and poses different challenges that can potentially disadvantage them in the future.

The COVID-19 pandemic might also adversely affect the school outcomes of learners [16]. Emerging empirical evidence reveals that the pandemic outbreak and its related policy measures have exacerbated socioeconomic problems such as poverty, inequality, unemployment, teenage pregnancy, and, in some cases, early or child marriage, which may in turn affect the school attendance of learners ([16–21]). The pandemic has resulted in a massive loss of jobs, leading to a significant shock to individuals and household income. Households that have a low level of educational attainment and rely heavily on income from labour would experience a significant real income shock that would adversely affect these households. This widens the existing poverty and unemployment thresholds; consequently, learners from such disadvantaged and severely affected homes cannot afford school fees and are therefore not likely to return to school after reopening [21]. Evidence suggests that the pandemic increases the chance of teenage pregnancy among learners. The school closure occasioned by the pandemic increases the chance of idle learners engaging in activities and unhealthy relationships that could lead to teenage pregnancy and, consequently, disruption of schooling ([22,23]). In some cases, the economic hardship exacerbated by COVID-19 has the potential to force learners into early or child marriage, leading to school disruption ([22,23]).

Several studies and reports reveal that teen pregnancies during the current COVID-19 crisis were high. For instance, globally, about 6% of learners dropped out of school due to the COVID-19 pandemic [24]. Similarly, during a three-month school shutdown in Kenya, officials observed a 40% spike in adolescent pregnancies leading to school dropout [16]. A longitudinal research study by Ref. [25] contrasted females who were scheduled to finish secondary school soon before the pandemic (in the year 2019 and below) with those who were expected to finish school immediately after the epidemic (from 2020). The authors discovered that Kenyan females who were affected by COVID-19 closures were twice as likely to report a pregnancy and three times as likely to drop out. Similarly, studies show that learners' chances of continuing education after pregnancy decline [26]. According to Ref. [17], the COVID epidemic could result in an extra 10 million child marriages by the end of the decade. Others predicted that COVID-19 might increase child marriages by over 5 million in only five nations with the highest rates of child marriage [16]. This estimate included five pathways: direct educational disruption, household economic shocks (especially in countries with bride price traditions, such as Malawi), and higher pregnancy risk [27]. This is because early pregnancy and marriage are more likely to have an impact on women [1].

The pandemic has affected learners' outcomes in nearly all countries. However, the degree of impact varies due to the different underlying socioeconomic ills of each country. South Africa is one of the most unequal and poverty-stricken countries in the world, with many socioeconomic problems ([28,29]). The outbreak of the pandemic has had a detrimental and disruptive effect, yet little is known about the impact of COVID-19 on school outcomes. The purpose of this paper is therefore to examine the impact of COVID-19 on the school attendance of learners in South Africa and how this outcome is exacerbated by socioeconomic precursors. This is very important not only for research purposes but also to inform policy decisions on access to education along socioeconomic lines in the management of current and future crises. This study is conducted in the context of South Africa, which is known to be one of the countries that implemented the strictest lockdown and COVID-19 health protocols, leading to the closure of many schools for an extended period of time.

2. Material and methods

The empirical analysis in this paper is based on the extracted data of learners and adult individuals in the NIDS-CRAM dataset. The NIDS is a nationally representative, panel, face-to-face, individual-level, household-based survey conducted approximately every two years from 2008 to 2017 before COVID-19. The NIDS-CRAM sample is a sub-sample of the NIDS Wave 5 sample (collected in 2017) and was drawn using a stratified sampling design. The NIDS-CRAM is a representative, panel, individual-level, and individual-based survey of approximately 7000 South African adults, which is repeated over several months as South Africa's national lockdown progresses and was conducted as a collaborative research project by several South African universities. The sample frame consists of individuals resident in South Africa aged 18 years or older at the time of fieldwork in April 2020 who were surveyed in Wave 5 of the National Income Dynamics Study (NIDS) conducted in 2017. The NIDS-CRAM Wave 1 data include information on life status (e.g., individuals' earnings) in February (pre-lockdown) and April (one month into lockdown). Wave 2 of NIDS-CRAM was collected between July and August. While a number of rapid online or telephone surveys have been conducted in South Africa since the crisis began, the benefit of NIDS-CRAM is that it attempts to collect information on a nationally representative sample of adults (with children or relatives), to the extent possible under the circumstances.

The NIDS-CRAM dataset is a representative sample of adult individuals, but with detailed information on children of school-going age (learners) in the same dataset (that is, the adult dataset). The information on learners was adequate to address the research questions sought in this study. For instance, during the interview, individuals (that is, adults' respondent) were asked to indicate the number of learners attending school before COVID-19 with school closure and after COVID-19 when the school was reopened in the same data set. The child and parental information were also provided in the same dataset, making it possible to include background information for robust analysis. Relevant information on learners of adult individuals in NIDS-CRAM datasets in terms of school attendance, gender, population group (race), age, geographical location, provinces, and parents, socioeconomic characteristics was extracted. This study uses a set of specific interview questions in the data, including the following to estimate the COVID-19 impact on

school attendance [1]: How many children or learners were attending school before the school closure due to COVID-19? And [2], how many children are attending the school after the reopening of COVID-19? These two questions were used to investigate the impact of COVID-19 on school attendance in a univariate analysis. Furthermore, multivariate analysis was done using socioeconomic correlates of school attendance in the COVID-19 era. Wave 1 of NIDS-CRAM was not used because the closure of all schools was still in force and no clear-cut attendance model was universally announced, unlike Wave 2.

3. Results

3.1. Univariate analysis: school attendance rate and sociodemographic precursors

In the first stage, a univariate analysis was conducted to explore if a numerical difference existed between the school attendance rate before COVID-19 and after COVID-19, when the school officially reopened, along with the sociodemographic precursors. The second stage involves multivariate analysis to further investigate other significant sociodemographic predictors of school attendance rates among learners in the COVID-19 period.

3.2. Before Covid-19 and after Covid-19

We can observe a significant difference in the overall number of pupils attendance before and after COVID-19 in the graph (Fig. 1). According to the NIDS-CRAM data (Fig. 1), 3423 students from the survey households were enrolled and attending school prior to the pandemic. Following COVID-19, the number of students attending school decreased to 1772. This represents a reduction in the school attendance rate of 48.2%.

3.3. Gender

Prior to COVID-19, the school attendance levels of female and male learners were 1168 and 2252, respectively. However, after the school was reopened, the attendance levels dropped to 562 and 1203, respectively (Fig. 2).

3.4. Location: urban vs non-urban (rural)

The report in Fig. 3 shows a significant decline in school attendance levels in urban (from 2196 before COVID-19 to 1101 after COVID-19) and rural areas (from 1133 2196 before COVID-19 to 614 2196 after COVID-19).

3.5. Household employment status

Unemployment has been one of the most prevalent issues South Africa faces for decades. Fig. 4 shows that before COVID-19, 1322 of the learners had employed parents, while after COVID-19, only 962 of them had parents who were still employed.

3.6. Household size

The result in Fig. 5 documents that about 2412 learners were in a household with more than four members prior to COVID-19 and 1303 after COVID-19. As the pandemic spreads, it is critical to recognize how vulnerable South African families are. Large families tend to have trouble adhering to the COVID-19 regulations of social distancing. People living in underdeveloped areas tend to have overcrowded families in one house.

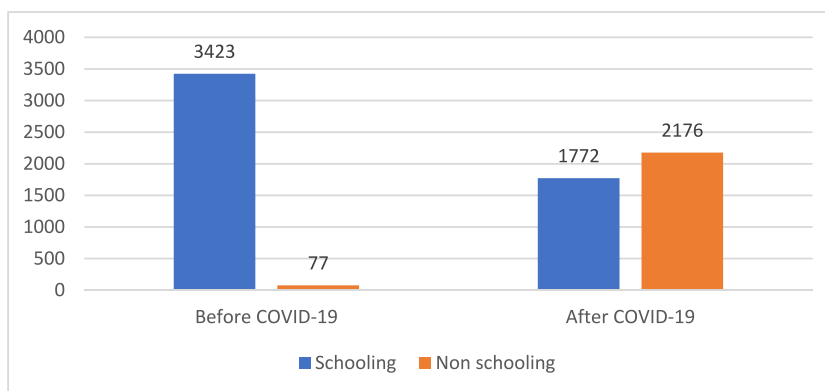


Fig. 1. Schooling and non-schooling before and after COVID-19. (Source: computed from NIDS-CRAM wave 2)

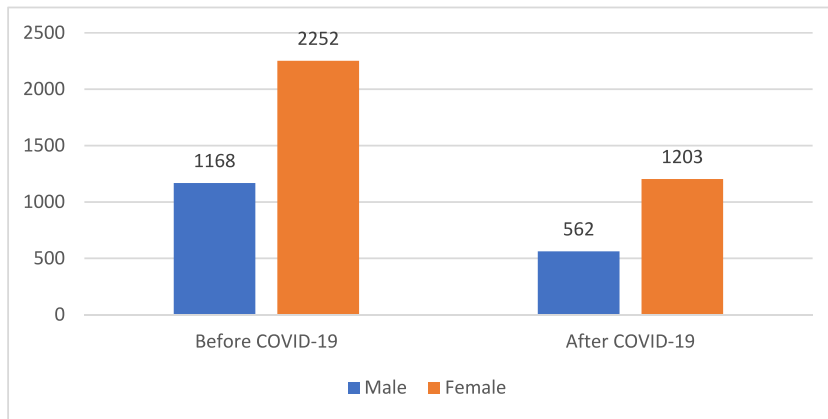


Fig. 2. Gender effect before and after Covid-19.
(Source: computed from NIDS-CRAM wave 2)

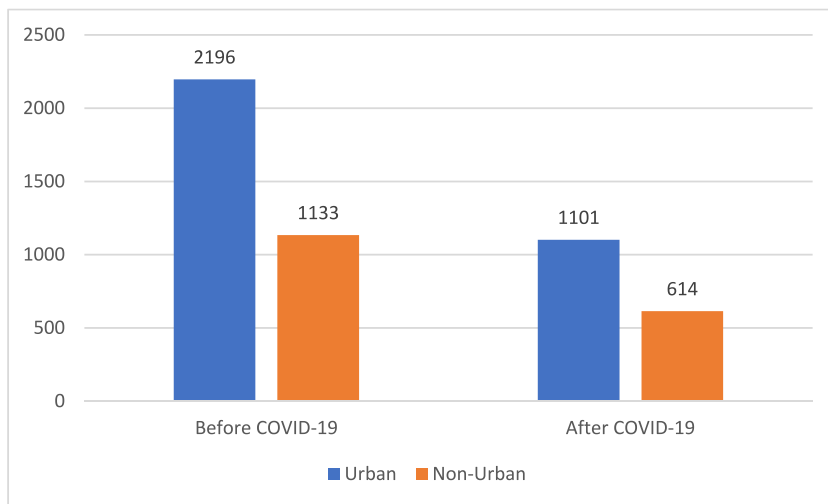


Fig. 3. Urban versus Rural effect before and after Covid-19.
(Source: computed from NIDS-CRAM wave 2)

3.7. Races mostly affected by Covid-19

Fig. 6 reports that the school attendance for the Africa race dropped from 3053 (before COVID-19) to about 1556 after COVID-19. Colour dropped from 276 to 147, 20 to 4 for Indian, and 68 to 46 for white. African households were affected more than other races.

3.8. Provinces mostly affected by Covid-19

The highest level of pre-COVID-19 school attendance is recorded by KwaZulu-Natal (896), followed by Limpopo (433), and Gauteng (416), whereas the Western Cape recorded the least (212), but this dropped sharply after COVID-19 to 530, 206, 187, and 121, respectively (Fig. 7).

3.9. Multivariate analysis of correlates of school attendance in the COVID-era

Table 1 documents a multivariate analysis of correlates (sociodemographic characteristics) of school attendance (of learners) in the COVID-19 period. The marginal coefficients for each African race, coloured race, household size, and Eastern Cape province were 21.9%, 24.7%, 30.1%, 2.6%, and 17.4% at 1% significance.

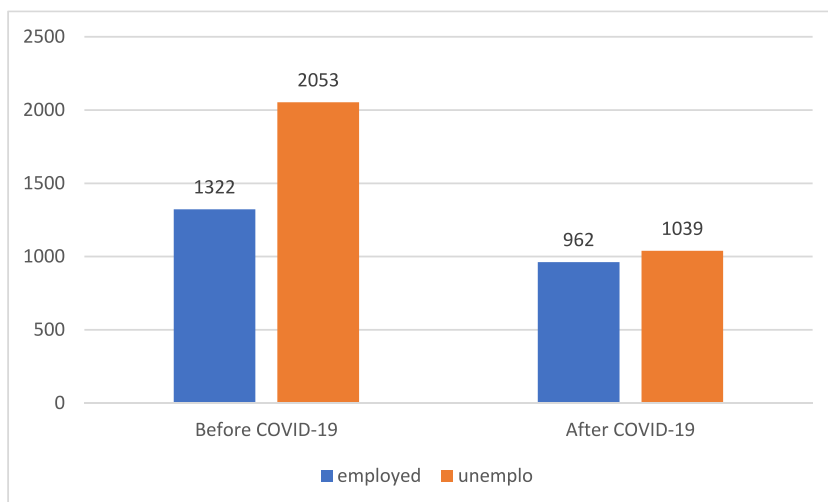


Fig. 4. Employment status before and after COVID-19. (Source: computed from NIDS-CRAM wave 2)

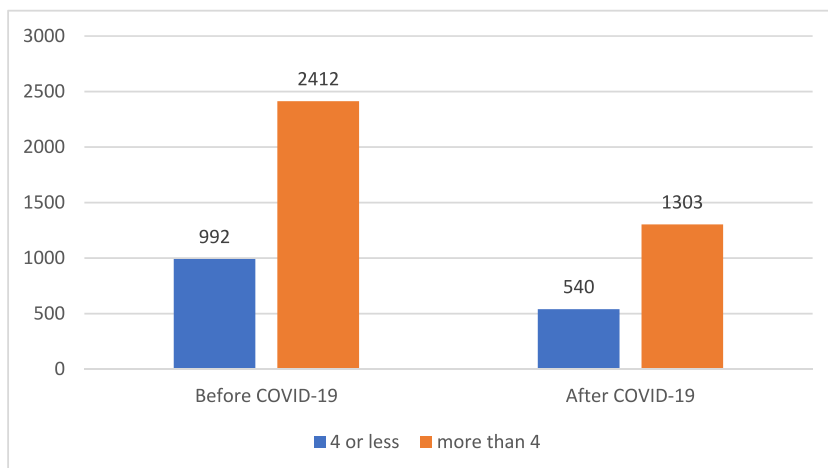


Fig. 5. Household size before and during COVID-19. (Source: computed from NIDS-CRAM wave 2)

4. Discussions

The pandemic has significantly affected the school attendance rate, and this was exacerbated by sociodemographic factors among the learners. South Africa was reported to have had a very high rate of enrolment and attendance in schools prior to COVID-19. For instance, in 2018, the vast majority of school-aged children (97–17) (98%) attended some sort of educational facility [30]. The author further explains that this kind of rate represents a minor but considerable increase over the stated attendance rate of 95% in 2002. Over a period of 17 years, the overall increase is primarily owing to a slight but real increase in reported attendance for African and coloured pupils [30]. The NIDS-CRAM data has provided a bleak picture of the pandemic’s impact on the country’s education system. There are a number of reasons why students stopped attending school, including the fear of contracting the virus, demographic variables, family dynamics, household income and geographical aspects, and other factors such as unemployment and poverty ([19,21,31]), since many students could not afford to return to school because they lacked the necessary facilities. New research has shown that the pandemic has resulted in a high level of school dropouts [32]. According to the author, at least 500 000 students were expected to be out of school. According to the report, an additional 200 000 children aged 7 to 17 were out of school in 2019 compared to 2018. It is reported that 400 000 pupils were out of school by November 2020 [32].

The pandemic has exposed severe inequities and a widening gap in communities all across the world ([33–35]). The disproportionate impact of the pandemic on females and males in South Africa is one of the fissures. Females have suffered more than males. According to NIDS-CRAM, net employment losses for women were larger than for males between February and April. Since the

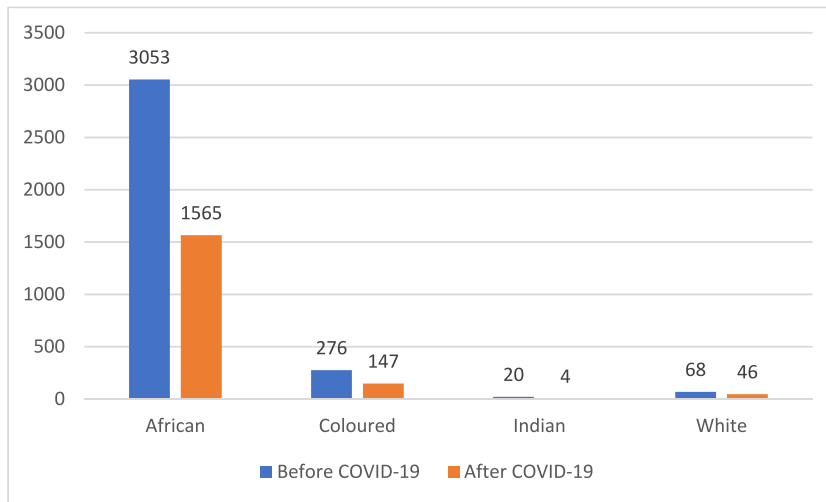


Fig. 6. Races mostly affected by Covid-19.
(Source: computed from NIDS-CRAM wave 2)

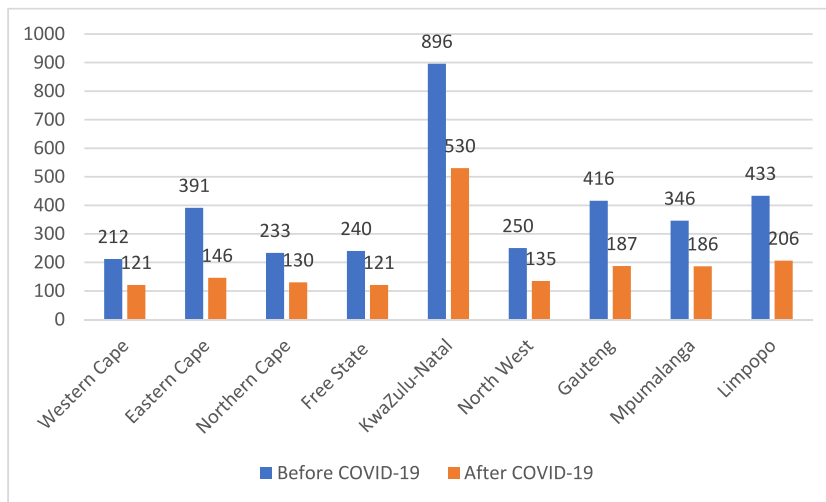


Fig. 7. Provinces mostly affected by Covid-19.
(Source: computed NIDS-CRAM wave 2)

pandemic started, more women than men have been living with children and spending longer hours on childcare [36]. This finding is consistent with a report by the [1] that females are more likely to be affected by early pregnancy and marriage, which may be a big disruption to continuous schooling.

Furthermore, there is a disproportional rate between urban and rural areas. According to the Children’s Institute’s 2019 Child Gauge, approximately 60% of South African children are reported to be living below the upper-bound poverty line, which is defined as the minimum requirements for nutrition and other basic necessities [36]. Explained further by the authors, child poverty is still more prevalent in rural areas, where 81% of students are assessed to be poor, compared to 44% of children in urban areas. According to the NIDS-CRAM data collected before COVID-19, children attended school in large numbers, but in comparison with the effect it had in rural areas, the epidemic afflicted a small number of people in rural areas. The study revealed that wealthy households are able to educate their children at home, in part because they have more access to internet connections than poor families. One element that may explain the growth in performance inequality inside and across the school system is the ability to take advantage of remote learning possibilities. School systems that already had the technical and institutional capabilities to transition to remote learning were able to quickly adapt to the ‘new normal’. According to the NIDS-Cram report, other school districts, on the other hand, had the daunting task of having to quickly design, deploy, and maintain distance learning during school closures, despite having significantly less expertise with the technology.

It is said that one of the biggest job crises since the Great Depression has erupted as a result of the pandemic. This virus has brought

Table 1
Multivariate analysis of Correlates of School attendance in the COVID-Era.

Variables	Marginal effect
African	-0.21839*** (0.064617)
Coloured	-0.24692*** (0.079848)
Asian	-0.30142*** (0.109721)
Female	-0.04055 (0.024971)
Non-urban	0.040252 (0.028787)
Unemployed	0.013998 (0.024521)
Household size	-0.02564*** (0.005871)
Western Cape	-0.00993 (0.05902)
Eastern Cape	-0.17397*** (0.043315)
Northern Cape	-0.02653 (0.056682)
Free state	0.048722 (0.049263)
KZN	0.021473 (0.040885)
North West	0.013017 (0.051069)
Mpumalanga	-0.00495 (0.044068)
Limpopo	-0.05269 (0.043667)
chi2(15)	78.39
Prob > chi2	0.000
Number of Observation	3815

standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1.

with it significant risks that the crisis will worsen poverty and inequalities, with consequences that could last for a very long time. According to the [37], South Africa entered the COVID-19 pandemic with low levels of employment and a decade of weak job creation, significantly below the requirements of most upper middle-income countries. The study documented that despite the government's strong reaction to the pandemic, the report indicates that jobs have been badly harmed, and recovery is delayed. Despite two-quarters of employment growth, the number of employed individuals had declined by approximately 1.5 million by the end of 2020. The paper indicates that job losses in COVID-19 times are disproportionately concentrated among low-income workers, aggravating already severe inequalities. This has implications for the learners as well.

Large families are a result of poverty, and this has a lot of circumstances, such as food insecurity in the house. Food insecurity is a prevalent public health problem and a major stumbling block for children's and teenagers' educational attainment [38]. The authors further reported that students from food-insecure households are also more likely to miss school than their classmates from food-secure households, owing to infectious illness exposure and socio-emotional issues. NIDS-CRAM claims that between waves 1 and 2, the proportion of respondents with students in their homes who reported that children went hungry at least once in the previous week dropped significantly from 15% to 12%, before rising to 16 in wave 3, a statistically significant increase and a worrisome finding. This metric fell dramatically to 14% in Wave 4, and it has remained like that in Wave 5. Child hunger has returned to the levels seen during SA's worst era of lockdown, prior to the implementation of the new handouts and top-ups [39]. This may have adverse effects on learners schooling outcomes.

The World Bank has placed South Africa as one of the hardest hit by COVID-19 in many aspects of life ([18,35,40,41]) and unequal countries on the planet, with a Gini coefficient of 63 [28]. Africans suffered more before and during the epidemic, according to the NIDS-CRAM data shown below. Reports have shown that the reason is largely due to the high level of inequality as a result of apartheid rule and colonialism, which pushed the bulk of the black population into poverty and deprived them of their land [28]. Nearly 30 years after democracy, the richest 20% of South Africa's population still controls 70% of the country's resources. The highest incomes are earned by white South Africans, who make up 8.4% of the entire population [37]. A large number of South African students belong to what is known as the "missing middle," which is a group of students who do not qualify for financial help but cannot afford to pay their tuition without it. Black pupils make up the vast majority of the "missing middle" [37]. Therefore, it is not surprising that the school attendance rate is lower for Africans than for other races.

There's a negative relationship between school attendance and household size, African race, coloured race, and Eastern race in the multivariate analysis; thus, learners with these characteristics are associated with a lower school attendance rate (that is, are less likely to return to school, that is, drop out). This finding is not surprising, as many studies [37] reported that most black South Africans are the hardest hit by many socioeconomic ills and limited opportunities. The outbreak of the COVID-19 pandemic with its lockdown restriction was a blow to the already struggling black Africans who have to fight for survival and lack the needed resources to invest in learners' education. This experience is not different from that of other races, such as coloured Indians and whites.

Family size is also associated with the school attendance of learners; that is, the larger the household size, the lower the attendance. With a large household size, learners could not have been able to attend school or be able to conduct online learning from school because of the number of people at home and the pressure and competition of limited family resources. Furthermore, because of the high cost required to conduct online learning or even have to go back to school, many households could not afford to have their children go back to school. This finding is consistent with [42], who found that bigger households are at higher risk of socioeconomic outcomes such as education outcomes.

Eastern Cape Province is associated with the school attendance of learners. During the first wave, the Eastern Cape experienced a number of challenges; it had the highest number of cases. Sunridge Primary, Hoerskoel Brandwag, Grey Boy's College, and Victoria Park had the most infections in the region during the first wave [43], coupled with their long history of being one of the poorest

provinces in South Africa.

5. Conclusion

COVID-19 has affected education in many aspects. Using National Income Dynamics Study-Coronavirus Rapid Mobile Survey data (NIDS-CRAM), this study addresses two research questions [1]. How does COVID-19 affect the school attendance of learners in South Africa? [2] What are some of the underlying sociodemographic correlates of school attendance among learners in the COVID-19 era? The finding reveals that COVID-19 has led to a sharp drop of 48.2% in the school attendance of learners following the reopening of schools after the state of national disaster-based lockdown. The study has demonstrated that the impacts of COVID-19 on the school attendance of learners vary according to socioeconomic factors such as gender, race, geographical area, family size, economic status of learners' parents, and geographical location. Sociodemographic characteristics such as African race, coloured race, Asian race, female gender, rural location, large household size, and Eastern Cape are associated with lower school attendance of learners. Based on this finding, educational-based policy needs to include these sociodemographic factors to promote a high school attendance rate among learners. This may include a shift from a blanket approach (one fit all approach) to specific considerations such as geographical, racial, family, and gender-based interventions for this and future crisis.

5.1. Limitations of the study

This study is not without limitations. First, while the result of this study is a true reflection, strictly speaking, the data used for this analysis is not a random sample in itself but learners of adult individuals from a random sample; therefore, the results may not necessarily be generalised to the whole population of South Africa. Second, it is possible that some learners may still be receiving some form of education at home instead of going back to school, thus missing the attendance rate. Lastly, learners who may return to school later after this data was collected (for instance, due to changes in socioeconomic circumstances) could not be reported in this study. Notwithstanding the above limitations, the analysis and result follow standard research and estimation procedures.

Data availability statement

Data will be made available on request.

Additional information

No additional information is available for this paper.

CRedit authorship contribution statement

Godfred Anakpo: Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization. **Sanelise Nkungwana:** Writing – original draft, Methodology, Formal analysis, Conceptualization. **Syden Mishi:** Writing – review & editing, Writing – original draft, Validation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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