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The Contribution and Challenges of School Feeding Program on Students' Educational Outcomes: The Case of Public Primary Schools in Gulele-Sub-City

Alene Matsentu[1]

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Abstract

This study investigates the contribution and challenges of the School Feeding Program (SFP) on educational outcomes in public primary schools in Gulele Sub-City of Addis Ababa City Administration. The educational outcome variables of this study encompass academic performance, enrollment rates, attendance rates, dropout rates, and repetition rates. The study employed a quasi-experimental design with a mixed-method approach. The study utilized both secondary and primary data collection methods, including qualitative data from an open-ended questionnaire at Hamle 19/67 Public Primary School, which was used to triangulate the quantitative findings. The study analyzed data from 14,898 grade 8 students who took the Primary School Leaving Certificate Exam (PSLCE) from 2018/19 to 2021/22 across 18 public primary schools that benefited from the SFP. The analysis of OLS regression showed that students receiving the program had a 9.6% higher likelihood of promotion and scored an average of five points higher compared to non-beneficiaries. Additionally, the program significantly improved enrollment, reduced dropout rates, and decreased repetition rates. The findings suggest revising the budget allocation per student, expanding the SFP to secondary schools, and ensuring the program's sustainability, with a recommendation for parents and government to further invest in students' education to enhance future outcomes.

Key Words: Academic performance, dropout, educational outcomes, enrollment, public primary schools, school feeding program

[1] Frontieri Consult, Addis Ababa, Ethiopia. Email: adalmatsentu@gmail.com

1. Introduction

Every day, millions of children around the world go to school on an empty stomach, which negatively affects their concentration and ability to learn (World Food Programme [WFP], 2023). In addition, the WFP indicates that there are millions of children, particularly girls, who do not attend school because their families need them to help in the agricultural work or perform domestic duties. School meal programs can help address many of these challenges.

The School Feeding Program (SFP) is a multi-sectorial game-changer that improves children's education, health, and nutrition (WFP, 2023). SFPs are powerful tools for combating child hunger. Around the world, SFPs are gaining momentum and support as their multitude of benefits becomes apparent. In addition to tackling hunger, well-planned SFPs have been found to boost school attendance and performance and protect children from all forms of malnutrition, including micronutrient deficiencies and childhood obesity (Global Food Banking Network, 2022).

With this understanding, the UN Sustainable Development Goal 4 indicates that ensuring inclusive and equitable quality education is the foundation for improving people's lives and sustainable development (MoE, 2018). The Ethiopian Government has also shown its commitment to expanding and improving the quality of early childhood education programs in its ESDP V (2015-2020) and GTP II (2015-2020) programs. Following the international and national growing interest in the area, assessing the state-of-the-art of early childhood care and education in the country becomes mandatory. Among other critical interventions, effective implementation and

expansion of school feeding programs are very important as most children come from poor households that cannot afford regular meals. This may also help curb the issue of absenteeism (MoE, 2018).

Nevertheless, food insecurity and malnutrition still hold back economic growth and persist to be major bottlenecks. The learning outcomes of students in Sub-Saharan Africa, particularly those in rural areas, remain unsatisfactory. For instance, of the continent's approximately 128 million school-aged children, only half attend school and learn basic skills (Brookings, 2016).

The Ministry of Education is aware that poor health and nutrition can negatively impact pupil's ability to learn, attend school, and concentrate. With this understanding, interventions targetting school children are increasingly considered pivotal to enhancing the health and nutrition status of the population as a whole (MOE, 2012).

As elaborated in Yirga (2020), the WFP, USAID, Yenat Weg, the Ministry of Education, and other donors have undertaken school feeding programs for about 850,000 school children in Ethiopia, mainly targeting primary school children, over the past two decades. The program is envisioned to reduce school dropout rate, absenteeism, and poor academic performance (WFP, 2018).

SFPs address one of the main barriers to regular school attendance: hunger. Malnutrition, often caused by food insecurity, directly impacts children's ability to concentrate in class and their overall participation in educational activities

(Bouterakos & Bundy, 2021). By providing meals or snacks, SFPs reduce short-term hunger, which has been shown to improve students' ability to focus, participate in class, and perform academically (Adelman, 2009). This improved cognitive function directly influences enrollment rates, as children are more likely to attend school when their nutritional needs are met. Furthermore, a well-nourished child is less likely to suffer from illnesses, thereby reducing absenteeism.

In line with this, SFPs have been shown to motivate parents to send their children to school, particularly in rural or economically disadvantaged areas where food security is a major concern. When children are provided with meals at school, parents are more likely to enroll their children and ensure they attend regularly, knowing that their nutritional needs will be met (Adelman, 2009; Amanuel, 2021). This is especially critical in areas where the opportunity cost of schooling is high due to household labor needs or where families struggle to provide enough food.

The introduction of SFPs in rural Burkina Faso increased girls' enrollment by 5 to 6 percentage points in one academic year (Kazianga, 2009). Evidence from Ethiopia, where food insecurity is prevalent, shows that SFPs help boost enrollment by offering a tangible incentive to attend school (Misrak, 2018; Zenebe, 2018). This indicates that targeted feeding programs can have a direct impact on school attendance, especially among vulnerable groups such as girls, who may otherwise face barriers to education.

In line with this, the Addis Ababa City Administration in 2020 launched a school feeding program providing free meals and school materials for more than 300,000 students at primary schools as the city intensified its efforts to stop student drop-out

from the state-run schools (Ethiopian Monitor, 2020). It also established an agency to run a free meal program that supplies nutritious food items and provides school materials to children to increase educational outcomes through improved enrollment, enhanced academic performance, reduced dropouts, and decreased repetition rates.

In addition, it is public information that Addis Ababa was awarded the Milan Pact Award of 2022 during the 8th annual gathering of the Milan Urban Food Policy Pact (MUFPP) for gaining exceptionally positive results in its large-scale school feeding program for more than 450,000 children in 225 public elementary schools in Addis Ababa (EATFORUM, 2022).

1.1. Statement of the problem

School feeding programs (SFPs) have been widely recognized as a crucial intervention in improving children's nutritional status, school attendance, and enrollment. Several empirical studies have demonstrated that SFPs positively affect children's health and education by addressing hunger, which, in turn, enhances students' ability to focus, engage in class, and attend school regularly. In Sub-Saharan Africa, where many children face challenges such as hunger, poverty, and limited access to quality education, SFPs are seen as a promising strategy to break the cycle of under-nutrition and poor educational outcomes (World Food Programme, 2013). Albeit the growing body of evidence confirming the contributions of school feeding programs, their comprehensive contribution to educational outcomes are adequately in Ethiopia, particularly in urban areas like Addis Ababa.

Even though numerous studies (for instance Assefa, 2022 and Yirga, 2020) have revealed the positive contribution of SFP in school enrollment and attendance, there is a paucity of research that directly examines their contribution to more comprehensive educational outcomes like academic performance, dropout rates, and repetition rates. Studies in countries like Nigeria and Cameroon have shed light on the positive contribution of school feeding programs in school enrollment, but they have often ignored the effects of these programs on long-term academic success or the quality of learning (Misrak, 2018). While attendance and enrollment are necessary, understanding how SFPs influence actual learning outcomes over the course of a child's education is equally important.

Furthermore, existing literature falls short of investigating thoroughly the mechanisms through which school feeding programs influence educational outcomes. Although studies such as Jepkemboi (2018) have explored the physical and cognitive benefits of school feeding, little is known about how providing meals influences students' cognitive abilities, concentration, and overall academic performance in the long term. The mechanisms through which school feeding programs impact cognitive function and learning outcomes need further studies to provide a clearer understanding of how school feeding program directly translates into academic achievement.

Moreover, there is inadequacy of research on the contextual and implementation challenges that affect the efficacy of school feeding programs, particularly in urban locations like Addis Ababa. Although studies have generally reported the benefits of school feeding programs, factors such as financial constraints, implementation

challenges, and community involvement are often underexplored. Addis Ababa, with its unique urban challenges, including rapid population growth, food insecurity, and socioeconomic disparities, presents a context where these factors could significantly influence the effectiveness of SFPs. Therefore, a detailed exploration of the local conditions and implementation challenges in urban areas is needed to understand the broader applicability and sustainability of these programs in Ethiopian urban settings.

A significant gap in the literature also lies in the lack of longitudinal studies evaluating the long-term effects of SFPs. While short-term benefits, such as improved attendance and health outcomes, have been well-documented, there is limited empirical evidence on the sustainability of these effects over time. Few studies have tracked students' academic trajectories over multiple years to assess whether the benefits of school feeding persist and contribute to sustained educational improvement. This study aims to bridge this gap by analyzing school feeding programs' contribution to academic performance, dropout rates, and repetition rates.

Additionally, many existing studies focus primarily on physical health outcomes or enrollment rates, without sufficiently addressing other critical educational indicators such as academic achievement, attendance, and student retention. As a result, there is a need for more comprehensive evaluations that consider multiple outcome variables to fully understand the effects of SFPs on students' overall educational experiences and challenges.

Another underexplored area in the literature is the potential role of school feeding programs in addressing gender and socio-economic disparities in education. While

some studies have touched on gender disparities in access to education, there is limited research on whether school feeding programs help narrow these gaps or promote social equity in education. Understanding whether SFPs have a differential contribution to boys and girls or on children from different socio-economic backgrounds is crucial for ensuring that these programs contribute to inclusive and equitable educational outcomes.

Finally, despite the Ethiopian government's efforts to implement large-scale school feeding programs, there is a lack of rigorous studies that evaluate their contribution to educational outcomes in urban areas like Addis Ababa. Most existing studies have been conducted in rural or conflict-affected regions, with little attention given to the unique challenges and opportunities that exist in Ethiopia's urban contexts, particularly in major cities like Addis Ababa.

Thus, this study seeks to fill the gaps in the literature by conducting a comprehensive analysis of the contribution of school feeding programs in Addis Ababa's Gulele Sub-City. By examining a broader range of educational outcomes, such as academic performance, attendance, enrollment, dropout rates, and repetition rates, this study provides valuable insights into the effectiveness of school feeding programs in urban Ethiopia. Additionally, it explores the long-term contribution of these programs, the mechanisms through which they influence educational outcomes, and the implementation challenges that affect their success. The findings of this research offer critical recommendations for improving the design and execution of school feeding

programs, ensuring that they are optimized to meet the needs of students and contribute to achieving sustainable educational outcomes.

1.2. Objectives of the Study

Given the background information and statement of the problem presented above, this study was conducted with the following general and specific objectives.

1.2.1. General Objective of the Study

This study aimed to examine the contribution of the school feeding program to students' educational outcomes. It also aimed to assess the implementation challenges of the school feeding program in Gulele Sub-city.

1.2.2. Specific Objectives of the Study

The specific objectives of the study were to investigate the contribution of the school feeding program to the academic performance of 8th-grade students (including average score and passing status), students' school enrollment, school attendance, dropout rate, and repetition rate. Additionally, the study aimed to assess the extent of the school feeding program's implementation and the challenges faced in Gulele Sub-City.

1.3. Theoretical and Conceptual Framework

The theoretical and conceptual framework for this study is grounded in behavioral, social learning, cognitive, and humanistic (Maslow’s Hierarchy of Needs) theories.

These theories provide a comprehensive understanding of how school feeding programs (SFPs) can influence students' academic performance, attendance, and retention. Below is an integration of these theories about school feeding interventions.

Behavioral Theory: focuses on how external stimuli (rewards and reinforcement) influence behavior. According to Skinner (1953), behavior is shaped by its consequences, whereas positive reinforcement encourages desirable behaviors. In the case of school feeding programs, meals serve as positive reinforcement that encourages school attendance, participation, and academic performance. By addressing hunger, a major barrier to concentration, SFPs help foster improved school attendance and academic focus. In the application of the school feeding program, the provision of meals as a reward for attending school can be seen as a form of operant conditioning (Skinner, 1953). Studies have shown that children who receive regular meals are more likely to attend school and perform better academically (Adelman, 2009). The SFP helps reinforce the behaviors of regular attendance and academic engagement by addressing the immediate physiological need for food.

Social Learning Theory: Social learning theory, developed by Bandura (1977), emphasizes that learning occurs through observation and imitation of others. This theory asserts that children can be motivated to attend school and engage academically when they see the positive outcomes associated with such behaviors, particularly when they observe peers benefiting from school feeding programs. The implementation of school feeding programs in communities with high levels of food insecurity, students are likely to observe their peers benefiting from the provision of

meals, which can serve as a powerful motivator for school attendance. Additionally, social interactions around food can promote social bonding, further encouraging attendance and reducing absenteeism.

Cognitive Theory: Cognitive theory, as articulated by Piaget (1970), focuses on the mental processes involved in learning, such as attention, memory, and problem-solving. Hunger directly affects cognitive functions like concentration and memory, which are critical for academic success.

According to the cognitive perspective, SFPs help improve students' attention and memory by addressing nutritional deficiencies, thereby enhancing their academic performance application lack of school feeding programs is a major factor that inhibits cognitive development, particularly in children. By addressing basic nutritional needs, SFPs improve cognitive functions, which, in turn, enhance learning outcomes. Studies have demonstrated that improved nutrition leads to better school performance (Ahmed, 2004). Thus, providing meals in schools can significantly contribute to cognitive improvement, which impacts academic achievement and retention.

Maslow's Hierarchy of Needs (Humanistic Theory): Maslow (1943) proposed that human beings are motivated by a hierarchy of needs, starting with basic physiological needs such as food, water, and shelter, followed by safety, social needs, esteem, and self-actualization. In the context of school feeding programs, providing meals addresses the fundamental physiological needs of students, which form the foundation for achieving higher-order needs such as safety, social belonging, and academic

success. The implementation of school feeding programs satisfies students' basic physiological needs for food. SFPs allow students to progress toward higher-level needs, such as safety, social connection, and academic achievement. With their nutritional needs met, students are better positioned to focus on learning, feel secure in their school environment, and engage meaningfully in academic tasks.

In addition to the above, several points emphasize the determinant role of food in Maslow's hierarchy of needs; the need for achievement will not drive a person's thoughts and behaviors until needs on the lower levels have been met. According to Maslow, humans cannot pay full attention to their education unless their basic nutritional needs are met. He argues that "for the chronically and extremely hungry man, life itself tends to be defined in terms of eating. Anything else will be defined as unimportant" (Maslow, 1943, pp. 373-374; Woodhouse & Lamport, 2012). Consequently, the cognitive processes and behaviors associated with the more advanced levels on the hierarchy cannot be achieved; great academic performance cannot be expected from students experiencing basic needs deprivation (Woodhouse & Lamport, 2012).

From an economic point of view, Dessalegn (2011) contended that severe poverty primarily limits households from sending children to school as their day-to-day survival - rather than educational needs - becomes the top priority. As a result, such households cannot provide children with the opportunity to go to school and learn. On top of this, even if some costs, such as school fees, are free, such households still do not have the means to cover other costs such as books, clothes, shoes, or

transportation. Thus, these households are unable to afford the cost of schooling and instead involve their children in money-generating activities or take care of their younger siblings at home. In response to such and other economic barriers to school participation, SFPs provide economic incentives for households to send their children to school (Desalegn, 2011). In addition, Adelman et al. (2019) stated that the decision of households on whether to send children to school is determined by comparing the expected future benefits of education to the current cost. Some research consistently demonstrated that education yields numerous long-term benefits for both individuals and society. For instance, education is a significant determinant of individual earning potential. Individuals with higher levels of education generally earn more than those with less education. According to Psacharopoulos and Patrinos (2018), individuals with higher education levels tend to have higher lifetime earnings, often making the financial return on investment in education substantial. School feeding programs, by ensuring that children can attend school regularly and focus on their studies, increase the likelihood that students will complete their education, leading to greater earning potential in the future (Adelman, 2009).

In addition, on a broader scale, education contributes to national productivity and economic growth. As argued by Barro (2001), societies with higher education levels tend to have higher levels of economic development and political stability. Moreover, education is associated with lower crime rates, increased civic participation, and better governance (Lochner, 2011). By ensuring access to education for children in food-insecure areas, SFPs can help children attend school, laying the foundation for

long-term societal benefits, including a more educated, healthier, and productive population (WFP, 2023).

Finally, education empowers individuals to make informed decisions, improve their livelihoods, and contribute positively to society. Moreover, educated parents are more likely to invest in their children's education, creating a cycle of empowerment across generations (Chepkwony et al., 2013). School feeding programs support this cycle by reducing hunger, which can hinder academic performance and retention, thereby enhancing the educational opportunities available to future generations (Meyers et al., 2013).

Citing Kaziangaet al., (2009), Desalegn (2011), from a nutrition perspective, further illuminated that the interplay between nutrition and education can generally be conceived in three ways. First, the nutrition and health of a child influence learning and performance in school. That is, poor nutrition affects children's cognitive function and hence limits their ability to participate in learning activities at school. Second, malnourished and unhealthy children are unable to attend school regularly, which in turn results in poor academic performance. Third, hungry children face difficulties in concentrating and accomplishing more complex tasks than well-nourished ones.

Adelman (2019) stated that the School Feeding Programs can contribute to children's educational improvements in three ways. First, they can enhance children's enrollment and regular school attendance by encouraging parents to send their children to school regularly. Second, they can improve cognitive functions by

enhancing children's attention and concentration while minimizing the prevalence of short-term hunger, which is also a major factor in worsening the cognitive function of a child. Third, they can enhance academic performance via the accomplishment of the above two objectives (Adelman, 2019).

Organizational documents also state that one of the goals for the school feeding program is to increase academic performance, school attendance, and student enrollment to achieve improved educational outcomes. The school feeding program is also expected to reduce the number of children who do not attend school due to poor health and malnutrition. The programs have impact on school participation (Bisratemariam, 2017, cited in Hailemariam, 2018). In addition, the WFP emphasizes that poor dietary intake can leave students susceptible to illness or cause headaches and stomachaches, resulting in school absences. Other studies have indicated that the diet children take has an impact on their academic performance, including health, behavior, and thinking skills (WFP, 2016).

1.4. Empirical Evidence

According to Assefa (2022), the school feeding program is an intervention that aims at improving primary school students' enrollment, increasing attendance and reducing students' retention in primary schools. In addition, Adelman (2009) stated that there are three objectives associated with school feeding. First, SFPs can motivate parents to enroll their children and see that they attend school regularly. Second, SFPs can improve the nutritional status of school-age children over time and alleviate short-term hunger in both malnourished and otherwise well-nourished schoolchildren.

Third, SFPs can improve cognitive functions and academic performance via reduced absenteeism and increased attention and concentration due to improved nutritional status and reduced short-term hunger. He further justified that SFPs are appealing because, if properly designed and implemented, they lead to a growth in the number of children being enrolled with better academic performances.

From a perspective, Dessalegn (2011) argues that severe poverty primarily restricts households from sending children to school because their day-to-day survival, and not educational needs, stands to be their immediate priority. Consequently, such households cannot afford to send their children to go to school and learn. Besides, even if some costs, such as school fees, are free, households still do not have the means to cover other costs such as books, clothes, shoes, or transportation. Thus, such households cannot afford the cost of schooling and instead engage their children work in money-generating activities or look after their younger siblings at home. To curb such and other economic barriers to school participation, SFPs provide economic incentives for households to send their children to school (Desalegn, 2011). Adelman et al. (2019) argues that the decision of households on whether to send children to school is determined by comparing the expected future benefits of education to the current cost.

On the other hand, Kaziranga (2016) drawin on a randomized trial conducted in rural Burkina Faso argues that school feeding programs in this specific context of agricultural households without an active labor market can increase enrollment, but may fail to improve attendance and academic performance for a larger number of

children. The SFP has a statistically significant positive effect on learning as measured by achievement test scores. Participation in the SF program increases test scores by 15.7 percentage points (Ahmed, 2004, cited in Abiye, 2017). The study by Chepkwony et al. (2013), cited in Abiy (2017), also suggested that schools with SFP had the higher academic performance compared to those without SFP.

On the contrary, Ermias (2008), cited in Abiye (2017) substantiated that SFP had no significant positive effect on academic performance. However, in the Tamale metropolis, following the SFP, pupil enrolment rose, leading to an increase in class size, which affected the availability of teaching and learning materials (Aliu & Fawzia, 2014). The study observed that the increase in enrollment in the South Tongu district increased the workload of the school, which led to a higher demand for the School Feeding Program

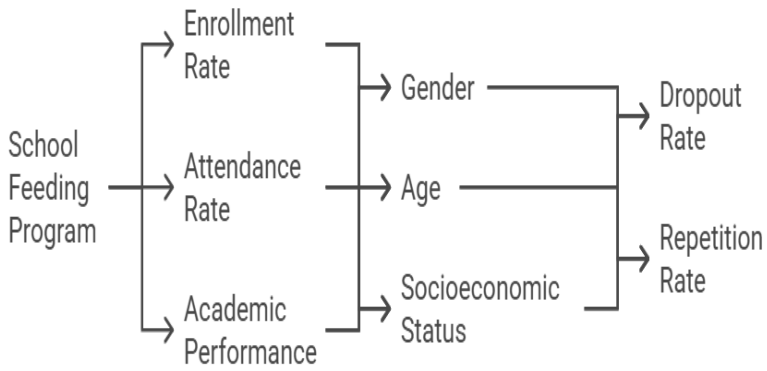
The above discussions establish a theoretical framework for the relationship of food and academic achievement, school attendance, and enrollment. This indicates the existence of a causal relationship or, at least, an associated relationship between food and academic achievement, school attendance, and concentration. Abraham Maslow's need hierarchy also emphasized the contribution of food to the school performance of children such as achievement, concentration, and paying attention (Woodhouse & Lamport, 2012 as cited in Abiye, 2017) helped generate the conceptual framework for this particular study. The theoretical framework that guides the study was adopted from Frederick Dayour (2015). Figure 1 below analyzes the relationship between school feeding programs and school enrollment and attendance. The conceptual

framework diagram is represented by dependent and independent variables within boxes. The variables, including the school feeding program, academic achievement, attendance, enrollment, dropout rate, and repetition rate, are measured variables. The causal linkages are indicated by the arrows, which show the relationship between variables. A positive relationship is when an increase in one variable is linked to an increase in another variable, whereas a negative relationship is when an increase in one variable is linked to a decrease in another variable. In a bidirectional relationship, the variables have an impact on one another, both positively and negatively.

Regarding the causal relationship of variables, the School Feeding Program (SFP), as an independent variable, has a direct positive effect on the dependent variables - enrollment rates, school attendance, academic performance, dropout rates, and repetition rates. Additionally, age, another independent variable, influences attendance and academic performance, with older students potentially experiencing higher dropout rates. Gender also plays a significant role in shaping enrollment rates, attendance, academic performance, dropout rates, and repetition rates, as gender-based barriers to education may exist and affect students differently.

Figure 1

Visual representation of conceptual framework on School feeding



Source: Adapted from Frederick Dayour (2015), the Effect of the School Feeding Program

2. Methods

2.1. Approach and Design

A quasi-experimental design was employed to assess the effect of the school feeding program on educational outcomes. A mixed research design was employed using primary and secondary data collection methods. Both qualitative and quantitative data were collected on students' academic performance, including

average scores and passing status, dropout rate, repetition rate, attendance rate, and student enrollment. This study was conducted in Gulele Sub-City of Addis Ababa, located in the northern part of the city.

2.2. Data Collection Methods and Procedure

The study used both primary and secondary data sources. Document review was applied to collect quantitative data covering the period from 2017/18 to 2021/22 from the Addis Ababa City Administration Education Bureau. Similarly, data during the same years were gathered from Gulele Sub-city Education Office. Besides, qualitative data were gathered using Key Informant Interviews with the head of the education office at the sub-city level, school directors, students, and parents on the benefits of the school feeding program, challenges, and its contribution to educational outcomes.

2.3. Population, Sample Size, and Sampling Method

The study population comprised Grade 1–8 students from 23 public schools located in 10 districts of Gulele Sub-City, Addis Ababa. A complete enumeration (census) of the 23 schools was conducted to collect data on various student-related factors, including enrollment, attendance, repetition, dropout rates, academic performance, and other pertinent issues. Among these schools, a sample of 18 primary public schools benefiting from the school feeding program was selected as the treatment group, while the years prior to the program's implementation (2017/18 and 2018/19) served as the comparison group. This design allowed for an assessment of the changes in outcomes between the years when the program was implemented and

when it was not. Of the 23 schools, 18 were eligible for analysis met the inclusion criteria and were deemed eligible for analysis.

For the analysis of academic performance, 8th-grade students who took regional examinations between 2018/19 and 2021/22 were included in the census. A total of 16,294 students (7,250 males and 9,044 females) were initially considered, with 14,898 students (6,585 males and 8,313 females) selected for analysis based on the inclusion and exclusion criteria. The inclusion criteria for the 18 schools were as follows: i) participation in the school feeding program, ii) grades 1–8, iii) location in *Gulele* Sub-City, and iv) operation before 2017/18. These criteria ensured the schools selected were suitable for the study's focus on enrollment, attendance, dropout rates, and repetition rates. For 8th-grade students, the inclusion criteria focused on their subject scores, regular attendance, school type, and examination year to assess academic performance. Schools excluded from the analysis were pre-primary schools, private schools, mission schools, evening programs, and schools where Afan Oromo was not offered as a subject.

For the qualitative part of the study, a case study was employed, utilizing purposive sampling techniques to select participants, including students, school principals, sub-city-level experts, and parents. The primary reason *Hamle* 19/67 school was selected was because the school was the best performing on school feeding program implementation. The sampling involved two key informant interviews, three in-depth interviews, and one observation at the sub-city level and the *Hamele* 19/67 School community. These qualitative data were used to further

investigate the contribution of the school feeding program to students' academic performance, attendance, enrollment, and implementation challenges encountered.

2.4. Ethical Consideration

In keeping the standards of scientific research ethics and confidentiality, the researcher obtained informed consent from school principals, guardians, and students as an essential component of the data collection process, especially for qualitative data collection. A clear and understandable written consent form was prepared for each research participant to sign, with the full right to decline or participate in the study. The form explained the objective of the study, the focus and purpose of the information to be collected, the way the information would be utilized, and to whom the research findings would be shared.

2.5. Study Variables

Dependent Variables: The dependent variables included academic performance, attendance, enrollment rate, repetition rate, and dropout rate. Academic achievement is treated as a continuous variable that measures the individual students' academic performance, while enrollment, attendance, repetition rate, and dropout rate are measured at the school level.

Independent variables: Based on the conceptual framework provided in Figure 1 above, the explanatory variables were identified as school feeding program, age, and gender. A dummy variable was created to distinguish between treatment and control

years depending on whether or not the school feeding program intervention was in place.

2.6. Methods of Data Analysis and Assumptions

The nature of this study required the application of both qualitative and quantitative data analysis methods. For descriptive statistical analysis, measures of central dispersion (e.g., variance) along with frequencies, ratios, or percentages were calculated. Measures of central tendency such as mean (average) were also used to describe the quantitative data about the education outcomes of each school such as the enrolment rate, attendance rate, and dropout rate.

In addition to this, to assess the contribution to students' academic performance of the School Feeding Program, the data were analyzed using an OLS (Ordinary Least Squares) regression analysis to see the outputs of the regression (coefficients) since it is an unbiased estimator of the real values of alpha and beta. The OLS formula for a simple linear regression with one independent variable x and one dependent variable y is:

$$Y = \beta_o + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_n X_n + e_o$$

Where β0=intercept,

β1=slope (unknown constant), and

ε=random error component.

Here, where y is a dependent variable, we want to predict that x is the independent variable, and β0 and β1 are the coefficients that we need to estimate. The STATA software application, version 17, was used to analyze the organized dataset. In addition, the qualitative information was organized using the explanatory analysis method to see the depth of the information on the school feeding program from Hamle 19/67 school, which was purposively selected as the model school in the implementation of the School Feeding Program.

2.6.1. Variable Coding and OLS Assumptions of Diagnostic Statistics Robust Regression

For the purpose of analysis, variables were created and coded for OLS regression to analyze the contribution of the school feeding program on students' academic performance while accounting for other control variables. The following variables were coded for the purpose.

- **SFP (School Feeding Program)**: A dummy variable (1 if the year is a treatment year, 0 if control year). This will allow you to measure the direct contribution of the school feeding program on the academic performance of students.
- **Gender**: A dummy variable to distinguish between male and female students. This could help control for potential gender differences in academic outcomes.

- **Academic performance** is considered a dependent variable that could be measured by a continuous variable like "test scores," "average score," or "passing status" (binary: 0 = fail, 1 = pass).

The key OLS assumptions and their relevance to your study on SFP and academic performance are as follows. The following were the assumptions and valuables codes used for dependent and independent variables.

- **Linearity:** The relationship between the presence of the school feeding program and students' academic performance was accurately represented by a linear model. It means an increase in the number of school meals provided has a consistent contribution to academic performance across different years.
- **No Perfect Multicollinearity**: No high correlation between the school feeding program and other variables such as gender, and others, which could distort the estimation of the SFP's contribution to academic performance.
- **Exogeneity (No Endogeneity)**: The school feeding program has been considered as an exogenous factor, meaning its implementation is not driven by unobservable factors that also affect academic performance, such as economic conditions of parents, studying tutors, school and extracurricular curricula.
- **Homoscedasticity (Constant Variance of Errors)**: The residuals (or errors) of the model should have a constant variance when predicting academic performance school feeding program year and without.

- **Independence of Errors**: There were no autocorrelation residuals for one observation should not be correlated with the residuals for another observation.

While analyzing OLS regression, the multicollinearity, heteroscedasticity, and other OLS assumptions have been done. When looking at the diagnostic statistics of OLS and robust regression, there is no significant difference comparing the coefficient estimates, standard errors, t-statistics, and p-values of OLS as well as the R-squared and adjusted R-squared, the regression result justifies that the OLS is robust and reliable. The table below shows the result of diagnostic statistics of OLS robust regression of grade 8^{th} students pass and fail and average score.

Table 1:

Diagnostic Statistics Robust Regression (Linear regression)

Pass_Fail	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Treatment_Control	.096	.007	12.92	0	.082	.111	***
Gender	-.058	.005	-11.97	0	-.067	-.048	***
Age	-.048	.002	-29.91	0	-.051	-.045	***
Constant	1.623	.025	63.98	0	1.574	1.673	***

Mean dependent var	0.868	SD dependent var	0.339
R-squared	0.221	Number of obs	14898
F-test	384.351	Prob > F	0.000

Akaike crit. (AIC)	6302.724	Bayesian crit. (BIC)	6333.160

*** p<.01, ** p<.05, * p<.1*

Average_Score_excl~s	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Treatment_Control	4.749	.208	22.79	0	4.341	5.158	***
Gender	-3.081	.19	-16.19	0	-3.454	-2.708	***
Age	-1.435	.049	-29.12	0	-1.531	-1.338	***
Constant	76.015	.797	95.43	0	74.453	77.576	***

Mean dependent var	52.932	SD dependent var	12.392
R-squared	0.159	Number of obs	14522
F-test	490.432	Prob > F	0.000
Akaike crit. (AIC)	111806.541	Bayesian crit. (BIC)	111836.875

*** p<.01, ** p<.05, * p<.1*

Source: Source: Own computation from AAEB data, 2023.

3. Results

3.1. Grade 8 Students' Pass and Fail Status Analysis

As portrayed in Table 1, on average, 81.1%, 77.7%, 96.6%, and 96.8% each year passed the PSLCE from 2018/19 to 2021/22, respectively. The percentage of students

who passed the exam was distributed from a minimum of 81.1% in 2018/19 in the comparison year to a maximum of 96.8% in 2021/22 in the school feeding treatment year. Data on gender-wise comparison showed that male students' passing rate was higher than their female counterparts in all academic years. Despite the figure changes between male and female students over the years, the school feeding program has a positive contribution to both genders.

When comparing the results of 2018/19, during which school feeding intervention was not taking place, 81.1% of the students passed the PSLCE, while 96.8% did during the intervention year of 2021/22. In this result, there is a 15.7 percentage point increase or positive change in 8th-grade students' passing performance. Despite other factors that this study did not consider, it is possible to indicate that the school feeding program meaningfully contributed to the students' academic performance. However, the positive changes in academic performance are manifested, and the occurrence of variabilities created in 2019/2020, the effect of the COVID-19 pandemic, and other factors were justifiable reasons.

Table 2

Grade 8 students' performance in PSLCE

	Gender					
	Males		Females		Total	
	Fail	Pass	Fail	Pass	Fail	Pass
Year	Row N %	Row N %	Row N %	Row N %	Row N %	Row N %
2018/19 (Control)	15.3%	84.7%	21.8%	78.2%	18.9%	81.1%
2019/20 (Intervention)	16.8%	83.2%	26.2%	73.8%	22.3%	77.7%
2020/21 (Intervention)	3.1%	96.9%	3.6%	96.4%	3.4%	96.6%
2021/22 (Intervention)	2.6%	97.4%	3.8%	96.2%	3.2%	96.8%

Source: Own computation from AAEB data, 2023.

3.2. Mean Score of Grade 8 Students in PSLCE

For Grade 8 students, the school feeding program started in 2019/20 and was designated as the treatment year, as 2018/19 was the control year – the final year before school feeding program started. The average student results during the school feeding intervention years indicated that there were progressive and considerable positive performances in 2019, 2020/21, and 2021/22 intervention years (50.52, 54.69, and 57.87), respectively, compared with the 2018/19 control year (49.63%). When looking at the gender comparison of the students' results, male 8th-grade students achieved better than female 8th-grade students compared with the control, and all school feeding intervention years did. The average score was the highest in 2021/22 for the intervention and the lowest for the control groups when we compared

the performance after the school feeding program was practiced. With this mean score, it is possible to conclude that the school feeding program had a positive impact on students' academic achievement, both for male and female students.

Table 3

Average Score of Grade 8 Students in PSLCE

Year	Gender		
	Males' Mean Score Excluding Absentees	Females' Mean Score Excluding Absentees	Total Mean Score Excluding Absentees
2018/19(Control)	50.85	48.68	49.63
2019/20 (Intervention)	52.61	49.01	50.52
2020/21 (Intervention)	56	53.64	54.69
2021/22(Intervention)	59.36	56.49	57.87

Source: Own computation from AAEB Data, 2023, Grade 8 students master sheet, 2023

3.3. OLS Regression Analysis on Students Pass or Fail Status

In this OLS regression analysis, the dependent variable was the 8th-grade students' pass or fail result, excluding absent students. The model used for adjusted R-squared was 0.221, and the number of observations considered for OLS regression was 14,898, as seen in the table below. The result showed that the school feeding program variable had a significant contribution to the dependent variable. The coefficient of 0.096% result indicated that the school feeding program had a contribution of 0.096 on the passing probability of every student each year. This implies that the students who benefited from the school feeding program had an

additional chance of passing of 9.6% compared with those who did not benefit from the school feeding program. The R-squared value of 0.221 also indicated that about 22% of the variation in the students' passing performance can be explained by the school feeding program intervention. In this regard, school feeding has a positive contribution to the students' academic achievement. The p-value of school feeding is less than 0.05, which implies the school feeding program is a statistically significant predictor of the passing performance of 8th-grade students.

The standard error of the school feeding program was 0.06. This measures the variability of the slope around its true value. The confidence interval for the academic achievement or 8th-grade passing result was (0.0845, 0.108), which implies that we are 95% confident that the true slope of the regression line lies within this interval. On the other hand, as can be seen in the OLS regression, the gender coefficient was significant, indicating the gender difference in academic achievement. In this result, we can understand that being female reduced academic achievement by 0.058, holding all other variables constant. This can be interpreted that there was a significant gender gap in academic achievement, which needs further investigation. A look at the age coefficient, one can see that there was reduced performance by 0.048 as age increased. This can also suggest that age had a significant contribution to the dependent variable.

Table 4

OLS regression on students' pass or fail

Pass/Fail	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Treatment/Control	.096	.006	16.05	0	.085	.108	***
Gender	-.058	.005	-11.70	0	-.067	-.048	***
Age	-.048	.001	-62.93	0	-.049	-.046	***
Constant	1.623	.015	109.52	0	1.594	1.652	***

Mean dependent var	0.868	SD dependent var	0.339
R-squared	0.221	Number of obs	14898
F-test	1412.200	Prob > F	0.000
Akaike crit. (AIC)	6302.724	Bayesian crit. (BIC)	6333.160

**** p<.01, ** p<.05, * p<.1*

Source: Own computation from AAEB data, 2023

3.4. OLS Regression Analysis of Grade 8 Students' Average Scores

The model yielded an adjusted R-squared of 0.1589, and the number of observations considered for OLS regression was 14,522, as can be seen in the table below. The result showed that all independent variables had a significant contribution to the dependent variable. The results showed that the average score of 8th-grade students was 76.01472. In addition, the coefficient of the 4.74928 result indicated that the school feeding program had a contribution of 4.74928 more-point scores on their

average academic results across intervention years, and the coefficient is statistically significant at the 1% probability level.

This implies that every year, the average score of each student lies in the range of 76.01472 to 80.764. This means that the students who benefited from the school feeding program had an average of 5 points higher than those who did not benefit from the school feeding program. This significant positive change increased by additional average scores of five every year, excluding all other factors that this study did not consider. The R-squared value is 0.1591, which means that about 16% of the variation in the average academic scores can be explained by the school feeding program intervention. In this regard, school feeding and academic achievement have a significant relationship or impact. The P-value of school feeding is less than 0.05, which implies the program is a statistically significant predictor of the academic performance of grade 8 students.

The standard error for the school feeding program, which measures the variability of the slope around its true value, was 0.231. The confidence interval for the academic achievement of 8th-grade students was (4.2959, 5.2026), which implies that we are 95% confident that the average additional academic achievement obtained because of school feeding is not less than 4.3 and not more than 5.2. Moreover, the gender coefficient indicated that the variable had a significant contribution to the dependent variable, and the coefficient is significant at the 1% probability level. The findings showed that we are 95% confident that the average academic score of female students was lower than that of male students by 3.1 points. On the other hand, the

age coefficient, as age of the students increases, performance decreases by 1.435. This can also suggest that age has a significant contribution to the dependent variable.

Table 5

OLS regression on students' score

Linear regression

Average Score excl~s	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
Treatment – Control	4.749	.231	20.53	0	4.296	5.203	***
Gender	-3.081	.19	-16.23	0	-3.454	-2.709	***
Age	-1.435	.031	-46.40	0	-1.495	-1.374	***
Constant	76.015	.588	129.28	0	74.862	77.167	***

Mean dependent var	52.932	SD dependent var	12.392
R-squared	0.159	Number of obs	14522
F-test	915.720	Prob > F	0.000
Akaike crit. (AIC)	111806.541	Bayesian crit. (BIC)	111836.875

**** p<.01, ** p<.05, * p<.1*

Source: Own computation from AAEB data, 2023.

3.5. Results on Students' Enrollment Rate

Regarding the students' enrolment rate, the mean analysis indicated that 1000, 1072, 1017, 978, and 1017 students were enrolled in each school in the 2017/18,

2018/19, 2019/20, 2020/21, and 2021/22 academic years, respectively. However, the variation in 2020/21 was exceptionally low and had either dropped or stayed at the baseline comparative year level. There were fairly few changes during the first year, and there were 17 students additionally enrolled compared with the 2017/18 (control year) enrolment and 2021/22 (treatment year). This suggests that the school feeding program contributed to the students' enrollment. External factors, such as the COVID-19 pandemic, may have influenced variations in enrollment rate.

Table 6

Students' enrollment by school

Year	Students' enrolment per School- (Mean)			Enrolment Total (N=18)		
	Males	Females	Total	Males	Females	Total
2017/18	459	541	1000	8262	9741	18003
2018/19	500	572	1072	8997	10293	19290
2019/20	476	540	1017	8576	9722	18298
2020/21	467	511	978	8399	9197	17596
2021/22	497	520	1017	8945	9359	18304

Sources: Own computation from Gulele Sub-city data, 2023

3.6. Results on Students' Repetition Rate

According to the line graph, the likelihood of grade repetition among students in Gulele Sub-City's public primary schools is relatively low. The data reveals notable variations in repetition rates over the years, indicating significant differences between the treatment and control periods. Specifically, the graph demonstrates a consistent

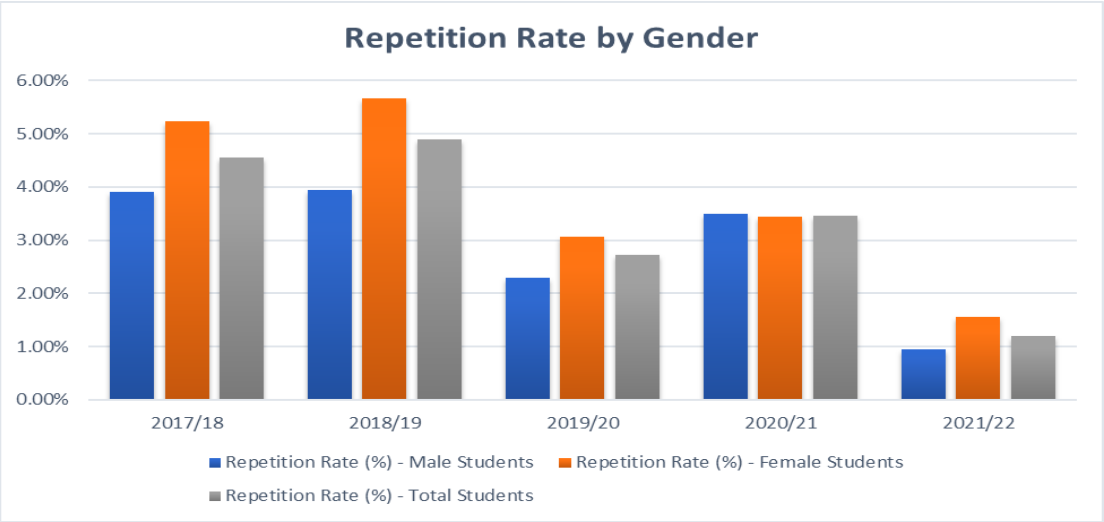
decline in repetition rates during the years when the school feeding intervention was implemented.

Compared to the control years (2017/18 and 2018/19), where the total repetition rate stood at 4.5, the intervention years (2019/20, 2020/21, and 2021/22) saw a marked decline, with repetition rates dropping to 2.8, 3.2, and 1.1, respectively. While the variations are somewhat pronounced, the overall trend suggests a positive contribution to the school feeding program. However, external factors, such as the COVID-19 pandemic, likely influenced the repetition rates during some of the treatment years (2020/21), which stood at 3.2.

From this study, it can be inferred that the school feeding program has contributed to reducing grade repetition rates in *Gulele* Sub-City. Additionally, when examining the trend from a gender perspective, the program positively impacted both male and female students, though the reduction in repetition rates was more pronounced among male students compared to their female counterparts.

Figure 2

Changes on Students Repetition Rate by Year



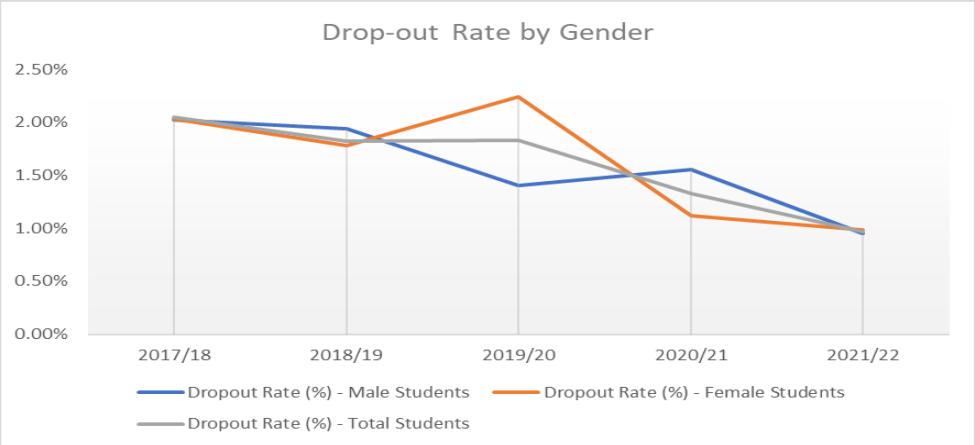
Source: Own Computation from Gulele Sub-City Data, 2023

3.7. Results on Students' Dropout Rate

The result shows that the dropout rate was 2.05% at the baseline or comparison year (2017/18) and decreased throughout the treatment years after the school meal program was implemented (1.83, 1.33, and 0.97, respectively, in 2019/20, 2020/21, and 2021/22). However, the dropout rate in 2019/20 was comparably higher than in 2017/18 and 2018/19, the control years. The primary reason for this was most likely the impact of the COVID-19 outbreak. Then, the school feeding program contributed positively to the student dropout rate, which reduced from 2.05% to 0.97% when the control and treatment years were compared. Despite the school feeding program having significant contributions of both sexes to reduce dropout, it is largely contributed for females than males.

Figure 3

Change in dropout rate



Source: Own computation from Gulele Sub-City data, 2023.

3.8. Findings from Explanatory Case Study

This explanatory qualitative case study has been conducted at Hamle 19/67 School level and Sub-city level to capture the views and perspectives of beneficiaries and implementors at the School and Government office level. According to qualitative findings, the school feeding program Key Informant Interview Gulele Sub-city and case study in Hamle 19/67 has shown a positive contribution to educational outcomes by reducing hunger, allowing students to focus on education, and supporting families who cannot afford meal provisions. The program has significantly decreased the dropout and repetition rates among students and has also helped students arrive at school early without waiting for their breakfast at home. In addition, academic performance and attendance rates have also increased over the years. The respondent portrayed that the positive result was because the program created a conducive school environment, allowing students to participate more actively in extra-curricular activities and increased learning interest.

School feeding programs have significantly improved students' behavior, social cohesion, equality, and respect by providing similar food in the same room for all, regardless of their economic and social status. In addition, the findings indicated that families and teachers are giving less attention and insufficient funding of tutorial materials provision and transportation from school-to-home trips, which may affect the student's academic performance. As students attend school regularly, there will be less absenteeism due to sickness and learners become attentive and effective.

School feeding also provides students with timely food that they may not get at home, enhancing their self-confidence and time management. However, concerns

arise when schools are closed during the summer season as such food may not be accessible to the beneficiaries. Parents also believe that the government's free meals are a significant benefit to households and schools.

Other studies conducted using qualitative methods concur with this study that parents, teachers, and students have a strongly positive opinion on the effectiveness of a school feeding program in that it reduces absenteeism and increases students' enrollment rates (Master's Capstone Projects, Center for International Education, University of Massachusetts Amherst, n.d.).

The case study highlighted that the School Feeding Program has made significant strides in improving educational outcomes, student behavior, and social dynamics. Nonetheless, challenges such as limited funding, meal quality, and the lack of standardization across the program must be addressed to fully maximize its benefits for students, schools, and communities. To further strengthen and ensure the program's sustainability, improvements in monitoring, a larger budget, and greater community involvement are essential.

3. Discussions

This section examines how the findings of this study align with or diverge from existing research on the contribution of school feeding programs (SFP) to educational outcomes, particularly student enrollment rates, dropout rates, repetition rates, and academic performance. The discussion is structured based on these key outcome variables.

Regarding the academic performance of 8th-grade students, the findings reveal a 15.7 percentage point increase in passing rates, indicating that the SFP significantly contributed to student achievement. While other external factors that not accounted for in this study may have influenced these results, the positive effect of the program remains evident. This finding is consistent with the study by Awojobi (2009), as cited by Tagoe (2018), which reported a significant improvement in primary school pupils' academic performance due to SFP. However, fluctuations observed in 2019/2020 partially attributable to the COVID-19 pandemic and other external disruptions suggest that additional factors may have played a role in academic outcomes during that period.

When assessing mean academic scores, the results confirm that the SFP positively impacted students' academic achievement, benefiting both male and female students. This is in line with Abiy (2017), who concluded that school feeding programs significantly improved student attendance and academic performance. Similarly, Tagoe (2018), as cited in Awojobi (2019), confirmed that primary school pupils who participated in SFP demonstrated substantial academic improvements. Moreover, the OLS regression results indicate that the SFP is a statistically significant predictor of 8th-grade students' academic performance, reinforcing findings from Ahmed (2004), as cited in Abiye (2017), which showed a 15.7 percentage point increase in test scores due to SFP participation.

In terms of gender disparities, the OLS regression analysis reveals that gender has a significant contribution to academic performance, with female students scoring

0.058 points lower than their male counterparts, holding all other variables constant. This suggests the presence of a gender gap in academic performance, warranting further investigation into potential barriers faced by female students. Similarly, the study finds that age negatively affects academic performance, with an estimated 0.048-point decrease per additional year. This implies that as students grow older, they may experience increased attention diversion, potentially affecting their academic success. Furthermore, the coefficient estimate of 4.74928 suggests that students benefiting from the SFP scored, on average, 5 points higher than non-beneficiaries, with statistical significance at the 1% probability level. Interestingly, this finding contrasts with Ermias (2008), as cited in Abiye (2017), who concluded that SFP had no significant contribution to students' academic performance.

With regard to student enrollment, the study finds only modest changes in the initial year of implementation, with 17 additional students enrolling when comparing the 2017/18 control year to the 2021/22 treatment year. This suggests that while SFP contributed positively to school enrollment, its contribution may have been moderate. Supporting this finding, Destaw et al. (2021) reported that the SFP in Addis Ababa led to a moderate increase in enrollment rates, particularly among middle- and late-adolescent boys.

The findings further indicate that the SFP contributed to reducing student repetition rates in Gulele Sub-City. The trend analysis also shows a gendered effect, with the program lowering repetition rates for both male and female students, albeit with a greater benefit observed among male students. This aligns with the findings of

Gosheme(2020), who highlighted the role of SFP in decreasing school repetition rates.

Concerning dropout rates, the results reveal a reduction from 2.05% to 0.97% when comparing control and treatment years, demonstrating the program's effectiveness in keeping students in school. While SFP contributed to lowering dropout rates for both sexes, its contribution was more pronounced among female students. In agreement with this, Amanuel (2021) asserted that the proper implementation of SFP significantly reduces dropout rates while improving academic performance and school enrollment.

Additionally, qualitative studies support these findings, with parents, teachers, and students expressing strong positive opinions on the effectiveness of SFP in reducing absenteeism and increasing student enrollment. This sentiment is echoed in the Master's Capstone Projects at the Center for International Education, University of Massachusetts Amherst (n.d.), which emphasized the program's role in enhancing student retention and participation.

Overall, the findings of this study largely align with previous research, highlighting the positive contribution of SFP on academic performance, enrollment, and retention. However, the observed gender disparities and the relatively moderate effect on enrollment suggest that further research is needed to address potential challenges and optimize the program's effectiveness. The study also acknowledges that external factors, such as the COVID-19 pandemic, may have influenced

variations in educational outcomes, emphasizing the need for ongoing evaluation and policy adjustments.

4. Conclusions and Recommendations

4.1. Conclusions

This study aimed to examine the contribution of the School Feeding Program (SFP) on the academic performance, enrollment, dropout rates, and repetition rates of primary students in Gulele Sub-City, Addis Ababa. The findings revealed significant positive changes in multiple educational outcomes, indicating that SFP has a substantial effect on students' academic success. In this result and the research questions, the following conclusions are drawn:

The study clearly demonstrates that the school feeding program positively impacted students' academic performance. Over the course of the intervention years (2019–2022), there was a consistent improvement in the percentage of students passing the Primary School Leaving Certificate Exam (PSLCE), with a notable 15.7 percentage point increase in passing rates between the non-intervention year (2018/19) and the intervention year (2021/22). The regression analysis further supports this finding, with school feeding significantly contributing to a higher passing probability (9.6% increase in the likelihood of passing each year). This suggests that the provision of meals enhanced students' cognitive abilities, concentration, and overall academic achievement. The average academic score during the feeding years increased by approximately 5 points per student each year, further affirming the positive influence of school feeding on academic success.

In addition, gender was found to have a significant contribution to academic outcomes, with male students generally outperforming female students across all years, both before and during the school feeding intervention. Although the school feeding program improved academic performance for both genders, the gender gap persisted, suggesting that further attention is needed to address the factors contributing to lower academic achievement among female students. This finding highlights the need for future studies to explore how school feeding programs can be tailored to bridge gender disparities and promote gender equity in educational outcomes.

Moreover, the school feeding program demonstrated a modest positive effect on student enrollment, with an increase in enrollment numbers from 2017/18 to 2021/22. While the variation in enrollment was not drastic, the overall trend supports the idea that SFP contributes to a more stable and consistent student enrollment. Regarding dropout rates, there was a notable decrease in dropout percentages over the years. The dropout rate reduced from 2.05% in 2017/18 to 0.97% in 2021/22, suggesting that school feeding programs help retain students in school, particularly among female students. Similarly, repetition rates declined during the school feeding years, with a more substantial reduction among male students. These findings align with previous research, such as that by Gosheme (2020), showing that SFPs reduce repetition rates, contributing to higher retention and lower dropout rates.

The study acknowledges that external factors, such as the COVID-19 pandemic, may have temporarily skewed some of the results. For instance, the dropout rate in

2019/20 was higher than in control years, likely due to the disruptions caused by the pandemic. However, the overall trends suggest that once the school feeding program was implemented, it contributed to the stabilization of these rates in subsequent years, highlighting the resilience and positive contribution of the program even in the face of global challenges.

Major lessons (knowledge) acquired during the process of the undertaking of the researcher, **t**he study demonstrates that school feeding programs have a significant, positive contribution to both academic performance and student retention, as evidenced by increased passing rates, reduced repetition rates, and a lower dropout rate. In addition, gender remains a key factor in academic performance, with male students outperforming female students. This underscores the need for gender-specific interventions within school feeding programs to further reduce educational disparities. Above all, contextual factors, such as the COVID-19 pandemic, can temporarily affect academic outcomes, but the school feeding program still shows long-term potential to contribute positively to students' educational success.

This research answers the research question that **t**he school feeding program had a statistically significant positive effect on academic achievement, with a notable increase in passing rates and average academic scores. While the program improved outcomes for both genders, male students showed better academic performance overall, a significant gender gap in performance persists, suggesting the need for gender-specific interventions. The school feeding program contributed to a reduction in dropout rates, a decrease in repetition rates, and a modest increase in enrollment.

These changes were especially notable among female students. The study highlights that while the pandemic impacted results in some years, the overall effect of the school feeding program remained positive, contributing to reduced dropout rates and improved academic performance.

Overall, the study underscores the importance of school feeding programs as a tool for improving academic outcomes in Ethiopia, particularly in urban areas like Addis Ababa. It not only confirms the positive short-term benefits of SFPs but also reveals how these programs can help mitigate long-term challenges such as repetition, dropout, and enrollment instability. However, the persistence of gender disparities in academic performance calls for more targeted interventions to ensure that school feeding programs contribute to equitable educational opportunities for all students. The significant findings from this study provide valuable evidence to policymakers and educators on the role of school feeding in fostering academic success and educational equity.

4.2. Recommendations

Based on the conclusion drawn, the researcher believes that many issues need to be considered to effectively implement school feeding programs and thus recommends the following measures.

1. **Enhance Gender-Sensitive Approaches in School Feeding Programs:**

   While the school feeding program positively impacted both male and female students, the gender gap in academic performance remained significant, with

male students outperforming female students. To address this disparity, it is recommended that future school feeding programs implement gender-sensitive interventions. These could include targeted support for female students, such as mentoring, academic tutoring, and awareness campaigns to encourage girls' engagement and persistence in school.

2. **Expand and Sustain School Feeding Programs:** The positive effects on academic performance, enrollment, and retention underscore the importance of sustaining and expanding school feeding programs. It is recommended that the government and educational authorities prioritize the continued funding and scaling up of these programs, particularly in urban areas like Addis Ababa, where enrollment stability is critical. Efforts should be made to ensure that school feeding is implemented consistently across all schools and not disrupted by external factors such as pandemics or budgetary constraints.
3. **Focus on Long-Term Monitoring and Evaluation:** Although this study demonstrates the positive effects of school feeding programs, it is important to continue monitoring and evaluating their long-term impact. Regular assessments should be conducted to track the sustainability of the improvements in academic performance, dropout rates, and repetition. This would provide crucial data for making adjustments to the program, ensuring that it remains effective and adapts to changing educational and social contexts.
4. **Address Contextual and Implementation Challenges:** While the school feeding program has shown significant benefits, the study also highlights the

potential challenges related to its implementation, such as financial constraints (e.g., 22 Birr per day per student which is insufficient) or logistical issues in urban settings. It is recommended that further research explore these challenges and identify strategies to overcome them. Local governments, communities, and schools should collaborate closely to ensure efficient delivery and adequate funding for the program. Additionally, considering the contribution of external factors like the COVID-19 pandemic, contingency plans should be developed to ensure the program's continuity during crises.

5. **Invest in Supporting Academic Outcomes Beyond Feeding:** While school feeding has been shown to improve academic performance, it is important to recognize that feeding alone cannot address all the factors influencing student success. Therefore, it is recommended that school feeding programs be integrated with broader educational reforms. This could include enhancing teaching quality, providing additional academic resources, and implementing psychosocial support services to address factors like stress or low motivation that can affect student achievement.
6. **Promote Community Involvement and Stakeholder Engagement:** The success of school feeding programs is often linked to the support and active involvement of local communities. It is recommended that schools engage parents, local businesses, and other community stakeholders in the planning and implementation of school feeding programs. This would not only ensure a more sustainable and effective program but also create a sense of shared responsibility for students' well-being and academic success.

7. **Further Research on Long-Term Gender and Age-Specific Effects:** Given the findings on gender disparities and the contribution of age to academic performance, further research should focus on understanding the specific needs and challenges faced by different student demographics. Studies could explore how school feeding programs can be tailored to address the cognitive, social, and emotional needs of students based on their gender, age, and socio-economic status using new research models and study designs, likewise quasi-experimental designs and others.

By implementing these recommendations, stakeholders can optimize the effectiveness of school feeding programs, ensuring a provision of long-term educational benefits for all students, particularly in urban areas like Addis Ababa. These steps will contribute to reducing educational disparities, improving academic outcomes, and fostering better equity in education.

References

Abiy Yohannes (2017), *The effect of School Feeding Program on the school performance of primary public school children in Arada Sub City, Addis Ababa*, Unpublished MA thesis, AAU

Adelman, S. G.-L. (2019). School feeding reduces anemia prevalence in adolescent girls and other vulnerable household members in a cluster randomized controlled trial in Uganda. *The Journal of Nutrition, 149*(4), 659–666. https://doi.org/10.1093/jn/nxz001

Adelman, S. (2009). School feeding programs and academic performance. *Journal of Nutrition Education and Behavior, 41*(2), 1-4. https://doi.org/10.1016/j.jneb.2008.09.003

Ahmed, A. (2004). The impact of school feeding programs on school attendance and academic performance in developing countries. *The International Food Policy Research Institute*.

Aliu, M. & Fawzia, S.(2014). Assessing Ghana School Feeding Programme on the Enrollment of Beneficiary Schools in the Tamale Metropolitan Assembly of Northern Ghana. *International Journal of Economics, Commerce and Management,* 2(10), 1-30

Amanuel, G. (2021). Impact of school feeding programs on educational outcomes in Ethiopia: A case study of rural regions. *Journal of Educational Research, 32*(4), 110-124. https://doi.org/10.1056/edures.2021.0032

Assefa, M. (2022). Challenges and impacts of primary school feeding: Implications for selected primary schools in Addis Ababa. *PJERE, 64-76.*

Barro, R. J. (2001). *Education and economic growth*. Harvard University Press.

Bisratemariam. (2018). *The impact of Ye Enat Weg school feeding program on school participation and dietary intake of children in Addis Ababa*. St. Mary's University.

Bouterakos, M., & Bundy, D. A. (2021). School feeding programs and their impact on child health and education outcomes. *Global Health Action, 14*(1), 1-13. https://doi.org/10.1080/16549716.2021.1923839

Chepkwony, D., Kariuki, J., & Kosgei, S. (2013). Impact of school feeding programs on cognitive and academic performance of students. *Journal of Educational Psychology, 51*(3), 200-208.

Dayour, F. (2015). Effect of the National School Feeding Programme on pupils' enrolment, attendance, and retention: A case study of Nyoglo of the Savelugu-Nantong Municipality, Ghana. *Canadian Journal of Behavioural Science, 341-353.*

Destaw, A., Tesfaye, A., & Kiros, A. (2021). Impact of school feeding programs on school enrollment and retention rates in Ethiopia: A case study of rural areas. *Journal of African Education and Development, 21*(3), 55-67. https://doi.org/10.1016/j.jaed.2022.05.008

Destaw, Z., Wencheko, E., Kidane, S., Endale, M., Challa, Y., Tiruneh, M., Tamrat, M., Samson, H., Shaleka, D., & Ashenafi, M. (2021). Impact of school meals on educational outcomes in Addis Ababa, Ethiopia. *Public Health Nutrition, 25*(9), 2614–2624. https://doi.org/10.1017/s1368980022000799

Ethiopian Monitor. (2020, January 25). Addis Ababa to set up agency to run free meal program. *https://ethiopianmonitor.com/2020/01/25/addis-ababa-to-set-up-agency-to-run-free-meal*

Gosheme, G. (2020). *Assessment of the implementation of the school feeding program in selected primary schools of Addis Ababa* [Unpublished master's thesis, Addis Ababa University].

Kazianga, H. (2009). The impact of school feeding programs on school enrollment and gender equity in rural Burkina Faso. *Food Security, 1*(3), 201-215. https://doi.org/10.1007/s12571-009-0009-1

Lochner, L. (2011). The economics of crime and punishment. In J. H. Abowd & A. B. Krueger (Eds.), *The economics of crime* (pp. 1-30). Princeton University Press.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370-396. https://doi.org/10.1037/h0054346

Meyers, A., Jackson, A., & Ghirardi, L. (2013). The impact of school feeding programs on educational outcomes in developing countries. *Educational Researcher, 44*(5), 294-304.

MOE. (2012). *National school health and nutrition strategy*. Ministry of Education.

MoE. (2018, July). *Ethiopian Education Development Roadmap (2018-2030).* Education Strategy Center (ESC).

Psacharopoulos, G., & Patrinos, H. A. (2018). Returns to investment in education: A decennial review of the global literature. *Education Economics, 26*(5), 1-16.

Skinner, B. F. (1953). *Science and human behavior*. Free Press.

The Global Food Banking Network. (2022, March 1).Developing a School Feeding Program: *https://www.foodbanking.org/resources/developing-a-school-feeding-program/*. Retrieved from https://www.foodbanking.org/resources/developing-a-school-feeding-program/

WFP. (2018). *Homegrown school feeding resource framework synopsis*. FAO.

WFP. (2020). A chance for every schoolchild: Partnering to scale up school health and nutrition for human capital, WFP School Feeding Strategy 2020–2030. World Food Programme.

WFP. (2023, March 21). *School meals*. Retrieved from https://www.wfp.org/school-meals.

Yirga, A. (2020). *School feeding in Addis Ababa: The case of Bole Sub-City*. Addis Ababa University.

Zenebe, M. (2018). School feeding program and its influence on enrollment and attendance in Ethiopia. *African Journal of Educational Development, 10*(2), 45-60. https://doi.org/10.1016/j.ajed.2018.04.005