

Running head: THE EFFECT OF SCHOOL FEEDING PROGRAM

The effect of School Feeding Program on the school performance of primary public school  
children in Arada Sub City, Addis Ababa

By: Abiy Yohannes

School of Social Work

Addis Ababa University

May, 2017

A Thesis Submitted to School of Social Work  
in Partial Fulfillment of the Requirements for the Degree of Master of  
Social Work

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**Addis Ababa University**

**School of Graduate Studies**

**Thesis Approval**

This is to certify that the thesis prepared by Abiy Yohannes, entitled: “The effect of School Feeding Program on the school performance of primary public school children in Arada Sub City, Addis Ababa” submitted to Addis Ababa University School of Social Work in partial fulfillment for the requirements of Master of Social Work complied with the regulations of the Addis Ababa University and meet the accepted standards with respect to originality and quality.

Signed by the Examining Committee:

Examiner \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

Examiner \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

Advisor \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

## THE EFFECT OF SCHOOL FEEDING PROGRAM

### **Declaration**

I, the undersigned, declare that “The effect of School Feeding Program on the school performance of primary public school children in Arada Sub City, Addis Ababa” is my original work and has not been presented for a degree in any other university, and that all sorts of materials used for this thesis have been duly acknowledged.

Declared by:

Student Name: Abiy Yohannes

E-mail: byabiy@yahoo.com

Signature: \_\_\_\_\_

May, 2017

Confirmed by Advisor:

Advisor's Name: Dr. Meseret Kassahun

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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**Abbreviations and Acronyms**

AAU	Addis Ababa University
ACL	Attention Check List
AR	Absent rate
AY	Academic Year
BOE	Bureau of Education
BOWC	Bureau of Women and Children
DID	Difference In Difference
E.C	Ethiopian Calendar
ESDP	Education Sector Development Program
FFE	Food for Education
FGD	Focus Group Discussion
HGSFP	Home Grown School Feeding Program
MOE	Ministry of Education
NSHNS	National School Health and Nutrition Strategy
PSM	Propensity Score Matching
RDD	Regression Discontinuity Design
SDG	Sustainable Development Goal
SFP	School Feeding Program
SNNPR	South Nations Nationalities and Peoples Region
SPSS	Statistical Package for Social Sciences
THR	Take Home Rations
UNICEF	United Nations Children's Emergency Fund

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**Abstract**

*The research was aimed to assess the effect of School Feeding Program on the school performance of primary public school children in Arada sub city. A quantitative evaluative research approach and a quasi-experimental design were employed in order to accomplish the research objective. 320 school children whose grade range [3-7] are participated in the research. The data collection instruments were student roster card analysis and standardized attention measure scale. The study applied two statistical tests; Difference in Difference linear regression for academic achievement and attendance and independent samples t-test for attention measure. The main finding of the study is that the positive effect of School Feeding Program on academic achievement and attendance is not significant. Moreover, the program has not effect on children's' attention measure. However, the small positive effect of the program is detected on academic achievement and attendance score and this effect is more viable to academic achievement. At the end, the study recommends that all stake holders working on School Feeding Program need to focus at mezzo and macro level interventions to enhance the program effectiveness.*

**Key words:** *School Feeding Program; Academic achievement; Attendance rate*

*Attention; Children*

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## Chapter One: Introduction

### 1.1 Background

School feeding refers to provision of meal to school children. However, the form of school feeding can be classified into two main groups based on their modalities: in-school feeding, where children are feed in school; and take-home rations, where families are given food if their children attend school (Bundy, Burbano, Grosh, Gelli, Jukes & Drake, 2009). In-school feeding can also be divided into two common categories: programs that provide meals and programs that provide high energy biscuits or snacks to elementary school children. World Food Program [WFP] (2016) stated that School Feeding Programs are far more than food-giving. They are investments in the world's poorest children. The programs are also investments in our common future and global stability. School feeding can bring children into school and out of hunger.

There are a number of children who live in food insecure areas that need feeding support at school time (World Food Program, 2008). According to Neeser (2012) 60 million children go to school hungry every day in developing countries. Policy makers, local and international organizations use different interventions to target various groups within a population through social safety nets to address the problem of hunger and malnutrition. Food for Education (FFE) is one of the interventions to tackle such problems (Lawson, 2012).

Bundy et al. (2009) stated that different objectives and merits are mentioned for programs that provide meals. The primary objective is to provide breakfast, mid-morning meals, lunch or a combination (depending on the duration of the school day) to alleviate short-term hunger, increase attention span, facilitate learning and avoid the need for children to leave the school to find food. Likewise, WFP lists different merits of Food For Education (FFE). These are reducing

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short-term hunger of students at school, increasing students learning attentiveness, stabilizing students' school attendance, reducing dropouts by providing food for students in the targeted schools in food insecure areas and supplying good nutritious food to children (WFP, 2008).

School Feeding Program (SFP) contributes to the alleviation of short-term hunger and helps children to concentrate on their studies and enable them to gain increased cognition and better educational outcomes. Addressing micronutrient deficiencies such as vitamin A, iodine, and iron among students directly or indirectly affect cognition and can result in better school performance. Hence, school feeding programs shall be promoted with the intention of providing balanced meals for children in schools especially for those coming from poor households and food insecure households and areas (MOE, 2012).

School Feeding Program as a form of safety net has also several educational benefits. According to Bundy et al., (2009) school feeding helps increasing students' attendance rate, cognition, enrollment rate, retention rate and academic achievement. Since 2008, several countries have scaled up their national School Feeding Programs, indicating an increased demand for these safety nets. School-attending children who are beneficiaries of the national school feeding program in lower middle-income countries have a proportion of 49 percent, while the coverage in low-income countries is 18 percent. Ethiopia is among the least three countries in school feeding program coverage (WFP, 2013). In 2015, the Ethiopian School Feeding Program can reach 10.2% of the total school age children live in food insecure areas (MOE, 2015).

In 2009, the World Food Program is moving away from a project approach to integrate school feeding programs into the wider system of government policies in the education and social protection sectors. The policy included a renewed emphasis on government ownership by focusing on strong local procurement, link with smallholder farming and a commitment to more

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nutritious food baskets. This emphasis will create the modality which is called Home Grown School Feeding Program (HGSFP) (WFP, 2013). HGSFP targeted to increase children's school performances such as attention, attendance, enrollment and retention rate (Bundy et al.; Songa, 2011).

Ethiopian school health strategy also emphasizes the importance of good nutrition to fully realize the learning potential of children and to maximize returns on educational investments. Similarly, literatures findings on malnutrition show that nutrition affects a child's attentiveness, concentration, aptitude and overall performance and has a negative impact on school attendance and dropout. Thus, the strategy recommended that schools promotion of good nutrition practices which are implementing by different government and non-governmental bodies by integrating nutrition interventions including School Feeding Program to reach most of children and youth (MOE, 2012). Strong partnerships in implementation SFP can increase factors that pull children to school (WFP, 2016).

Addis Ababa's SFP modality is providing for more than 20,000 school children fresh traditional foods, locally purchased more diversified foods than the common SFP mainly delivered by the WFP. The program also supports 846 food cooker women by creating income (Belay, 'Yenat Weg' SFP expert, personal communication, December 22, 2016). The implementation of such kind of SFPs are expected to positively attribute to alleviate short term hunger and to enhance school performance.

### **1.2 Statement of the Problem**

Despite most government data do not illustrate the urban school food insecurity level, it is expected that the urban food items price inflation affects urban school children's parents to full fill their children's nutrition need. The survey research conducted by a joint force of Addis

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Ababa education bureau and Addis Ababa women and children affair bureau has shown that 26.5% of vulnerable primary school students eat once a day and the experience of 15.8% of them show that there are times that they never take any food for the whole day. Moreover, surprisingly, the study has found that 14.7% of the students are beggars. The data is collected from 11,682 children in all 220 primary public schools in Addis Ababa (BOE & BOWC, 2015).

The effect of malnutrition and food insecurity on school participation is assessed by different researchers. Belachew, Hadley, Lindstrom, Gebremariam, Lachat & Kolsteren (2011), examined the extent of food insecurity affects school attendance & educational attainment of adolescents in Jimma zone. The study uses the 2009 two consecutive surveys of a 5 year longitudinal family study and conducted on 2,100 adolescents in the age group of [13-17]. The research revealed that food insecure adolescents were absent from school compared with their food secure peers. Another study has shown that undernourishment of students has negative effect on their average score and grade level, memory and attention, school activities in addition to interaction with their teachers and peers at school. The under nourishment of the students was significantly related with income and occupation of the parents, household size and sex of the house hold head. This research has employed qualitative method and takes small number of sample (13 students) in 'Atse Libnedingel' primary public school in Gulele sub city of Addis Ababa. One of the study's recommendations was that effectively monitored SFPs can use as a good strategy for addressing under nutrition among primary school children (Beminet, 2015).

After summarizing across twenty six literatures which are done in developing countries, Lawson (2012) found strong evidence that food for education programs (FFE) positively influence the decisions and behaviors of households to send their children to school and children's enrollment and attendance. The reviewed studies by Lawson also suggested that FFE

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interventions positively impact the highest grade in school achieved by students and decrease the dropout rate. The interventions studied by the papers included in Lawson's review show that FFE programs conclusively impact the health and nutrition of targeted children as measured by some indicators.

Dheressa (2011) explored the impact of SFP on class attendance, enrollment and school drop outs among primary school students by participating 102 households and 17 selected individual stakeholders in Sidama zone. Household questioner, key informant interviews and observation were the methods employed to collect data and the 'within-without' approach is used to design the research. This study has shown that there is no significant positive impact of SFP on enrolment, attendance and drop outs. However the researcher claimed that the study doesn't use large sample size and the nature of the data made difficult to determine the absolute impact of SFP on school participation indicators. The effect on academic achievement and attention is out of the scope of the author.

Ermias (2015) evaluated the impact of SFP on primary school performance and has found that there was statistically significant difference between the two groups on attendance rate but there is no significance difference in their achievement test score. The sample consists of 195 students of Kasim elementary school as an intervention group and 228 students of Sele elementary school as a control group in Debrelibanos Woreda, Oromiya region. The study used an experimental research design specifically ex-post facto analyses of students' cases with and without the intervention program on different groups. The provision of the service in the research area had limitation of time quality. The school meal was delivering late in the day after the lesson begins so that children may leave school early in the day. According to Shadish, Cook &

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Campbell (2002) implementation quality acts as a mediator and carries treatment effects to outcome. The SFP impact on attention was beyond the scope of Ermias's (2015) research.

Ermias (2015) and Dheressa (2011) SFP impact evaluation research designs lack robust statistical analyses which can minimize the possible explanation of effect due to the groups' previous school performance difference before the program has begun. Therefore the employment of impact assessment research designs such as Randomized Controlled Trials (RCTs) which require randomized assignment of comparable group before the program has begun in prospective manner and in the cases of randomization is not possible, the use of Difference in Difference (DID) estimator which evaluates both the difference between the groups and difference over time on the same groups in retrospective manner or the employment of Regression Discontinuity Design (RDD) which uses eligibility criteria cut-off to select the two groups and the developing use of propensity Score Matching (PSM) to match participants on variables important to the treatment selection process are preferable to show the actual level of a certain program's or policy's impact ( Shadish , Cook, & Campbell, 2002; Regalia, 1999). The DID estimator is one of the prominent design/method in effect assessment studies. The design has an advantage over the common effect assessment methods the two groups cross-sectional (within-without) design and the one group pre-post (time series) design (Pomeranz, 2015; White & Sabarwal, 2014).

Asmamaw (2014) also compared the difference on school class attendance, enrollment and drop out of SFP beneficiaries and non-beneficiaries of primary schools in Bishoftu town. This study employed community based comparative cross sectional study and had 428 respondents from SFP and 428 respondents from non SFP. This research found significant increase in enrollment as a result of school meals. However, it did not detect evidence for the

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positive effect of SFP on attendance and drop outs. The researcher claimed his finding may be affected by the program delivery which is the participant children's long walking distance [30-40] minutes each day to school and waiting for meal at least for 4 hours until lunch time. In addition to that, the nature of the data made it impossible to employ advanced techniques to conduct an analysis to establish immediate causal relationship between SFP and school participation indicators. This study was not interested to see the groups' difference on academic achievement and attention.

Another SFP impact evaluation is done by Fitsum (2012). The researcher evaluated the impact of SFP on student enrollment and dropout among 94 schools in Jigjiga. The two stage sampling procedure using rigorous econometric technique called PSM is employed and the Focus Group Discussion (FGD) were used in addition to other primary data and secondary data which obtained from different government and non-governmental offices. The study has found SFP increased enrollment but it doesn't bring significant difference on students' dropout. Although the research has employed one of the strongest impact assessment design-PSM, the current research themes; academic achievement, attendance rate and attention were not the scope of Fitsum's research.

Unlike the focus of the above four researchers, Pope, Prollch & Haile (2016) have studied the effect of school meals on academic achievement and they found that supplementing on site school meals with take home rations can be beneficial for concentration, reading, writing and arithmetic skills. This study participated children whose age ranges [7-13] years per school catchment area using household lists irrespective of whether the children were enrolled in school at the survey and children enrolled in grades [2-4] if they were students. The school catchment areas data were collected across the major four regions (Amhara, Tigray, Oromia and South

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Nations, Nationalities and Peoples (SNNPR) of rural Ethiopia were the source of the research and employing a two stage stratified sampling namely highland and pastoral areas. This research lacks source of primary data because the data used in this paper come from a household survey conducted in 2010 by the WFP Ethiopia country office in partnership with the University of Mannheim.

The reviewed literatures so far have shown that, there is contradictory finding regards the effect of SFP on school performance. The unemployment of impact evaluation research design that have relative strength over the simple difference (cross sectional data) and time series data is identified as a methodological gap in Ethiopian based SFP researches. Hence, the current research has tried to evaluate the program's effect using the DID estimator at least to assess two of the three research questions to minimize the limitation of using cross sectional and time series quasi experimental designs. Apart this, there is less trial to evaluate the effect of SFP on children's' attention measure and a clear gap is to be found in assessing the impact of SFP in urban settings, specifically in Addis Ababa that is implementing the SFP having unique characteristics compared to the common SFP modality implementing across the nation. Thus, this research has tried to evaluate the effects of SFP on children's' school performance in Arada sub city to fill the aforementioned gaps and produced empirical data based knowledge about the relevance and effectiveness of SFP that informs programmatic actions and policy guides in order to improve the service in the future.

### **1.3 Objective of the Study**

The main objective of this study is to assess the effect of school feeding program on school performance of children's' in Arada sub city, Addis Ababa.

The specific objectives of the study are:

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- To assess the effect of SFP on children's' academic achievement in Arada sub city.
- To assess the effect of SFP on children's' school attendance in Arada sub city.
- To assess the effect of SFP on children's' attention in Arada sub city.

### 1.4 Research Questions

Up on the review of related literatures, the research questions are therefore designed as:

- Does SFP have significant effect on children's' academic achievement in Arada sub city?
- Does SFP have significant effect on children's' school attendance in Arada sub city?
- Does SFP have significant effect on children's' attention in Arada sub city?

### 1.5 Significance of the Study

Although the Addis Ababa's SFP runs over a year, its effect on academic achievement, attendance and attention is not assessed yet by academic researchers and the program implementer itself. Since the major objectives of SFP are bring children into school, improves academic achievement, retention rate, attention in addition to making them out of hunger. One of the primary aims of Social work profession is intervening to improve the wellbeing of vulnerable groups in the society; hence, the researcher believes that conducting research on SFP helps generalist social workers and school social workers to get involved in the practice, education, policy and research issues on the program delivery that targeted vulnerable school children. Moreover, the research can give constructive feedback for SFP implementers and other concerned bodies to improve the effectiveness of the program. The study's finding would also provide directions for future researchers, legislators, educational policy draft developers and school feeding programs implementers to scale up, to modify or to change the modality.

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### **1.6 Scope of the Study**

The study intends to assess the effect of SFP on school performance (specifically, academic achievement and attendance rate in 2014/15 A.Y and 2015/16 A.Y in addition to attention measure in 2016/17 A.Y) of primary public school children who are receiving support under ‘Yenat Weg’ charitable association’s SFP. The research has used cross sequential (both cross sectional and time series) data for the academic achievement and attendance in addition, it has employed cross-sectional data for attention measure. The research area is delimited to Arada sub city in Addis Ababa. The research participants’ are from both sexes. Moreover, the research participants’ age ranges [7-17] after they passed through the eligibility criteria to participate in the research. The sample grade ranges [3-7] in the current Academic Year (2016/17) are deliberately taken as the research participants. The rationale to select the grade level is discussed in sampling design section.

### **1.7 Limitations of the Study**

The general objective of the current study was to assess the effect of SFP on children’s’ school performance using DID research design specifically to assess academic achievement and attendance. However, it was not possible to employ DID design for attention measure (which was one of the three components of school performance) due to unavailability or impracticality of getting baseline data regards to attention measure. Therefore, the study employed the cross sectional (within-without) design by the assumption of there is no difference between the mean value of SFP participants and non-participants due to few studies are conducted in Ethiopian context regards to SFP effect on children’s’ attention measure. Hence, the research has tried to minimize the limitation of within-without approach by dividing the groups in different strata and tried to match the experimental and comparable groups’ based on school, grade level, sex and

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age groups in addition to the program implementer's household and children socio economic indicators to have similar comparable groups.

### 1.8 Operational Definitions

- **School performance** refers to the student's academic achievement, attendance and attention and it is measured separately by average score, attendance rate and attention measure respectively.
- **Academic achievement** refers to the students' actual academic performance which is indexed by the overall average scores on their class roster.  
In this research, academic achievement and average score are used interchangeably. Academic achievement is measured by the child's annual  
Average score = the sum of all subjects annual average/ the number of all  
Subjects taken in specified A.Y.
- **Absence Day** is the second indicator employed in this study and indirectly measures school attendance. The term measures the number of days a primary school child failed to fully attend class during the academic year. But for the inferential statistics analysis purpose, the absence day is changed to attendance rate.
- **Attendance Rate** is average attended days and measured by the Total attended days on academic year / Total days of academic year (207 days in each A.Ys).
- **Attention measure** refers to the degree of mental process by which a person selectively registers some stimuli and ignores the others to have the ability to focus (concentration) and the duration of focusing on certain stimuli (attention span). The term is measured by four scales and twelve items tool called Attention

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Check List (ACL) which was developed and used originally by Dr. Das and prepared to measure school children's' attention by teachers and parents (Papadopoulos, Das, Kodero & Solomon, 2002).

- **Comparison group** in this research is refers to a group of school children that does not receive a school feeding intervention, but in other ways it is as similar as possible to a group that does. By studying this comparison group, one can estimate what would have happened without the intervention often referred to as the 'counterfactual'. Since a 'control group' tends to refer to groups defined through more robust approaches such as random allocation, the current research prefers to call this group, a comparison group due to unemployment of randomization.

### 1.9 Organization of the Paper

The main body of the paper consists six chapters with different sections and sub-sections. Chapter one deals with the general introduction of the work with special emphasis on the background of the study, statement of the problem, general and specific objectives of the study, research questions, significance of the study, scope and limitation of the study, operational definitions and the organization of the study. Chapter two reviews the most significant theoretical and empirical studies of other writers on the topic of SFP in international and Ethiopian contexts. Chapter three focuses on the methods of the study. Chapter four also deals with the data analysis and interpretation results of the study and chapter five provides discussion. Finally, the conclusion, implication and recommendations parts are provided in chapter six.

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### **Chapter Two: Literature Review**

This chapter attempted to discuss the SFP's world and Ethiopian experience, empirical researches, different theoretical and conceptual framework. The section emphasized that SFP has a role in realization of two Sustainable Development Goals (SDGs) and examined the findings of different researches in the area. Finally it summarized by formulating the conceptual framework based on the reviewed theoretical literatures.

#### **2.1 School Feeding from Global Perspective**

School nutrition program has a long history of meeting the food and nutrition needs of children. School feeding has its origins in the 1930s, when scheme was introduced in the United Kingdom and the United States with the explicit aim of improving the growth of children (Richter, Griesel & Rose, 2000). Brazil and India have established school feeding programs by passing legislations (Lawson, 2012). Currently, almost all nations around the world have a school meals program and about 368 million children from kindergarten to secondary school receive food at school every day. Governments recognize school meals as an essential tool for the development and growth of children, communities and society as a whole (WFP, 2015).

WFP (2013), estimates on coverage suggest that while 49 percent of school children receive free meals in middle-income countries, the figure for low-income countries is 18 percent. This suggests that where the need is greatest in terms of hunger, poverty and poor social indicators, otherwise the coverage continues to be the lowest. WFP has done the most extensive school feeding operations than any international entity, benefiting millions of children and their families each year. In 2002, it assisted 64 countries' school feeding activities, reaching nearly 16 million children. Several international non-governmental organizations and some donors

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(through bilateral programs) also support school feeding activities in developing countries (WFP, 2004).

### **2.2 Home Grown School Feeding Program**

The in-school feeding is defined as feeding children in school and it has two common categories that are named as Home Grown School Feeding Program (HGSFP) and Non-HGSFP. HGSFP refers to a program that provides locally produced and cooked meals. According to Espejo, Burbano & Galliano (2009), HGSFP can be defined in the broadest sense as a school feeding program that provides food produced and purchased within a country to the extent possible. The non-HGSFP is a common school feeding program run by the food sourced externally.

Alderman and Bundy highlighted the tendency of favoring the local purchase of FFE programs which is a movement towards so called home grown school feeding. This has increased focus on procurement and quality. The emphasis on food procured in the communities around the school enhances the rural economy and food quality (Adelman and Bundy, 2012). Songa (2011) also stated that the Home Grown School Feeding Program theory act as vehicle for promoting local development and fighting food and nutrition insecurity within education for the purpose of increasing enrolment, promoting regular school attendance and retention to improve children learning.

HGSFP targeted three groups; school age children, small scale farmers (food producers) and the community stakeholders (food preparation jobs opportunities, food security) across gender dimension. The principal target groups are school age children who have not access to get adequate and nutritious food at home. Thus, the major benefits of the HGSFP theory for school children are increased enrolment/ Attendance, reduced drop-out/ Absenteeism, increased attention/ performance and improved nutritional status (Bundy et al, 2009).

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HGSFP can significantly contribute to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 2 (on ending hunger, achieving food security and improved nutrition, and promoting sustainable agriculture) and SDG 4 (on quality education). In recognition of this, numerous governments and regional organizations, including the African Union and the community of Latin American and Caribbean States, are including these initiatives in their strategies for achieving food security and implementing the 2030 development agenda (WFP, 2015). From the African states, Mozambique has an example of a school feeding program designed on the concept and principle of ‘Home Grown School Feeding’ whereby food will be directly purchased from the local farming community to foster local economic development (Lawson, 2012).

### **2.3 School Feeding in Ethiopia**

Honing (2016) explored the interaction between the SFP as a planned intervention by WFP, the intervening agents and its beneficiaries on the ground by adopting an actor-oriented interface approach in 18 schools of four regions of Ethiopia. The study interviewed school directors as major informants. Beneficiary households and students were informants and the research made observation on the school compound and conducted FGD with Parent-Teachers Associations (PTA). Finally, the finding was the SFP gets low priority during emergency because provision of food in a lifesaving operation is prioritized over education. In such situations girls are disadvantaged because they are engaging in fetching water. The study finding is limited to SFP implementation in chronic poverty situation and hazard prone areas.

The effectiveness and challenges of home grown school feeding program (HGSFP) in comparison to the non HGSFP is also assessed in Ethiopia, SNNPR by Mekuanent (2015). The researcher evaluates the two programs by employing a mixed approach research methodology on

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300 Beneficiary Students from 15 Sample Schools of Segen, Wolayita, Gurage and Selte zones.

The result of this study shows that HGSFP is providing a more prepared diversified and fresh food than the traditional SFP. In addition to that the HGSFP reduced delivery and commodity cost by providing culturally appropriate food. However, the effectiveness of HGSFP on education was beyond the scope of the study.

WFP sponsored school meals started in Ethiopia in 1994 with an initial pilot project in war-affected zones in Tigray region. Then, the school meal has been provided in chronically food insecure districts in six of the country's nine regional states (Afar, Amhara, Oromia, SNNPR, Somali and Tigray) by World Food Program, MOE, Regional education bureaus and the community with a particular focus on districts with lower enrollment and higher gender disparity. In 2008, WFP provided food for 915 schools with 482,000 children benefited from school meals. The per child food ration consists of 150 gm. of corn-soya blend 6 gm. of fortified vegetable oil and 3 gm. of iodized salt, provided as a cooked meal on every school day (Pope et al, 2016; WFP, 2008).

The Ethiopian National School Health and Nutrition Strategy (NSHNS) discussed that good nutrition is essential to fully realize the learning potential of children and to maximize returns on educational investments alleviation of short-term hunger and helps children to concentrate on their studies and enable them to gain increased cognition and better educational outcomes. In contrary, malnutrition affects a child's attentiveness, concentration, aptitude and overall performance and has a negative impact on school attendance and enrolment. Due to this, schools shall promote good nutrition practices by integrating nutrition interventions including school feeding programs and micronutrient supplementation into school activities thereby, reaching a high proportion of children and youth (MOE, 2012).

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The government of Ethiopia has launched a multiyear Education Sector Development Program (ESDP) in 1997 as part of a twenty-year education sector indicative plan which has been translated into series of national ESDPs. This ESDP has the aim of increasing access to education, while also improving equity and educational quality using different strategies. FFE is one of the major programs to implement ESDP and achieve the education needs of the country (WFP, 2008).

In Ethiopia, around 7 million school-age children live in food insecure areas. Out of this 3 million children are out of school. The School Feeding Program which starts in 1994 enlarges in scale and reaches 670,000 children and an additional 43, 000 children take part in the Home Grown School Feeding Program which began in SNNPR in ESDP IV period. Moreover, a take home food ration is provided to families in pastoralist regions who send their girls to school. However, the program implementation had problems regards to health issue mainstreaming. Ethiopia has planned a national school feeding strategy which involves inter-ministerial body with efficient collaboration to improve the organization and scale of school feeding activities in addition to create cost-effective implementation (MoE, 2015).

Though, a significant number of Addis Ababa's school children have get difficulty to access food while in school, the city is too late to start SFP in 2015. That is 5 years later after the "Addis Ababa education for all declaration" which declared call upon Education For All partners to build inclusive education systems and intensify efforts to support initiatives targeted at the most marginalized, including social protection measures such as cash transfers and multi-sectoral approaches such as school feeding.

The Addis Ababa's SFP has been running by 'Yenat Weg' charitable association since February, 2015 as a pilot project in Arada and Kirkos sub city based on the survey study

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conducted by Addis Ababa BOE and BOWC in 2015. The survey shows that there is sizable number of school children exist in public schools of Addis Ababa. The program targeted 20,135 school children and it created 846 jobs for unemployed mothers (parent and living around school). The program is heavily dependent on local donors and led by Ethiopian first lady, her Excellency Roman Tesfaye as a board chairman. The school menu is set up by nutritionists. It seems that it has cost effective, diversified and culturally sensitive diets. The breakfast menu consists of “Injera Firfir”, ‘Defo Dabo’ and ‘Marmalata’ with tea in different days of education. The lunch menu has ‘Injera’ with ‘Miser Wot’, ‘Injera’ with ‘Shiro Wot’, ‘Injera’ with ‘Poteto Wot’ and Rice with or without bread. The time for breakfast is from [7:00 to 8:30] in the morning and the lunch time is [12:00 to 1:30] in the noon (Belay, ‘Yenat Weg’ SFP expert, personal communication, December 22, 2016).

### **2.4 Theoretical Frameworks**

Experiments do not require well specified program theories, good program management, standard implementation or treatments that are totally faithful to theory (Shadish et al, 2002).

The author further emphasized the drawbacks of using distinct theoretical models as follows;

“ . . . Our confidence in any given model may be small because of different drawbacks of theoretical models. Such problems are often fatal to an approach that relies on theory to make strong causal claims. Though some of these drawbacks are present in experiments (e.g. failure to incorporate reciprocal causation, poor measures), they are of far less [importance] because experiments do not require a well-specified theory in constructing causal knowledge. Experimental causal knowledge is less ambitious than theory-based knowledge, but the more limited ambition is attainable (Shadish et al., 2002, p. 502).

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Thus, based on the above argument, the current research used theoretical constructs which can outline some of the theoretical links between School Feeding Program and educational benefits rather than using highly specified program theories. Moreover, experiments make a contribution when they simply probe whether an intervention-as-implemented makes a marginal improvement beyond other background variability. According to Shadish et al. (2002), Experiments should consider the following points to increase statistical power and uncover the causal inference (1) use large samples to detect effects (2) take pains to reduce the influence of extraneous variation either by design or through measurement and statistical manipulation and (3) study implementation quality both as a variable worth studying in its own right in order to ascertain which settings and providers implement the intervention better and as a mediator to see how implementation carries treatment effects to outcome.

According to Kazianga, Dewalque, & Alderman (2009), School Feeding Program can contribute for childrens' educational improvements in three ways. First, SFPs can increase childrens' enrollment and regular school attendance by initiating parents to send their children to school regularly. Second, SFP can improve cognitive functions through increasing attention and concentration ability of children due to giving the access to improved nutrition and reducing the prevalence for short-term hunger which is also a major factor to deteriorate cognitive function of a child. Third, SFPs can enhance academic performance via the accomplishment of the above two objectives.

Vermeersch and Kremer (2004) also stated that school meals increase school participation by improving child nutrition through two links. First, school meals improve nutrition by enabling children get more nutrients. Second, the improved nutrition leads to better educational achievements. The authors also reveal that, since child nutrition, child health and

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schooling reflect household preferences in human capital investments in the child; they might be correlated without any direct causal relationship between them. Neeser (2012) emphasized the importance of food for learning. According to him, children that don't eat don't learn. He (2009) also discusses that SFP can improve health by reducing morbidity and illness and hence attract children to school.

There are also points which emphasized the food determinant effect in Maslow's hierarchy of needs, the need or desire for achievement will not drive a person's thoughts and behaviors until needs on the lower levels have been satisfied. According to Maslow, humans cannot concentrate and pay attention to attain academic achievement unless their basic nutritional need is satisfied. 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" (Woodhouse and Lamport, 2012, cited Maslow, 1943, pp. 373-374). As a result, the cognitive processes and behaviors associated with the more sophisticated levels on the hierarchy cannot be achieved; great academic performance cannot be expected from students experiencing basic needs deprivation (Woodhouse and Lamport, 2012).

Woodhouse & Lamport, (2012) discussed that improvements in the nutritional quality of students' diets are associated with academically beneficial gains, but have not been repeatedly and causally correlated to increased academic achievement. However, in general, it is clear that consistently eating sufficient quantity and variety of nutrient-dense foods will improve children's diet quality, and consequentially reduce the potential for the cognitive impairments associated with malnutrition.

The above discussions can establish a theoretical framework for the relationship of food with academic achievement, school attendance and attention. This indicates the existence of a

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causal relationship or at least a concomitant relationship between food with academic achievement, school attendance and attention. Abraham Maslow's need hierarchy also emphasized the contribution of food for the school performance of children such as achievement, concentration and paying attention (Woodhouse and Lamport, 2012).

### **2.5 Empirical Studies on Educational Function of SFP**

Studying SFP is an interest of different natural and social science disciplines. The studies focus areas are effectiveness for education and health, its new approaches, food security, agriculture development etc. Some of the fields which studied the topic are Psychology (Ermias, 2015), Economics (Grillenberger, Neumann, Murphy, Bwibo, Veer, Hautvast & West, 2003), Nutrition (Hanushek, 1986), Development studies (Dheressa, 2011), Public health (Asmamaw, 2014), Policy study (Hinrichs, 2010; Sagenge, 2014) and Education (Mwavula, 2014).

FFE is not a substitute for a well-organized education system and teacher performance. However, there is extensive evidence that FFE can complement a good education program (Alderman and Bundy, 2012). School feeding programs can thus be a powerful instrument for achieving many multi sector benefits such as education, gender equality, food security, nutrition and health, poverty reduction and agricultural development. The recent food, fuel and financial crises have highlighted the importance of school feeding programs both as a social safety net for children living in poverty and food insecurity and as a tool for stimulating local agricultural production and economic opportunities in rural communities (Lawson, 2012)

The paper which reviewed two studies that evaluated the school feeding program in Jamaica has shown that the omission of breakfast affected a decline in performance on the verbal fluency and coding tests for the previously severely malnourished children (Simeon, 1998). The SFP's has also statistical significant negative impact on dropout. The study by Alderman &

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Bundy (2012) has found out that the results of the estimated probit regression indicated the participation in SFP reduces the probability of dropping out of school by 7.5 percent.

The SFP particularly, Take Home Ration (THR) intervention had a positive contribution to the life worlds of the intervened in four regions of Ethiopia. However, Honing (2016) recommended adaptations should be made to improve the contribution and to bring coordinating function. Thus, water provision and other school based nutrition interventions such as deworming, micronutrient supplements (if needed) and nutrition and health education should be incorporated into the intervention. The take-home rations which targeted girls who attend school with regularity, in-school meals or snacks to reduce short-term hunger and associated cognitive impediments and food-for-work targeted to teachers or parents engaged in activities improve schooling outcomes (Levinger, 2005).

Hinrichs (2010) also emphasized the contribution of SFP for education compared with its health benefits. According to his study, participation in the program as a child appears to have few long-run effects on health, but the effects on educational attainment are sizable. The educational and health outcomes of SFP differ across grade levels. He also found that participation in grades seven through twelve has a stronger effect on educational attainment than participating in the earlier grades does, whereas there is some evidence suggesting that participation in earlier grades is more important for the health outcomes.

In contrast to the upper literatures which advocate the effectiveness of SFP, some studies have found ineffectiveness of the program. The evidence from a randomized trial in rural Burkina Faso has shown 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 (Kazianga et al., 2009).

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### **2.5.1 School Feeding Program and Academic achievement.**

The SFP has a statistically significant positive impact on learning, as measured by achievement test scores. The participation in SF program increases test scores by 15.7 percent points (Ahmed, 2004). The study by Chepkwony, Kariuki & Kosgei (2013) also suggested that the schools with SFP had the highest academic performance compared to those without SFP.

Afridi, Barooah & Somanathan (2013), find out that the provision of school meals improved the class room concentration and effort of students in grade 7. The findings also suggest that school quality influences the extent to which school meals improve effort levels. Students in schools that had higher average scores in curriculum related tests gained significantly more from the extension of the meal program.

Few studies address some of the potentially adverse impacts of SFPs on academic performances. Intuitively, the positive impacts on academic performances would require that the learning environment remains constant or improves when enrollment increases. One can, however, anticipate several changes in the learning environment following the introduction of SFPs. First, if teachers allocate some of their time to administering the programs, the actual teaching time could decrease. Second, classrooms could become overcrowded since enrollment is likely to increase. In this case the teacher may become less efficient. Schools may find themselves lacking other inputs (e.g. books, notebooks) which could effectively reduce academic performances. Moreover, the additional incentives of the program will bring in students whose parents previously assessed the benefits of schooling as lower than the costs; at the margin, these students can be expected to be less able to gain from schooling (Kazianga et al., 2009).

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### **2.5.2 School Feeding Program and Attendance.**

Based on the results from unannounced attendance data, Alderman and Bundy identified the positive impacts of school meal on morning and afternoon attendance (Alderman and Bundy, 2012). Similarly, Jacoby & Cueto (1996) stated that a school breakfast increased attendance rates of fourth and fifth-grade students by (0.58) percentage points in the treatment schools whereas the attendance score decreased in control schools by (2.92) percentage points. The evaluative research was conducted in Huaraz, Peru and it took place 30 days after the start of the breakfast program. Hinrichs (2010) finding also suggested that subsidized lunches induced children to attend school. Other studies have also showed that SFP has a statistically significant positive impact on class attendance of participating pupils (Ahmed, 2004; Sarah, Adelman, Gilligan & Lehrer, 2008).

Literatures also discussed about covariates which negatively influence attendance. From these variables, illness is the major problem that hinders attendance. Asmamaw (2014) states that mild to severe sicknesses that often relates to poverty and inadequate nutrition negatively affects children's attendance and it was also a cause of drop-outs. Studies also show that school age children with severe hunger have significantly higher chronic illness rates than those with moderate or no hunger. Weinreb, Wehler, Perloff & Scott (2002) have shown that severe poverty has negative effects on children's health. When poor children are sick, they will stay at home for extended period of time without seeing a medical practitioner.

The effect of SFP on attendance may differ in age groups. Alderman, Lehrer & Gilligan (2012) find no significant impact of SFP and THR on average morning attendance of children aged [6–13]. However, there are positive and statistically significant impacts of both the SFP and

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THR programs on the morning attendance of older children, aged [10–17], ranging from [8 –12] percentage points.

On the other hand, although SFPs increase the benefits of school participation, they could actually reduce household income due to reduced child labor supply which thus lowers household food availability thereby posing negative impact on current nutrition and health. The increased school participation due to SFPs could also lead to crowded classes and hence negatively affects learning unless school capacity is increased accordingly (Dheressa, 2011).

### **2.5.3 School Feeding Program and Attention.**

A hungry child cannot concentrate or perform and is unlikely to stay in school. School feeding programs have proven effective in encouraging enrolment, increasing attention spans and improving school attendance. School feeding programs are powerful tools for alleviating day-to-day hunger pains. It is suggested that giving children a daily breakfast at school may improve their scholastic achievement. When the time spent in school is increased, certain cognitive functions and attention to tasks are improved (Grantham-McGregor, Chang & Walker, 1998). Afridi et al. (2013) also proved the positive effect of SFP on classroom concentration in their study entitled “School Meals and Classroom Effort”.

Another study stated that girls who are better nourished are more attentive and involved during class, and well-nourished boys exhibit improved classroom behavior and activity levels (Bundy et al., 2006). Similarly, Mahoney, Taylor, Kanarek & Samuel (2005) has discussed the effects of breakfast on cognitive performance that shows the standard main effect of task duration in dependent measures, particularly visual attention and auditory attention. Performance on most measures is enhanced by breakfast consumption and that the composition of breakfast can also influence children’s cognitive performance like the measure of auditory attention.

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Stuijvenberg, Kvalsvig, Faber, Kruge, Diane, Kenoyer & Benadé (1999) has also found a significant between-group treatment effect ( $P < 0.05$ ) in cognitive function with the digit span forward task (short-term memory). All these findings emphasized the effect of SFP on attention.

### **2.6 Conceptual Framework**

Kazianga et al. (2009) shows the interaction between nutrition and education. According to the authors, proper nutrition influence the child's learning and performance in school, enables children to have regular attendance and concentration to perform complex tasks. Bundy et al. (2009), theory which is discussed under theoretical framework section has illustrated that SFP increased children's attendance and increased attention performance. Adelman et al. (2008) also discussed that attendance is one of the two factors which enables the school meal to have impact on learning. The relationship of the variables reveals that the SFP is the independent variable whereas attendance rate, academic achievement and attention of children in school are the dependent variables. Thus, based on the above theoretical view, the following conceptual framework is drawn.

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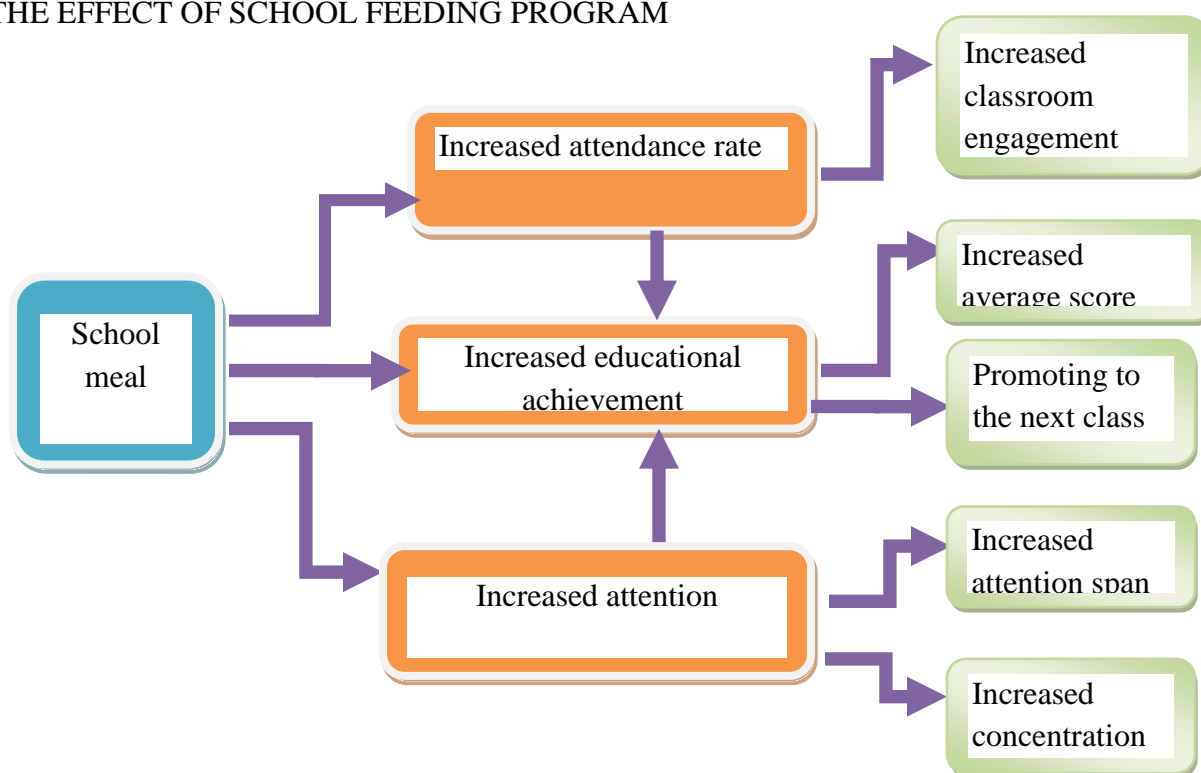


Figure: 1 Illustration of the relation between School meal and school performances

Source: Researcher's construct based on Kazianga et al. (2009); Bundy et al. (2009) and Adelman et al. (2008)

The above framework illustrates that SFP is the motivating factor to children's' academic achievement, regular school attendance and attention measure increment.

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### **Chapter Three: Research method**

The current research is an assessment of the SFP effect on school children's' school performance in Arada sub city. The study has employed quasi experimental method to assess the effectiveness of the program. The Attention Check List (ACL) is a tool to assess attention measure and the school children's' roaster analysis is employed to measure academic achievement and attendance rate. In order to analyze the collected information, the researcher has followed quantitative research method. This chapter is discussed about the researcher philosophical stance, research design in detail, description of the study area, sample size and sampling technique followed by instrumentation, ethical consideration and data analysis and interpretation procedure, finally the pilot test section.

#### **3.1 Philosophical Stance of the Researcher**

Based on the positivists' assumption, the researcher assumed that reality is objective and should be verified objectively. The Researcher believed that in the assessment of effect, it is necessary to view the dependent variables in objective manner. In another way it is easier and reliable to measure effect empirically particularly, by experiment. That is why the researcher used quantitative measures and instruments to conduct the study.

The positivist approach follows experimental methodology and follows chiefly quantitative methods. The approach assumed that reality is rooted on the ontological principle and doctrine that truth and reality is free and independent of the viewer and observer. The positivist paradigm emphasizes that genuine, real and factual happenings could be studied and observed scientifically and empirically and could as well be explained by way of easy and rational investigation and analysis (Aliyu, Bello, Kasim & Martin, 2014). Thus, this research has

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employed a quantitative method and followed explanatory approach to answer the cause and effect questions between the independent variable and the dependent variables.

### **3.2 Research Design**

The current study is an effect assessment research that uses quasi experimental research. In quasi-experiments, random assignment to the experimental and comparable group is not possible; hence, the researcher has tried to match the experimental group (typically a class or school in which an intervention is taking place) with a comparison group by trying to make the comparison group as similar as possible with the experimental group on all factors except for the treatment, although it is not usually be possible to get complete parity. Other than that, the basic two groups' pretest- posttest design is similar to that used in pure experimental research (Muijs, 2004). Hence, the current research has employed the two groups' pretest- posttest design of quasi experimental research to assess the effect of SFP on children's' academic achievement and attendance, which are the first and second research objectives respectively.

According to Muijs (2004), quasi-experimental research designs do have one clear advantage over pure experimental designs, which is that they are studied in natural educational settings. If we find program effects we can at least be confident that these work in real schools and classrooms with all their complexity rather than just in the laboratory setting. This makes quasi experimental research a good way of assessing new initiatives and programs impact in education.

The current research has employed two sub designs under quasi experimental design. The Difference in Difference (DID) research design to assess academic achievement and attendance; in addition to the within-without (the two group post-test only design) to assess attention. In the first design, due to availability of two years data and the possibility of having two comparable

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groups, the research has employed DID design/method. According to White & Sabarwal, (2014), DID is a stronger impact estimate than single difference or within-without design which only compares the difference in outcomes between treatment and comparison groups following the intervention. Pomeranz (2015) also stated that “DID controls for all the characteristics that do not change over time (both observable and unobservable) and all the changes over times that affect the treated and untreated group in the same manner”( p. 19).

Although applying the DID design can remove the difference in the outcome between treatment and comparison groups at the baseline; it is best used in conjunction with other matching methods such as PSM (Propensity Score Matching) or RDD (Regression Discontinuity Design). However, “If DID is used without matching, the researchers should test the ‘parallel trends assumption’, that is, the trend in outcomes in treatment and comparison areas was similar before the intervention” (White & Sabarwal, 2014, p.9). Hence, the current research primarily tested the parallel trend assumption on the experimental and comparable group by taking two points (first and second semester average and absent score) of the base line 2014/15 A.Y (2007 E.C).

The research also used the two group post-test only design to meet the third research objective that is to assess the effect of SFP on children’s’ attention measure. This design is employed because of unavailability of attention score before the intervention. According to Shadish et al. (2002), it is possible to assess the effect of treatment using the two-group post-test only design, by controlling the covariates in strong design and statistical technics. The best controlling mechanism to avoid such bias is random assignment. However, random assignment in the current research was not possible due to the program participants are already assigned and the program run over a year. Thus, the research divided the research participants in different

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strata and matches them based on school, grade level, sex and age groups in addition to the program implementer's household and children's' socio economic indicators to have similar comparable groups.

The two group post-test only design is also applied in Economics studies to evaluate the program effect by the name of "with in-without approach" as a supplement for "before-after approach". In this design, program countries are not randomly selected; instead they are adversely selected in the sense of having relatively poor economic performance prior to the program period (Khan, 1990). Similarly, Khan (1990) also suggested that identifying and controlling the specific differences in the initial position of the program and non-program countries can overcome the selection bias limitation.

Shadish et al. (2002) stated that matching and stratifying methods require that researchers match participants in each group as many characteristics as possible to ensure that comparable and experiment groups are as similar as possible before the treatment is introduced. Regalia (1999) also discussed the combination of quasi-experimental methods helps to control selection bias (Regalia, 1999). The use of various methods during experiment minimizes other causal factor (Shadish et al., 2002). Therefore, the current study has employed multi stage sampling method to match the research participants by dividing them in different strata ( school and grade) and testing the parallel trend assumption for academic achievement and attendance to reduce the plausibility of other explanations for the effect (if any) of SFP.

### **3.3 Description of the Study Area**

As an administrative zone, Arada sub city is organized by 10 Woredas and it is located in the down town of Addis Ababa which constitutes the slum areas which are existed from the establishment of the city in the early nineteen century. The sub city consists 23 public primary

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schools, 331 sections, 13,975 primary school students of whom 6,211 boys and 7,764 girls and 901 public primary school teachers in 2015/16 Academic Year (AY). Thus, the primary school teacher- student ratio was (1:16) and the section- student ratio was (1:42) in the aforementioned AY (Abebe, Arada sub city-SFP coordinator, personal communication, December 20, 2016).

The Central Statistical Agency (CSA) figure has shown that in 2007, Arada sub city has a total population of 211,501 of whom 99,165 are males and 112,336 are females. The primary school age population [5-19] is 30,753, of whom 13,683 are boys and 17,070 are girls (CSA, 2007). According to BOE and BOWC report, 10.8% of the total 11,682 vulnerable students attended school in the sub city (BoE & BoWC, 2015). The sub city is one of the two sub cities of Addis Ababa where the pilot project of School Feeding implemented because of pupils' high vulnerability of food shortage.

### 3.4 Sampling Technique

The two groups of samples (experimental and comparable) were selected by employing a three stage sampling scheme. In the first stage the target sample size of 8 primary (local donors funded) public schools are selected in the sub city. The sample schools are selected from five out of ten administrative Woredas and their names are Ras Abebe, Birhan Ethiopia, Kebena, New Era, Atse Naod, Key Kokeb, Mehal Genfele and Menelik I primary school.

. The selections of the schools are based on two major criteria. The first reason is that, these schools have started the SFP implementation in 2014/15 A.Y ( 2008 E.C), therefore, it just needs to tracing back only one year from the follow-up period ( 2015/16 A.Y) to have the baseline data of on average and absence score. This could not be easy task for a personal researcher to trace back two years from current Academic Year 2016/17 to access students roster cards. The second reason is the availability of eligible school feeding waiting list of children.

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That is six of the total primary public schools in the sub city are formally reported the waiting list of additional school feeding needy children to the sub city education office. The report of beneficiary and needy children of selected sample schools in 2015/16 AY is provided in annex 5. The information gap filling technique of two of the eight sample schools' is discussed in the third stage sampling. After all, first selection criterion helped the researcher to show the effect in pre and post treatment intervention and the second one enabled the researcher to have the right comparable group.

At the second stage, the 2016/17 A.Y grade 3, 4, 5, 6 and 7 are selected for the sample. The selection is based on the assumption of existing previous 2 years (2014/15 A.Y and 2015/16 A.Y) academic record in grades with similar medium of language. The selection helps the researcher to see the baseline and follow up period difference in their status of attendance and academic achievement. However, the evaluation of the children's attention is measured based on the current (2016/17 A.Y) status of the children.

At the third stage, 320 eligible research participant children who are enrolling in 2016/17 A.Y are selected with 12.4% and 27.4% additional children respectively for experimental and comparable groups. From the total primary public school SFP participants in the sub city, 145 SFP beneficiary children treated as experimental group and from the total of school feeding needy primary school children, 175 primary school children are selected for the comparable group. Since the SFP participants were selected non-randomly, the males share is larger than the females. Thus, this proportion also keeps in the comparable groups in addition to assimilate the percentage of age level category in both groups. These matches are more illustrated in table 1.

In this research case, the public schools children's' socio-economic status is similar due to the free fee education applied in those schools. However, the comparable group is selected

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based on the severity level of the children's vulnerability for short term hunger and malnutrition using the schools' report of school feeding needy children in 2016 G.C. The researcher checked the 6 schools' each needy child status based on eligibility cut-off criteria of 'Yenat Weg' charitable association and has selected non-participant children's from the two sample schools (Atse Naod and Key Kokeb schools) which didn't report the waiting list of SFP needy children based on similar criteria of the participant group was selected. The researcher has done the selection in collaboration with the home room teachers and the schools' SFP coordinators.

The eligibility cut-off criteria of the program implementer 'Yenat Weg' charitable society includes the family's income status, number of family members who generate income, whether there is non-governmental organization that support the family or not, the number of children who have not income and the home room teacher suggestion are taken as inconsideration by giving priority for Orphans, children with disabilities, street children, children exposed to labour exploitation, single parent children, children living with HIV/AIDS including those who lost their parent/s because of HIV/AIDS (Belay, 'Yenat Weg' SFP expert, personal communication, December 22, 2016).

### 3.5 Sample Size

According to Rose, Spinks and Canhoto (2015), the sample size of a population based on the sample required to estimate a proportion with an approximate 95% confidence level can be calculated by using the formula;

$$nr = \frac{4pq}{d^2}$$

Where  $nr$  = required sample size,  $p$  = proportion of the population having the characteristic, since the proportion of SFP participants from the total population (1,361 out of 13,302) is 10% & ( $p=0.1$ ). Therefore ( $q=1-p$ ) and  $d$  = the degree of precision. As this is a

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preliminary study the research is prepared to accept a margin of error of  $\pm 5\%$ , so it sets ( $d = 0.05$ ). Based on the above calculation the sample size could be 144.

In the cases when the sample represents a significant (e.g. over 5%) proportion of the population; a finite population correction factor can be applied. This procedure can reduce the sample size required (Rose et al., 2015). The formula for this is:

$$n_a = \frac{n_r}{1 + \frac{(n_r - 1)}{N}}$$

Where  $n_a$  = the adjusted sample size,  $n_r$  = the original required sample size and  $N$  = population size.

Thus, the total number of ‘Yenat Weg’ school feeding beneficiaries (the population) in primary (Grade 1-8) public schools of the sub city is 1,361. And, the total government primary school students of Arada sub city in 2009 E.C is 12,628 and 13,975 in 2008 E.C (Abebe, Arada sub city-SFP coordinator, personal communication, December 20, 2016). Thus, the two consecutive year’s total average pupil is 13,302. Hence, the proportion of the primary school SFP participant in the sub city is ten percent. i.e.  $(1,361/13,302) * 100 = 10.2\%$

The total number of SFP participants who are enrolling from grade 3 to 7, who have ‘permanent’ beneficiaries status (have been started receiving the benefit since 2015/16 A.Y), participants who have been enrolled in their current school since 2014/15 A.Y (base line period), and children who have complete information in absence score in both academic years are 145. Based on the finite population correction factor calculation, the sample size could be minimized to 127. However, the research purposively has taken all eligible beneficiaries ( $n=145$ ) as an experimental sample. Then after, from the total of 1643 SFP needy children who are reported as an aggregate level to the sub city education office, the comparable 175 children who need SFP

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selected as a comparable group based on similar sample size calculator formula employed for the experimental group.

Moreover, educational researchers Gay & Airasian (2003) state that a sample size between 10% and 20% of the total population is representative. The sample size 145 is 10.7% of the total primary public schools beneficiaries of the program in Arada sub city. Since the research is a quasi-experiment, another sample of comparison group is needed to detect the groups' difference. Therefore, 175 children are selected from the eight sample schools based on multi stage sampling method to have similar characteristics of children who have not been pass through the program.

### **3.6 Instrumentation**

The study will use primary and secondary data sources. The Attention Check List (ACL) is the primary data source and the document review particularly; children's' roster card is the secondary source. The roster card will enable to measure the change in attendance rate and academic achievement. The ACL will measure children's' attention. The school record can be obtained from the selected schools' record offices. The schools' feeding program coordinators and record officers are expected to participate in data collection to refining the sample and to identify the research participants.

- **Students' roster card.**

The researcher used students' roster cards to collect data from 2014/15 A.Y (2007 E.C) and 2015/16 A.Y (2008 E.C) rosters from eight sample schools. The data collected by using this instrument are average and absence score of the experimental group and comparable group. The researcher has taken the images of all 2007 E.C rosters from grade 1 to 5 and 2008 E.C rosters from grade 2 to 6 to record the research participants' average score and absence score.

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- **Standardized Scale.**

The research has used a standardized instrument called Attention Check List (ACL) to measure the research participants' attention; the tool is primarily developed by Dr. J. P. Das in 1989. The scale was primarily invented to measure Attention Deficit Hyperactive Disorder (ADHD), but it is proved that it can be used for the normal classrooms children. The instrument is developed to measure pupils' attention by their teachers and parents (Papadopoulos et al., 2002).

In this study the scale is used to measure the attention of SFP participants and the non-participant groups. However, in our country's context, teachers are more viable than parents to have more access to know the school children's' classroom attention ability. Thus, the attention measure of the experimental and comparable groups is recorded through ACL by 44 teachers who have at least 7 months of exposure for the research participants. Most of them are homeroom teachers and they teach different subjects of natural, social, art and physical education. This is deliberately done to minimize the subject difference effect on attention score. The proportion of subjects to measure attention is illustrated on annex 10. The maximum score of ACL is 48 and the minimum score is 12.

### **3.7 Reliability and Validity**

The use of quasi-experimental designs minimizes threats to ecological validity as natural environments do not suffer the same problems of artificiality as compared to a well-controlled laboratory setting. For the first two research questions, the study has used DID regression analysis method of quasi experimental research. The regression analysis has used for controlling of differences in initial observed characteristics between comparable and treatment groups and for changes in exogenous variables. The study's information reliability has been ensured by

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gathering similar data from both experimental and comparable groups' roster records. The researcher tested the parallel trend assumption to check the two groups were in similar movement of average score and absence score. This helped the researcher to reduce the chances of having biased information to compare the two groups.

Moreover, since the comparable and experimental groups are selected at follow up period and referring the baseline a year back by checking their roster, the occurrence of attrition bias is avoided (Regalia, 1999). Thus, this research design has greater internal validity than the simple series designs (one group pre-post measure and the two groups within- without measure). To minimize the occurrence of attribution bias, the researcher has used the already assignment of all experimental groups and 6 of 8 comparable schools groups' status. In addition, the research has selected representative sample size proportionally from different strata (Woreda, school, sex, grade and age category). Therefore, it has high external validity.

The research has employed Attention Check List (ACL) to collect data about the children's attention. According to Papadopoulos et al. (2002) a statistically significant overall inter-rater correlation of the test was obtained in normal classrooms, ( $r(108) = 0.75$ ), ( $p < 0.01$ ). Furthermore, a high internal consistency of 0.95 was also obtained. Similarly, the pilot test of the current research has got 0.79 level of internal consistency. These findings support high reliability and validity of the ACL as a screening device of attention in regular classroom settings. These results are also particularly consistent with Das and Melnyk (1989) research, the first study on participants with mental retardation.

### **3.8 Ethical Consideration**

The study has considered respondent's privacy and willingness. The issue of truthfulness, reciprocity, thoroughness, objectivity and relevance principle also applied in all procedures until

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reporting the result. Participants are fully informed as to the purpose of the study and consented verbally. When undertaking research with children, researchers must gain the co-operation of a range of different ‘gatekeepers’, such as school staff and parents (Cree, Kay & Tisdall, 2002). The researcher has used official support letter of Addis Ababa University and Arada sub city education office and has got the permission of sample schools’ principals to conduct the research. In addition, the school children, teachers and record officers was informed that the information they provide and record ( for teachers) kept confidential and undisclosed to anyone else including members of their school community.

### **3.9 Data Analysis and Interpretation Procedure**

The Difference in Difference (DID) linear regression is used to measure the effect of SFP on attendance rate and academic achievement. The regression analysis is done for controlling of differences in initial observed characteristics between comparable and treatment groups and for changes in exogenous variables. The basic assumption of DID model is its ability to reduce the potential selection bias in a situation of unobservable individual characteristics are assumed to be time invariant and its special advantage to minimize the impact of other observable exogenous factors to the program (Regalia, 1999). The mathematical formula to calculate the net difference is;

$$D = (X E1 - X C1) - (X E0 - X C0)$$

Where,  $X$  be the indicator for average and attendance score and the subscript E and C indicate experimental and comparable groups, and time index 0 and 1 indicate the time before and after the implementation of the School Feeding Program.

The simplest set up of the DID model is one where outcomes are observed on two groups for two time periods. One of the groups is exposed to a treatment-SFP in the second period but

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not in the first period. The second group is not exposed to the treatment during either period. In the case where the same units within a group are observed in each time period, the average gain in the second (comparable) group is subtracted from the average gain in the first (experimental) group (Imbens, 2007). The impact of the intervention is the difference in attendance rate and academic achievement outcomes for treatment and control groups after the intervention is implemented.

The students' average score and absence score was recorded from the roster cards and objectively measured. Just for the inferential analysis purpose only, the absence score of the children was changed to attendance rate. Since, 'Yenat Weg' school feeding project started full scale implementation in selected schools in 2015/16 AY, the research has taken 2014/15 AY as a baseline period and the 2015/16 AY as a follow up period.

The independent t-test analysis is used to test the effect of SFP on attention measure. Comparing the mean difference of attention between the two groups' used to test the existence of the effect. The independent t-test analysis is done by the assumption of there is no difference between the mean value of SFP participants and non-participants due to few studies are conducted in Ethiopian context regards to SFP effect on children's' attention measure. The attention measure analysis has used the children's' grade ranges from three to seven and the enrollment year in 2016/17(2009 E.C) AY.

The data was analyzed by using computer software in conformity with the objectives of the study. Primarily, the data was tabulated and encoded on the Statistical Package for Social Sciences (SPSS, version 24.00), cleared and verified. Then, it is transferred to STATA 13 by STATA transfer software for inferential analysis to test the magnitude and the direction of the

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SFP effect on academic achievement and attendance rate. The independent t-test analysis and all case summaries are done on SPSS.

Finally, the interpretation of the finding was presented by sorting all dependent variables (academic achievement, attendance rate and attention) thematically with the reviewed literatures in chapter two in line with the research questions. The participants' score was also analyzed and presented descriptively in accordance with their grade level.

### **3.10 Pilot test**

After the ACL translated to Amharic language to reduce language barrier, the final Amharic version of the instrument was pre tested on sample of 30 (16 male and 14 female) children whose grade ranges from [3-7]. From the participation perspective, 16 children were from the experimental and 14 were from the comparable group. The pilot test sample size is 11.1% and 8% respectively for experimental and comparable groups of the main study's samples. All children were selected from Arbegnoch primary school in Arada sub city. The school is selected due to the severity of children's malnutrition problem under the subjective view of the sub city's SFP coordinator. To prevent test contamination, the questioner was tested only in Arbegnoch School which is not selected for the main study. The responses of the respondents are scored and the internal consistency of the items was computed by using Cronbach's alpha. This procedure uses to omit or modify the items which have low internal consistency for the final study.

The responses of the respondents were scored and the internal consistency of the items on the four sub scales of ACL was computed by using Cronbach's alpha. Thus, the result has shown that items had internal consistency of ( $\alpha = .79$ ). Therefore, the measure is capable and used as it is in the final study.

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### **Chapter Four: Data Analysis and Interpretation**

The analysis of the quasi experimental data is presented under eight sub sections of this chapter. The descriptive statistics analysis; (1) Participants' Demographical characteristics per Group, (2) testing of the parallel trend assumption, (3) average and absence scores movement per group and year, (4) average and absence score difference per year, group and grade ,(5) average and absence score difference between two different periods per group are analyzed and interpreted. Such analyses enabled the researcher to assess the distribution of participants and to show the movement of trend in academic achievement and attendance score. The inferential statistics analysis were employed using DID estimator to evaluate the effect of SFP on students' academic achievement and attendance and independent samples t-test to assess if SFP has effect on children's' attention measure in Arada sub city.

#### **4.1 Participants' Demographical Characteristics per Group**

The data were collected from 320 school children of which 145 children are in the treatment group and 175 are from children in the comparable group. The research analysis touches 13 variables to generate all findings. These are, the information on the group the child belongs to (treatment or comparable), the school they go to, their sex, grade and age, as well as the attendance rate in 2007 E.C, attendance rate in in 2008 E.C, absence score of the first semester in 2007 E.C and absence score of the first semester in 2007 E.C. In addition, it contains data on the average scores in 2007 E.C and average scores in 2008 E.C as well as the subject that the evaluator teachers administered attention measure using ACL which evaluates how well the child in attention measure. Attendance and average scores are measured in 2007 E.C and 2008 E.C whereas attention is measured in 2009 E.C. The case summaries of the observable

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demographical characteristics of school children in the treatment and controlled groups indicated in table 1.

Table 1 - *Participants' Demographical Characteristics per Group*

Demographical Characteristics	Category	Group			
		Comparable		Experimental	
		N	%	N	%
Sex	Male	88	60.9	102	58.3
	Female	57	39.3	73	41.7
Age category	7-11	76	52.4	90	51.4
	12-17	69	47.6	85	48.6
Grade	3	28	19.3	29	16.6
	4	36	24.8	40	22.9
	5	33	22.8	40	22.9
	6	22	15.2	32	18.3
	7	26	17.9	34	19.4

In general, males have the largest share in both groups. The male dominance is come from the already assigned SFP participants share and the selection of the comparable groups with similar characteristics. By using the mean age of the total observation, that is 11.5, the age category is created to show the percentage of age distribution between two groups. In this analysis, the two age categories share equivalent observations in both groups. The schools' representation in the sample of experimental group differs based on the availability of eligible

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children. The lowest representation is from Ras Abebe and Menelik I primary schools with 6.9% and 7.6% share respectively, whereas the largest share is from Key Kokeb primary school (19.3%) and Kebena primary school (17.9%). The detailed share is illustrated in annex 6. Moreover, as can be seen in table 1, the children in the study are ranges from grade 3 to 7 based on the current academic year 2016/17 or 2009 E.C.

### 4.2 Testing the parallel trend assumption

Since the research doesn't use Propensity Score Matching (PSM), it was necessary to test the parallel trend assumption as discussed in chapter 3. The baseline comparison enabled the researcher to show the two groups' movement before the intervention applied. The following two figures show the trend of movement in average and absence score respectively before the intervention applied to the treatment group.

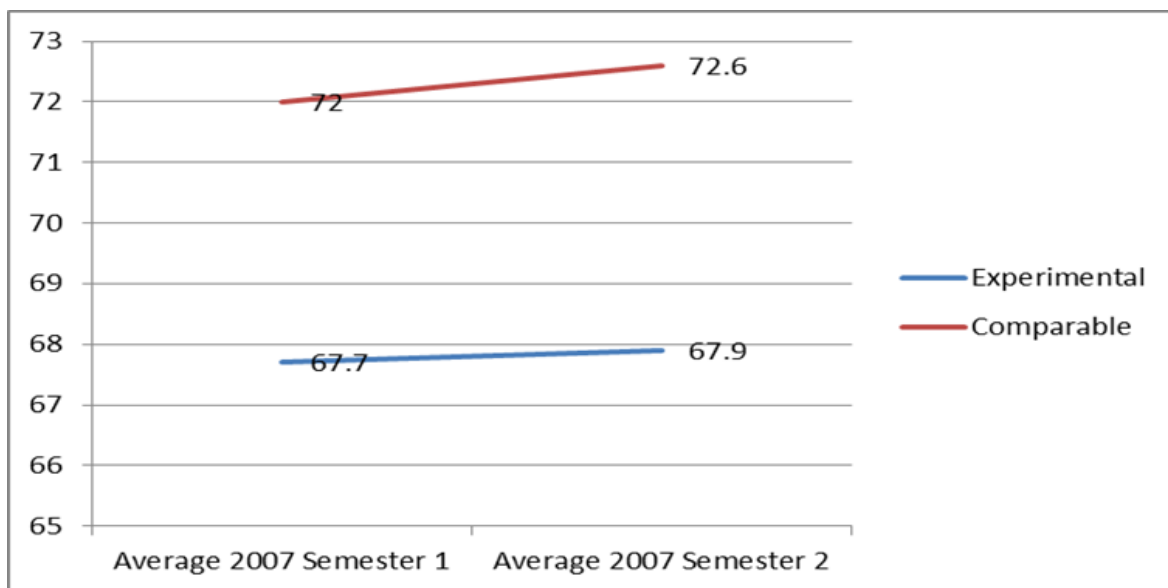


Figure 2 The movement of average score before the implementation of the treatment in 2014/15 A.Y

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As figure 2 shows the mean score of the comparable groups' average score changes by (0.598) mean difference between semester 1 of 2014/15 A.Y (2007 E.C) and semester 2 of the same year. Similarly, the experimental group has shown similar trend of movement before the treatment-SFP applied on it. The mean score change for the average score was (0.219) between the two consecutive semesters in 2007 E.C. This implied that the two groups' average score movement was similar before the SFP has begun.

Similarly the following figure tests the parallel trend assumption on absence score of the comparable and experimental groups. The analysis used the mean scores of absence in consecutive semesters of 2014/15 A.Y (2007 E.C) of the two groups.

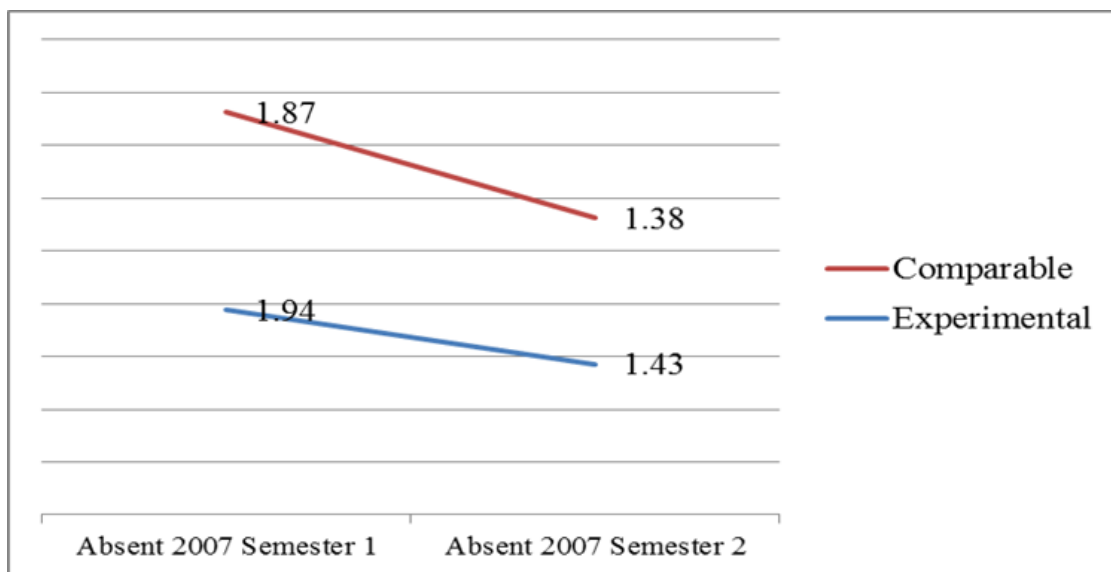


Figure 3 The movement of absence score before the implementation of the treatment in 2014/15 A.Y

Figure 3 shows that the comparable group's mean score of absenteeism decreased by (0.05) within the first and second semester of 2007 E.C. The similar fashion was also observed for the experimental group. This group's mean score of absenteeism was decreased by (0.07) in the consecutive semesters of 2007 E.C (2014/15 A.Y).

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This finding also suggested that the experimental and comparable groups were moving in similar fashion before the implementation of the program. The occurrence of such type of movement fulfills the parallel trend assumption. Thus, the two consecutive analyses in addition to the use of socioeconomic eligibility cut-off criteria of the program implementer and having similar proportion of participation in demographic characteristics is enabled the researcher to create the causal relationship between SFP and academic achievement and attendance.

### 4.3 Average and absence score movement per group and year

The research participants' average and absence score of change is analyzed descriptively and illustrated in the following two figures. The result of these analysis is further analyzed and presented latter using DID estimator to detect the net difference and significant level due to the School Feeding Program.

#### 4.3.1 Average scores movement per group and year.

The average scores change of the experimental and comparable groups is analyzed by the mean values on two time points, that are 2007 E.C and 2008 E.C. Figure 4 illustrated the change.

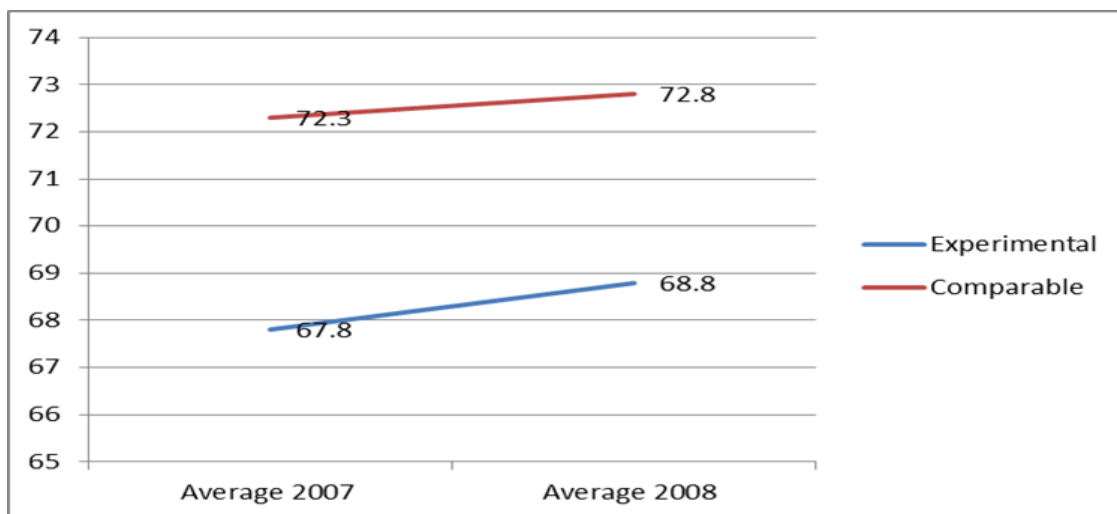


Figure 4 Average scores movement per group and year

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From Figure 4, it can be seen that the movement over time is positive and similar for both groups. Scores increased on average by 1 point (from 67.8 to 68.8) for the experimental group and by half point (from 72.3 to 72.8) for the comparable group. Hence, the difference is not large and the change follows similar fashion.

### 4.3.2 Absence score movement per group and year.

The absence scores change of the experimental and comparable groups is analyzed by the mean values on two time points, that are 2007 E.C and 2008 E.C. Figure 5 illustrated the change.

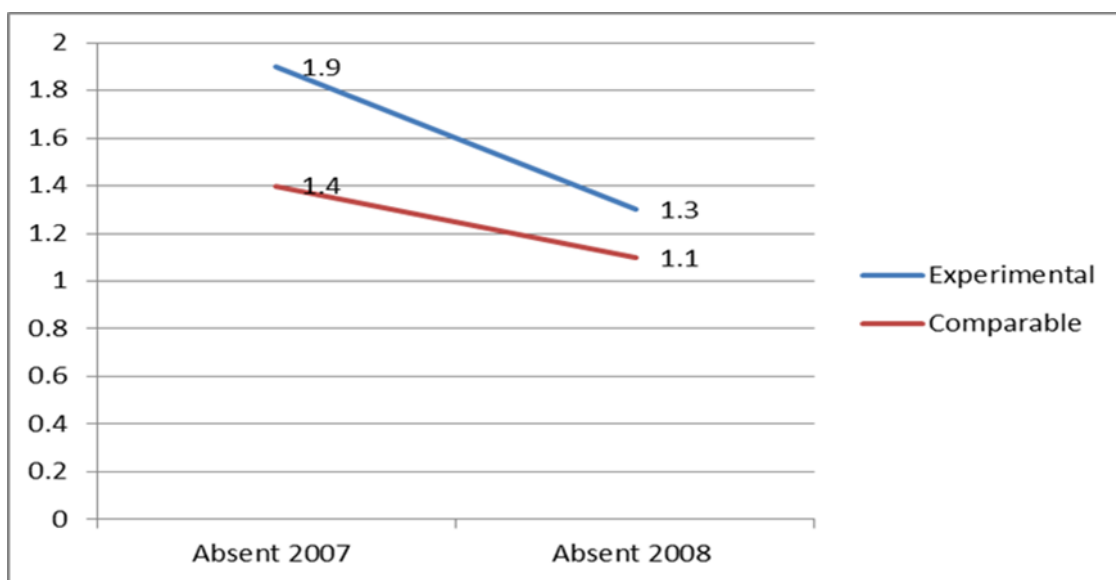


Figure 5 Absence scores movement per group and year

Figure 5 shows that the movement of absence scores in both groups is negative and decreased by an average 0.6 point for the experimental group and by 0.3 point for the comparable group. Hence, the difference is twice and the change follows similar fashion.

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### 4.4 Average and absence score difference per year, group and grade.

Figure 4 and 5 do not show the specific grade level contribution for the positive movement and do not illustrate which grades were lagged. However, the following two tables are provided to give specific information about each grade level movement on average and absence score.

#### 4.4.1 Average score difference per year, group and grade.

Table 2 is generated to show each grade levels movement on average score. The positive numbers indicate the upward movement between 2007 E.C and 2008 E.C whereas the negative numbers indicate the reverse movement in the specified period.

Table 2 *Difference between 2007 E.C and 2008 E.C average score per group and grade*

Grade	Treatment Group	Comparable Group
Grade 3 (from Grade 1 to2)	2.8	1
Grade 4 (from Grade 2 to3)	-0.2	-0.6
Grade 5 (from Grade 3 to 4)	-2	-0.7
Grade 6 (from Grade 4 to5)	4.1	-0.2
Grade 7 (from Grade 5 to 6)	1.9	3.3
All Grades	1	0.5

Note that the information in the table is presented as a difference between the scores. As such, a negative number represents a worsening of the academic performance whereas a positive number indicates an improvement. Overall, no distinct pattern of improvement emerges. Looking

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at the table by grades, one can observe the unevenness of the effect. There is a big positive jump for experimental children in Grades 3 and Grade 6 and a decline for experimental children in Grade 4 and 5. Since quasi-experimental researches do not employ randomization and have lower ability than the experimental researchers to control confounding variables, the decline results of grade 4 and 5 of the experimental groups may emanate from other uncontrolled confounding factors.

### 4.4.2 Absence score difference per year, group and grade.

Table 3 shows the difference of absent score per group within time change. Notice that in contrast to table-2 interpretation, table's 3 negative values show advancement in attendance, 0 value show no change and positive values indicated worsening of attendance score.

Table 3 *Difference between 2007 E.C and 2008 E.C absent score per group and grade*

Grade	Treatment Group	Control Group
Grade 3(from Grade 1 to2)	-1.7	-1.6
Grade 4 (from Grade 2 to3)	0	0.6
Grade 5(from Grade 3 to 4)	-0.5	0.4
Grade 6(from Grade 4 to5)	-1	-0.7
Grade 7(from Grade 5 to 6)	-0.2	-0.8
All Grades	-0.6	-0.3

Looking at the data for absence in the above table, the results are similar to those of exam scores, albeit with a different sign, the effect is larger for the treatment group but not large (in absolute terms). As table 3 shows, the larger decrement in absence is observed in grade 3. Grades

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4 and 5 of the comparable groups have shown the largest decrement in attendance. These results connote the SFP positive contribution for decreasing children's' absence score.

### 4.5 Average and absence score difference between two different periods per group

The study has tried to analyze and compare the average and absence score difference before and after the intervention. This analysis enables the researcher to detect the movement of change within the time period. To compute this analysis, the 2007 E.C average score of the groups' per semester is recorded and considered as first period and the 2007 E.C to 2008 E.C movement taken as second period.

#### 4.5.1 Average score difference between two different periods per group.

The average score difference between the first period (within the 2007 E.C semesters) and second period (2007 E.C to 2008 E.C) movement per group is analyzed to observe the movement of change within the time period. The result of the analysis is presented in table 4;

Table 4 *Average score difference between two different periods per group*

2007 E.C			Year in E.C			
1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	(d)	Group	2007	2008	(d)
67.7	67.9	0.5	Experimental	67.8	68.8	1
72	72.6	0.6	Comparable	72.3	72.8	0.5

As the table 4 shows, the experimental group movement of advancement in the (first-second) semester of 2007 E.C has shown marked rise in (2007 E.C - 2008 E.C). The difference is increased twice from (d=0.5 to d=1). In contrast, the comparable group has been shown a slight fall in average score increment pace in the second paths. That is, the score difference decreased from (d=0.6 to d=0.5).

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### 4.5.2 Absence score difference between two different periods per group.

The absent score difference between the first period (within the 2007 E.C semesters) movement and second period ( 2007 E.C to 2008 E.C) movement per group is also analyzed to observe the movement of change within the time period. The result of the analysis is shown in table 5.

Table 5 *Absence score difference between two different periods per group*

2007 E.C			Year in E.C			
1 <sup>st</sup> Semester	2 <sup>nd</sup> Semester	(d)	Group	2007	2008	(d)
1.94	1.87	0.07	Experimental	1.9	1.3	0.6
1.43	1.38	0.05	Comparable	1.4	1.1	0.3

As table 5 shows, though both groups decreased their absent scores, the change of difference is still a bit larger in the movement of the experimental group. That is (d=0.07 to d=0.6) and (d=0.05 to d=0.3) respectively for the experimental and comparable group.

### 4.6 Difference in difference analysis of academic achievement

Difference in Difference (DID) is a method of analysis that allows the researcher to extract the effect of a treatment by netting out the effect of the passage of time by considering any pre-treatment group differences. Table 6 contains the results of the DID linear regression analysis for the simple case-column using time and group variables. Since, the DID analysis table is generated using the hash tag method of STATA software table generation, the coefficient for 'time#treated' is the DID estimator in the original table (see annex 9) and now named DID for readers' understanding.

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Table 6 - *DID Regression results for average score*

	Coef.
time	0.464 (0.38)
group	-4.530** (-3.33)
DiD	0.541 (0.29)
P>  t	0.774
_cons	72.30 (81.79)
<i>N</i>	640

*t* statistics in parentheses

\*\* $p < 0.05$

Table 6 shows the variable time captures differences over times that are not related to the treatment. The variable group captures the relevance of pre-treatment group differences. The value for time is not statistically significant at the 5% level. However, the value for group alone is significant. It reveals that there was significant initial difference in mean score at baseline point of 2014/15 A.Y cumulative average (67.8 for experimental group and 72.3 for comparable group). The distinct difference between the groups is not surprising as a reason of the group's selection before the treatment was not random and it does not affect the result because DID calculates just the difference in change of mean rather comparing the raw mean score of the groups.

The estimated DID coefficient for School Feeding Program is positive but not significant (coefficient = 0.541,  $p = 0.774$ ) for the average score difference after the implementation of the program. This result is interpreted as; the net effect of the intervention presents less incentive for the program participants to improve their average score.

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### 4.7 Difference in Difference analysis of attendance

The Difference in Difference linear regression was also run to estimate the net effect of time within the experimental and comparable groups for attendance. Table 7 provides the finding in simplest way.

Table 7 *DID regression results for attendance score*

	Coef.
time	0.001 (0.90)
group	-0.003 (-1.53)
DiD	0.002 (0.93)
p>  t	0.351
_cons	0.993 (911.3)
<i>N</i>	640

*t* statistics in parentheses

Table 7 shows that the estimated coefficient for the program is positive but not significant (Coefficient of DID = 0.002,  $p= 0.351$ ) indicates a very small upward shift of attendance score is brought due to SFP. However, this improvement of attendance has minimum contribution for SFP beneficiaries.

### 4.8 Independent t-test analysis for attention measure

Finally, the independent sample t-test analysis is done to test the effect of attention on SFP participants' attention score by calculating the mean score difference and the standard deviation values of the two groups. The following tables briefly expressed the result.

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Table 8 *Number of children and groups' mean of attention*

Group (Experimental and Comparable)	n	Mean	SD
Experimental	145	32.51	7.01
Comparable	175	33.78	7.2

Table 9 *Independent t-test analyses (equal variance assumed) for attention*

t	Sig. (2-tailed)	Mean Difference
-1.587	0.114	-1.267

As it described in data analysis procedure, the independent t-test analysis is done by the assumption of there is no difference between the two groups attention measure due to few works are done regards to SFP effect in Ethiopian contexts. Table 8 has shown that, the mean values and Standard Deviations are (M= 32.5, SD=7.01, n=145) and (M=33.78, SD=7.2, n=175) respectively for experimental group and comparable group. Since the two groups' mean and standard deviation is roughly similar, the two groups lie under similar point of the normal curve. Table 9 has shown that (d= -1.267) mean difference is observed between the two groups with regards to attention. Table 9 has also shown that at (p>0.05), two tailed; insignificant effect is shown. This implied that SFP does not have any contribution for the program participants. In other words the analysis cannot show the causal relationship between SFP and attention.

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### Chapter five: Discussion

In this section, major findings of the study are discussed based on the data analysis and interpretation chapter. The present study was designed to assess the effect of SFP on academic achievement, attendance and attention. Thus, the following sections of this chapter discussed the research finding in line with the relevant theoretical explanations provided, previous empirical studies on similar issue and the specific research questions.

According to White & Sabarwal (2014), it is possible to do the DID regression analysis and other descriptive measures, if the test of the parallel trend assumption shows similar movement between the experimental and comparable groups. Hence, in the current research, the test of parallel assumption has shown that the two groups were in similar movement of average and absence score before the program implementation. Moreover, the groups' demographical characteristics analysis has shown the proportional distribution in sex, age and grade level.

#### 5.1 SFP and Academic Achievement

Prior studies that have noted the importance of nutrition for the children learning and performance in school emphasized the effect of malnourishment to attend school regularly and which in turn leads to poor academic performances. These studies advocate school meals improved nutrition and bring educational achievements due to its primary effect on child nutrition (Kazianga et al., 2009; Vermeersch and Kremer, 2004; Neeser, 2012).

The intervention-SFP doesn't have significant positive effect on academic achievement of Arada sub city SFP participants. This implied that the program participants don't gain significant benefit of SFP regards to academic achievement. Thus, the current research finding just gives less favorable support for Ahmed (2004); Chepkwony et al. (2013) and Afridi et al. (2013) studies which have got significant effect of the program on academic achievement in

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different countries. However, the current research finds out that School Feeding Program of Arada Sub City has a small positive effect (with the largest share of positive movement in grade 3 and 6) on the feeding participants' academic achievement. In this case, the finding supports the Ahmed (2004); Chepkwony et al. (2013) and Afridi et al. (2013) studies which links nutrition and educational performances.

Kazianga et al. (2009), highlight the determinants of SFP which can hinder its effectiveness regards academic achievement such as allocation of teachers to SFP administration could decrease the actual teaching time and classrooms overcrowded due to enrollment increase negatively affects the teaching-learning process ( lacking resource and difficult to follow-up children by decreasing students' academic achievement). However, in Addis Ababa's case the program runs in all public schools, hence, the overcrowding effect and its consequences have low possibility of emergence. However, the teachers over involvement in the implementation of the program with other duties may consider as a hindering effect of children's' academic achievement. Other factors may also affect the possible occurrence of significant effect such as, poor education quality, health determinants, family follow-up etc. which cannot be fully controlled in such quasi-experimental design nature.

The current research finding corroborates the ideas of (Ermias, 2008), who suggested that SFP has not significant positive effect on academic performance and Woodhouse & Lamport, (2012) recommendation that improvements in the nutritional quality of students' diets are associated with academically beneficial gains but have not been repeatedly and causally correlated to increased academic achievement. Similarly, this research cannot show the significant effect of the program that consist more diversified and culturally sensitive diets than the formal non HGSFP.

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The net effect of the program on academic achievement is unevenly distributed by grade. The current grade 3 and 6 of the experimental group has scored larger difference on average compared to the comparable group and grade 4 and 5 deteriorate on their average score after the program run for a year. This finding clicks Hinrichs (2010) research result which shows that the SFP has different educational outcomes across different grade level and Kazianga et al., (2009) finding of active labor market may fail to improve attendance and academic performance for a larger number of children. Therefore the observed deterioration in grade 4 and 5 could be the result of the uncontrolled confounding variables such as the level of labor market in the area, health status, hidden negative effect of the program itself such as psychological effects, etc.

The research has also found the positive effect of the program by comparing the pace of movement of the experimental and comparable groups' before and after the implementation. In this regard, the average score change of experimental and comparable group before the implementation (referring the two consecutive semester of 2007 E.C). The result has shown that the experimental group has scored a 0.8 advancement whereas the control group's movement deteriorated by 0.1. If this movement continues; the research predicted that the possible occurrence of significant effect in the long term implementation of the program. In general any program has short and long term outcomes, hence, the finding of the current research regards the positive small advancement in average score may advance significantly while the program continue running. This in turn, has a possibility of increasing the benefit of children due to the program by improving their academic achievement.

### **5.2 SFP and Attendance**

The second question in this research was "Does SFP has significant positive effect on children's academic achievement in Arada sub city? In this case, the research finding has shown

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insignificant positive effect of attendance due to the SFP in Arada sub city of Addis Ababa. Thus the program doesn't have significantly contribution to improve the children's' attendance rate.

However, the research can detect the program's small positive effect to improve attendance rate.

This finding is consistent with Ahmed (2004) finding which states that the impact of SFP on school attendance is positive though small. In his finding, the SFP contributes for the increment of participating students' school attendance by 1.34 days a month, which is 6 percent of total school days a month. Jacoby & Cueto (1996) also found that, a school breakfast increased attendance rates of fourth and fifth-grade students by 0.58 percentage points in the treatment schools.

The present finding is contradicted with the findings of SFP researchers such as (Ermias, 2008; Alderman & Bundy, 2012) who have found the significant positive effect of SFP on attendance. However, the current research finding is in agreement with Dheressa (2011) who has found SFP has not significant effect on attendance. The insignificant effect of attendance may emanate from other cofactors of attendance. Some of the reasons are; unhealthiness to attend school regularly (Kazianga et al., 2009) and household income, education and age level are also hindrances of children's' attendance (Dheressa, 2011).

The nonequivalent effect of grades is also shown on attendance score. Similarly with average score, the current grade 3 and 6 of the experimental group has scored larger difference on attendance compared to the comparable group in the one year implementation period. This score difference within the lower grade levels suggested the need of closer view on Hinrichs (2010) discussion of SFP participation in lower grade has weaker effect than latter grades involvement.

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### 5.3 SFP and Attention

Based on the reviewed literature, different authors made theoretical interaction of nutrition and attention. According to Kazianga et al., 2009, hungry children encounter difficulties to concentrate and perform complex tasks than well-nourished ones. Poor nutrition among children affects their cognitive function and hence reduces their ability to participate in learning activities at school. Maslow also argues that humans cannot concentrate and pay attention to attain academic achievement unless their basic nutritional need is satisfied (Woodhouse and Lamport, 2012).

The current study is also set out with the aim of evaluating the significant effect of SFP on the attention of children. However, the research finding has shown that SFP has not effect on the participants' attention measure due to the observed insignificant difference between the two groups mean difference after the maximum possible control of other confounding variable in the research design. Thus the children are not benefited to increase their attention measure due to the SFP.

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### **Chapter Six: Conclusion, Implications and Recommendation**

On the basis of the discussion presented in the preceding chapter, this chapter attempts to give conclusion and outline the implication for social work.

#### **6.1 Conclusion**

This research has been made attempts to assess the effect of school feeding program on the educational performance of primary public school children who are receiving support from ‘Yenat Weg’ charitable society in Arada sub city of Addis Ababa. The research has employed relatively strong statistical test of quasi experimental design-DID, particularly for academic achievement and attendance. It has also tried to have similar comparable groups by controlling sex, age and grade distribution in addition of other socio-economic criteria for both groups based on ‘Yenat Weg’ charitable society socio economic eligibility cut-off criteria and by proving the two groups’ similar fashion of movement on average and attendance score. Moreover, the research assumed that the two groups were also in similar movement in attention ability by conducting correlation analysis on average score of 2015/16 A.Y and attention measure of 2016/17 A.Y. Hence, it could be inferred that the observed difference between the two groups in terms of educational performance indicators is attributed to the effect of the program.

Findings from this study provide further evidence that, though the result has shown School Feeding Program has some positive effect on children’s’ academic achievement and attendance, yet its effect on the aforementioned components of educational performance is not statistically significant in the specified research area. Furthermore, the program induced negligible effect on the program participant children’s’ attention. This implied that the existing program presents less incentive to enhance academic achievement, attendance and attention of the school children.

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Despite the observed insignificant positive effect of school feeding on academic achievement and attendance, the SFP altered the pace of movement on average and attendance score between the two groups in addition to be inevitable solution for the possible occurrence of short term hunger among urban school children. This can be explained as, after the implementation of the program, the experimental group preceded the comparable group in both ways of movement that is in average increment and absent decrement. The magnitude of difference was the reverse before the implementation of the program. This implied that if the program implementation continues; considering that other conditions being the same, the program effect will improve more to the possible occurrence of significant effect on academic achievement and attendance score of the school feeding participants. However, for the time being, the positive effect of School Feeding Program is not giving sizable contribution to school children.

### **6.2 Implication for Social Work**

The findings of the current research are important for the profession of social work to create tremendous and effective intervention in different aspects. The followings are the basic findings of the current research relating with social work profession that indicated implications of the study for social work practice, education, research and policy.

The practice implication of this study for social work profession starts from at school level implementation. Because the main purpose of the schools is education, social workers in school settings are expected to support this educational purpose. The school social worker's very diverse roles encompass consultation, facilitation, advocacy, collaboration, education, mediation and intervention. Thus, their roles in the implementation of SFP are crossing over identification of children in need of SFP to the service delivery to school children.

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Implementers with the help of school social workers are supposed to enhance the source and amount of fund to scale up the SFP coverage and service delivery quality for further effect of the program. Attaining an advance collaborative relationship with government is also a pivotal element of the program success. The school social workers' participation in the implementation of SFP helps teachers to focus on teaching-learning process which contributes for the advancement of treatment effect.

The study's implication for Social Work education goes to the inculcation of the relevance, effectiveness and modality differences of SFP into its curriculum, specifically in the education of school based interventions, policy analysis and working with children courses. Such kind of measure enables social work students to fully involve in SFPs design, implementation and evaluation steps. In fact, this will be applicable when the education sector authorities give recognition for the professional intervention of social workers on school activities. Moreover, the current research finding could be used as a reference for school social workers and other concerned bodies who work on SFP.

The study can contribute for social work research in the following manners. The current research could be a source for SFP effect in Addis Ababa context. Moreover, since social workers deal with the social enhancement programs and work with vulnerable groups, further researches could be done by social workers by conducting research on the goal and cost effectiveness, need and implementation of SFP and distinguish the major gaps of current services, identify target groups and prioritize actions accordingly.

At macro level, social workers could influence legislatures and policy draft developers to enact laws and social policy guidelines that have direct effect on unmet points of the SFP to the benefit of the community in general and program participant children in particular. Social

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workers also work at mezzo level together with the program participants, governmental and nongovernmental organizations in addition to SFP coordinating units in provision of the intervention to enhance the effectiveness of the program and in searching for finance for the program.

### **6.3 Recommendations**

To further enhance the effectiveness of SFP on the school performance of Arada sub city school children, the following recommendations are made:

- The negative results on children's' average score suggested that further studies need to be done with more focus on the investigation of possible moderators which have impact on the components of school performance. Thus, the research recommends that SFP is suggested to be seen with ecosystem theory/ generalist eclectic framework to evaluate its effect with other attributes in the social system such as quality education, instructional media delivery, family follow-up, educational facilities, health status, psychological problems like feeling of inferiority due to the program participation etc.
- Similarly, future studies on current topic, area and research participants with longitudinal basis, are highly recommended to test the long term effect of Yenat Weg's School Feeding Program on school performance.
- Further research is needed to answer the reason of differences on the average score across grade level.
- SFP Implementers with the help of social workers should enhance the source and amount of fund to scale up the program coverage and service delivery quality for further effect of the program. Moreover, attaining an advance collaborative relationship with government is also a pivotal element of the program success.

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- Continuous assessment should be done to evaluate the challenges and problems affecting the quality and performance of the program implementation.
- Awareness creation for legislators, policy draft developers, donors, school staff and the community at large should be given so as to enhance efficiency and effectiveness of the program.
- Since SFP determines the fate of many vulnerable school children, secondary beneficiaries (small scale farmers and people on the chain of food preparation) and the community at large, it needs the attention of social work profession. The concern should also extend to the treatment of the issue based on the principle of “best interest of the child”.
- The program should involve professional social workers at different levels of steps and structure to get technical support (need assessment, implementation, advocacy, evaluation, etc.) for further effect and quality of the service delivery.
- All stakeholders including social workers working on School Feeding Program need to focus at mezzo and macro level interventions to enhance the program effectiveness.

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## Part two-Attention Check List

**Instruction- 2 Read each item and circles the scale to what degree the children's' classroom**

### **Behavior reflects**

#### Attention Check List (ACL)

Observation	Not at all	Just a little	Pretty much	Very much
1. Does the child have a short attention span?	4	3	2	1
2. Does the child appear detached from class activities?	4	3	2	1
3. Does the child accurately heed directions?	1	2	3	4
4. Does the child daydream in class?	4	3	2	1
5. Does the child have trouble concentrating?	4	3	2	1
6. Does the child stay with one activity long enough to complete it?	1	2	3	4
7. Does the child work independently?	1	2	3	4
8. Is the child easily distracted?	4	3	2	1
9. Is the child able to concentrate on a task until completed?	1	2	3	4
10. Does the child listen attentively?	1	2	3	4
11. Does the child become easily engrossed in an activity?	1	2	3	4
12. Does the child disregard some or all directions?	4	3	2	1

School Code\_\_\_\_\_

Student Code\_\_\_\_\_

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Annex-2 The Amharic Version of Attention Check List

አዲስ አበባ ዩኒቨርሲቲ

የሶሻል ወርክ ድህረ ምረቃ ትምህርት ቤት

የተማሪዎች የአትኩሮት መጠንን ለመለካት በመምህራን የሚሞላ መጠይቅ

ይህ መጠይቅ የቀረበው በአዲስ አበባ ዩኒቨርሲቲ የሶሻል ወርክ ትምህርት ቤት የሁለተኛ ዲግሪ ተመሪ በሆኑት በ አቢይ ዮሐንስ ነው። ይህን መጠይቅ በመተንተን የማገኘው ውጤት የአራዳ ክፍለ ከተማ የተማሪዎች ምግብ ምገባ ፕሮግራምን አስመልክቶ ለምሳሌው ጥናት የፕሮግራሙ ተጠቃሚ ልጆችን የአትኩሮት መጠን ለመለካትና የተጽዕኖ ግምገማ በማድረግ በቀጣይ ፕሮግራሙን ለማሻሻል የሚረዱ ምክረ ሀሳቦችን ለማመንጨት ያስችላል። ስለትብብርዎ በቅድሚያ አመሰግናለሁ።

አጠቃላይ መመሪያ

1. እባክዎ መጠይቁን ለመሙላት የጥናቱ ተሳታፊ ልጆችን የዚህን ሳምንት የትኩረት መጠንን እርስዎ በሚያስተምሩት ትምህርት ታሳቢ ያድርጉ።
2. በመጠይቁ ላይ የተማሪው/ዋን ስም መጻፍ አያስፈልግም።
3. መጠይቁ ሁለት ክፍሎች አሉት፤ የመጀመሪያው ክፍል የተማሪው/ዋን አጠቃላይ መረጃ የተመለከተ ሲሆን 4 ጥያቄዎችን ይዟል፤ ሁለተኛው ክፍል የአትኩሮት መጠንን የተመለከቱ 12 ጥያቄዎችን ይዟል።
4. የመጀመሪያው ክፍል መረጃ ፣ የትምህርት ቤቱ እና የተማሪው/ዋ መለያ ቁጥር በአጥፊው ተሞልቶ ይቀርባል። እባክዎን የሁለተኛውን ክፍል መመሪያ በጥንቃቄ በማንበብ ምላሽዎን ይስጡ።
5. መጠይቁን የሚሞላው/ምትሞላው መምህር/ት መረጃው የሚሞላለትን/ላትን ተማሪ በ 2009 ዓ.ም የሚያስተምር/ የምታስተምር ሊሆን/ልትሆን ይገባል።

ክፍል ስንድ- ግሰሰባዊ መረጃ

መመሪያ-1 ስባክዎ በሳጥኑ ውስጥ “✓ “ ምሰክት ያድርጉ።

1. ደታ                      ወንድ  ሴት
2. ስድሜ                      \_\_\_\_\_
3. የክፍል ደረጃ                      ሶስተኛ                       ስራተኛ   
    ስምስተኛ                       ስድስተኛ   
    ሰባተኛ
4. መምህሩ/ች ተማሪው/ዋን የሚያስተምረው/የምታስተምረዉ የትምህርት ስደነት \_\_\_\_\_

የትምህርት ቤቱ መስደ ቁጥር \_\_\_\_\_ የተማሪው/ዋ መስደ ቁጥር \_\_\_\_\_

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የስትሁይት መጠን መመዘኛ

መመዘኛ-2 ስብከት የሚከተሉትን መሰኪያዎች በማንበብ የሰጧ/ሹቷን የ 2009 ዓ.ም የትምህርት ዘመን ቅደብ ታሳቢ

በማድረግ መሰኪያዎቹ የክፍል ውስጥ ባህሪው/ዋን የሚያንጸባረቁበትን መጠን ስማሳየት መመዘኛ ነጥቦችን ያክብቡ።

የስትሁይት መጠን መመዘኛ (Attention Check List)

ምስክታ	ፎድሞ የስም	በጥቂቱ	በብዛት	በጣም በብዛት
1. ስጦ/ስጦታ ስምር የስትሁይት መጠን( Attention span)				
ስስው/ሳት?	4	3	2	1
2. ስጦ/ስጦታ ክፍል ውስጥ የትምህርት ተግባራት				
ስራሱን/ሷን ያርቃል/ታርቃላለች?	4	3	2	1
3. ስጦ/ስጦታ ስክፍል ውስጥ መመሪያዎች በትክክል ትኩረት				
ይሰማል/ትሰማለች?	1	2	3	4
4. ስጦ/ስጦታ ሕዳኑ በክፍል ውስጥ በሀሳብ ይፈዳል/ትፈዳለች?	4	3	2	1
5. ስጦ/ስጦታ በስንድ ነገር ሳይ የማተኮር ችግር ስለበት/ሳት?	4	3	2	1
6. ስጦ/ስጦታ ስንድን ተግባር ስመጨረስ በትሰግስት				
ይቅደስ/ትቅደስለች?	1	2	3	4
7. ስጦ/ስጦታ ስብቻው መስራት ይችላል/ትችላለች?	1	2	3	4
8. ስጦ/ስጦታ በቀሳቡ ይረበሻል/ትረበሻለች?	4	3	2	1
9. ስጦ/ስጦታ የተሰጠው/ሳት ተግባር ስለከፈለች/ትከፈለች				
ስትኩር/ራ መስራት ይችላል/ትችላለች?	1	2	3	4
10. ስጦ/ስጦታ በጥሞና ማዳመጥ ይችላል/ትችላለች?	1	2	3	4
11. ስጦ/ስጦታ ክፍል ውስጥ በሚሰራው ስራ በቀሳቡ				
ይመሰግናል?	1	2	3	4
12. ስጦ/ስጦታ ክፍሎችን ወይም ሁሉንም መመሪያዎች				
ቻል ይሳል/ትሳለች?	4	3	2	1

የትምህርት ቤቱ መስያ ቁጥር \_\_\_\_\_

የተማሪው/ዋ መስያ ቁጥር \_\_\_\_\_

## THE EFFECT OF SCHOOL FEEDING PROGRAM

### Annex-3

#### **Checklist Developed by the Researcher to collect data from the School Roster**

1. The age of children in 2014/15, 2015/16 and 2016/17.
2. The grade of the children in 2014/15, 2015/16 and 2016/17.
3. The sex of the children.
4. The average score of the experimental and comparable groups in 2014/15 A.Y.
5. The average score of the experimental and comparable groups in 2015/16 A.Y.
6. The absent score of the experimental and comparable groups in 2014/15 A.Y.
7. The absent score of the experimental and comparable groups in 2015/16 A.Y.
8. The attendance rate of the experimental and comparable groups in 2014/15 A.Y.
9. The attendance rate of the experimental and comparable groups in 2015/16 A.Y.
10. The absent score of the experimental and comparable groups of 2014/15 A.Y (2007 E.C)  
first semester.
11. The absent score of the experimental and comparable groups of 2014/15 A.Y (2007 E.C)  
second semester.

# THE EFFECT OF SCHOOL FEEDING PROGRAM

## Annex-4 Arada sub city location map by Woreda administration

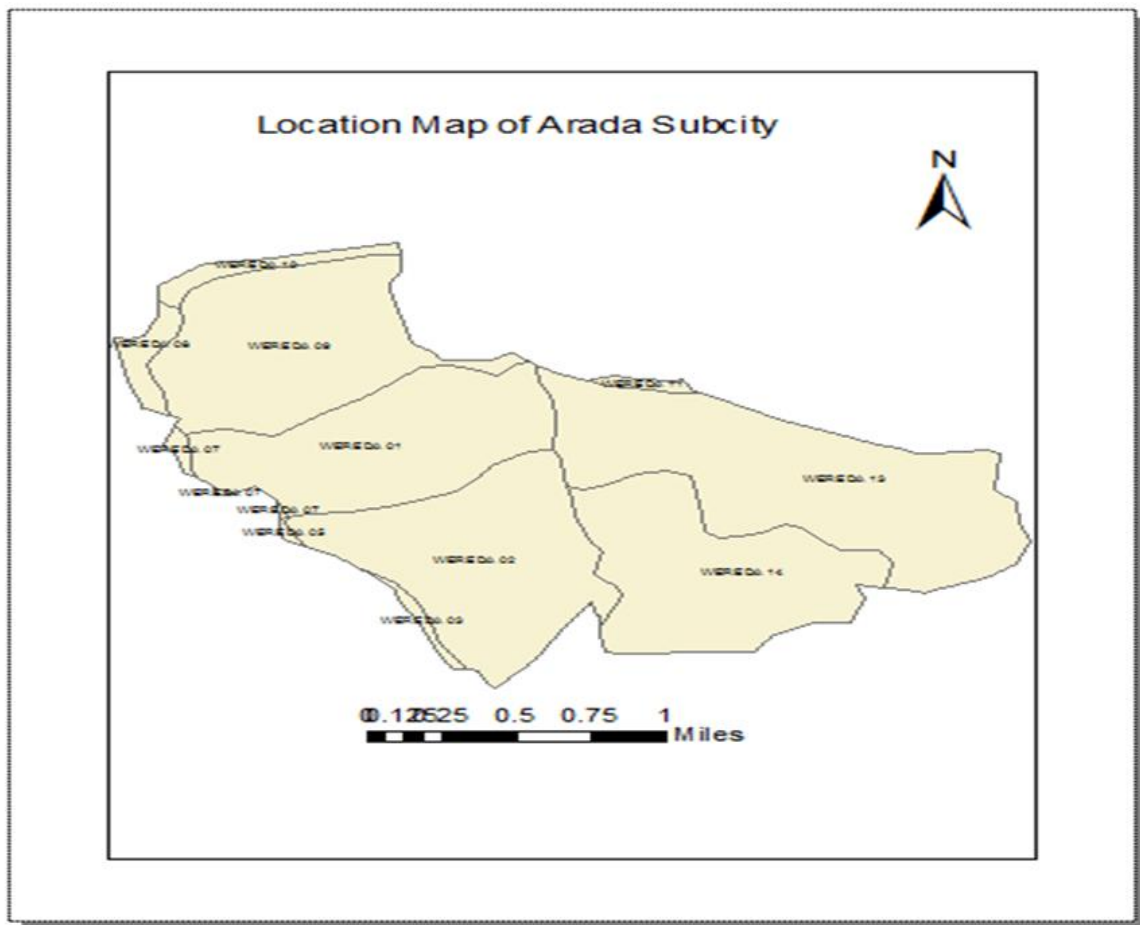


Figure 1 Arada sub city location map by Woreda administration

Source: Addis Ababa Land Development and Management Bureau, 2016

THE EFFECT OF SCHOOL FEEDING PROGRAM

**Annex-5 Report of beneficiary and needy children of sample schools in 2015/16 A.Y**

Table 1 *Beneficiary and needy children of sample schools in 2015/16 A.Y*

Sch. Code	Name of school	W or ed a	Total No. of students			Beneficiary of 'Yenat Weg' SFP (For experimental group)			Need request students (For comparable group)		
			M	F	T	M	F	T	M	F	T
1	Ras Abebe	5	198	217	415	38	32	70	150	200	350
2	Bhere Ethiopia	7	239	400	639	43	31	74	-	-	74
3	Kebena	7	153	235	388	34	40	74	25	27	52
4	New Era	5	662	590	1252	50	25	75	15	15	30
5	Atse Na'od	6	321	356	677	45	25	70	-	-	-
6	Key Kokeb	2	343	382	725	52	22	74	-	-	-
7	Mehal Genfele	9	146	194	340	29	44	73	11	12	23
8	Menelik I	9	132	157	289	41	38	79	15	20	35
Total			2194	2531	4725	332	257	589			

Source; Arada Sub City Education Office, 2016

# THE EFFECT OF SCHOOL FEEDING PROGRAM

## Annex-6 Case Summaries of SFP Participant Samples per School

Table 2 *SFP participants per school*

Case Summaries		
School Code	% of Total	
	N	N
Ras Abebe	10	6.9%
Behere	13	9.0%
Ethiopia		
Kebena	26	17.9%
New Era	15	10.3%
Atse Naod	22	15.2%
Key Kokeb	28	19.3%
Mehal Genfele	20	13.8%
Menelik I	11	7.6%
Total	145	100.0%

# THE EFFECT OF SCHOOL FEEDING PROGRAM

## Annex-7 Case Summaries with Covariate Variables

Table 3 *Observation per group and grade*

Group ( Experimental n Comparable)	Grade 2009	N
Comparable	3	29
	4	40
	5	40
	6	32
	7	34
	Total	175
Experimental	3	28
	4	36
	5	33
	6	22
	7	26
	Total	145

Table 4 *Observation per group and sex*

Group ( Experimental n Comparable)	Sex	N
Comparable	Male	102
	Female	73
	Total	175
Experimental	Male	88
	Female	57
	Total	145
Total	Male	190
	Female	130
	Total	320

Table 5 *Observation per group and age category*

Group ( Experimental n Comparable)	Age Group	N
Comparable	7-11	90
	12-17	85
	Total	175
Experimental	7-11	76
	12-17	69
	Total	145
Total	7-11	166
	12-17	154
	Total	320

# THE EFFECT OF SCHOOL FEEDING PROGRAM

## Annex-8 Case Summaries of Testing Parallel Trend Assumption

Table 6 *Case summaries of testing the parallel trend assumption*

Group ( Experimental n Comparable)		Average 2007	Average 2007	Absent 2007	Absent 2007
		Semester 1	Semester 2	Semester 1	Semester 2
Comparable	N	175	175	175	175
	Mean	71.840	72.438	.69	.64
Experimental	N	145	145	145	145
	Mean	67.857	68.076	.97	.90
Total	N	320	320	320	320
	Mean	70.035	70.462	.82	.76

# THE EFFECT OF SCHOOL FEEDING PROGRAM

## Annex-9 Simple DID Analysis for Average Score and Attendance

Table 7 DID linear regression tables for average and attendance

```

. *****
. *** Step 2 - Simple DiD analysis
. *****
.
. *** First on the average score
. reg average time##group, vce(robust)

```

```

Linear regression                               Number of obs =    640
                                                F( 3, 636) =    7.05
                                                Prob > F    = 0.0001
                                                R-squared   = 0.0326
                                                Root MSE   = 11.77

```

average	Robust		t	P> t	[95% Conf. Interval]	
	Coef.	Std. Err.				
1.time	.4640002	1.208879	0.38	0.701	-1.909877	2.837878
1.group	-4.530256	1.360628	-3.33	0.001	-7.202123	-1.858389
time#group						
1 1	.540758	1.884126	0.29	0.774	-3.159101	4.240617
_cons	72.30343	.883993	81.79	0.000	70.56753	74.03933

```

. * eststo: quietly reg average time##group, vce(robust)
. *** Then on attendance
. reg attendance time##group, vce(robust)

```

```

Linear regression                               Number of obs =    640
                                                F( 3, 636) =    1.76
                                                Prob > F    = 0.1531
                                                R-squared   = 0.0112
                                                Root MSE   = .01524

```

attendance	Robust		t	P> t	[95% Conf. Interval]	
	Coef.	Std. Err.				
1.time	.0013143	.0014524	0.90	0.366	-.0015378	.0041664
1.group	-.0030538	.0019927	-1.53	0.126	-.0069669	.0008593
time#group						
1 1	.0023064	.0024705	0.93	0.351	-.0025449	.0071577
_cons	.99324	.0010899	911.31	0.000	.9910998	.9953803

```

. * eststo: quietly reg attendance time##group, vce(robust)
.

```

end of do-file

```

. do "C:\Users\nigussie\AppData\Local\Temp\STD05000000.tmp"

```

## THE EFFECT OF SCHOOL FEEDING PROGRAM

### **Annex-10 Number of observations per subjects for attention measure**

Table 8 *Number of observations per subjects for attention measure*

Attention 2009

Subject code used to measure attendance	N	% of Total Sum
Environmental Science	37	11.5%
Amharic	53	17.4%
English	55	16.6%
Social Studies	45	14.3%
Maths	36	11.0%
Astetics	6	2.1%
Physical Education	6	1.9%
Biology	20	6.1%
Physics	11	3.2%
Chemistry	9	2.6%
Maths and English	18	5.5%
Art	13	4.5%
Maths and Environmental Science	11	3.4%
Total	320	100.0%

# THE EFFECT OF SCHOOL FEEDING PROGRAM

## Annex-11 Group Statistics and Independent Samples t-test

Table 9 *Group Statistics for mean comparison*

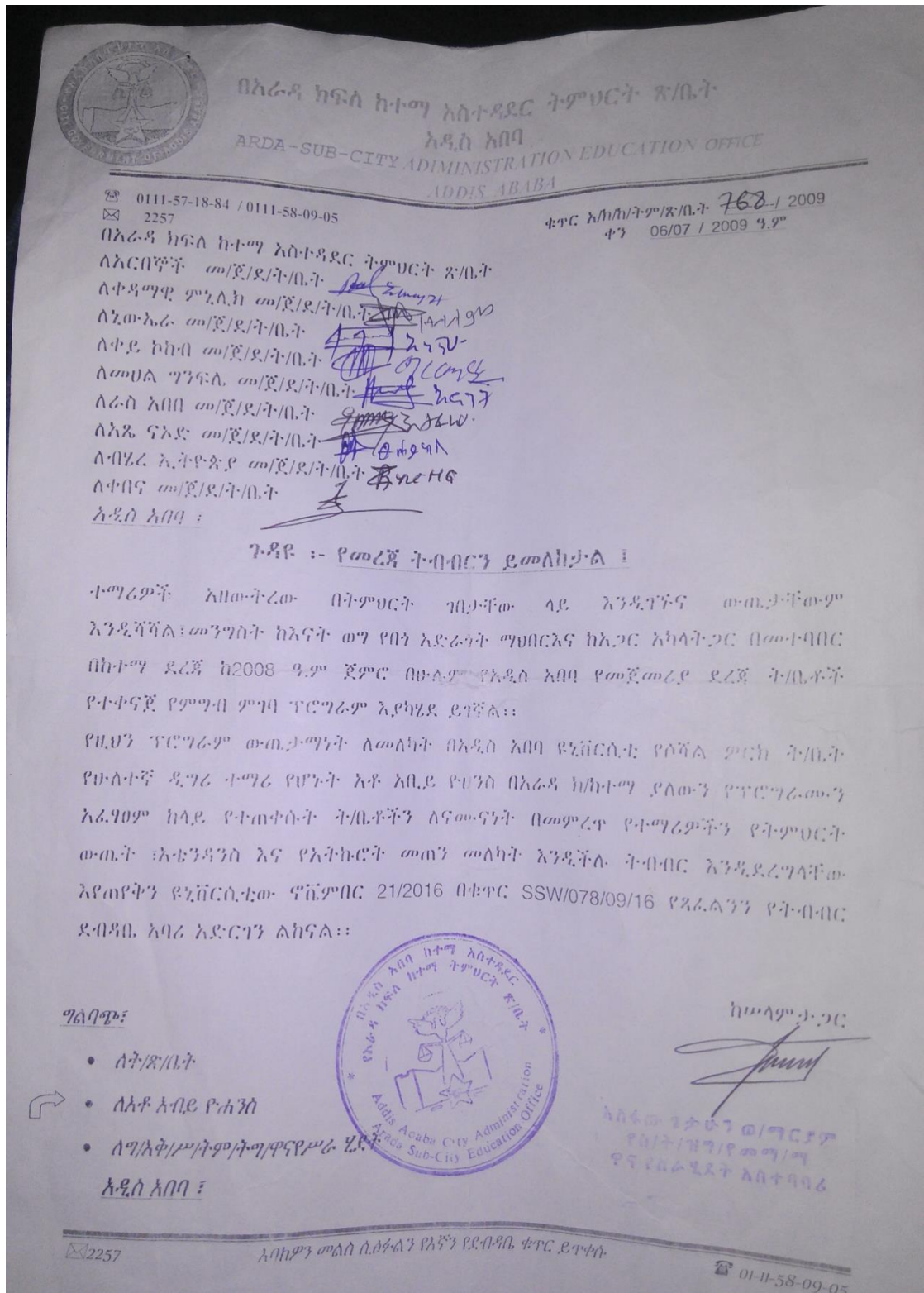
Attention	Group ( Experimental n Comparable)	N	Mean	Std. Deviation	Std. Error Mean
	Experimental	145	32.51	7.005	.582
Comparable	175	33.78	7.194	.544	

Table 10 *Independent Samples Test*

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Attention	Equal variances assumed	.147	.701	-1.587	318	.114	-1.267	.798	-2.837	.304
	Equal variances not assumed			-1.591	309.827	.113	-1.267	.796	-2.834	.300

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Annex-12 Support Letter from Arada Sub City Education Office to all Sample Schools



THE EFFECT OF SCHOOL FEEDING PROGRAM

Annex-13 Support Letter from AAU to 'Yenat Weg' Charitable Society

