



**COLLEGE OF DEVELOPMENT STUDIES CENTRE FOR FOOD
SECURITY STUDIES**

**SCHOOL FEEDING PROGRAM: STUDENT NUTRITIONAL STATUS,
NUTRITIONAL COMPOSITION OF SCHOOL MEALS AND SANITATION
FACILITIES AND HYGIENE OF THE COMPOUND: THE CASE OF NEW ERA
PRIMARY SCHOOL, WOREDA 05, ARADA SUB-CITY, ADDIS ABABA**

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School Feeding Program: Student Nutritional Status, Nutritional Composition of School Meals and Sanitation Facilities And Hygiene of the Compound: The Case of New Era Primary School, Woreda 05, Arada Sub-City, Addis Ababa

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DECLARATION

This thesis is my original work and has not been presented for a degree of master in any other University and that all the sources and materials used for the thesis have been properly acknowledged.

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ABBREVIATIONS

BMI	Body mass index
ENA	Emergency Nutritional Assessment
FAO	Food and Agriculture Organization
MDGs	Millennium development Goal
MUAC	Mid-Upper Arm Circumference
LIFDC	Low-Income Food-Deficit Country
NGO	Non-government organization
NSLP	National School Lunch Program
RNIs	Reference Nutrient Intakes
SFP	School Feeding Program
WASH	Water Access to clean water, sanitation, and hygiene
WFP	World food program
WHO	World health organization

ABSTRACT

School feeding program is a joint program that involves the World Food Program (WFP) and the Federal Ministry of education. The general objective of the study were to assess the nutritional composition of food made available to school children, measure the nutritional status of the school children and evaluate the level of sanitation and hygiene in the school compound of New-Era primary School. The questionnaires were designed to obtain information of food composition, sanitation facilities and hygiene in the school, and nutritional status of school children. Qualitative data like such as knowledge, attitude and practices on food handling, personal hygiene and water and sanitation assessment were converted to percentages and used as indicators for knowledge, attitude and practice on safe food handling. The data was analyzed using by Statistical Package for Social Sciences (SPSS v20) and children weight and height was used to calculate weight-for-age, weight-for-height and height-for-age by using Emergency Nutritional Assessment (ENA for SMART 2011) according to WHO guild line. Most (91.3%) of the school children considered in this study were beneficiaries of the School Feeding Program established by the Addis Ababa City Administration. Student anthropometric assessments, according to their age, weight and height, showed varying prevalence of under-weight (47%) and wasting (37.5 %). According to the student anthropometric resulted 46% of the students were under-weight, 48.7% were normal and 5.3% were overweight obese class 1. In this report washing vegetables they use pure water. The majority respondent 254 (78.6%) washed their hands with soap because of **Covid-19** precautions. The proportion of respondents who had appropriate practice in cleaning utensils after preparing foods (100%) all of them are used to clean, with detergent and storing perishable fresh foods are kept Covered. According to the personal hygiene the acceptable practice among respondents was about 100%.

Generally the result shows participants had good level of practice and good level of knowledge, respectively. The proportion of respondents who had appropriate practice in cleaning utensils after preparing foods (100%) all of them are used to clean, with detergent and storing perishable fresh foods are kept Covered (protected from insects, rodents, pests and dust). Although there were hand washing facilities near to the toilet, 85.1% of respondents said that no soap was available on the facilities.

Keywords: Knowledge, Attitude, Practices, SFP, Food Security, Nutritional status.

CHAPTER ONE

1. Introduction

1.1. Background

The school feeding program was started in London and USA in 1930 with the intention of solving the problems it was detected on the actual ground (Yigzaw. 2019). School feeding program can be defined as the giving of food to student, the main types programs can be classified into two main groups, which are where children are fed in school and other types of programs is take-home rations where families are given food if their children (world bank, 2009).

Local studying also indicates Ethiopia under big nutrition and health problem. In 2015 research shows, about 31% of the school children were lack of food out of which 19.6% were stunted, 15.9% underweight and 14.0% wasted (Zenebe *et al* , 2018). According to UNICEF and WHO researches around 663 million people worldwide do not have access to an improved drinking-water source(WHO, 2015) .

Evidence suggests that school feeding programs can successfully improve the lack of food and school children performance (Petralias *et al*, 2016). Not only that Learning depends on good nutrition, meal and good environment thus enhancing active student learning capacity and increase school attendance (Malongane and Mbhenyane 2017). The main advantage of School meals programs can remove short-term hunger in student, which increases their ability to concentrate and learn while they are at school(Shrestha *et al*,2020).

Poor health and insufficient food in school children is likely to enough their cognitive development either through physiological changes or by reducing their learning ability to participate in learning performance (Zenebe *et al*, 2018) .Source of Nutrition problems arise from different thing. Irregular and excessive feeding, socioeconomic, genetic, culture, environment, level of education about nutrition, and family affect school children' nutrition quality and their habits (Rebar *et al*, 2017)

Diseases have negatively impact school children's ability to learn, those caused by water, worm infections, are highly prevalent worldwide, especially among the poor sanitation (*world bank*, 2016) .Ethiopian government state every child has a right to access to safe drinking water and

adequate sanitation. Provision of safe water and sanitation shall be complemented by appropriate hygiene promotion and education.

Schools, found in out of the capital city, they have lack drinking-water and sanitation and for hand washing facilities; the rural part student are found at high-risk (Adams *et al*, 2009).Because student can't get water for drinking and washing purpose, WASH in Schools not only promotes hygiene and increases access to quality education but also supports national and local interventions to build equitable, sustainable access to safe water and basic sanitation services in schools (Water, Sanitation and Hygiene in Schools).

Unsafe food and water causes food borne illnesses manifested in the form of diarrhea,vomiting, loss of appetite, and other signs .Diarrhea is Cause many deaths per year specially in school children, or 10.5% of total under-5 mortality. These deaths are largely. An closed to 85% of diarrhea mortality is attributed to unsafe drinking water, inadequate sanitation, and substandard hygiene practices (Dreibelbi *et al*, 2014).

The cause of contamination of food from environmental pathovenic, food preparation, storage methods, hand washing of food handlers and consumers, poor awareness of and food borne disease. The food safety health risk ranges from short-term food-borne infections to long-term ill-health conditions (cancer, hypertension or coronary heart disease) (Uçar et al 2016)

School feeding programs are often used for social protection purposes as much as or more than for education goals. The School Feeding Program (SFP) in Addis Ababa formally started in. 2012 E.C. supported by Addis Ababa City Administration and other partners. The program started at an early time in other parts of the country supported by different NGO. WFP also designed school feeding program to fight under nutrition and low levels of education. While over the years the programme maintained a focus on enhancing schoolchildren's diets, and improving education in the country

This study sought to establish nutrition knowledge, attitude and practices and nutritional status of school going children in new era primary school.

1.2. Statement of the problem

The SFP is a very large programme, covering many all over the world, and reaching many children on the ground .Besides WFP reports and evaluations looking at the impact on educational outcomes. Obviously one would expect donor and beneficiary accountability as well learning for improved programming akey area of interest as it offers opportunities to improve it (UN World Food Programme).

School feeding programme have been implemented in all over the world to improve the nutritional value of the student, Nutrition is best guarantees to better health status and ensures sustained attention span for better academic performances (Zenebe *et al*, 2018).School meals programmes have an important role to play in the fight against hunger and malnutrition, by giving of meal to student. When appropriately designed, they have the potential to improve the diets nutrition knowledge (Smart School Meals 2017).

The nutritional condition of a population determines the overall health status which affects the health and development of a student (Josepha *et al*, 2015).School children are dramatically affected by anemia, VitaminA deficiency and parasitic infections with bad impact on their nutritional status as well as on their cognitive development and school performance (Brooker*et al* ,2006).

The supply of clean water is very important for sanitation and hygiene (WASH) facilities in schools has been highly related to the achievement of the Millennium Development Goals (MDGs) on universal primary education, gender equality and child mortality (Antwi-Agyeet *al* 2017).Schools with no hand washing facilities classified as providing no service for their student and teacher (*Global baseline report, 2018.*).

All school children learning ability can be affected by insufficient water, sanitation and hygiene conditions in several ways. Which affect hundreds of millions of school-age children, due to the lack of water and sanitary facilities school children can be exposed to diarrheal and others diseases. School feeding program is also expected to improve the nutritional status of school children so that they can have better health, school attendance and academic performance. As no research publication is available yet regarding the School feeding program, food composition,

student nutritional status and school sanitation and hygiene is not clearly known because of this reason the topic is selected

1.3. Objectives of the study

1.3.1. General objective

The general objective this research is to assess the nutritional composition of food made available to school children, measure the nutritional status of the school children and evaluate the level of sanitation and hygiene in the school compound of New- Era primary School Woreda 05, Arada sub-city, Addis Ababa. Ethiopia,2021.

1.3.2. Specific objectives

The specific objectives of the study are:

- i. To assess quality of school meal, student personal hygiene
- ii. To assess student personal hygiene
- iii. To assess student nutritional status by using anthropometric methods.
- iv. Assess sanitation facilities and hygienic condition of the school buy using cheek list meal nutrient composition
- vi. To evaluate food composition

1.4. Research questions

Based on the above specific objectives, the research will answer the following question:

- ❖ What kind of meal you eat at school?
- ❖ What type's mechanism do you use to wash your hand?
- ❖ What is the status of sanitation facilities and hygienic condition of the school?

1.6. Significance of the study

This research paper is meant mainly for the fulfillment of MSc degree in Food Security and Development. The formulation of this paper can, primarily, be used for academic exercise. The study will give insight and serve as a document for researchers and interested in the topic to stimulate further study in the area. In this regard, the research investigated the extent of student

nutritional status, school meal, nutritional composition and school water, sanitation and hygiene in the school. Which can be useful as input for other researchers who are interested in the area. This research will also help for policy improvement and local intervention practices

1.6. Scope and limitation of the study

The limitation of the study was unavailability of prior research in the study area or in school, making it difficult to compare the details of the finding of this research with similar studies and due to **Covid -19** making it difficult to measure MUAC sample.

The study was only done in arada sub city New -era primary school to measure the nutritional status of the school children and evaluate the level of sanitation and hygiene in the school

1.7. Thesis organization

This study is organized into five chapters. The first chapter deals with background of the study, statement of the problem, objective of the study, significance of the study and the scope and limitation of the study. The second chapter covers relevant literature review. Chapter three presents the setting, materials and methods used in the study. Chapter four presents the results and discussion in detail. Chapter Five Conclusions and recommendations based on the findings of the research work are presented including Appendix Tables

CHAPTER TWO

REVIEW OF RELATED LITERATURES

2.1. Theoretical review

2.2.1. Basic concepts of School feeding Programmes

At this time, SFPs found in 70 of the 108 Africa, Asia, Europe and Latin America countries, and most of them have been initiated and supported by the WFP (Jomaa *et al* 2011). Ethiopia national SFP is a joint program that involves the World Food Program (WFP) and the Federal Ministry of education (Zenebe, *et al*, 2018). In the study area the program was start in 2012. School feeding program can defined as the giving of food to student ,the main types programs can be classified into two main groups, which are where children are fed in school and other types of programs is take-home rations where families are given food if their children(World Bank, 2009). .

In school compound all student may have accesses to get meals and high energy biscuits or snack, the meal and biscuits they can be an important source of micronutrients and macronutrients, both of them are prepared from different food (Yigzaw, 2019).

2.2. School feeding in Ethiopia

Ethiopia has big food problem and the country is found under the rank of as a Low-Income Food-Deficit Country (LIFDC).The main reason of these crises is droughts (shortage of rain), and traditional farming system(FAO 2014). . Ethiopia has started the school feeding programme in 1994 especially in rural areas (Rajkumaret *al*, 2011).but in Addis formally started in. 2012 E.C. supported by Addis Ababa City Administration and other partners

2.3. Benefit of school feeding program

SEP has huge contribution for school children and family to protect children from hunger (School meals reduced short term hunger), Student improved health; provide energy children develop healthy eating habits (Patricia *et al*2011). Used to reduce food insecurity, increase the number of attending student, decrease the dropout rate and in general program may have big contribution for teaching learning process (*School Feeding Interventions*).It can Improved by

supplying balanced diet. Like Fresh banana, orange, mango and apple and cabbage, carrot and potato (<https://canadian>).

2.3.1. Benefit of school feeding for attendance and learning

Now a day all research paper states, school feeding program has big contribution for enrollment attendance (Jomaa *et al*, 2011) and an on-going school feeding program in Africa and Asia, the program is associated with increased school enrollment, student can attend, frequently decrease repeater rates, reducing the dropout especially among girls (Rosso, 1999). For example more than 216 reviews indicate, in 52 low and middle income country and middle-income countries were implemented the programmes, so the programmes has good impact on all over the country (Snilstveit,2015).

2.3.2. Improving nutrition and health

Nutrition is very important component for human health, mental development through the entire life span. Balanced diet (nutritional food) important for physical strength, cognitive development and productivity. School feeding program is not only reduced short time hunger, in school. Nutrition has a nice contribution for any human being. It may have direct or indirect impact for student; poor nutrition can be leading to loss of Weight, stress, tiredness and decrease the capacity to do work (http 2006). At the time school age student need sufficient amount of micronutrient and macronutrient. The deficiencies of three micronutrients Iron, Vitamin A and Iodine are particularly common in children in developing Countries (Akoto-senaman).The lack of micronutrient leads to complicated health problems like loss resistance, expose to infection, blindness, reduced learning capacity, and mental retardation and in some cases, to death (Ekweagwu&Agwu 2008).

2.3.3. To improve student nutritional status

All findings are mention, the higher nutritional food can delivered through school feeding programmes via on-site feeding, by using of essay way the schools can implement WFP. Guidelines to improve the quality of life of school children to get healthy school children, the food should have nutritional content. FAO and WHO has recommended amount of nutrient intake per day, the nutrients are important to all apparently healthy individuals in an age and sex-

specific population shown in table 1 .The amount daily taking, it may be differences from country to country. (Aliyar et al, 2015)

Table 3. Recommended ranges nutrient intakes

Dietary component	Goal expressed as % of total energy
Total carbohydrates	55–75
Total fat	15–30
Proteins	10–15
Free sugars	<10

Source: WHO/FAO 2004

The following nutrient has good contribution on health (particularly zinc, B vitamins, Omega-3 fatty acids, and protein) early in life can affect the cognitive development of school aged children. Reports suggest that diet should be balanced (WHO, 2018)

2.3.4. School food programs keep girls in school

In many Country’s female’s education is under expected level and girls are exposed to dropping out or they may not be come to class (school), there family will be sent to work or subjected to early marriage. Not only marriage and they faced with disease like fistula. When girls feeding in school it can help keeping girls in school and school feeding program is a virtuous circle, decrease the financial pressure for family (<https://canadianfeedthechildren>).

2.4. Malnutrition in school children

The definition of malnutrition is that refers to both below the limit of permissible nutrition and above the limit of permissible nutrition. If food does not contain the right amount of nutrients like carbohydrate and protein student should take through their diet (Das & Gulshan, 2017).School children faced with malnutrition is, multiple risk factors which, when challenges can lead to a significant reduction in cases as seen in children. Malnutrition is **caused** by having an inadequate diet or a problem absorbing nutrients from food. There are many reasons why these might happen, including having reduced mobility, a long-term health condition, or a low income (Jomaa, 2011).

2.5. School meal composition

The Major objective of school meal program is to promote, enrich food and increase ingredients in food according to the guide line (Behrens *et al*, 2018). When we compare the physical, mental redness and education status of those who took school meal children have good progress than others student (Behrens *et al*, 2018). School children need a balanced diet in both quantity and quality to stay healthy, get energy, and boost immunity, build and repair of body tissues, those changes are coming through balanced food (Ayogu *et al*, 2018).

A school feeding program can give as a Breakfast Program and the National School Lunch Program (NSLP). The NSLP aim is given to 1/3 added nutritional value of their daily food diet. Finding shows all beneficiaries in NSLP school children have good performance than others school children. The program shows, school provide meal without any fee to school children. According to the report more than 30 million school children who get food from there school (Behrens *et al*, 2018). Developed country the nutritional status of children completely differently compare with European country. In sub – Sahara 19% children live with Underweight, for instance, are lower when compared with South Asia (30%) whereas stunting in both regions is similar (Agbozo ,*et al* 2018).

The report of show close to 3.5 million meals give to student, especially in England and Wales 45% of school child using the school meal service. In England, 16.8% of primary school children and 14.5% of secondary school children were entitled to free school meals (*Nutrient-based, 2014*). This strategy will guide on the minimum school meal composition as suggested below:

Table 4. Standards for composition of school meal

Standard for composition of 1 school meal	
Cereal and root crops(energy food) cassava, maize, rice, sorghum millet, sweet, potato ,yams ,iris potato, bread and chapatti	~ 150 grams per child preschool ay
Protein sources and possible substitutes: eggs ,pulses, (beans, lentils, pigeon peas, cow peas etc.)	~ 40 gram per child per school day
Dairy	1/2 to 1 cup
Vegetables oil	~ 5 gram per child per school day
Iodized salt	~ 3gram per child per school day
Complementary ration of fresh fruits (1 cup) and vegetables (1/2 cup cooked or 1 cup fresh) should be provided as often as possible	
When school meal do not sufficient, micro nutrient powder can be added to cooked school meal to address micronutrient deficiency among school children	
This amount to ~ 30percent or one third of the daily energy requirement and the dieatry diversity need for a child	

Source adopted (Stathers, T., L et al 2018).

2.6. Importance of adequate water supply, sanitation and hygiene in schools

In 1990 the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF).Create uniform Monitoring Programme for Water Supply, Sanitation and Hygiene. The WHO efferent is to achieve sanitation and water for all by 2030 is expanded beyond the home to include institutional settings, such as schools, healthcare facilities and other workplaces. The facility of School water, sanitation and hygiene, can give the strength for quality education and learning especially for girls (Ayogu, *et al*, 2018).

Contaminated water has a big impact on health; especially for school children, Government and non-government organization agree to supply clean drinking Water and Sanitation Decade in the 1980s and the millennium Goal (MDGs) state global policy attention about the access of pure water. An access of Programme for Water Supply and Sanitation are controlled by World Health Organization (WHO) and UNICEF (Shields *et a,l* 2015)

The facility of pure water is important for improving education quality. The school should have safe drinking water for sanitation facilities and hygiene, which can improve to grow healthy generation for the country, is called Water, Sanitation and Hygiene Education (WASH) in Schools. The other benefit is helps increase education participation, reduced drop out and it can reduced student mortality rate, improving water and sanitation, promoting gender equality and has been widely recognized for its significant contributions to achieving the MDGs – particularly those related to providing access (*Water, Sanitation and Hygiene*).

2.6.1. Drinking water in schools

In 2015, more than 663million people worldwide had no access of drinking water and around 1.9 billion People depend on contaminated (unsafe) water and Close to 2.4billion people, that means one-third of the world’s population, they face to lack access to sanitation facilities and 13% population has not has enough toilet. Specially, Sub-Saharan Africa and South Asia continue to have the lowest sanitation coverage (Bekele, *et al*, 2020).

School should have enough water for drinking purpose. More than 92 countries had adequate water supply for school children. Close to 12% of school had shortage of drinking water supply, 19% of schools had no drinking water supply (UNICEF, 2018).The finding shows safe and clean drinking water is highly related student health (Hunter *et al*, 2014) A school has a big challenge to supply drinking water for student ((Lucas *et al*, 2011)).

Children’s immunity is low, the new reports shows more than 1.9 million children’s are dead because of diarrhea. More than 78% occurred in developing country, Water can be contaminated by chemical, microorganism and others living and nonliving things, According to the report of Patricia J. Lucas¹ and Christie Cabral water quality can be decrease rates of child diarrhea by 42% (Kenney *et al*, 2019).

2.6.2. Sanitation and hygiene

Academic finding indicate that the access to enough WASH service in school has big impact to increase education quality and heath of children by reduced the number of absenteeism in school especially girls they may absent due to of menstrual periods. Sanitation and hygiene should safe from diarrhea and gastrointestinal diseases. The main causes of diarrhea are unsafe drinking

water, poor sanitation and hygiene (Antwi-Agyeiet *al* 2017). For Example, in 2012, because of diarrhea more than 1.5 million dead, from 1.5 million gone close to 502,000 deaths were related to inadequate water and sanitation, respectively (Prüss-Ustün, *et al* 2019)

Most of the time girls are affected in different way because water has big Role in teaching learning process, and this may contribute to unequal learning out come because female student pretentious than children because the insufficient of sanitary services means that they cannot attend school during menstruation. If school children may have sufficient water for, and hygiene in school can be effective envoys and representatives for change in their families and the wider community (Adams, *et al* 2009)

2.7. Food safety knowledge, attitudes and practices of school

The effective way of preventing food from contamination is necessary. From this perspective the food safety is interesting for school children. Therefore, handlers' consciousness of their critical role and accountability in food safety, as well as their knowledge and skills, are of crucial importance for handling food carefully (Isoni Auad, *et al* , 2019) If the student had knowledge of keeping food prevent them, family and environment. Reports show in Canada University close to 53% of school children had low ability knowledge the cause of food born disease (Dehghan et al, 2017)

The main cause of food contamination are, storage of food is not Improper cooking temperatures of food, Dirty and/or contaminated utensils and equipment, Poor employee health and hygiene, Food from unsafe sources and un safe storage had big contribution to food born disease (Teffo&Tabit, 2020).To reduced or minimize the expansion of food born disease, the way of hygienic food preparation education is mandatory (Aisha, et al 2016).

2.8. Knowledge of food maker

The knowledge of such important hygienic procedures by majority of the school food-handlers in this study is very appropriate, due to a lot of reason. Knowledge of food-handlers can protect from diseases. Proper hand washing by food handlers reduced the threat of diarrheal disease in school children and combine proper hand washing with the wearing of gloves and other hygienic practices in order to decrease the risk of pollution during food preparation .On the other hand,

food-handlers should be use exact instrument (utensil). All food makers in Ethiopia less familiar with time and temperature abuse and its effect on food safety. Different study shows that unsafe handling of food, including the abuse of time temperature, account for most food-borne disease outbreak (Akabanda, *et al* 2016).

2.9. Anthropometric measurement

Well-adjusted food is important to good growth and development in every human, the absence of good nutrition has health problems. Malnutrition still remains a big problem in Ethiopia, especially among children (Kwabla, *et al* 2013)

Anthropometric is the way of measurement of the proportionality of human body include weight, height, length, selected skinfold thicknesses, and head, waist, hip, and arm circumferences. When compared with reference values, these measurements or combinations of these measurements can provide information on body size and the proportion and distribution of body fat and lean body mass in adults.

In anthropometric valuation the raw measurements are obtained to form guides, and then the indices are used to interpret and classify the measurements. The guides are weight-for-age (W/A), height-forage (H/A), and weight-for-height (W/H).They can also be used to assess growth in children. Anthropometric measurements indirectly indicate present or past nutrition and may be markers of future ill-health (<http://www.indepth->)

2.10. Conceptual Framework

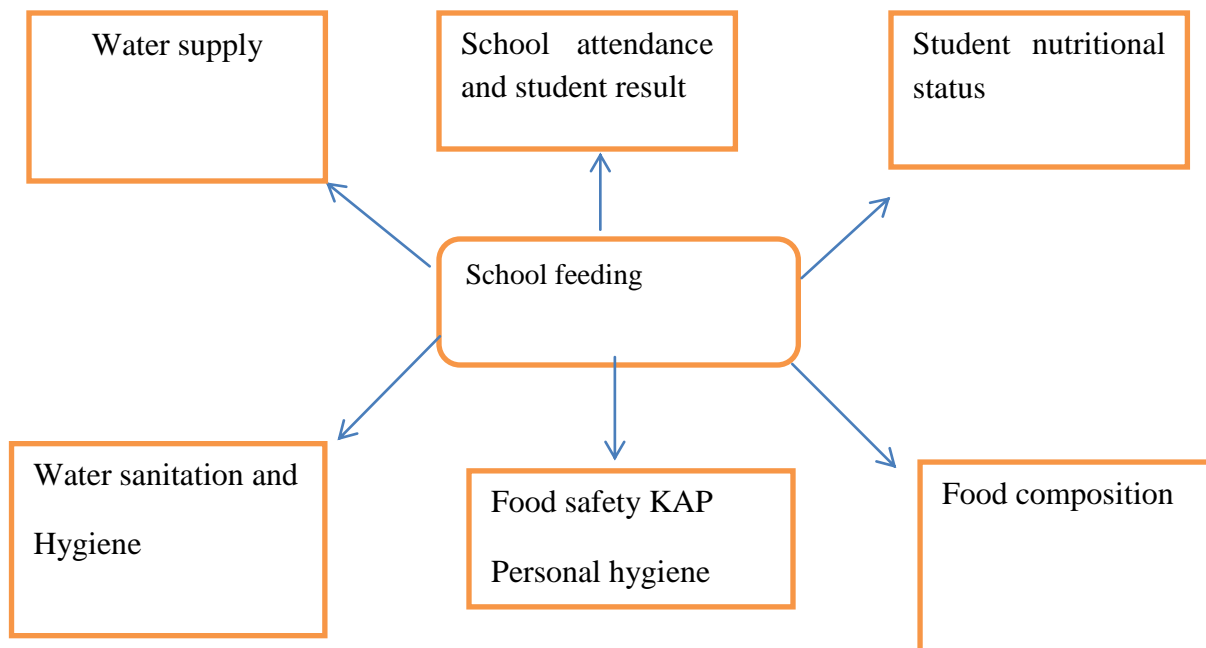
The conceptual framework shows that student nutritional status, school meal food composition and school water, sanitation and hygiene may influence the school child feeding practice, and food safety KAP are associated with a child's nutritional status at school.

The relationship between school feeding programmes and sanitation facilities and hygiene of the compound is crucial in improving children nutritional status, improving cognitive skills and behavior and educational achievement., According to the model (Fig.1), the potential impact goal of targeting children through Food for Education programmes is to increase their educational achievement so as to improve their potential future productivity and earnings. However,

improvement in educational achievement due to serving food in SFPs is thought to occur through three pathways as demonstrated.

Used to the alleviation of short term hunger which improve children’s cognitive functioning and attention. The third path is through the improved nutritional status of children by providing them calories and nutrients in addition to their regular diet. This leads to better health and better resistance to infectious diseases and illnesses that would keep children attending school. Thus, better nutrition indirectly improves educational achievement by increasing school attendance by children.

The water supply and sanitation conditions of schools have become a public health concern in recent years. School hygiene in Ethiopia indicated that the majority of surveyed primary schools did not have access to drinking water sources or adequate sanitation facilities for hand washing and excreta disposal. School dropouts are observed among female school children due to a lack of latrines with facilities for menstrual hygiene. The report also found that the hygiene knowledge of the prevention of communicable diseases was poorly understood by school children (Haile, 2019).



Source: adapted from Yendaw. & Dayour (2015)

CHAPTER THREE

3. DESCRIPTION OF THE STUDY AREA AND RESEARCH METHODS

3.1. Description of the study area

Arada is one of the ten sub-cities of Addis Ababa, located in the northwestern part of the city. The average altitude of the city is 2400 meters above sea level. The city occupies a total area of 540Km². According to United Nations - World Population Prospects (2020), the population of Addis Ababa, in 2020, was close to 4,794,000. It borders with the sub cities of Gullele in the north, Yeka in the east, Lideta in the south and Addis Ketema in the west. The population of Arada sub city is 225,999, of which 120,036 female and 105,963 male. Arada sub-city comprises of 11 Woredas, and the old city center (piazza) is located in the sub-city. The study will be conducted in New Era primary school found in Woreda Five of Arada sub city, Addis Ababa, Ethiopia. The total number of students in New Era is 1248 of which 690 female and 558 male.

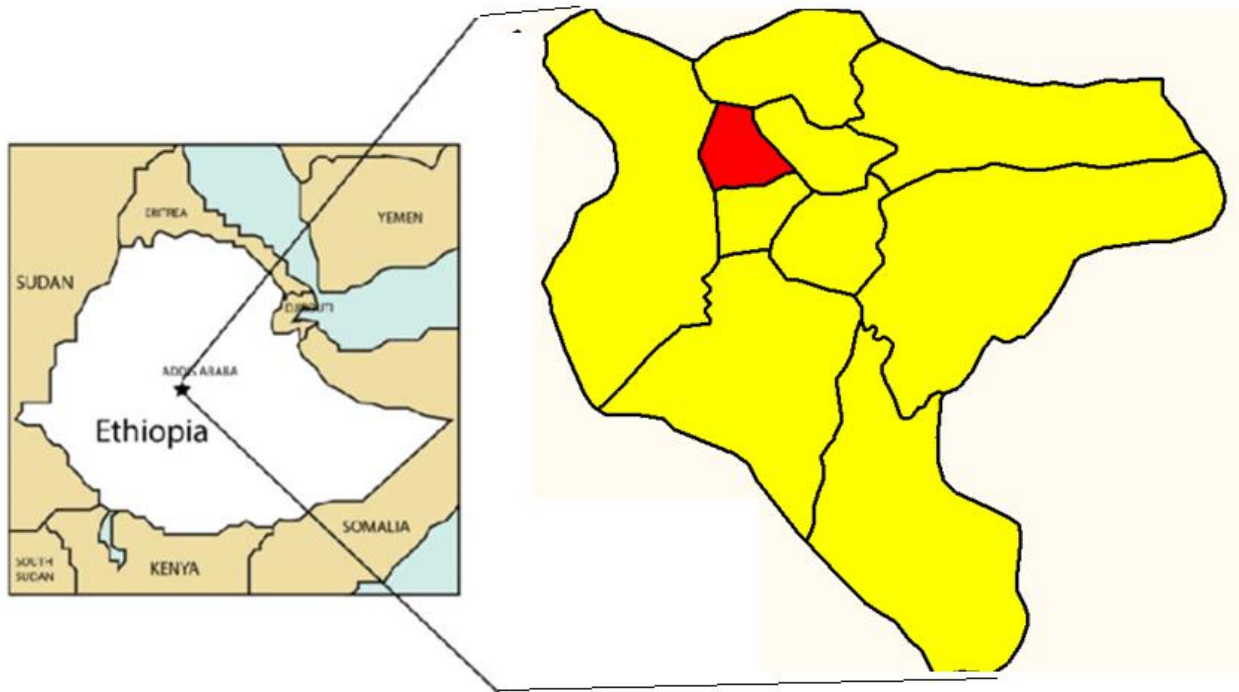


Figure 2: Addis Ababa sub-city Geographical Map (uploaded by Matthew L Boulton)

3.2. Research Design

The study uses a cross-sectional study design. Both qualitative and quantitative data will be collected. The data was gathered in the school. The study was conduct from January to February 2021.

3.3. Source population

All SFPs beneficiary and non-beneficiary student in the school are source population.

Study population

All beneficiary school children under School feeding program (SFP) are study population

3.4. Sampling Techniques

Systematic random sampling was the most common and the simplest method of sampling. Each unit of the population has the equal chance of being drawn in the sample or types of probability which is used to select appropriate samples.

There were a total of 1248 student and 13 food preparation staffs are part of the program. The sample population consists of randomly chosen school children and the sample size was calculated based on Cochran's formula for calculating sample size when population size is finite: Cochran pointed out that if the population is finite, then the sample size can be reduced slightly. He proposed a correction formula to calculate the final sample size in this case which is given below:

$$n = \frac{N}{1 + N(e)^2} \qquad n = \frac{1248}{1+1248(0.05)^2} = 303$$

Where = n is the sample size

$$5 \% \text{ non-response} = \frac{303 \times 5}{100} = 15$$

= N is the population size

= e is the level of precision.

Finally, with 5% non-response rate, the size is 318 school children. However, since more respondents than the plan were found, 318school children were considered for the study.

3.5. Study Variable

The dependent variables in this study were nutritional status, school feeding, food composition, food safety KAP and. Independent variables consisted of family demographic factors such as and family occupation and residential area.

3.6. Types and Sources of Data

All relevant primary and secondary data sources were considered in the study. Primary data was collected from direct observation and structured interview. Secondary data was collected from published and unpublished work on child nutrition related materials.

3.7. Tools and Techniques of Data Collection

The questionnaires were designed to obtain information of food composition, sanitation facilities and hygiene in the school, and nutritional status of school children. It was translated into Amharic for easy communication with student and other participant. For the qualitative method, the researcher was use the pre-designed checklist to probe the desired answers from the student and others staff. The primary data will be collected through questionnaires from each selected student and staff member and secondary data can be obtained from different sources.

Qualitative data like as knowledge, attitude and practices on food handling, personal hygiene and water and sanitation assessment were converted to percentages and used as indicators for knowledge, attitude and practice on safe food handling. A three point Likert's scale with a positive, negative and neutral response was used to measure the knowledge, attitude and practices of food handling.

3.9. Anthropometry measurement and Procedures

3.9.1. Age determination

Information on age was obtained by asking of the student, Child's nutritional status was assessed using child's weight, height, and age. Using this measurement three indices were used in the evaluation of nutritional status; height-for-age (HAZ below -2SD) which measures stunting; weight-for-height (WHZ below -2SD) which reflects wasting; and weight-for-age (WAZ below -2SD) that reflects underweight.

3.9.2 Body mass index (BMI)

BMI is a measure to define overweight and thinness. BMI is defined as the weight in kilos divided by the square of height in meters. In developing countries, the BMI is primarily used with age-independent cutoffs to identify chronic energy deficiencies (or obesity) in adults. $BMI = \text{Weight (kg)} / \text{Height}^2 \text{ (meter)} = (\text{kg}/\text{m}^2)$. BMI values were calculated using measured height, in meters, and weight, in kilograms. BMI = weight/height. BMI weight categories were underweight (BMI values < 18.5), normal or desirable weight (BMI values 18.5-24.9), overweight (BMI values 25.0-29.9), obese-Class I (BMI values 30.0-34.9) (National health & nutrition examination survey, 2009).

3.10. Data Quality Control

All the questionnaires were checked for completeness before releasing the interviewees at the end of the interview. Also good quality data was obtained by pre-testing the tools before actually administering the tool to the target population. Each day before leaving the school, the researcher reviewed all forms to ensure that no pieces of data were left out. The researcher recorded all additional important points in a notebook (including observations, ideas, problems, actions taken and the rationale for such action).

Completed questionnaire were collected on daily basis and checked for completeness and consistency. Cleaning was done on daily basis and timely feedback was communicated to the data collectors. Data was collected from 318 student and 13 staff member.

3.11. Technique of Data Analysis

The data was analyzed using by Statistical Package for Social Sciences (SPSS v20) and children weight and height was used to calculate weight-for-age, weight-for-height and height-for-age by using Emergency Nutritional Assessment (ENA for SMART 2011) according to WHO guild line. Cross tabulation was used to analyze the association between multiple variables and the association between dependent and independent variables by p valu at 0.05 level of significance.

3.12. Indicators used to Quantify KAP

Total knowledge percentage among respondents was calculated as. Appropriate practice was calculated

$$\text{percent appropriate practices} = \frac{\text{sum of response}}{\text{Total number of responses given by all respondent}} \times 100$$

3.13. Ethical Consideration

As measurement was taken from human subjects, research ethical issues were duly addressed. I was taken ethical clearance from Addis Ababa University College of development studies, department of food security. VIC principals and teachers were informed about the purpose of the research and permission to conduct the study in new era primary school. In the presentation of the study results, name of respondent was not used. Finally informed oral consent was obtained from respondents.

CHAPTER FOUR

RESULT AND DISCUSSIONS

4.1. Socio-Economic and Demographic Characteristics of the student

In this study, 318 school children participated. School children in grades 1 to 8 were considered for the study as they could understand and fill the questioners on food safety and nutrition KAP satisfactorily. The age range of school children of both sexes was from six years to 16 years. Over 62.6% were female and 37.4% were male. More than 65% of families of school children had private work and the others were working in government sectors (20%) and as daily laborers (15%). The family occupation may create differences in the nutritional statuses of school children. Although the school is situated in Arada sub-city, about 28% of school children came from Addis Ketema and Gulele sub-cities. School children from three woredas in Arada sub-city made up 71.8% of respondents (Table 4.1). The study included school children of 6 to 16 years and 13 food preparation staff.

4.2. Conditions of school feeding beneficiary

Most (92.8%) of the school children considered in this study were beneficiaries of the School Feeding Program established by the Addis Ababa City Administration. Some (1.5%) ate school meals sometimes. Only 5.7% of school children were non beneficiary (Table 4.2). The respondents, 5.1% used to come to school without eating before the SFP started and a few of them faced with different kinds of problems such as sleep in the class and feeling weak, dizzy and close to losing consciousness. Studies are similar with published in (<https://www.jaacap.org/>). The documents showed that hunger had big impact on their academics performance, especially in the hard sciences (Gbolliet *al*, 2017)

Table 4.1. Socio-economic and demographic status of the study population in New-era primary school, N=318, 2021.

Variables	Categories	Grade Level								Total
		1	2	3	4	5	6	7	8	
Age group	6-16	6-7	8-9	10-11	12-13	14-15	16-12	13-14	15-16	
Sex										
Male	119 (37.4%)	9 (7.6%)	15 (12%)	19 (16%)	15(12.6%)	7(5.9%)	14(%11.8)	22(18.5%)	18(15%)	119
Female	199 (63.6%)	22 (12)	31(16)	20(9.8%)	29(14.2)	25(13)	22(10.8)	25(12.7)	24(11.8)	199
Resident Sub city	Arada (71.8%)	31	44	32	28	21	25	24	27	232
	Addis K.(11.5%)	-	-	6	2	6	5	10	8	37
	Gulele (16.7%)	2	4	-	8	9	8	10	8	49
Family occupation	Government (20%)	2	13	11	6	4	3	18	7	64
	Private (65.3%)	26	31	27	18	25	34	24	26	211
	Char 15%	2	4	7	5	5	9	-	11	43

Source: Owen survey data

4.3. Feeding status of respondent school children

In the study, 88.7% of respondents' school children) ate three times a day at home and 11.7% of student ate only two times a day (Table 4.3). This indicated that their family could not feed their children three times per a day.

Table 4.2. Feeding status of respondent school children in New-Era Primary school, N=318, 2021.

Related to school feeding	Yes	No	Some times
Are you benefiting from school meal	295 (92.8)	18(5.7)	5(1.5%)
Did you come ever to school without eating?	16(5.1%)	302(94.9%)	
If the answer yes for question the above. What problem faced you come to school	13(62%)	8(38%)	

About 92.8% of regular school feeding beneficiary school children said that they ate at school until they were satisfied but 52.3% were not always so satisfied. School meals, with limited menus, were provided during breakfast and lunch (Table 4.3).

Table 4.3. Respondents' satisfaction with school meals.

Related to school feeding	Frequency				Always	Sometimes
	1	2	3	4		
How many times a day do you eat at home		36 11.3 %	282 88.7%			
How many meals do you eat at school?	30 9.4%	288 93.6 %				
You will eat until you are satisfied with school meals?					152(47.7%)	166(52.3%)
What do you want to improve on school meals?	More than 90% student need some improvement					

Source: Owen survey data

Most of the time tea with bread was served for breakfast. Lunch consisted of Rice with bread, or basically injerra with Shirowett, miserwett, dinich wettor Shirowett with boiled egg on different days of the week. On Fridays, one of the weekly menus was repeated. In general, the weekly menu was repeated every week through the year (Table 4.4). But students say rice with bread is repeated dish these indicate program menu is not implemented. The WHO (2003) recommends that school children should take their daily requirement per day. In addition to providing energy, foods in this group contributed significantly to the intake of protein, fiber, various minerals and vitamins.

4.4. School feeding program menu and amount of food given for each student

Days	Breakfast	Weight of food (k)	Lunch	Weight of food (g)
Monday	Firfir with tea	190g + 1 cup	Enjerra with Shiro/missirwett	190g/208g
Tuesday	Bread with tea	65g + 1 cup	Rice with bread	275g + 65g
Wednesday	Bread with strawberry jam	65g + 1 table Spoon	Enjerra with Dinich (wett)	190g + 265g
Thursday	Firfir with tea	190g + 1 cup	Enjerra with Shirowett and one boiled egg	190g + 240g
Friday	From the above list one repetition is possible			

Source: Owen survey data

In this study, it was, at least, observed that school meals provided a good proportion of energy and protein to school children based on their age (Table 6). The average energy content of school meals in this study was estimated to be 906 (CV, 12.2%) calories as calculated from the ‘composition table for use in Ethiopia.’ (EHNRI, 1998). This amount provided about 60% of the calorie requirement for school boys and girls of six to eight years old. It also provided 50% of the calorie requirement for school girls of nine to 13 years old and 45% of school boys in the same age group. For school boys and girls of 14 to 16 years old, the proportion was 34% and 45% of the calorie requirement, respectively. This indicated that the school children in the study school, adolescents in particular, needed to obtain the remaining amount of calories from elsewhere to satisfy their daily requirement.

School meals had a daily average protein content of 33.5g (CV, 13.3%). Therefore, they provided much over the daily requirement of proteins for both male and female school children aged six to eight years. The amount was also almost sufficient (about 99%) for the protein requirement of boys and girls aged nine to 13 years.

Table 4.5. Average energy and protein content of school meals vis-à-vis the daily requirement of the school childrens

Age (yrs)	Sex	Number	Energy ¹ (Calories)			Protein ² (grams)		
			Daily requirement ³	Daily Average from meals	Proportion of requirement	Daily requirement	Daily from meals	Proportion of requirement
6-8	M	11	1500	906	60%	19	33.5	176%
	F	27	1500	906	60%	19	33.5	176%
9-13	M	30	2000	906	45%	34	33.5	98.5%
	F	58	1800	906	50.3%	34	33.5	98.5%
14-16	M	34	2600	906	34.9%	52	33.5	64.4%
	F	72	2000	906	45%	46	33.5	72.8%

¹according to Zelman, (2005); ² Cleveland Clinics. (2017)

³Moderate activity is equivalent to walking about 2.4 km to 4.8 km per day and light physical activity associated with typical day-to-day life Zelman, (2005)

School feeding program had its own menu to students. When COVID-19 forced schools to close in mid-March 2020, school nutrition professionals quickly adapted their programs to ensure hungry school children continue to have access to healthy school meals (<https://schoolnutrition.org/uploadedFiles/11COVID19/3>).

But the school did not implement the WHO guideline. Poor health and inadequate nutrition among school-age children is likely to diminish their cognitive development either through physiological changes or by reducing their ability to participate in learning experiences - or both(Zenebe, *et al* 2018)

It is widely acknowledged that school meals as an in-kind conditional safety net which address the immediate food needs of schoolchildren while promoting long-term child development, and act as indirect income transfer to their families. According to the data, more than 90% school

children needed some improvement on food. They complained that rice with bread is frequently prepared and should be substituted by other meals (table 5). I think sometimes the menu is not implemented

4.4. Anthropometric Data

Student anthropometric assessments, according to their age, weight and height, showed varying prevalence of under-weight (52%), Wasting 10(31 %) and 17(6%) stunting. (Table 4.6 and Table 4.7). Prevalence of under-weight and wasting observed in theses report was high but that of wasting was small. The higher prevalence of malnutrition shown in this study might be due to the fact that families of almost all students were poor and they might have been exposed to food insecurity for a long time. Wasting of children was significantly associated with balanced diet. The other socio-demographic parameters did not have any association with nutritional status.

Regarding the evaluation of the nutritional status of primary school children, this study revealed that more than half of them were within healthy weight status. Similar findings were obtained by Shabu(Shabu, *et al*, 2009)who found that most school children in Erbil City were in normal nutritional status. Furthermore, another study on children in Duhok City by Mohammed (Abdullah, *et al* 2017) found that most of them had normal nutritional status. The current study showed that most of primary school children were at somewhat healthy food behavior.

Table.4.6. Weight-based anthropometric evaluation of children (6-16 years), in New-era primary school=318, 2021.

Age	Sex	Number (%)	Median Weight (kg)	Median Height (cm)	weight-for-age	Normal	Weight for-height	Normal
					underweight (<-2 z-score)		Wasting(-2z score)	
77-90	F	29 (67%)	21 (55%)	127(51)	0	29(74%)	3(100%)	26(65%)
	M	14(33%)	17(45%)	122(49)	4(100%)	10(3%)	0	14(35%)
	Sum	43(100%)	38(100%)	249 (100)	4(100%)	39(100%)	3(100%)	40(100%)
91-113	F	40(70%)	21(55.3%)	127(51%)	18(33.3%)	22(67%)	11(61%)	29(74%)
	M	17(30%)	17(44.7)	122(49%)	4(66.3%)	11(33%)	7(32%)	10(26%)
	Sum	57(100%)	39	149(100%)	22(100%)	33(100%)	18(100%)	39(100%)
114-132	F	31(60.7)	31(49.6%)	132(79%)	11(73%)	6 (37.5%)	0	31(61%)
	M	20(39.3%)	31.5(51.4%)	135(21%)	4(27%)	16(62.5%)	0	20(29%)
	Sum	51(100%)	62.5(100%)	167(100%)	15(100%)	18(100%)	0	51(100%)
133-156	F	39(68%)	33.5(49%)	133.9(80%)	1(25%)	38(71%)	0	39(80%)
	M	18(32%)	34(51%)	133(20%)	3(75%)	15(29%)	8(100%)	10(20%)
	Sum	57	67.5(100%)	166.5(100%)	4(100%)	53 (100%)	8(100%)	49(100%)
157-192	F	76(69%)	50(48%)	149(50%)	1(50%)	75(69%)	1(50%)	75(69%)
	M	34(31%)	54(52%)	149(50%)	1(50%)	33(31%)	1(50%)	33(31%)
	Sum	110	104(100)	296(100%)	2(100%)	108(100%)	2(100%)	108(100%)
Total		318	--	--	47(15%)	271(85%)	31(10%)	287(90%)

Source: Own survey data

According to the student anthropometric resulted 52% of the student were under-weight, 38% were normal and 10 % were overweight obese class 1 (Table4.6). The high prevalence of underweight was a manifestation of food problems. Almost half of the students were found to be under weight. Under weight of student was significantly associated with family work ($p < .05$) indicating that food was short for family members in quality or quantity. But the other socio-demographic characteristics did not have any association with BMI.

Table.4. 7.BMI-based anthropometric evaluation of student (6-16), in New-era primary school=323, 2021

Age	Sex	Number (%)	Median Weight (kg)	Median Height (cm)	Height for age		Underweight (BMI<18.5)	Normal (BMI:18.5 - 24.9)	over weight (BMI 25-29.9)
					Stunting(< 2 z-score)	Normal	underweight(<- 2 z-score)		Wasting(-2z score)
77-90	F	29 (67%)	21 (55%)	127(51)	0	29(74%)	24(63)	5(100%)	0
	M	14(33%)	17(45%)	122(49)	4(100%)	10(26%)	14(37)	0	0
	Sum	43(100%)	38(100%)	249 (100)	4(100%)	39(100%)	38(100%)	5(100%)	0
91-113	F	40(70%)	21(55.3%)	127(51%)	2(100%)	38(69%)	39(69%)	1(100%)	0
	M	17(30%)	17(44.7)	122(49%)	0	17(31%)	17(31%)	0	0
	Sum	57(100%)	39	149(100%)	2(100%)	55(100%)	56(100%)	1(100%)	0
114-132	F	31(60.7)	31(49.6%)	132(79%)	1(100%)	30(60%)	14(50%)	17(73%)	0
	M	20(39.3%)	31.5(51.4%)	135(21%)	0	20(30%)	14(50%)	6(27%)	0
	Sum	51(100%)	62.5(100%)	167(100%)	1(100%)	50(100%)	28(100%)	23(100%)	0
133-156	F	39(68%)	33.5(49%)	133.9(80%)	0	39(68%)	15(79%)	24(63%)	0
	M	18(32%)	34(51%)	133(20%)	0	18(68%)	4(21%)	14(27%)	0
	Sum	57	67.5(100%)	167(100%)	0	57(100%)	19(68%)	38(68%)	0
157-192	F	76(69%)	50(48%)	149(50%)	2(20%)	74(74%)	19(76%)	48(85%)	9(31% %)
	M	34(31%)	54(52%)	149(50%)	8(80%)	26(26%)	6(24%)	8(15%)	20(69%)
	Sum	110	104(100)	296(100%)	10(100%)	100(100%)	25(100%)	56(100%)	29(100%)
Total		318	--	--	17(6%)	301(94%)	166(52%)	123(38%)	29(10%)

4.5. Hygiene at school and quality of school meal

The condition of school kitchen facility is 275(86.4%) as shown in table 4.8. found in satisfactory condition. The school food preparation room cannot full fill the whole requirement and the quality of kitchen is not that much satisfy.

There are a few reasons it's important to wash every vegetable no one likes eating dirt. In this report washing vegetables they use pure water. The level of acceptable practices among the respondents was 318(100%) in table 4. 8. the most important reason for rinsing and scrubbing vegetables is to protect our self from food borne illnesses.

Table 4.8.School meal and hygiene of kitchen (6-16), in New-era primary School, N=318, 2021.

Do you think the school meal full fill the whole requirement?	
Yes	28(9%)
No	290(91%)
How was the quality of the kitchen?	
Excellent condition	0
Very good	20(6%)
Good	22(8%)
Satisfactory	275(86.4%)
Goodness of washing fruits and vegetables with clean water	
With water	318(100%)
With water and soap	-
Without washing	-

Source: Own survey data

Assessment of student hygiene focused on actions taken to prevent germs. The assessment indicated that all school children had good hand washing habit. All respondents know about hand washing before eating. The majority respondent 269(75%) washed their hands with soap because of Covid-19 precautions. Addis Ababa education bureau supplied hand soap but 25% did not use soap to wash hands. Although there were hand washing facilities near to the toilet, 84.6% of respondents said that no soap was available on the facilities. According to the respondent and my observation, female student had separate toilets from boys with own a shower.

Table 4.9.Student hand washing habit and toilet facility (6-16), in New-era primary school,N=318, 2021

Do you wash your hand before eating	
Yes	318 (100%)
No	—
If you're answer yes for question No 1.What type's mechanism do you use to wash your hand?	
With water	49(15%)
With water and soap	269 (75%)
Is there any bathroom next to the toilet?	

Near from Toilet	269(84.6)
Far from Toilet	15(4.71)
Nearby from Toilet	34(10.7)
Is there water and soap in bathroom?	
Yes	—
No	318
Is there a separate toilet for women	
Yes	318
No	—
If your answer is yes, what kind of toilet is there?	With Shower

Source: Own survey data

The purpose of a shower was to change their pad and wash their body during menstrual period. Previous studies have indicated that personal hygiene in Ethiopia is very low (Kumie, A., & Ali, A. 2005). In this report almost all personal hygiene materials are available in the school compound. These indicate school is well organized.

4.6. An assessment of the food safety knowledge and attitudes of food handlers in School

The World Health Organization (WHO) express food safety as the conditions and measures that important during preparation, cleaning, storage, of food to keep that it is safe(WHO 1984).

The participants had good level of practice and good level of knowledge, respectively. The proportion of respondents who had appropriate practice in cleaning utensils after preparing foods (100%) all of them are used to clean, with detergent and storing perishable fresh foods are kept Covered (protected from insects, rodents, pests and dust).

Table 4.10. Food Handling Practice, for food processors in New-era primary school, Arada Sub-city, N=318, 2021.

Food Handling Practice, for food processors	Percent
After cooking, the cooking area, Pots, pans, plates, and more Utilities must be cleaned. How to clean them most of the time?	
Scrape excess food into rubbish bin	
Wash with hot water	
Wash with detergent	13(100%)
no answer	
What about leftover enjera or stew Will it are done?	
We use for next time	
There is no leftover	
Other	they give for beggar people
What about leftover enjera or stew Will it are done?	
Covered (protected from insects, rat, and dust)	13(100%)
Separated from cooked or ready-to-eat foods	
Other	

Source: Own survey data

The level of practice of the study participants in our study is in keeping with a study conducted in Tigray prison centers, Ethiopia; 52.5% had level of practice these is lower than participants in the school feeding program (Mardu, *et al*, 2020). Although the level of hygienic practice protected method is low. Leftover enjera or stew are given to the beggar people

4.7. Personal Hygiene Practice

Personal hygiene a key of health protection method; it is used to prevent from different kinds of disease and reduced children mortality rate. Personal hygiene was assessed with regards to preventing food borne diseases from germs. Personal hygiene practice was assessed step by step description of hand washing (Table 4.11). The majority (100%) of respondents had appropriate practice hand washing practice. Among those who had appropriate practice of hand washing, most washed with used running water from the tap and feces hand was use of soap was quite limited (25%). Total acceptable practice among respondents was about 100%. The appropriate practice level in this study was higher than that observed by (Jemal, S. 2018).

Table 4.11. Personal Hygiene Knowledge, in New-era primary school, Arada Sub-city, N=318, 2021.

Personal Hygiene Practice	Bad habit	Appropriate
Could you please describe step by step how you wash your hands?		
a. Washes hands in a bowl of water (sharing with other people)		
b. With someone pouring a little clean water from a jug onto one's hands - appropriate practice	-	
c. Under running water	-	9
d. Washes hands with soap or ashes	-	4
e. Other	-	-
f. Do not know	-	-

Source: Own survey data

4.8. School Water Sanitation Practice

A practice of water sanitation is measured in terms of main sources of safe water, safe collection and storage of water, and treatment of water to make it safe. 100% school water is obtained from the main source of water pipe as shown in (table 4.12).

Table 4.12. School toilet type

Kinds of student toilet in school (most common one)	Yes	No	Number
With feces to wash away	318		
With covered			
A hole without lid			
Toilet seat under bucket			
No Toilet			
How many student toilet are functional at the moment			48
Student accessible (unlocked or always functional	318(100%)		
Which can be used by a student (the toilet seat is not broken, the toilet hole is not blocked, or there is enough water to flush the feces) and	318(100%)		
One-person access (with locked doors inside, no large holes in the wall	318(100%)		
Are there different toilet for female and male student	Yes		

Source: Own survey data

Table 4.12. School Water sanitation Practice Result in New-era primary school, areada Sub-city, N=318,2019.

Main source of water for school for drinking purpose.		
Water Sanitation Practice	Yes	No
From the pipe	13(100%)	
From a pipe coming out of the ground		
From a covered well spring		
Accumulated from rain water		
From an uncovered well / accumulated spring		
Tanker-truck		
Surface water		
Bottled water		
Don't know		
Is there drinking water from the main source?	13(100%)	

Source: Own survey data

4.9. School toilet sanitation (Major sanitation question)

The present study showed that half of the toilet has water to wash the poo but the water is put by some kind of tanker (bermal) and half of toilet was a hole without lid. More than 48 toilets are given service to student but from 48 toilets 20 them are for females student and 20 toilets are for meals the other toilet are taken by meal and females teachers. All school children and teachers toilets are unlocked door; not only that all toilets can give suitable services to all student and teachers because there is no any fixed flush water they use from tanker to wash. According to my observation the school has not that match good facility.

Table 4.13 School toilet sanitation Result in New-era primary school, areada Sub-city, N=318,2019.

Kinds of student toilet in school (most common one)	yes	NO	Number
With feces to wash away			
With covered			
A hole without lid	✓		
Toilet seat under bucket			
No Toilet			
How many student toilet are functional at the moment			48
Student accessible (unlocked or always functional	✓		
Which can be used by a student (the toilet seat is not broken, the toilet hole is not blocked, or there is enough water to flush the feces) and	✓		
One-person access (with locked doors inside, no large holes in the wall	✓		
Are there different toilet for female and male student			
Yes			
No	✓		

Source: Own survey data

4.10. Major hygiene question

Coverage of hand washing facility was shown in this study is 100% there was a soap and hand sanitizer due to of Covid19. At the time of observation there was drinking water from the main source for last two weeks. The school is not suitable for disable and blind student to get safe drinking water but the drinking water areas easily accessible for lower class student in the school 60 pipe are found from 60 pipes 57 of them are functional. The school is not use any treatments after fetching water from the source I am not sure the main source water is fulfill the national drinking water standard, there was only water in the girls' restrooms (has one different rest room) without any soap.

Table 4.13. School Hygiene Result in New-era primary school, areada Sub-city, N=273, 2019.16

Is there hand washing facility in the school?		
Yes	318	
No		
Is there soap and water on hand sanitizers?	0	
Yes there is water and soap		
Only water	318	
Only soap		
There is no any soap and water	0	
Is there soap and water on hand sink?	318	
Has drinking water from the main source Available at school the past two weeks		
Yes	✓	
No		
Is drinking water from the main source available throughout the school years		
Yes always		
More often (only valid for less than 30 days)	✓	
No it may more than 30 day		
Can limit mobility or blind are school children are able to safe drinking water		
Yes	✓	
No		
Is drinking water is easily accessible for lower class student		
Yes	✓	
No		

Source: Own survey data

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

Student anthropometric assessments, according to their age, weight and height, showed varying prevalence of under-weight 47(15%) and wasting 10(37.5%). According to the student anthropometric resulted were normal and 10% were overweight obese class 1. In the study, 87.3% of responden^ts' school children) ate three times a day at home and 12.7% of student ate only two times a day.

About 47.71% of regular school feeding beneficiary school children said that they ate at school until they were satisfied but 52.3% were not always so satisfied. Most of the time tea with bread was served for breakfast. Lunch consisted of Rice with bread, or basically enjerra with Shirowett, miser wett, dinichwett or Shirowett with boiled egg on different days of the week. The condition of school kitchen facility is 275 (86.4%) as shown in table 4.8 found in satisfactory condition. Although there were hand washing facilities near to the toilet, 85.1% of respondents said that no soap was available on the facilities. According to the report, female student had separate toilets from boys with own a shower. The majority (100%) of respondents had appropriate practice hand washing practice. Among those who had appropriate practice of hand washing, most washed with used running water from the tap and feces hand was use of soap was quite limited (25%). Total acceptable practice among respondents was about 100%. A practice of water sanitation is measured in terms of main sources of safe water, safe collection and storage of water, and treatment of water to make it safe. All school children and teachers toilets are unlocked door; not only that all toilets can give suitable services to all student and teachers because there is no any fixed flush water they use from tanker to wash.

5.2. Recommendations

Based on the findings of this study, the following issues are recommended to minimize the poor nutrition, food safety knowledge, and attitude, practices and school hygiene.

- ❖ The program should include balanced diet according to the WHO
- ❖ Further research is needed to assess nutritional statuses school feeding programme in other sub city and woreda
- ❖ The school improves toilet service like door and fixed flush water.
- ❖ Need follow-up the program, menu is implemented or note

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Appendixes

APPNDIX -1

በአዲስ አበባ ዩኒቨርሲቲ የምግብ ዋስትና የትምህርት ክፍል ለጥናት እና ምርምረ የተዘጋጀ መጠይቅ

I. በመጀመሪያ ለዚህ ቃለ መጠይቅ ፍቃደኛ ስለሆኑ ከልብ አመሰግናለሁ

1. የትቤቱ ስም _____
2. ክፍል _____
3. የትውልድ ቀን _____ ወር _____ አመት _____
4. ፆታ _____
5. የመኖሪያ ወረዳ _____
6. ትምህርት ቤት ከመግባት በፊት ነበረህ/ሽ ኪሎ _____
7. የወላጅ የስራ ሁኔታ የመንግስት የግል የቀን

II. የት/ቤት ምግብ ጋር የተያያዘ

1. የትምህርት ቤት ምግብ ተጠቃሚ ነህ/ሽ?
አዎ አይደለም አልፎ አልፎ
2. በትምህርት ቤት በቀን ምን ያህል ጊዜ ትመገባለህ/ሽ?
ቁርስ መክሰስ ምሳ
3. እቤት ውስጥ በቀን ምን ያህል ጊዜ ትመገባለህ/ሽ
ቁርስ ምሳ መክሰስ እራት
4. በት/ቤት ውስጥ ስንት አይነት ምግብ ትመገባለህ/ሽ?
አንድ ሁለት ሶስት አራት አምስት
5. በት/ቤት ምግብ እስክ ትጠግብ/ እስክ ትጠግቢ ድረስ ትመገባለህ/ሽ
አንዳንድ ጊዜ ሁል ጊዜ

6. በት/ቤት ውስጥ መመገብ/ሽያ መጣህው /ሽ ለውጥ አለ?

አለ የለም ካለ ምን አይነት ለውጥ _____

?

7. በት/ቤት ውስጥ በብዛት የምትመገቡ/ቢው ምግብ ምንድን ነው?

1. _____ 2. _____ 3. _____ 4. _____

8. የት/ቤት ምግብ ከተጀመረ በኋላ በትምህርት ላይ ያመጣው/ሽው ለውጥ

አጅግ በጣም ጥሩ በጣም ጥሩ ጥሩ መጠነኛ

9. ወደ ት/ቤት ስትመጣ/ጩ ምግብ ሳትበላ/በይ መጥተሽ ታውቁአለሽ

አዎ አላውቅም አልፎ አልፎ

10. ለ8ኛው ጥያቄ መልስ አዎ ከሆነ ትምህርት ቤት ከመጣህ/ሽ በኋላ

ያጋጠመ/ሽ ችግር ነበር

አዎ አልነበረም

11/በት/ቤትምገባምን እንዲሻሻልት ፈልጋለህ/ሽ

III. በት/ቤት ውስጥ ያለው የፅዳት ሁኔታ

1. በት/ቤት ግቢ የሚዘጋጀው ምግብ ጥራቱን የጠበቀ ነው? አይደለም ነው

2. ምግብ የሚዘጋጅበት ቦታ (ኩሽና) የጥራት ሁኔታ እንዴት ነው?

አጅግ በጣም ጥሩ በጣም ጥሩ ጥሩ መጠነኛ

3. ምግብ የሚያዘጋጁት ሰዎች ንፅህናቸው ይጠብቃሉ?

አዎ አይጠብቁም

4. ምግብ የምትመገቡበት እቃ የሚታጠበው

በውሀ ብቻ በሳሙና እና ውሀ አይታጠብም

5. ሊበላሹ የሚችሉ ምግቦችን የሚቀመጥበት ዘዴ

በመሸፈን በፍሪጅ ሌላ ምንም ዘዴ የለም

6. አትክልቶች ወይም ፍራፍሬዎች ከመሰራታቸው በፊት በምን ይታጠባሉ

በውሀ ብቻ በውሀ እና በሳሙና ሳይታጠቡ ይሰራሉ

አይታጠቡም

IV. የተማሪዎች ንፅህና በተመለከተ

1. ከመመገብህ/ሽ እጅህን/ ሽንት ታጠባለህ/ሽ?

አዎ አልታጠብም

2. ለ 1ኛው ጥያቄ አዎ ከሆነ የምትታጠብበት ነገር ምንድን ነው?

በውሀ ብቻ በውሀና በሳሙና

3. በጊቢው ውስጥ በቂ የመጠጥ ውሀ የሚገኘው ከየት ነው

ከታንክር ከቧንቧ ከጉድጓድ የለም

4. ከመፀዳጃ ቤቱ አጠገብ የእጅ መታጠቢያ ቦታ አለ?

አዎ የለም በቅርብ እርቀት

5. በእጅ መታጠቢያው ላይ ውሃ እና ሳሙና አለ?

ውሃ ብቻ ውሃ እና ሳሙና

6. ለሴቶች የተለየ መፀዳጃ አለ?

አዎ የለም

7. ለ6ኛው ጥያቄ አዎ ከሆነ ምን አይነት መፀዳጃ አለ?

ለዚህ መጠይቅ ስለተባበሩትሁኝ ክልብ አመሰግናለሁ

ለምግብ አዘጋጆች የሚቀርብ ጥያቄ

1. የምግብ አያያዝ ልምድ

ተ.ቁ	/ጥያቄ/	/የመልስ አማራጭ/
1	ምግብ ካዘጋጁ በኋላ የማብሰያ አካባቢው፣ ድስቶች፣ መጥበሻዎች፣ ሰሃኖች እና ሌሎች መገልገያዎች መጽዳት ይኖርባቸዋል። አብዛኛውን ጊዜ እንዴት እንደሚያጸዷቸው ሊነግሩኝ ይችላሉ?	1=ጠራርጌጥራጊውን ወደ ቆሻሻ ማጠራቀሚያው እደፈዋለሁ። 2=በሞቀ ውሃ አጥበቀለሁ። 3=በሳሙና (አጃክስ) ወይም በፈሳሽ ሳሙና አጥበቀለሁ 4=መልስ የለም
2	ቶሎ ሊበሳሹ የሚችሉ ምግቦችን እስኪሰሩድረስ እንዴት ያቆዩዋቸዋል?	1= ፍሪጅ ውስጥ 2=ዝንብ፣ አቧራ ወይም አይጥ እንዳይደርስበት ተሸፍኖ 3=ለምግብነት ከተዘጋጁ ምግቦች ጋር እንዳይካካ ተለይቶ 4=ሌላ 5=መልስ የለም
3	ሳይበላ የተረፈ እንጀራ ወይም ወጥ ምን ይደረጋል?	1 = ለሚቀጥለው ቀን ይቀመጣል 2 = የሚተርፍ ነገር አይኖርም 3 = ሌላ ካለ

2. የግልሃይጅንንበተመለከተ ልምድ

ተ.ቁ	ጥያቄ/	የመልስ አማራጭ	መልስ
34	እጆችዎን እንዴት እንደሚታጠቡ በቅደም ተከተል ሊነግሩኝ ይችላሉ?	1. እጆችን ሰሃን ውስጥ ባለ ውሃ ውስጥ እየነከሩ ከሌሎች ሰዎች ጋር አብሮ መታጠብ (መጥፎ ልምድ) 2. ሌላ ሰው ትንሽ ንጹህ ውሃ አያንቆረቆረ መታጠብ (ትክክለኛ ልምድ) 3. ከቧንቧ በሚወርድ ውሃ መታጠብ (ትክክለኛ ልምድ) 4. እጆችን በሳሙና እና ውሃ መታጠብ 5. ሌሎች 6. መልስ የለም	

3. ውሃ እና ሳኒቲሽን ልምድ

ተ.ቁ	/ጥያቄ	የመልስ አማራጭ
1	ለመጠጥ፣ ለማብሰያ እና እጅን ለመታጠብ የሚሆን ውሃ የሚያገኙት በዋነኛነት ከዬትነው?	1=የቧንቧ ውሃ () 2=ቤት ውስጥ ካለ የቧንቧ ውሃ 3= ግቢ ውስጥ ካለ የቧንቧ ውሃ 4= ከቦኖ ውሃ 5= ከጉድጓድ በቧንቧ ከሚወጣ ውሃ 6=ጉድጓድ ከሚጠለቅ ውሃ 7= ከአካባቢው ቆሻሻ እንዳይገባበት መከላከያ ካለው ጉድጓድ 8= ከክፍት ጉድጓድ 9=የምንጭ ውሃ 10= መከላከያ ካለው ምንጭ

		<p>11= መከላከያ ከሌለው ምንጭ 12=የዝናብ ውሃ በማጠራቀም 13=ውሃ ከሚያድል የመኪና ቦቲ 14=የውሃ በርሜል ካለው ጋሪ 15=የገጽ-ምድር ውሃ (ውንዝ፣ ምንጭ፣ ግድብ፣ ሃይቅ፣ ኩሬ፣ ቦይ፣ የመስኖ ቦይ 16=የታሸገ ውሃ 17=ሌሎች (ዘርዘር) _____ 18=መልስ የለም</p>
2 A	ለቤት ውስጥ አገልግሎት ውሃ ይቀዳሉ?	<p>1= መልሱ አዎ ከሆነ ወደሚቀጥለው ምርጫ ይሂዱ 2= መልሱ አልቀዳም ከሆነ ወደ ጥያቄ 3 ይሂዱ</p>
2.B	ውሃ ለመቅዳት ምን አይነት መቅጃ ይጠቀማሉ?	-----
2.C	መቅጃው ንጹህ ካልሆነ መቅጃውን ንጹህ ለማድረግ የሚጠቀሙት ነገር አለ?	<p>1=አዎ 2= ምንም አልጠቀምም 3= መልስ የለኝም:: መልሱ አዎ ከሆነ እንዴት? ----- 4=መቅጃውን በሳሙና እና በውሃ አጥቦቀሁ 5=ሌላ 6= አላውቅም/መልስ የለም</p>
3	ውሃውን እንዴት እንደሚያጠራቅሙ ሊያብራሩልኝ ይችላሉ?	<p>1=ንጹህ ውሃ ማጠራቀሚያ ውስጥ 2= የተከደነ ውሃ ማጠራቀሚያ ውስጥ 3=ንጹህ እና የተከደነ ውሃ ማጠራቀሚያ ውስጥ 4=ሌላ 5= አላውቅም/መልስ የለም</p>
4.A	የቀዳት ውሃ ለመጠጣት ጤናማ እንዲሆን የሚያከሙበት መንገድ አለ?	<p>1=አዎ 2=አይ 3= አላውቅም/መልስ የለም መልሱ አዎ ከሆነ ወደ 4ይህ ሂዱ</p>
4.B	የቀዳት ውሃ ለመጠጥ ጤናማ እንዲሆን ብዙውን ጊዜ ምን ያደርጋሉ?	<p>1=ማፍላት 2=በረከት መጨመር 3=በጨርቅ ማጥለል 4=የውሃ ማጣርያ መጠቀም (ሴራሚክ፣ አሸዋ፣ ቅልቅልጠጠር) 5= በጸሃይ 6=ቆሻሻው እስኪዘቅጥ ማስቀመጥ 7=ሌላ 8= አላውቅም/መልስ የለም</p>

APPNDIX -2

English version Questionnaire and interviews

Addis Ababa University College of development studies center for food security studies

The aim of this study will be to investigate the School feeding program: student nutritional status, nutritional composition of school meals and sanitation facilities and hygiene of the compound: the case of New Era primary School, woreda 05, Arada sub-city, Addis Ababa. The information you provide used only for academic purpose. So, please put a thick mark and short answer for the following questionnaires

I would like to thank you in advance for sharing your time with me

Part I. Anthropometric data and social demography

1. Name of school _____
2. Grade _____
3. Date of birth _____ month _____ year _____
4. Sex _____
5. Weight _____
6. Resident Sub city _____
7. Family occupation government _____ privet _____ Char _____

Part II. Related to school feeding beneficiary

1. Are you benefiting from school meal?
Yes _____ no _____ sometimes _____
2. How many times a day do you eat at home
1 _____ 2 _____ 3 _____ 4 _____
3. _____ How many meals do you eat at school?
1 _____ 2 _____ 3 _____ 4 _____
4. You will eat until you are satisfied with school meals
1. Always _____ 2. Sometimes _____ 3. Never _____
5. What do you want to improve on school meals?

6. What is the most common food you eat at school?

1 _____ 2 _____ 3 _____

7. Did you come ever to school without eating?

Yes _____ 2. No _____ 3. Sometimes _____

8. If the answer yes for question number 7. What problem faced you come to school

Part III. Regarding student hygiene

1. Do you wash your hands before eating?

Yes _____ No _____

2. If the answer is yes for question 1 what type of martial do you use

1. Only water _____ water and soap _____

3. Where does enough drinking water come from in the yard?

1. Tanker _____ 2. Tape (pipe) _____ 3. From the well _____

4. Is there a hand basin near the toilet?

1. Yes _____ 2. No _____ 3. Near distance _____

5. Is there water and soap in the bathroom?

1. Only water _____ 2. Only water and soap _____

6. Is there a separate toilet for women?

Yes _____ No _____

8. If yes to question 6, what kind of toilet is there?

After cooking, the cooking area, Pots, pans, plates, and more Utilities must be cleaned. How to clean them most of the time?
1=Scrape excess food into rubbish bin
2=Wash with hot water
3=Wash with detergent
4= no answer
What about leftover enjera or stew Will it are done?
1=We use for next time
2=There is no leftover
3= Other
Storing perishable fresh foods such as vegetable, poultry and seafood
1=Covered (protected from insects, rat, and dust)
2=Separated from cooked or ready-to-eat foods
3=Other

Experience with personal hygiene

Personal Hygiene Practice	Bad habit	Appropriate
Could you please describe step by step how you wash your hands?		
a. Washes hands in a bowl of water (sharing with other people)		
b. With someone pouring a little clean water from a jug onto one's hands - appropriate practice		
c. Under running water		
d. Washes hands with soap or ashes		
e. Other		
f. Do not know		

School Water Sanitation Practice

Kinds of student toilet in school (most common one)	Yes	No
1=With feces to wash away		
2=With covered		
3=A hole without lid		
4=Toilet seat under bucket		
5=No Toilet		
How many student toilet are functional at the moment		
6=Student accessible (unlocked or always functional)		
7=Which can be used by a student (the toilet seat is not broken, the toilet hole is not blocked, or there is enough water to flush the feces) and		
8=One-person access (with locked doors inside, no large holes in the wall)		
Are there different toilet for female and male student		

Main source of water for school for drinking purpose.		
Water Sanitation Practice	Yes	No
From the pipe		
From a pipe coming out of the ground		
From a covered well spring		
Accumulated from rain water		
From an uncovered well / accumulated spring		
Tanker-truck		
Surface water		
Bottled water		
Don't know		
Is there drinking water from the main source?		

Major hygiene question

Is there hand washing facility in the school?		
Yes		
No		
Is there soap and water on hand sanitizers?		
Yes there is water and soap		
Only water		
Only soap		
There is no any soap and water		
Is there soap and water on hand sink?		
Has drinking water from the main source Available at school the past two weeks		
Yes		
No		
Is drinking water from the main source available throughout the school years		
Yes always		
More often (only valid for less than 30 days)		
No it may more than 30 day		
Can limit mobility or blind are school children are able to safe drinking water		
Yes		
No		
Is drinking water is easily accessible for lower class student		
Yes		
No		

School Hygiene question

Kinds of student toilet in school (most common one)	YES	NO
With feces to wash away		
With covered		
A hole without lid		
Toilet seat under bucket		
No Toilet		
How many student toilet are functional at the moment		
<p>Student accessible (unlocked or always functional</p> <p>Which can be used by a student (the toilet seat is not broken, the toilet hole is not blocked, or there is enough water to flush the feces) and</p> <p>One-person access (with locked doors inside, no large holes in the wall</p>		
<p>Are there different toilet for female and male student</p> <p>Yes</p> <p>No</p>		