

School Feeding Programs and Development: Evidence from Some Developing Countries

Md. Shahadat Hossain^{1*}

Abstract

School feeding programs have been a crucial response to food and economic crises and exist in some form in almost every country throughout the world. According to the empirical evidence, the persistence of poverty, hunger, and malnutrition is the reason why school feeding programs are implemented in developing nations. The study has tried to determine whether school meals had generally consistent positive effects on children's calorie intake, micronutrient status, school enrollment, and attendance as compared to non-participants in its many modalities. To comprehend the basis of school feeding and its development in numerous developing countries, the study applies a descriptive research technique. Data was gathered from a variety of sources, including journals, research papers, survey reports, and files. Despite various limitations, significant collaborative attempts are required to attain the intended outcomes of SFPs in the short and long terms. A need exists, however, for further high-quality studies.

Keywords: School feeding programs, Developing countries, School-aged children, Nutrition, Education

1. Introduction

School feeding programs are intended to be transfer programs that promote human capital investment while acting as a social safety net. School feeding programs are run as a persistent and well-liked development assistance arrangement in developing countries to promote the physical and psychosocial health of school-aged children. For decades, World Food Programme (WFP) and national governments in both rich and developing countries have spent significant resources to provide disadvantaged school-aged children with free school meals. School feeding programs encourage low-income households to support their school-aged children's education by uplifting them to send them to school and helping them stay there. Benefits of school feeding for children and adolescents include reducing hunger, reducing nutritional deficiency and anemia, preventing overweight and obesity, improving school enlistment and attendance, improving cognitive and schooling performance, and helping to eliminate gender discrimination in access to education. Every country around the globe has developed its pattern and range of school feeding programs. To maximize the advantages of school feeding programs for children and adolescents, it is essential to extend their coverage and improve the quality of existing programs (Wang, D., & Fawzi, W.W, 2020). Despite some limitations, school feeding programs help children reach their full potential while simultaneously assisting low-income families.

This study seeks to delineate the school feeding program's pattern in the context of various developing countries. To do so, a descriptive technique, like tabular form is used to analyze the secondary sources' data. Although very few studies have been done on the topics of School Feeding programs the issues of 'School Feeding Programs and Development: Evidence from Some Developing Countries' is remaining unexplored. In sum, this study will assist in comprehending the school feeding development in terms of some developing countries.

¹ Assistant Professor (Economics), BCS (General Education) Cadre, Assistant Director (on deputation), Harmonized stipend program, secondary education development program (SEDP), Prime minister's education assistance trust, ministry of education, Dhaka Bangladesh.

* Corresponding author email: milueco2017@gmail.com

The study has been organized as follows: section 2 shows the objectives of this study, section 3 shows the literature review, section 4 describes the benefits of SFP, section 5 shows the methodology of this study, and section 6 discusses the findings of this study, section 7 shows the drawbacks and challenges to this study and the final section describes the conclusions with some recommendations of the study.

2. Objectives of the Study

This study describes the nature and development of school feeding programs in some developing countries. However, to achieve this goal, the study focuses on the following objectives:

- To develop a general view of school feeding initiatives.
- To delineate the school feeding program's pattern in some developing nations.
- To determine how school feeding initiatives have far-reaching effects in various developing nations, like the Philippines, Indonesia, Kenya, Mexico, Bangladesh, etc., and at last, drew some attention to school feeding programs.

3. Literature Review

3.1 Concept of School Feeding Programs

In general, school feeding refers to a broader and more diverse range of food-related activities aimed at attaining educational goals. School feeding programs are characterized as initiatives that provide a meal or snack to students in the classroom to enhance enrolment, attendance, nutritive condition, and schooling outcomes. According to the World Bank, school feeding programs are defined as "targeted social safety nets that provide both educational and health benefits to the most vulnerable children, thereby increasing enrollment rates, reducing absenteeism, and improving food security at the household level". ("School feeding in low-income countries," n.d). However, the School Feeding Program (SFP) refers to the distribution of food to school-aged children during the school day. It has been initiated in several developed and developing nations around the world to combat poverty and solve issues such as low school enlistment, attendance, and schooling performance. Furthermore, the goal of school feeding differs by country in terms of design, purpose, and achievement, as well as the socioeconomic situation of the areas where school feeding is offered (Sitali, C et al., 2020).

School feeding arrangements are categorized as school meal programs and another take-home ratio. The school meal program provides breakfast, lunch, or both during the school day. In some situations, the food could be supplemented with vitamins A or iron, for example. Take-home rations are a set of essential nonperishable foodstuffs, which are provided to children from low-income households.

In short, school feeding arrangements give meals or snacks to school-aged children on-site, whilst take-home rations are given to schoolchildren to consume at home. Under the school feeding program, the food for schoolchildren can be prepackaged or prepared on the spot. Table 1 lists some of the pros and cons of these two types of feeding arrangements.

Table 1: Types of school feeding arrangements and their pros and cons

	School Feeding Program (Prepackaged)	School Feeding Program (Cooked Meals)	Take-Home Rations
Pros	<ul style="list-style-type: none"> • Children who are maintaining regular basis attendance are expected to be benefited. •Relieves short-term hunger, allowing children to concentrate in the classroom. • Foods are frequently fortified. 	<ul style="list-style-type: none"> • Children who are maintaining regular basis attendance are expected to be benefited. • Relieves short-term hunger, allowing children to concentrate in the classroom. • Milk products and other nutrient-dense foods are commonly included in meals. 	<ul style="list-style-type: none"> • When children's attendance requirements are met, it benefits both the children and their families. • It does not take time away from teaching. • Possibility of focusing on specific households and students.
Cons	<ul style="list-style-type: none"> • The scope of targeting is vast. • It will take time away from teaching. 	<ul style="list-style-type: none"> • The scope of targeting is vast. • It will take time away from teaching. 	<ul style="list-style-type: none"> • Within the family, nutritional advantages may be diluted. • Cereals and oils are frequently used as rations (might not be fortified).

Source: Lawson, T. M, 2012.

3.2 Need for school feeding programs

School feeding arrangements are initiated due to the prevalence of country-wide poverty, hunger, and severe malnutrition of school-aged children. Hunger is a persistent condition caused by chronic undernutrition and poor diet quality, which leads to severe underweight and malnutrition in children. Meanwhile, the most common underlying cause of malnutrition is poverty. The factors that influence malnutrition are depicted in **Figure 1**.

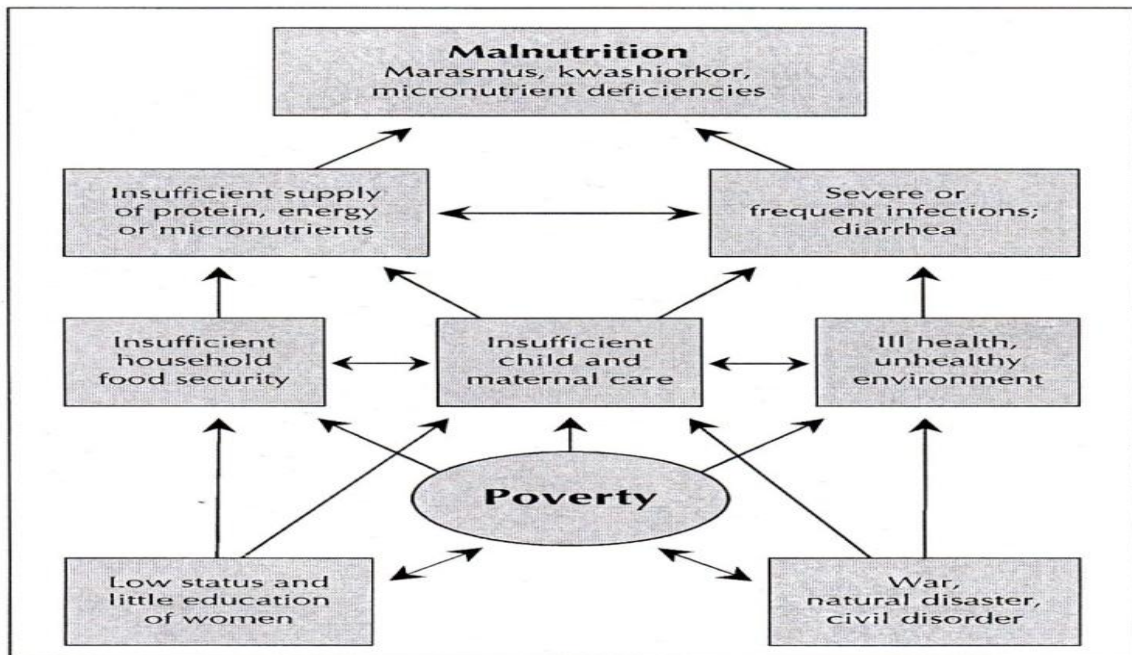


Figure 1: Direct and indirect causes of malnutrition. Source: (Müller, O., et al., 2005)

Here, severe malnutrition manifests itself as wasting, edema, or both, which is almost exclusively seen in children. Marasmus is described as extreme wasting; marasmic kwashiorkor, as extreme wasting in the presence of edema; and kwashiorkor, as malnutrition combined with edema. The degree of protein-energy malnutrition, the absence of micronutrients, and its prevalence in a particular population, as shown in Figure 1, are dependent on several factors: the political and economic condition, education and sanitation levels, the season and climate status, production of food, dietary practices based on culture and religion, breastfeeding practices, the ubiquity of contagious diseases, the existence and efficacy of nutrition programs and the accessibility and quality of health-care services.

3.3 Evidence from the developing countries

School food programs have historically served as a preventive measure. Evidence suggests that these initiatives help children reach their full potential while also compensating for lost income for low-income households. Households are best suited to manage financial difficulties when their children are fed at school, and this, in turn, creates extensive economic growth across the country. Globally, school feeding programs were first developed in South Africa in the 1940s, and extensive school feeding programs in China were put into place in the 1970s and 1980s. Numerous organizations have worked with the UN to accomplish the Millennium Development Goals (MDG) and current Sustainable Development Goals (SDG) pertaining to health, hunger, and penury during the past 20 years.

When the feeding program design and the context in which it functions are a good match, school feeding programs appear to provide improved attendance and enrolment. In times of crisis, school feeding programs have proved reasonably simple to scale up. As a result of the 2007–2008 spikes in food prices, several countries, including Burundi, Ghana, Liberia, Togo, and the Central African Republic, established or expanded SFPs (Alderman, H., & Bundy, D., 2012).

School feeding programs, which subsidize the expense of education, are well-liked initiatives in developing nations for expanding package school participation (like conditional cash transfers, Progreso in Mexico; free textbooks and uniforms in Kenya; free food grains in Bangladesh). In India, the government launched the National Programme of Nutritional Support to Primary Education (NPNSPE, also referred to as the Mid-Day Meals Scheme or MDMS) on August 15, 1995. The scheme aimed to bring together and cover all of the states' existing noon meal programs. It comprised transportation subsidies from the nearest distribution point of the Food Corporation of India as well as government support for the states in the type of a daily free ration of 100 grams of food grain per child (Athreya, 2011).

Brazil's PNAE (Brazilian School Feeding Program) was established in 1954. The PNAE is among Brazil's most crucial initiatives for food and nutrition security. Its broad coverage and unique design work to support household farms while also ensuring that all public schools have access to sufficient and healthful diets. With a budget of \$US 1.9 billion for 2012, the Brazilian program is likewise remarkable in terms of scope, reaching almost 45 million children. In Brazil, school feeding is both a legally required governmental responsibility and an unalienable entitlement of all students enrolled in public basic education. All public and community institutions in the fundamental schooling pattern are covered by the PNAE, including daycare, kindergarten, rudimentary school, high school, and adult schooling (Sidaner, E., et al., 2013).

The school feeding program was initiated in Zambia in 2003. The Zambian government and the World Food Programme (WFP) jointly started a school feeding arrangement as piloting in some realms where the most food insecure and drought-prone as well as districts with subpar schooling levels was prevailed. Every day, children at all of the targeted schools were given porridge when they arrived at school. The initiative was expanded to other regions of the country after years of successful execution (Sitali, C et al., 2020).

In Ghana, school feeding entails the distribution of hot meals to children while they are in class.

The Ghana School Feeding Programme (GSFP) was initiated to provide one hot, nourishing meal each day to school-aged children in public basic schools, especially those in the country's poorest realms. Ghana was chosen as one of ten African nations by the New Partnership for Africa's Development (NEPAD) to test out domestically run school feeding programs. The GSFP's three main objectives are to enhance internal food production, decrease hunger and undernutrition, and increase school enlistment, attendance, and retention (Abotsi, 2013).

In Bangladesh, the school feeding program helps overcome the gap between primary enrolment and completion rates by bringing and keeping children in school. School feeding initiatives have improved enrollment, attendance, and completion rates for primary school in the food insecure and poverty-stricken regions. Furthermore, short-term hunger has been reduced, and this has helped to improve nutrition. By the end of 2012, the National School Feeding Program in poverty-prone realms had expanded at an astonishing rate from starting with 55,000 children in 2011 to nearly 1.4 million children. The government's commitment is reflected through providing Tk. 1,578 crore set aside over four and a half years to implement school feeding related activities in poverty-stricken realms. Presently, the government contributes Tk. 876 crore, with the remaining Tk. 702 crore coming from donors through the World Food Programme ("Annual Report-2012 on School Feeding Programme in Poverty-Prone Areas of Bangladesh," 2013).

3.4 Involvement of the World Food Programme

The World Food Programme (WFP) has worked with over 100 nations to build long-term national school feeding programs, as well as having experience of six decades for aiding school feeding and health activities. The WFP prioritizes the school feeding initiative in many countries where WFP-supported projects are prevalent. Hunger relief for school-aged children is more expensive and time-consuming than other school-based health and nutrition programs since it frequently involves providing meals or snacks at school (Del Rosso, J.M et al., 1996).

WFP collaborates with national, local, and non-governmental organizations (NGOs) to use food to encourage school-aged children to go to school in realms with low rates of enrollment, attendance, and performance. In 2020, 15 million children in school-age receive nourishing meals and snacks from WFP. WFP assisted 65 countries in strengthening their national school feeding programs, benefiting an additional 39 million school-aged children, through working with governments to develop capacity. Presently, 73 million children who are now living in extreme penury in 60 different countries need nutritional support at urgent basis. WFP works with partners to make sure that meals are provided with a full range of health and nutrition services, such as deworming, health screenings, vaccines, and WASH (water, hygiene, and sanitation training). Moreover, WFP collaborates with governments to tailor its responses: in extremity situations where countries cannot meet the nutritive and educational needs of all

vulnerable children, WFP will expand its coverage and operations; in more stable situations, WFP helps to strengthen systems and provides technical support, upgrading the scale and standard of national programs and assisting governments in innovating and testing new techniques (“School feeding,” n.d).

4. Benefits of School Feeding Program

School feeding programs are likely to attract disadvantaged school-aged children to school, increase attendance, and lower dropout rates. Since 388 million school-aged children are globally receiving school meals through school feeding arrangements, this initiative is recognized as the expanded and most popular social safety net in the world. Evidence from 163 nations show that 99 percent of them have school food programs. Globally, 388 million school-aged children, or one in every two, now receive a school food, albeit there are big variations across different nations. Low-income countries benefited the most from the extension and institutionalization of these programs, ensuring their sustainability of attempts (The World Food Programme [WFP], 2021). In India, a federally mandated program for prepared school meals has reduced gender gaps in enrolment and daily attendance while raising overall rates of school attendance (Afridi, F, 2007).

In short, the benefits of school feeding program can be stated as follows:

- School feeding program incentivizes disadvantaged households to invest in their school-aged children's schooling.
- School feeding programs provide nutritive food for school-aged children and promote healthy nutrition which is crucial for their physical and psychological development.
- School feeding programs may increase gender parity in educational access, enabling it in all spheres of social and economic life.
- School feeding programs significantly contribute to children's access to education. Parents are encouraged by school feeding programs to enroll and keep their children in school.

These programs enhance incomes and assist to reduce poverty by relieving parents of having to pay for lunches—school meals account for 10% of the income of poor and disadvantaged families, which is a remarkable saving for families with more than one child. In benefitting schoolchildren and their households, school feeding and health contribute to develop human capital (“School feeding,” n.d).

Indeed, the school feeding program helps to improve overall human development.

5. Methodology

This study solely depends on descriptive research, and the analysis technique is based on secondary sources data. The data was gathered from various research articles, journals, newspapers, online news, program reports, and the annual report of the World Food Programme (WFP). To analyze and represent the accumulated data, a descriptive technique like tabular form is used.

6. Findings and Analysis

The school feeding program (SFP) is a designated safety net program that benefits economically disadvantaged students in terms of their health and education. The supply of meals in schools was a crucial attempt that was treated as one of the first public welfare initiatives in the globe and as well as the first interventions to be broadly offered through the schooling sector. Many outcomes are said to have developed due to school feeding. School feeding arrangements have been observed to directly enhance beneficiary children's schooling and nutritional situation, as well as their household's socio-economic lives.

6.1 Impact of school feeding on education and learning

Education is a crucial component of school feeding programs and global enhancement since an educated person has more opportunities in life, earns more money, and enjoys a higher standard of living than an illiterate person.

6.1.1 Educational attainment

Numerous studies have shown that school feeding improves enrollment or involvement in schools, particularly in areas where early indicators of academic participation are poor. The impact may seem moderate in many cases because starting enrollment rates are high and so cannot be remarkably raised. However, consequences can be modest because studies' time spans are frequently too short to show the overall effect of programs, particularly randomized trials that allow for the gradual introduction of a control group. For instance, in the Uganda experiment, an SFP led to a substantial 9 percent increase in the proportion of children aged 6 to 13 who entered school when compared to the control group. Despite the fact that overall enrollment did not increase significantly over 18 months, this difference was significant (Alderman, H., & Bundy, D, 2012).

According to WFP study, a moderate, experimental school feeding program in Malawi increased enrollment by 5% and attendance by 36% over the course of three months. According to an assessment of a school feeding program in Jamaica, after the first semester, the treatment class had better attendance than the control class. In Burkina Faso, a distinct study of a school feeding arrangement found that the presence of school canteens increased participation in school, regular presence, decreased repetition rates, lessen dropout rates, and increased success rates on national exams, especially among girls (Ahmed, A.U, 2004).

A randomized study of a preschool feeding program in Kenya exhibited a 30% increase in school involvement compared to the control group, while a school feeding program in Bangladesh's tremendously food insecure realms found a 14.2% rise in enrolment (Afridi, F, 2007).

The simplest method of increasing school attendance is to reduce the cost of schooling or even remunerate for attendance. Schultz (forthcoming) looks at the impact of Mexico's PROGRESA initiative, which provided financial subsidies to households in exchange for their children attending school. He reports an increase in enrollment of 3.4% for students in grades 1 through 8, with the remarkable increase (14.8%) occurring among girls who had completed grade 6. The randomized phase-in provided such convincing evidence of the program's efficacy that the Mexican government opted to preserve and extend the program, and similar projects are being undertaken throughout Latin America (Kremer, M, 2003).

School feeding initiatives have also shown to be beneficial in closing the gender gap in schooling. In India, two elements of the school financing plan are shown to explain the gender impacts. First, because the cost of education rises as students progress through the grades, while the cash value of prepared school food remains constant, the food subsidy is implicitly higher for lower-grade school-aged children. Second, the fact that there is almost no redistribution of nutrients away from a program partaker within the family, combined with the reason that meal transfers through school food account for a larger ratio of the daily dietary need of the young and females, has an impact on the incentives of these children's parents. These two elements work together to encourage families to send girls in lower grades to school on a more frequent basis (Afridi, F, 2007).

6.1.2 Dropout rates

School feeding contributes to the enhancement of educational programs by lowering the dropout rate. Numerous studies have shown that school food programs have a beneficial impact on reducing the dropout rate. Ahmed (2004) demonstrated that in-school meals in Bangladesh reduced the likelihood of dropping out by 7.5 percent using econometric criteria similar to those used to measure the impact of the program on enrollment and attendance in this study (Adelman, S. Wet al., 2008).

Children who are gone from school for a short period and children who drop out of school permanently are both counted as absent. Although India largely lacks statistics on daily attendance rates, anecdotal evidence suggests that student absenteeism is substantial. The poor quality of education and family budgetary restrictions are to be the main reasons behind these dismal attendance rates. Enhancements in regular attendance may, possibly, upgrade schooling performance and, as a result, lower grade repeat and drop-out rates (Afridi, F, 2007).

Parents in many countries are faced with considerable private educational costs, whether for school fees or additional inputs like uniforms. Kremer et al. (2002) evaluate a program where an NGO called International Christelijk Steunfonds Africa (ICS) gave uniforms, books, and classroom furnishings to seven Kenyan schools that were randomly selected from a group of 14 under performing candidate schools. Parents in a country with a \$340 per capita income are typically required to pay for the uniforms, which cost about \$6. After five years, students in treatment schools had completed around 15% more coursework, and dropout rates at these institutions dramatically declined. Additionally, a lot of students from nearby schools transferred to the program schools, increasing class sizes by 50%. This demonstrates that school-aged children and parents were willing to give up the benefits of free uniforms, textbooks, and better classrooms in exchange for the advantages of noticeably bigger class sizes. These results suggest that current budgets may be effectively reallocated to decrease parental payments and significantly increase academic participation in schools given that the addition of these additional inputs and a 50% increase in class size had no discernible impact on test scores, but the cost savings from a much smaller increase in class size would have allowed the Kenyan government to pay for the textbooks, uniforms, and other inputs provided under the arrangement (Kremer, M. 2003). In Bangladesh, surveys show that a take-home raw food grains program had a considerable impact on raising school enrolment rates (Afridi, F, 2007).

6.1.3 Academic performance

The expectation of improved academic achievement is supported by increased school attendance and retention, more classroom attention, and increased pupil participation in the teaching and educating system. Academic performance, according to Adams and Hayes, consists of three components: the capability to learn and memorize facts, the ability to learn constructively and see how facts fit together to create larger patterns of knowledge, the ability to think for yourself in relation to facts, and the ability to communicate your knowledge verbally or on paper (Abotsi, A.K, 2013).

The majority of developing nations have low levels of academic achievement, especially in the early stages of education. This problem has a number of reasons that can be dealt with in a number of ways by supply-side and demand-side initiatives. Health and nutrition inputs are commonly incorporated in programs to improve academic achievement since it is well known that poor health and nutrition have an impact on children's capacity to learn. Giving children breakfast or lunch at school every day is probably going to improve their schooling performance through a number of ways, such as lengthening the time spent in class, enhancing certain cognitive processes and task attention, and, perhaps indirectly, enhancing nutritional status. Poor social surroundings and substandard socio-economic household characteristics, for instance, are typically connected to poor dietary habits and low schooling performance (Ahmed, A.U, 2004).

Ahmed (2004) evaluated the impact of the in-school feeding program on test results using data from 1,648 Bangladeshi grade 5 students who were enrolled in primary schools and took achievement tests. He used an econometric specification to isolate the effects of the program, and the results showed that students in program schools scored 15.7% higher than did students in control schools. This incremental result is found as statistically significant (Adelman, S.W et al., 2008).

School feeding had a consistent beneficial impact on arithmetic assessments, but less so on spelling reading, and writing tests (Jomaa, L.H et al., 2011). For instance, in a study conducted in Uganda, both the School Feeding Program (SFP) and Take-Home Ration (THR) had significant impacts on math test scores of students aged 11 to 14, but no impact on literacy test scores, and only THR had a noticeable influence on Primary Leaving Exam scores (Alderman, H., and Bundy, D, 2011).

When undernourished children were given breakfast, their performance on a verbal fluency test improved dramatically. School food programs affect academic performance. In 22 of Burkina Faso's 30 provinces, schools that had school feeding programs had a greater performance percentage on a nationwide exam for sixth-grade students (Ahmed, A.U, 2004). Furthermore, in India, it has been revealed that the impact of food on behavior and cognition emerges swiftly and can be seen in short-term assessments. This suggests that in phase 1, the scores of the control group grade seven pupils should be higher than those of treatment schools. Grade seven students in the treatment schools should have made more progress between phases than grade seven students in the control schools if the meal helped enhance classroom behavior and cognition (Afridi, F et al., 2013).

6.2 Impact of school feeding on nutrition and health of school-aged children

Children and adolescents ages 6-19 need a healthy diet during their schooling years for physical and psychological enhancement. When children and adolescents arrive at school hungry, it

severely hinders their capacity to learn, grow, and reach their full potential. Participating in children's nutritional intake is likely to be improved by school meal programs. Research in Huaraz, Peru reveals in comparison to the control group, children who took breakfast at school consumed 2% more calories, 28% more protein, and 4% more iron. Another study in Sao Paulo, Brazil, examined the impact of a significant school lunch arrangement on the calorie and protein intake of children. An increase in 357 calories and 8.5 grams of protein was associated with program participation. Few studies have specifically evaluated whether meals from school feeding arrangements are substituted for regular home meals or added to children.

To prevent the negative effects of a micronutrient shortage, some school feeding initiatives arrange fortified foods. It has been proven that providing such food increases micronutrient consumption in the diet. Researchers in Peru, for example, looked into the impact of an iron-fortified breakfast program. The program significantly increased iron intake, which increased by 46%, as well as calorie and protein intake, which increased by 25% and 28%, respectively (Ahmed, A.U, 2004).

6.2.1 Nutritional status

School meals may offer instant relief from hunger, as well as reduce distractions and improve concentration among school-aged students. In the long run, school meals could boost student effort in the classroom and thus their educational success by increasing their nutritional status (Afridi, F et al., 2013).

Some studies even suggest that, except in emergency cases, food-based interventions have a minimal quantifiable effect on the nutritional condition, morbidity, or mortality levels. However, assessments of school feeding initiatives reveal that some programs improve the nutritional status of children. For example, breakfast was given to undernourished children vs. children who were properly fed in a randomized, controlled trial in Jamaica, and the results were positive; in comparison to the control group, the breakfast group's height and weight significantly increased (Ahmed, A.U, 2004).

6.2.2 Growth and body composition

Evidence of the impact of SFPs on children's growth and body composition is still ambiguous due to the inconsistent findings from various studies. In order to examine how school feeding affects on a range of physical and psychological characteristics in schoolchildren, Kristjansson et al. published the first thorough study and meta-analysis in 2006. The evaluation covered 18 studies, 9 of which were undertaken in developing or low-income nations (Kenya, Indonesia, Jamaica, China, and India), 5 of which were Randomized Controlled Trials (RCTs), and 4 of which were Controlled before and after (CBA) trials. The meta-analysis of RCTs indicated no significant difference in height between children who got school foods and those who did not, whereas CBA trials exhibited a substantial height increase. Children who were fed at school typically grew 1.43 cm taller on average than the control group. A meta-analysis of two RCTs conducted within the same research found a small but remarkable effect of school feeding on height for age (z-score change = 0.04 [95 percent CI: 0.02-0.06]). The three RCTs and three CBA research that were analyzed, however, showed a stronger and more consistent effect of school feeding on weight increase, with gains ranging from 0.25 to 0.75 kg each year (Jomaa, L.H., et al., 2011).

Ahmed (2004) examined how the school feeding program affected children's body mass index (BMI) in Bangladesh, and found that the program led to increase 0.62 point in BMI, or 4.3 percent of initial BMI. As a result of participating in the program, a healthy 6-year-old with average height would obtain an additional 0.85 kg or a healthy 12-year-old with average height would obtain 1.4 kg (Adelman, S.W et al., 2008). Another study in South Africa revealed that adding iron and vitamin C to fortifying soup powders, along with deworming within an SFP, significantly improved the height, height-for-age, and weight-for-height z scores of primary schoolchildren aged 6 to 8 years; the improvements were largely seen in those with low baseline iron stores (Jomaa, L.H., et al., 2011).

7. Drawbacks and challenges to school feeding

School feeding initiatives require balancing the political, nutritional, economical, and logistical dimensions. The problems linked to school feeding initiatives are prominently known:

- School feeding arrangements only assist children who attend school, excluding those who are too young or ill to attend.
- The school feeding program resulted in higher class sizes and more crowded classrooms. In Kenya, Vermeersch and Kremer (2004) found that the school feeding program significantly increased class sizes, which had a variety of repercussions on learning levels. Furthermore, if teachers spent additional time on daily administration and arrangement of school foods, there could be a reallocation of resources away from instruction. As a result, the total impact of such an arrangement on students' academic achievement is unclear (Afridi, F et al., 2013).
- The school feeding took up time that could have been used for teaching. The school feeding was supposed to be provided between 8 and 8.30 a.m. before classes began. In practice, many schools delay serving the food. The food was served on time in only around a quarter of the observations. Porridge was served at 9.30 a.m. or later in 30% of the instances. Furthermore, the schools stated that feeding took half an hour on average, although casual observation suggests that this figure is likely too low, particularly in large schools. In preschools, a half-hour early accounts for 15 to 20% of teaching time. This could lead to poor academic performance, higher dropout rates, and grade repetition. (Vermeersch, C., & Kremer, M, 2005).
- SFPs are also costly. In low-income countries, the average annual investment of \$56 per child is accounted for by 83% of external development aid. In some countries, the costs of SFP exceed the costs of education, which raises high food prices or may lead to poor educational quality, as well as the challenging trade-offs that may face by the educational ministries and other stakeholders (Lindow,O, 2015).

Despite the somewhat inconsistent results, offering school feeding efforts to provide snacks (typically early in the school day) to remove temporary hunger or more significant meals to help specifically undernutrition or to provide an income transfer to disadvantaged households. These arrangements are remarkably more costly than the other interventions listed because of the cost of meal (and day-to-day logistical needs); however, these costs can often be partially covered by food aid, and if attendance consequences are strong, program benefits could outweigh even notable expenses (Jamison,D. T., & Leslie,J, 1990).

8. Recommendations and Conclusion

Around the globe, in many developing countries, school feeding arrangements have been initiated as a means of enhancing general socio-economic conditions. To enhance the sustainability of the school feeding program, it is crucial to undertake the following steps:

- i. The school meal should be served early in school time. This may help to alleviate children's hunger and increase classroom concentration. The program should run through such a handling and distribution mechanism so that the meal reached the poorest school-aged children.
- ii. Set up an appropriate guideline to evaluate the caloric ration's content and nutritive quality which may ensure the children's actual needs. School feeding programs should be combined with additional treatments that address the basic nutritional and health needs of school-aged children.
- iii. To meet the nutrition and health needs of school-aged children and improve educational performance, the government, relevant ministries, and development partners should put in place plans and effective measures focusing on upgrading existing human, physical, and financial resources to ensure the school feeding program is sustained.
- iv. Well-designed research is needed to measure the influence of school feeding programs on nutritional results and children's educational attainment.
- v. As school feeding programs are costly and out of reach for many developing countries, it is important to examine and find alternate finance and cost solutions for school feeding programs. Here, UN organizations, philanthropic organizations, etc. may be introduced as a possible source of funding.
- vi. Establish program functioning by developing monitoring procedures that focus on program systems and implement an assessment method to measure the program's influence on certain results.
- vii. Find and direct supply and other fund availability, the suitability of the cooking circumstance and cleanliness, cooking exercises, and private sector input management. School administration must distribute additional funds and participate in the current expertise, re-feed the expertise, re-evaluate, and make a final decision.

In sum, in the context of developing countries, school feeding initiatives are treated as vital tools for accelerating development. These arrangements provide substantial social advantages covering a safety net role. School feeding programs could upgrade learning and academic attainment which may reinforce by enhanced nutrition and accompanying advances in the cognitive capabilities of children. Combined endeavors of healthcare professionals, instructors, analysts, and social workers are required for designing national and zonal school feeding programs and planning trials to assess their influence on various targeted outcomes.

Acknowledgments

I desire to express my gratitude to Dr. Shafiun Nahin Shimul, Associate Professor, The Institute of Health Economics, Dhaka University, Dhaka, Bangladesh, for his valuable guidance and support. Finally, I thank the anonymous reviewers and the editors for their constructive comments that improved the quality of this paper.

References

- Abotsi, A. K. (2013). Expectations of school feeding program: Impact on school enrolment, attendance and academic performance in elementary Ghanaian schools. *British Journal of Education, Society & Behavioural Science*, 3(1), 80.

- Adelman, S., Gilligan, D., & Lehrer, K. (2008). *How effective are food for education programs?: A critical assessment of the evidence from developing countries* (Vol. 9). Intl Food Policy Res Inst, 29, 30, 44.
- Afridi, F. (2007). The impact of school meals on school participation: Evidence from rural India. Working Paper, 4, 6, 28.
- Afridi, F., Barooah, B., & Somanathan, R. (2013). School meals and classroom effort: Evidence from India. *International Growth Centre*, 2, 3, 13. Retrieved from International Growth Centre website: <https://www.theigc.org/wp-content/uploads/2014/09/Afridi-Et-Al-2013-Working-Paper1.pdf>
- Ahmed, A. U. (2004). Impact of feeding children in school: Evidence from Bangladesh. *Washington, DC: International Food Policy Research Institute*, 3, 4.
- Alderman, H., & Bundy, D. (2012). School feeding programs and development: are we framing the question correctly? *The World Bank Research Observer*, 27(2), 212.
- Annual Report-2012 on School Feeding Programme in Poverty-Prone Areas of Bangladesh. (2013). In *World Food Programme*, 13, 18. Retrieved from: http://sfp.dpe.gov.bd/sites/default/files/files/sfp.dpe.gov.bd/page/30427c5d_e425_4992_b356_dd33d1bf1884/2020-09-22-21-41-a4d9ecb3fc899053932894dff9f1c5b6.pdf
- Athreya, V. B. (2011). The School Feeding Programme in India. *MS Swaminathan Research Foundation, The School Feeding Programme in India, Chennai: MSSRF*.
- Badri, A. Y. (2014). A review of the progress of school meal programs around the globe. *Sky Journal of Food Science*, 36, 58.
- Del Rosso, J. M., & Marek, T. (1996). *Class action: improving school performance in the developing world through better health and nutrition*. World Bank Publications, 24.
- Jamison, D. T., & Leslie, J. (1990). Health and nutrition considerations in education planning. 2. The cost and effectiveness of school-based interventions. *Food and Nutrition Bulletin*, 12(3), 12.
- Jomaa, L. H., McDonnell, E., & Probart, C. (2011). School feeding programs in developing countries: impacts on children's health and educational outcomes. *Nutrition Reviews*, 69(2), 85, 90, 91.
- Kremer, M. (2003). Randomized evaluations of educational programs in developing countries: Some lessons. *American Economic Review*, 93(2), 102-106.
- Lawson, T. M. (2012). Impact of school feeding programs on educational, nutritional, and agricultural development goals: a systematic review of literature, 9. Retrieved from <https://www.semanticscholar.org/paper/Impact-of-School-Feeding-Programs-on-Educational%2C-A-Lawson/be537bf3d9e33a85e487528a4fa00f1618c892c8>
- Lindow, O. (2015). School Feeding in Bangladesh-a mid-term outcome evaluation of the Government of Bangladesh's School Feeding Programme in Poverty-Prone Areas.
- Müller, O., & Krawinkel, M. (2005). Malnutrition and health in developing countries. *Cmaj*, 173(3), 279, 280.
- School feeding (n.d.). In *World Food Programme (WFP)*. Retrieved from <https://www.wfp.org/school-meals>

- School feeding in low-income countries.(n.d). In *Wikipedia*.Retrieved from https://en.wikipedia.org/wiki/School_feeding_in_low-income_countries
- Sidaner, E., Balaban, D., & Burlandy, L. (2013). The Brazilian school feeding programme: an example of an integrated programme in support of food and nutrition security. *Public Health Nutrition*, 16(6), 989.
- Sitali, C., Chakulimba, O., & Ng'andu, S. K. (2020).The Benefits of School Feeding Programme in Western Zambia. *International Journal of Research- GRANTHAALAYAH*, 8(9), 176, 177.
- Vermeersch, C., & Kremer, M. (2005).*School meals, educational achievement, and school competition: evidence from a randomized evaluation* (Vol. 3523). World Bank Publications. Retrieved from [https://books.google.com.bd/books?hl=en&lr=&id=2vt3FfNpWK4C&oi=fnd&pg=PA4&dq=Vermeersch,+C.,+%26+Kremer,+M.+\(2005\).+School+meals,33,34,44](https://books.google.com.bd/books?hl=en&lr=&id=2vt3FfNpWK4C&oi=fnd&pg=PA4&dq=Vermeersch,+C.,+%26+Kremer,+M.+(2005).+School+meals,33,34,44).
- Wang, D., & Fawzi, W. W. (2020). Impacts of school feeding on educational and health outcomes of school-age children and adolescents in low-and middle-income countries: protocol for a systematic review and meta-analysis. *Systematic reviews*, 9(1), 2. Retrieved from <https://systematicreviewsjournal.biomedcentral.com/track/pdf/10.1186/s13643-020-01317-6.pdf>
- World Food Programme (WFP). (2021, February 24). *State of School Feeding Worldwide 2020*, 23. Retrieved from <https://www.wfp.org/publications/state-school-feeding-worldwide-2020>