

School Feeding Programme Implementation and Perceived Child Health and Educational Outcomes in Rural Somalia: A Cross-Sectional Study

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Abstract: Background: School feeding programmes can reduce short-term hunger and support child nutrition and education, but their effectiveness may be limited by food insecurity, weak infrastructure and supply-chain disruptions in rural Somalia.

Aim: To assess programme implementation and perceived child health, school attendance and educational outcomes in selected rural areas of Somalia.

Methods: A descriptive cross-sectional study included 60 respondents associated with public primary schools in rural districts of Lower Shabelle and Bay regions. Data were collected using a structured questionnaire and analysed descriptively in SPSS version 27.

Results: An active feeding programme was reported by 53.3% of respondents. Meals were provided daily by 33.3%, 3–4 days/week by 31.7%, and 1–2 days/week by 35.0%. Perceived weight or physical growth improvement was reported by 56.7%, and 58.3% reported fewer episodes of sickness; however, 58.3% reported no appetite improvement and 50.0% disagreed that meals were nutritionally adequate. Educational effects were limited: 73.3% reported no improvement in attendance, 73.3% no improvement in punctuality, 65.0% no improvement in concentration, and 75.0% no improvement in academic performance. Major challenges included delayed or insufficient food supplies (63.3%), food quality or variety problems (73.3%), inadequate storage/preparation facilities (83.3%), financial/logistical challenges (70.0%), and limited parent/community involvement (88.3%).

Conclusion: School feeding programmes may provide perceived short-term health benefits, but irregular provision and operational constraints may limit nutritional and educational benefits. Strengthening supply chains, food infrastructure, dietary diversity, community participation and monitoring is warranted.

Keywords: school feeding; child nutrition; malnutrition; rural Somalia; food security; school attendance

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1. INTRODUCTION

Child malnutrition remains a major public health challenge in low-resource settings, particularly where poverty, food insecurity, displacement and recurrent climate shocks compromise access to adequate diets and essential services. School meal programmes are widely used as social protection interventions because they can address short-term hunger while potentially supporting nutrition, school participation and learning. Recent evidence from sub-Saharan Africa shows that school feeding can improve selected nutritional outcomes, but implementation quality, food quality, infrastructure, financing and community participation strongly influence programme performance (Liguori et al., 2024; Mainje et al., 2024).

Evidence from East Africa illustrates both the potential and the limitations of school feeding. In southern Ethiopia, a prospective study found no statistically significant net effects of school feeding on haemoglobin, BMI-for-age or height-for-age z-scores after adjustment for confounding, demonstrating that the presence of a feeding programme does not automatically translate into measurable anthropometric improvement (Desalegn

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et al., 2022). In Addis Ababa, a prospective cohort study found a favourable change in BMI-for-age among school-fed adolescents compared with non-beneficiaries, while a 2024 study of adolescent girls in Sidama reported higher dietary folate intake and dietary diversity among school-feeding beneficiaries (Mekonnen et al., 2023; Bolka et al., 2024).

Meal composition and implementation systems are also important. Research in Addis Ababa found that school meals supplied substantial but suboptimal amounts of energy and several nutrients, and recommended greater inclusion of animal-source foods, fruits and vegetables to improve nutritional value (Gebremedhin et al., 2022). A 2024 mixed-methods systematic review of publicly procured school meals in sub-Saharan Africa identified implementation challenges across food preparation, meal distribution, infrastructure, funding, monitoring and coordination, while community engagement and programme coordination were identified as important facilitators (Liguori et al., 2024).

Somalia provides an important but under-researched context. National and humanitarian programmes have expanded school feeding, but implementation remains vulnerable to funding and delivery disruptions. WFP's 2024 Somalia reporting documented that 87,000 schoolchildren received nutritious meals, but this represented only 44% of the annual plan because of funding constraints; the programme was suspended in several regions, while WFP also reported construction or rehabilitation of 22 school kitchens and introduction of digital monitoring in supported schools (World Food Programme, 2025). The present study therefore addresses an important evidence gap by examining programme regularity, perceived health and educational outcomes, and operational barriers in selected rural Somali schools.

2. METHODS

2.1 Study design and setting

A descriptive cross-sectional study was conducted in selected rural districts in the Lower Shabelle and Bay regions of southern Somalia. The study period was reported as October 2025 to February 2026. These areas were selected because of food insecurity, child undernutrition and the presence of school feeding initiatives.

2.2 Study population and participants

The target population comprised school-aged children aged 6–14 years enrolled in public primary schools implementing school feeding programmes, together with parents or guardians, teachers, school administrators and local health officers who could provide information about programme implementation and perceived outcomes. The final sample consisted of 60 respondents. The results section indicates that respondents included parents/guardians, teachers and other respondents.

2.3 Sampling

The source thesis describes a multistage approach. Rural districts with operational school feeding programmes were purposively selected; schools were selected randomly; pupils were selected systematically from school registers; and key informants were purposively selected. The sample-size calculation used a finite-population formula with a target population of 70 and a 5% error level, producing a final sample of 60 respondents.

2.4 Data collection

Data were collected using a structured questionnaire. The questionnaire covered respondent characteristics, school feeding availability and frequency, meal type and food-group diversity, perceived child health and nutrition, school attendance and academic performance, and implementation challenges. The questionnaire was pre-tested in a nearby rural school not included in the main study. Data collection was conducted with

trained enumerators fluent in Somali. The source thesis also describes semi-structured interviews with key informants; however, the reported results and abstract are based on the quantitative questionnaire data. Therefore, the present manuscript focuses on the quantitative component.

2.5 Data analysis

Quantitative data were coded and analysed using SPSS version 27. Descriptive statistics, including frequencies and percentages, were calculated. The source methodology states that chi-square tests were planned to examine relationships between school feeding and nutritional status, but no inferential test results are presented in the reported results. Accordingly, this manuscript reports descriptive findings only and does not claim statistically significant associations.

2.6 Ethical considerations

The source thesis states that ethical approval was obtained from the relevant university research ethics committee and that permission was obtained from the Somali Ministry of Education and local school administrations. Participation was voluntary, informed consent was obtained, confidentiality was maintained, and participants were informed of their right to withdraw. Ethical approval was obtained from the relevant institutional ethics committee.

3. RESULTS

3.1 Participant characteristics

The study included 60 respondents. Among the children represented, 43 (71.7%) were aged 6–10 years and 17 (28.3%) were aged 11–14 years. Females represented 35 (58.3%) and males 25 (41.7%). Respondents included 27 teachers (45.0%), 24 parents/guardians (40.0%) and 9 participants in other categories (15.0%).

Characteristic	Frequency	%
Age of child: 6–10 years	43	71.7
Age of child: 11–14 years	17	28.3
Female	35	58.3
Male	25	41.7
Teacher respondent	27	45.0
Parent/guardian respondent	24	40.0
Another respondent	9	15.0

Table 1. Participant characteristics

3.2 Programme availability and meal provision

Thirty-two respondents (53.3%) reported that their school had an active school feeding programme, while 28 (46.7%) reported that it did not. Meal frequency was inconsistent: 20 respondents (33.3%) reported daily meals, 19 (31.7%) reported meals 3–4 days per week, and 21 (35.0%) reported meals 1–2 days per week. Lunch was the most commonly reported meal type (50.0%), followed by snacks (33.3%) and breakfast (16.7%). Thirty-two respondents (53.3%) reported that meals were provided regularly without interruption, whereas 28 (46.7%) reported interruptions. Regarding food-group diversity, 35 (58.3%) reported that meals included cereals, legumes and vegetables, while 25 (41.7%) reported otherwise.

Indicator	Frequency	%
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Active programme: Yes	32	53.3
Active programme: No	28	46.7
Meals daily	20	33.3
Meals 3–4 days/week	19	31.7
Meals 1–2 days/week	21	35.0
Lunch	30	50.0
Snack	20	33.3
Breakfast	10	16.7
Regular provision without interruption: Yes	32	53.3
Regular provision without interruption: No	28	46.7
Different food groups included: Yes	35	58.3
Different food groups included: No	25	41.7

Table 2. School feeding programme characteristics

3.3 Perceived child health and nutritional outcomes

Twenty-five respondents (41.7%) reported improved appetite after joining the feeding programme, while 35 (58.3%) reported no improvement. Thirty-four (56.7%) reported perceived weight gain or physical growth improvement, compared with 26 (43.3%) who did not. Thirty-five respondents (58.3%) reported that children fell sick less frequently after receiving school meals. However, perceptions of nutritional adequacy were less favourable: 20 respondents (33.4%) agreed or strongly agreed that school meals were nutritionally adequate, 10 (16.7%) were neutral and 30 (50.0%) disagreed or strongly disagreed.

Indicator	Frequency	%
Appetite improved: Yes	25	41.7
Appetite improved: No	35	58.3
Weight/physical growth improved: Yes	34	56.7
Weight/physical growth improved: No	26	43.3
Falls sick less frequently: Yes	35	58.3
Falls sick less frequently: No	25	41.7
Meals nutritionally adequate: Agree/strongly agree	20	33.4
Neutral	10	16.7
Disagree/strongly disagree	30	50.0

Table 3. Perceived child health and nutrition outcomes

3.4 School attendance and educational outcomes

Only 16 respondents (26.7%) reported improved school attendance after implementation of school feeding, while 44 (73.3%) reported no improvement. The same distribution was observed for punctuality. For concentration, 21 (35.0%) reported improvement and 39 (65.0%) did not. Academic performance was reported to have improved by 15 respondents (25.0%), while 45 (75.0%) reported no improvement.

Indicator	Yes (%)	No(%)
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Attendance improved	16 (26.7)	44 (73.3)
Punctuality improved	16 (26.7)	44 (73.3)
Concentration improved	21 (35.0)	39 (65.0)
Academic performance improved	15 (25.0)	45 (75.0)

Table 4. Perceived educational outcomes

3.5 Implementation challenges

Food supply was reported to be delayed or insufficient by 38 respondents (63.3%). Challenges related to food quality or variety were reported by 44 (73.3%). Only 10 respondents (16.7%) reported adequate facilities for food storage and preparation, while 50 (83.3%) reported inadequate facilities. Financial or logistical challenges were reported by 42 (70.0%). Community and parent involvement was reported by only 7 respondents (11.7%), while 53 (88.3%) reported no involvement.

Challenge	Yes (%)	No (%)
Delayed/insufficient food supply	38 (63.3)	22 (36.7)
Food quality/variety challenges	44 (73.3)	16 (26.7)
Adequate storage/preparation facilities	10 (16.7)	50 (83.3)
Financial/logistical challenges	42 (70.0)	18 (30.0)
Parent/community involvement	7 (11.7)	53 (88.3)

Table 5. Major implementation challenges

4. DISCUSSION

This study found substantial implementation gaps in school feeding programmes in selected rural areas of Somalia. Although 53.3% of respondents reported an active programme, only one-third reported daily meal provision, while 35.0% reported meals on only 1–2 days per week. More than six in ten respondents also reported delayed or insufficient food supplies. These findings are consistent with recent sub-Saharan African evidence showing that school feeding effectiveness depends on reliable procurement, transport, storage, preparation, financing and programme coordination (Liguori et al., 2024; Mainje et al., 2024). Somalia-specific programme monitoring also documents missed and incomplete school entitlements and funding-related interruptions, supporting the interpretation that continuity of provision is a major implementation issue in the Somali context (Ministry of Planning, Investment and Economic Development, 2024; World Food Programme, 2025).

The findings suggest some perceived short-term health benefits: more than half of respondents reported improvements in weight or physical growth and fewer episodes of sickness. However, these findings should not be interpreted as evidence of measured improvements in nutritional status because the study did not report anthropometric measurements such as height-for-age, weight-for-age or BMI-for-age. Recent Ethiopian studies demonstrate mixed nutritional effects: Desalegn et al. (2022) found no significant adjusted effects on haemoglobin, BMI-for-age or height-for-age, whereas Mekonnen et al. (2023) reported a favourable change in BMI-for-age among school-fed adolescents. The present study therefore adds evidence on stakeholder perceptions rather than objective anthropometric change.

Half of respondents disagreed that school meals were nutritionally adequate, and 73.3% reported challenges related to food quality or variety. This concern is supported by recent evidence from Addis Ababa showing that school meals supplied useful nutrients but

remained suboptimal for several dietary requirements, with greater dietary diversification recommended (Gebremedhin et al., 2022). Similarly, a 2024 study in Sidama found higher folate intake and dietary diversity among adolescent girls benefiting from school feeding (Bolka et al., 2024). The findings support strengthening menu diversity and nutritional adequacy in rural Somali programmes rather than assuming that any school meal automatically provides adequate nutrition.

The educational findings were less favourable than expected from much of the African literature. Nearly three-quarters of respondents reported no improvement in attendance or punctuality, 65.0% reported no improvement in concentration and 75.0% reported no improvement in academic performance. This contrasts with a 2022 systematic review that found generally positive associations between school meals and educational outcomes across African settings (Wall et al., 2022). One plausible explanation in the present study is irregular meal provision: a meal provided only once or twice per week may provide a weaker attendance incentive and less sustained nutritional support than a predictable programme. Nevertheless, the cross-sectional design and reliance on perceptions rather than administrative attendance records or standardized academic assessments mean that this explanation remains hypothesis-generating rather than causal.

Operational constraints were prominent. More than four-fifths of respondents reported inadequate food storage and preparation facilities, 70.0% reported financial or logistical challenges and 88.3% reported a lack of parent or community involvement. These findings closely correspond to implementation themes identified in recent systematic reviews, which emphasize infrastructure, funding, monitoring, coordination, food preparation and community engagement as determinants of programme sustainability (Liguori et al., 2024; Mainje et al., 2024). The Somalia evidence is especially relevant because recent national monitoring and WFP reporting show that funding gaps and incomplete programme entitlements can interrupt delivery (Ministry of Planning, Investment and Economic Development, 2024; World Food Programme, 2025).

The study has several implications. First, programme performance should be assessed not only by whether a feeding programme exists but by how consistently meals reach children. Second, nutritional adequacy should be assessed using standardized meal composition and, where feasible, objective child anthropometry and haemoglobin measures. Third, attendance and academic outcomes should be monitored using school records rather than perceptions alone. Finally, investments in storage, kitchens, procurement planning, community participation and monitoring may improve the reliability and sustainability of school feeding programmes.

5. STRENGTHS AND LIMITATIONS

A strength of this study is its focus on an under-researched rural Somali setting and its examination of programme implementation, perceived health outcomes, educational indicators and operational constraints in one survey. The study also highlights implementation problems that may be missed when programme evaluations focus only on coverage.

Several limitations should be considered. First, the sample was small ($n=60$) and selected from selected rural areas, limiting generalizability to Somalia as a whole. Second, the study used cross-sectional data, so causal effects of school feeding on nutrition, attendance or academic performance cannot be established. Third, several outcomes were based on respondents' perceptions and self-report rather than objective measurements. Fourth, the study did not report anthropometric measurements, biochemical indicators or verified school attendance and academic records. Fifth, although the methodology

describes qualitative interviews and planned inferential analysis, the reported results do not provide qualitative themes or inferential statistics. Finally, the manuscript is based on the thesis report, and some methodological details, including the exact ethics approval number, school-level sampling frame and distribution of respondents by school, require confirmation before submission.

6. CONCLUSION

School feeding programmes in the study setting appear to offer some perceived short-term health benefits, but their potential nutritional and educational contribution is constrained by irregular meal provision, supply interruptions, poor food quality or variety, inadequate storage and preparation facilities, financial and logistical difficulties, and weak community participation. The findings do not demonstrate a causal reduction in child malnutrition because objective nutritional measures were not reported. Strengthening programme reliability and nutritional quality, while improving infrastructure, community ownership and monitoring, may increase the likelihood that school feeding programmes contribute meaningfully to child health and education in rural Somalia.

7. IMPLICATIONS FOR PRACTICE AND POLICY

Programme implementers should prioritize predictable food delivery and pre-positioning of supplies in areas vulnerable to seasonal access problems.

Schools require appropriate storage and cooking facilities, safe water and hygiene arrangements, and basic food-safety systems.

Meal composition should be reviewed to increase dietary diversity and nutritional adequacy using locally appropriate foods where feasible.

Parent-teacher associations and community structures should be involved in oversight, food preparation and accountability.

Monitoring systems should track meal days delivered, number of children served, food stocks, attendance and selected nutrition indicators. Where resources permit, future evaluations should incorporate anthropometric measurements and longitudinal designs to assess changes in nutritional status over time.

8. ETHICAL STATEMENTS

Ethical approval: Ethical approval for the study was obtained from Metropolitan University of Somalia. The ethical approval/oversight was provided by Dr. Bashir Abubakar Mohamud and Eng. Abdullahi Mohamed Hared. Participants and parents/guardians provided voluntary informed consent, and confidentiality and the right to withdraw were maintained. The official ethics approval/reference number should be inserted if one was issued by the university.

Consent to participate: The source study reports that participants and parents provided voluntary informed consent. Participation was voluntary, confidentiality was maintained, and participants could withdraw without penalty.

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