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Pradhan Mantri Poshan Shakti Nirman
(PM POSHAN)

GOVERNMENT OF KARNATAKA

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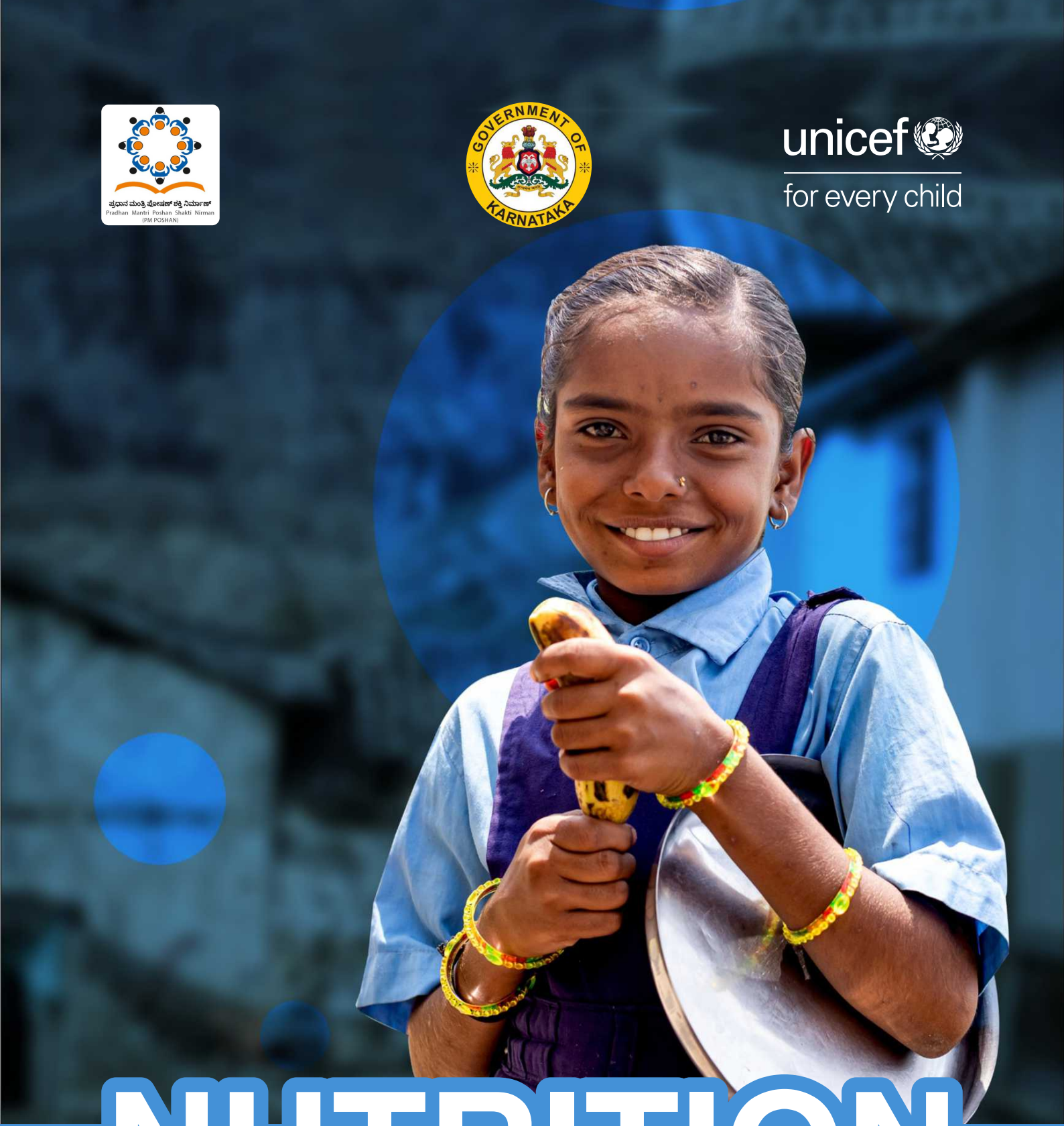

NUTRITION
THAT MATTERS

Shaping Children's Choice in Karnataka

United Nations Children's Fund (UNICEF)
April 2026

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CONTENTS

Sr No	Heading	Page No
1	Executive summary	1-7
2	Introduction	8-9
3	Methodology	10-11
4	Result section	12-42
5	Conclusion	43

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Foreword

Children in India face a complex and evolving nutrition landscape, where undernutrition, micronutrient deficiencies, and the rising prevalence of overweight and obesity coexist. These multiple burdens are shaped not only by household factors but increasingly by the broader food environments children are exposed to in their daily lives. Addressing this spectrum of challenges requires a more comprehensive understanding of the determinants influencing children's dietary behaviours and nutrition outcomes.

Schools, where children spend a significant part of their formative years, are critical in this context. The food environments within and around schools directly influence what children eat, their food preferences, and long-term dietary habits. Recognizing and strengthening these environments is essential for designing effective, context-responsive public health interventions that promote healthy diets and improve nutrition outcomes among children and adolescents.

In this context, I am pleased to present this report on the School Food Environment Assessment conducted across Karnataka, in collaboration with the state education departments. The assessment contributes important evidence on how school ecosystems influence food choices and identifies opportunities to better nurture these environments to support healthier behaviours among children and adolescents.

The findings of this assessment highlight both encouraging progress and persistent gaps in creating enabling school food environments. It examines key dimensions, including food availability, adherence to existing guidelines, nutrition awareness among students, and the broader institutional and policy landscape. Importantly, the report brings forward perspectives from students, teachers, and school administrators, offering grounded insights into the behavioral and systemic factors that shape food choices.

UNICEF remains committed to supporting the governments of Andhra Pradesh/ Telangana/ Karnataka in translating these insights into actionable strategies. Strengthening policy frameworks, improving implementation mechanisms, and advancing nutrition education will be critical to ensuring that all children have access to safe, healthy, and nutritious food within school settings.

I commend the efforts of all partners, state departments and stakeholders who contributed to this assessment. It is my hope that this report will serve as a valuable resource for policymakers and practitioners, and as a catalyst for sustained action to improve nutrition outcomes for children and adolescents.

EXECUTIVE SUMMARY

“School Food Environment Assessment in Karnataka”

1. Background and Rational

Adolescents constitute a critical demographic for human capital formation in karnataka. Evidence from national and state-level surveys indicates a persistent dual burden of malnutrition among adolescents, characterised by undernutrition, micronutrient deficiencies—particularly anaemia—and a rising prevalence of overweight and diet-related non-communicable disease risk factors. In karnataka, 39% of adolescent girls (15–19 years) are underweight, 6% are overweight, and 49% are anaemic. Additionally, 57% of adolescents suffer from vitamin b12 deficiency and 71% from folate deficiency, signalling significant micronutrient gaps. Rising hba1c and triglyceride levels further reflect increasing exposure to ultra-processed foods and poor dietary habits. Schools, where adolescents spend a significant portion of their formative years, represent a strategic platform for shaping dietary behaviours, health awareness, and long-term lifestyle choices.

While karnataka has implemented several national programmes such as pm poshan (mid-day meal scheme), anemia mukt bharat, weekly iron and folic acid supplementation (wifs), and menstrual hygiene management (mhm) initiatives, there is limited consolidated evidence on how effectively these interventions interact with the broader school food and health environment. There has been a gap in understanding students' actual food choices, exposure to unhealthy food environments, and the role of school-level infrastructure, policies, and practices in influencing adolescent behaviour.

To address this evidence gap, unicef supported the application of the nutrition environment assessment toolkit for schools (neat-s) in karnataka to systematically assess school food environments, nutrition services, wash facilities, physical activity provisions, and adolescent dietary behaviours across diverse school settings.

2. Study Objectives

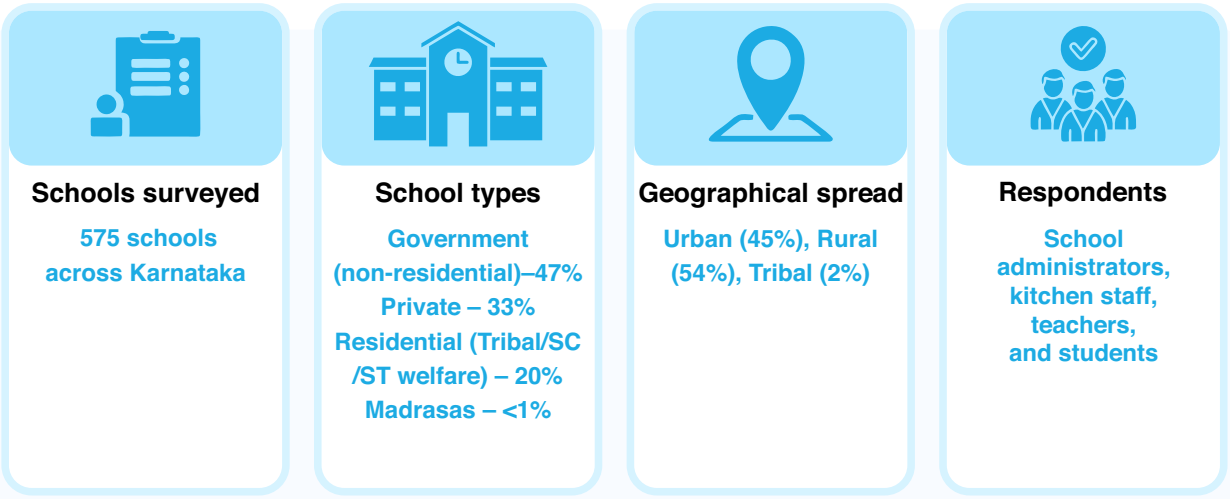
The study aimed to:-Assess the availability, quality,and management of school meal programs across government,private,residential,and Madaras schools.-Examine nutrition diversity,food safety practices, and use of fortified foods in school meals.-Evaluate the status of micronutrient supplementation, deworming, and health assessments.-Assess WASH infrastructure and menstrual hygiene management services in schools.-Examine food environments with in and around school premises, including exposure to unhealthy foods.-Understand adolescent snacking behaviours,food preferences, and nutrition awareness.-Identify system-level gaps and opportunities to strengthen school-based nutrition and health interventions.

3. Methodology

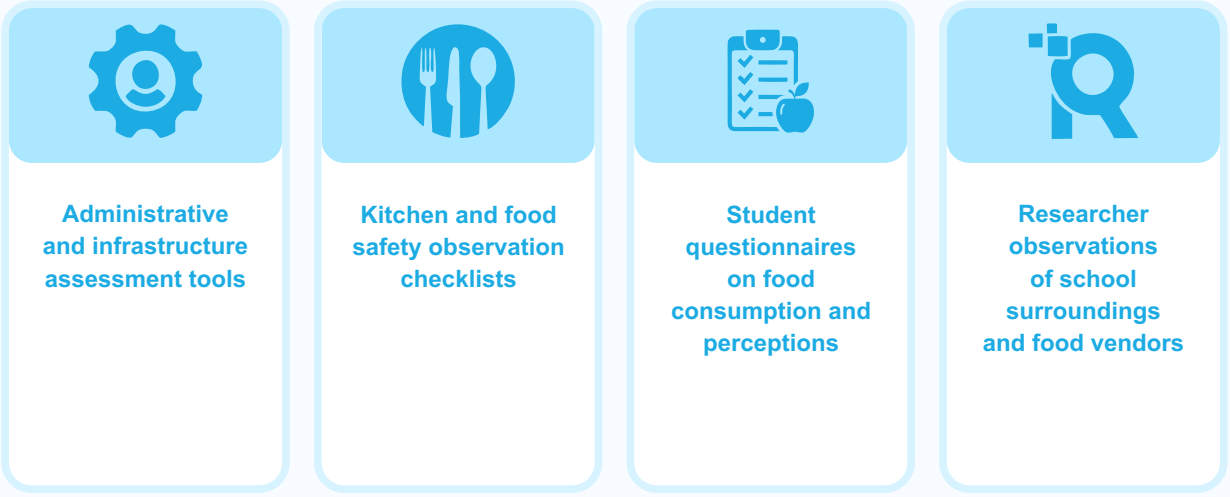
1. Study Design

A mixed-method, convergent parallel design was adopted to capture both quantitative indicators and contextual insights. The assessment was conducted using a contextualized version of the NEAT-S toolkit.

2. Coverage and Sample



3. Data Collection Tools



4. RESULTS

School Characteristics

A total of 575 schools across karnataka were assessed as part of the neat-s study. Government non-residential schools constituted nearly half of the sample (47%), followed by private schools (33%) and residential schools catering to tribal and sc/st populations (20%). Madarsas represented less than 1% of the surveyed institutions. The majority of schools were located in rural areas (54%), with 45% in urban settings and a small proportion (2%) in tribal regions. Most schools catered to upper primary and secondary grades, reflecting the study's focus on adolescent populations.

Theme 1: School Meal Programme Management and Services

Availability of Meal Programme

Overall, 61.6% of surveyed schools reported having a school meal programme. Among these, the majority operated under a government-funded scheme (74.9%), while 14.4% were residential school meal systems. A smaller proportion received NGO or CSR support. Encouragingly, among schools offering meals, 86% served all enrolled students, indicating equitable programme coverage where available.

Meal Acceptability and Student Perceptions

Student perceptions of school meals were generally positive but not uniformly strong. Among students who consumed school meals, 58.8% reported always liking the meals, while 28.3% reported liking them sometimes. However, 11.5% reported rarely liking the meals and 1.4% reported not liking them at all. This suggests that while acceptance is moderate to high, there remains scope for improving menu diversity, taste, and consistency to enhance student satisfaction.

Meal Diversity andNutritional Content

Core food groups were widely represented in school meals. Cereals were included in 95% of schools providing meals, vegetables or fruits in 90%, pulses in 81%, and dairy products in 69%. However, deviations from recommended nutrition standards were observed. While fortification compliance was high—with 86% reporting regular use of fortified rice, oil, and iodized salt—37% reported irregular supply, which may compromise nutritional consistency.

Food Procurement and Kitchen Gardens

Food procurement patterns varied. Around 37% of schools received rice from government sources while procuring other ingredients locally, and 29% sourced all materials from local markets. Only 19% of schools reported having a functional kitchen garden, while nearly 69% had none. This indicates limited integration of school-based food production as a strategy for dietary diversification and nutrition education.

Monitoring and Food Safety

Internal monitoring of meal quality was common, with 76% of schools conducting daily sampling and supervision. However, 9.6% reported no checking at all. External food safety validation was limited, with only 7.9% of schools conducting laboratory testing of meals. This indicates a reliance on internal oversight without standardized external quality assurance mechanisms.

Theme 2: Meal Preparation and Cooking Infrastructure

Most schools with meal programmes had on-site kitchens and basic infrastructure for food preparation. Approximately 62% reported having three kitchen staff members, while 27% had five staff members. The majority (58.8%) prepared only one meal per day, primarily lunch, although residential schools prepared multiple meals.

Dining infrastructure varied considerably. Only 36% of schools had dining halls with tables and chairs. Around 28% had dining halls where students sat on the floor, while 22% relied on open playgrounds for meal consumption. Approximately 14% reported no proper designated eating space, with students consuming meals in classrooms or other informal areas. These infrastructural limitations may affect hygiene, dignity, and the overall eating experience.

Theme 3: Micronutrient Supplementation and Health Assessments

Health and nutritional assessments were widely implemented, with 93% of schools conducting some form of health check. Anthropometric measurements such as height and weight were recorded in 90.5% of schools. However, haemoglobin testing was conducted in only 50% of schools, despite the high prevalence of anaemia in the state. General health check-ups were conducted in 73% of schools, while eye and dental examinations were conducted in 52.6% and 41% respectively.

Micronutrient supplementation programmes were reported in 377 schools. Iron and folic acid (ifa) tablets were distributed in 79.6% of these schools, calcium tablets in 71.9%, and multiple micronutrient supplements in 15.9%. Supplements were provided to all students (with consent) in 87.5% of schools, rather than being targeted to nutritionally vulnerable groups. Despite substantial coverage, persistent anaemia and micronutrient deficiencies indicate potential gaps in compliance, adherence, or dietary adequacy.

Theme 4: Water, Sanitation and Hygiene (WASH)

Handwashing infrastructure was present in 82% of schools. However, 28% had water available without soap, and 3.7% lacked both water and soap, undermining hygiene practices. Regarding sanitation facilities, 63% of schools maintained a student-toilet ratio of 50 or fewer students per toilet. Daily cleaning of toilets was reported in 60% of schools, though a notable proportion reported less frequent maintenance.

Menstrual hygiene management (MHM) programmes were available in 81% of schools. Among these, 58% provided free sanitary napkins monthly along with education sessions, while 39% provided only annual MHM or gender education without consistent pad provision. Coverage in private schools was comparatively weaker than in government and residential schools.

Theme 5: Food Environment Around Schools

The external food environment posed a significant challenge to healthy eating behaviours. A substantial proportion of schools (42%) were observed to have presence of vendors selling energy-dense, nutrient-poor foods. Administrators reported that 59% of schools had shops selling chips and sugary drinks nearby, 58% had fried snack vendors, and 47% had bakeries in proximity. Researcher observations similarly documented the presence of Kirana shops, bakeries, and mobile vendors near many schools.

Despite these exposures, only 25% of schools ensured the availability of affordable healthy food options within or around the campus. Awareness of FSSAI regulations restricting the sale of high-fat, salt, and sugar (HFSS) foods within 50 metres of schools was limited, with less than half of schools reporting familiarity with the guidelines.

Theme 6: Nutrition Education and Physical Activity

Nutrition education was reported in 73% of schools. Approximately 65% provided nutrition education sessions for parents at least once per year. However, 55% relied on teachers who were not formally trained in nutrition, potentially limiting the quality and consistency of messaging.

Physical education policies were reported in 80% of schools, and 85% had access to playground facilities. However, focus group discussions revealed that nearly half of students reported missing structured playtime due to academic pressures, highlighting a gap between policy intent and actual implementation.

Theme 7: Adolescent Snacking Behaviours

Snacking behaviour among adolescents reflected strong exposure to processed foods. Among students who reported consuming snacks, 60% consumed biscuits, 40% consumed chips, and 34% consumed chocolates or toffees. Fresh fruits were consumed by 43%, and homemade snacks by 42%. Approximately 64% of students consumed snacks daily, while others reported weekly or alternate-day consumption patterns.

More than half (53%) brought snacks from home, while 35% purchased them from outside vendors. About one-third of students received ₹100 or more per week as pocket money, which may facilitate frequent purchase of packaged snacks. Although approximately 80% of adolescents demonstrated awareness of healthy versus unhealthy foods, taste preferences, peer influence, and easy availability of processed foods continued to drive consumption patterns.

Actionable Recommendations for Strengthening School Nutrition Systems

1.Strengthen Enforcement of FSSAI Guidelines

To ensure availability of healthy foods near schools, it is critical to implement and strengthen the regulations from Food Safety and Standards Authority of India (FSSAI) that prohibit the sale, marketing, and distribution of High Fat, Salt, and Sugar (HFSS) foods within a 50-meter radius of school premises. While these provisions are clearly laid out in the Gazette, their on-ground enforcement remains limited. Monitoring mechanisms should therefore be reinforced by actively involving School Management Committees (SMCs), local health departments, and designated school-level health and wellness teams to ensure sustained compliance and accountability. Enforcement efforts may be further strengthened through convergence with local governance structures (Urban Local Bodies/Panchayats) and law enforcement agencies, particularly for regulating vendors operating outside school premises, where schools alone may have limited authority.

2.Nutrition Education

Schools need to be encouraged to strengthen age appropriate and relevant nutrition awareness through curricular and extra-curricular activities to influence healthy choices in children.

3.Improve PM Poshan Implementation

The PM Poshan scheme should incorporate robust quality control measures, including institutionalised external food safety testing to maintain hygiene and nutritional standards. Addressing supply chain gaps in fortified product delivery and integrating menu diversity based on regular student feedback can enhance both the nutritional value and acceptability of school meals.

4.Promote Healthy Snacking and use of Kitchen Gardens

Schools should be supported to establish kitchen gardens using local produce, promoting farm-to-table awareness and practical nutrition education. Healthy snack kiosks, backed by peer-led promotion and school-led initiatives, can provide affordable, culturally relevant alternatives to processed snacks while reinforcing positive dietary habits.

INTRODUCTION

Adolescents represent a key demographic in India's public health agenda, yet they continue to face significant nutritional challenges. In Karnataka, 39% of adolescent girls aged 15-19 years are underweight with 6% being overweight, 49% adolescent girls are anemic reflecting a dual burden of malnutrition. Additionally, 57% of adolescents suffer from vitamin B12 deficiency and 71% from folate deficiency, surpassing national averages. Rising levels of HbA1c and triglycerides further signal increasing exposure to ultra-processed foods and poor dietary habits.

Schools, where adolescents spend a substantial part of their day, offer a strategic platform to influence nutrition-related behaviours and promote healthier lifestyles. Current interventions—such as the PM Poshan scheme and Anemia Mukt Bharat—primarily focus on meal provision and iron-folic acid supplementation, with limited integration of broader food environment strategies. Existing regulations restricting the sale of unhealthy foods near schools are promising but require stronger enforcement and contextual adaptation. Furthermore, there is limited information on children's actual food choices and preferences, making it challenging to design effective, targeted interventions.

National programs and regulatory frameworks have been established to improve school nutrition across India. However, the school food environment continues to exhibit significant variability and gaps in systematic monitoring. Public, private, and residential schools differ widely in infrastructure, vendor presence, and institutional priorities, which limits the effectiveness of standardized interventions. Adolescents' growing autonomy in food choices, combined with peer influence and aggressive marketing of unhealthy products, further complicates efforts to promote healthier dietary behaviours. Data on the availability, accessibility, and appeal of nutritious food options within and around school campuses remain limited, and no standardized tools are widely used to comprehensively assess these environments. This presents a critical challenge in designing context-specific strategies that address the diverse realities of school settings.

To address this data gap, the **Nutrition Environment Assessment Toolkit for Schools (NEAT-S)** was globally designed to assess and optimize school food environments and support healthier dietary practices in middle childhood and adolescence. UNICEF has adopted the NEAT-S tool for Karnataka to systematically evaluate school food environments, generate evidence, and inform context-sensitive policy solutions. The study aims to inform policy recommendations, strengthen implementation frameworks, and contribute to creating supportive environments that foster healthier dietary behaviours among adolescents.

Creating Evidence: Assessing School Food Environments

The **school food environment assessment study** systematically evaluated food environments in and around schools across karnataka, with a focus on adolescent dietary behaviours and institutional readiness to promote healthy eating. Recognizing the diversity of school settings—public, private, and residential—a mixed methods-convergent parallel approach was employed to capture the contextual realities influencing nutrition practices.

A contextualized version of the **nutrition environment assessment toolkit for schools (neat-s)** was used to assess six critical domains: pm poshan scheme implementation, micronutrient supplementation, wash infrastructure, physical and nutrition education, adolescent dietary patterns, and the surrounding food environment. Data collection involved structured observations, stakeholder interviews, and focus group discussions with adolescents.

The study identified key barriers and enablers to healthy food access, policy enforcement gaps, and opportunities to strengthen school-based nutrition strategies. Importantly, it generated actionable evidence underscoring the need to improve food safety standards, enhance nutrition literacy through curriculum integration, and implement age-appropriate engagement strategies within schools. The assessment also highlighted the critical role of establishing stronger regulatory frameworks and promoting community-led accountability mechanisms to ensure sustained compliance with healthy food standards in and around school premises.

Collectively, these findings provide a robust evidence base to inform strategic policy decisions, drive programmatic redesign, and support advocacy efforts that aim to create enabling environments for healthier dietary behaviours among adolescents.

METHODOLOGY

Phase 1: Contextual Adaptation

An exploratory qualitative approach was adopted to adapt NEAT-S for southern Indian contexts. A desk review examined national policies, regulatory frameworks, and evidence related to school nutrition, including guidelines from education departments, FSSAI, and public health programs.

Findings informed semi-structured in-depth interviews (IDIs) exploring school food procurement systems, institutional norms, dietary practices, and enforcement challenges. Insights were used to refine tool constructs and indicators.

Phase 2: Pilot Testing

The adapted toolkit was pilot tested in 5 government schools across 2 districts.
Three instruments were administered:

School Administrator Questionnaire

Kitchen Checklist

Student Attitudes and Perceptions Survey

Respondents included 5 administrators, 5 kitchen staff, and 10 students (Grades 6–12). Tools were administered through interviews and classroom surveys using Kobo Toolbox for digital data capture.

Feedback highlighted the need to simplify terminology, add locally relevant food examples, and improve question flow. Revisions were incorporated to enhance clarity and feasibility while retaining core domains.

Data Collection Tool

The digital data collection platform Kobo Toolbox was utilized across both phases of the study, including the pilot testing of tools and the subsequent large-scale survey implementation, to ensure standardized, efficient, and real-time data capture.

Phase 3: Large-Scale Implementation

Following validation, the refined toolkit was implemented across three states using a mixed-methods convergent parallel design. Quantitative school assessments and surveys were conducted alongside qualitative inquiry to enable triangulation.

Coverage Included:

Karnataka

575
Schools

5,418
Respondents

16
Districts

Government, private, and residential schools in rural and urban areas were included. A multi-stage sampling strategy ensured geographic and institutional representation. Administrators were purposively selected, and students were randomly sampled within eligible grades.

Data collectors received structured training on tool administration, observation protocols, ethics, and quality assurance. Formal approvals were obtained from state and district authorities, and written institutional consent was secured at school level and individual level. Student surveys were anonymous, and confidentiality was maintained.

Structured observations documented infrastructure, WASH facilities, meal preparation areas, and vendors within a 50-meter radius of schools. Quantitative data was digitized and cleaned, with quality checks including back-verification and logical validation.

Qualitative data were transcribed and thematically analyzed under NEAT-S domains to interpret findings, identify implementation bottlenecks, and highlight behavioral and governance challenges.

RESULT

School Characterstics

Nearly half of the schools were government non-residential schools (47%), followed by private schools (32.9%) and residential schools serving tribal or SC/ST communities (19.7%). Very few were Madrasas (n=3). In terms of curriculum, most schools offered only upper primary education (46.6%), while nearly one-third provided primary to high school levels (32%). A smaller proportion offered both upper primary and high school (11.3%), high school alone (7.5%), or primary plus upper primary (2.6%). Geographically, the schools were almost evenly distributed between urban (44.5%) and rural (53.9%) areas, with a small proportion of schools located in tribal regions (1.6%).

Table 1: Characteristics of schools (Admin tool)

Characteristics	%	n
School Type		
Residential (Tribal welfare, SC/ST)	19.7	113
Government (non-residential)	47.0	270
Private	32.9	189
Madrasa	0.5	3
Curriculum offered		
Primary and upper primary	2.6	15
Only upper primary	46.6	268
Both (Upper primary & High school)	11.3	65
High school	7.5	43
Primary to high school	32.0	184
Location		
Urban city	44.5	256
Rural	53.9	310
Tribal	1.6	9
Total	**575**	

Theme 1: School Meal Program Management And Services

Availability of Meal Program

Among the 575 schools, 61.6% (n=354) reported having a school meal program. No Madrasa reported availability of meal program. Among schools where meal program was available, most of these programs were supported through government-funded schemes (74.9%), while a smaller proportion relied on regular meals in residential schools (14.4%), NGO/CSR assistance (5.1%), or paid programs (2%). Very few schools mentioned support through community events (0.3%), and 2.3% reported having no additional support. Regarding beneficiaries, the majority of schools with meal programs served all children (86.2%), while only a small proportion targeted financially challenged (1.4%) or undernourished children (0.9%). Another 1.1% catered to both groups, and 1.1% involved a paid model where students contributed financially.

Table 2: Availability and type of school meal program (Admin tool)

About school meal program	%	N
School meal program available	61.6	354
Type of meal program		
Govt. funded scheme	74.9	264
Regular meals at residential schools	14.4	51
NGO/CSR supported scheme	5.1	18
Community events	0.3	1
Paid program	2.0	7
No other support	2.3	8
Don't know	1.4	5
Beneficiaries		
All children	86.2	305
Financially challenged children	1.4	5
Undernourished children	0.9	3
Both undernourished and financially challenged children	1.1	4
Paid program and charge some amount	1.1	4
Don't know	9.3	33

Note: Among Those Schools Where Meal Program Available (354)

Figure 1: Meal Provision In Schools

Nearly 65.7% of students reported meal provision across in their schools (Figure 1). Residential schools had the highest meal provision (90.9%), followed by government schools (74.8%). In contrast, private schools reported much lower provision (39.9%). By location, tribal-area schools showed very high provision (86.5%), while rural schools also performed well (76.2%). Urban schools had comparatively lower meal provision (52.6%).

Among the students who reported eating school-provided meals, the majority expressed positive perceptions. About 58.8% stated that they always like the meals, while 28.3% reported liking them sometimes. A smaller proportion (11.5%) liked the meals very rarely (Table 3).

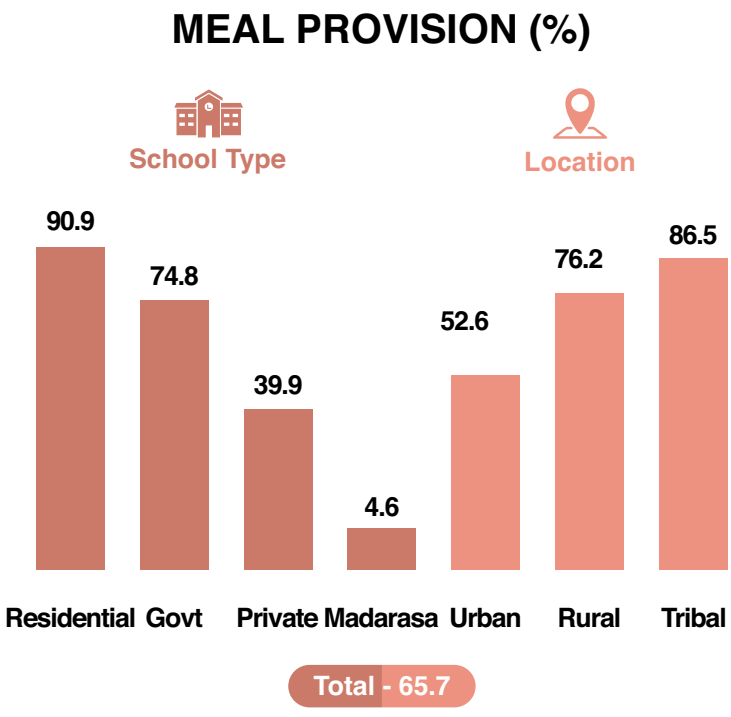


Table 3: Student's Perception About The Meal Program (individual Tool)

About school meal	%	N
Like meal provided by school		
Yes, always	58.8	2045
Yes, sometimes	28.3	984
Very rarely	11.5	400
Not at all	1.4	50
Total	**3479**	

Note: Those Students Who Reported on eating School Meals

Meal Diversity And Food Group Inclusion

The school meals commonly included cereals, with very high availability across all school types (95.2% overall). Vegetables or fruits were also widely provided (89.6%), followed by pulses (81.1%) and dairy items (68.9%). Residential schools consistently offered a slightly more diverse meal composition, with higher inclusion of cereals, vegetables/fruits, pulses, and sweets compared to government and private schools. Less healthy options such as deep-fried foods were available in 18.9% of schools, often in the form of evening snacks in residential schools.

Table 4: Type of food included in the meal in schools (Admin tool observation)

Type of food	Residential	Govt.	Private	Total %(N)
Cereals	99.0	92.2	97.1	95.2
Pulses	82.7	78.3	85.7	81.1
Vegetables/Fruits	94.2	86.7	90.0	89.6
Dairy	68.3	70.0	67.1	68.9
Total	**104**	**180**	**70**	**354**

Note: Multiple Response; Among Those Where Meal Program Available (354)

Sources of food procurement

Among the 306 schools where meals were prepared on-site or by local self-help groups, procurement practices varied considerably. The most common approach was sourcing rice from the government and other ingredients from the local market (37.3%), followed by schools procuring everything directly from local markets (29.4%). About 21.2% relied entirely on contractor agencies for supplies. Smaller proportions reported receiving fortified rice from PDS along with market purchases (8.2%), or receiving fortified staples such as rice, oil, and salt from the government (1%). Regarding kitchen gardens, only 19.3% of schools had a functional kitchen garden,and 7.5% reported having one (likely non-functional or developing), while a majority (68.6%) had no kitchen garden.

Table 5: Sources of meal and snack preparation in surveyed schools (Admin)

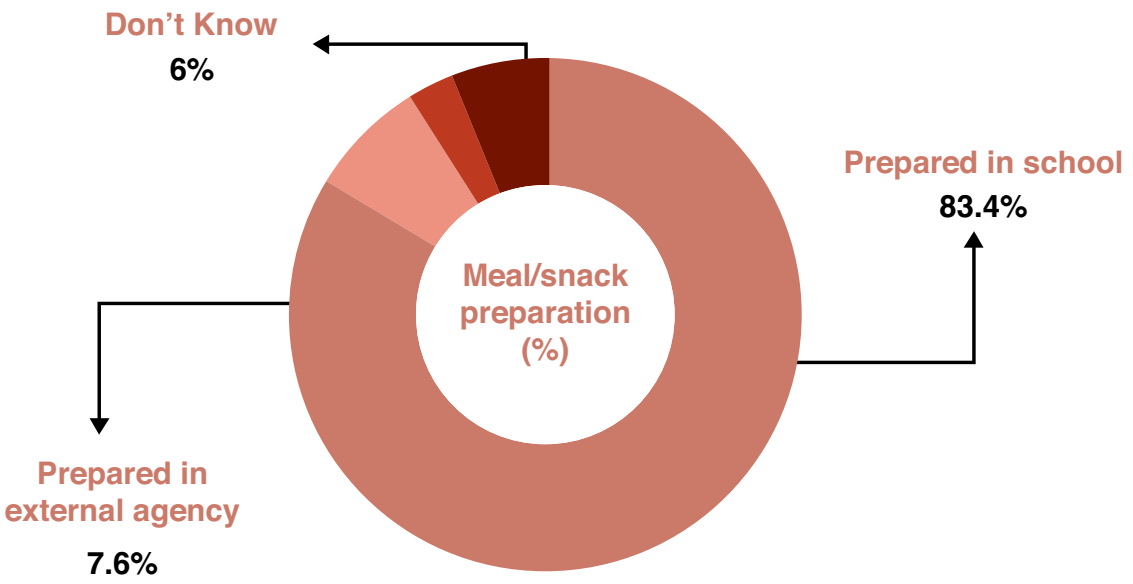
Procurement sources	%	N
Raw materials procured from		
Everything from local market	29.4	90
Get all the supplies from the contractor agency	21.2	65
Receive fortified rice from the PDS shop, we procure all other things from market	8.2	25
Receive rice from government and other products from local market	37.3	114
Receive fortified rice, oil salt from government	1.0	3
Other (NGO, another tender)	1.0	3
Don't know	2.0	6
Kitchen garden		
School has functional kitchen garden	19.3	59
School has a functional kitchen garden	7.5	23
No kitchen garden	68.6	210
Don't know	4.6	14
Total	**306**	

Note: Among Those Schools Where Meals Are Prepared In School Kitchen Or Local SHGs (306)

Monitoring Of Meal Scheme

According to the school administration staff, most schools prepared meals or snacks on-site, with 83.4% reporting in-school preparation. A smaller proportion (7.6%) relied on external agencies for meal preparation.

Figure 2: Meals/snacks Preparation In Schools (admin)



School administration was the primary body responsible for monitoring meal schemes (72.9%), followed by school management committees (15.8%) and student committees (7.3%). A small proportion of respondents (3.9%) were unsure about who monitored meals. Regarding frequency of monitoring, daily sampling and quality checks were reported by the majority of schools (75.9%), reflecting consistent oversight. Random spot checks twice a month were carried out in 9.9% of schools, and monthly checks in 4.5%. However, 9.6% of schools reported no monitoring at all, more commonly in government schools. Laboratory testing of meals was uncommon, with only 7.9% of schools conducting lab tests, while 90.7% did not perform any laboratory-based quality checks (Table 6).

Table 6: Meal Scheme Supervision And Quality Monitoring Practices (admin)

Meal scheme monitoring	Residential	Govt.	Private	Total %(N)
Monitoring done by				
School administration	75.9	71.1	72.9	72.9 (258)
School management committee	14.4	15.6	18.6	15.8 (56)
Student management committee	7.7	7.2	7.1	7.3 (26)
Don't know	1.9	6.1	1.4	3.9 (14)
Frequency of checking meals				
Random spot checking - twice a month	17.3	7.8	4.3	9.9 (35)
Once in a month	4.8	5.0	2.9	4.5 (16)
Daily sampling & monitoring quality	75.0	72.8	85.7	75.9(269)
No checking	2.9	14.3	7.2	9.6 (34)
Lab test for meals				
Yes	11.5	4.9	10.0	7.9 (28)
No	87.5	92.8	90.0	90.7 (322)
Don't know	0.9	2.2	0.0	1.4 (5)
Total	**104**	**180**	**70**	**354**

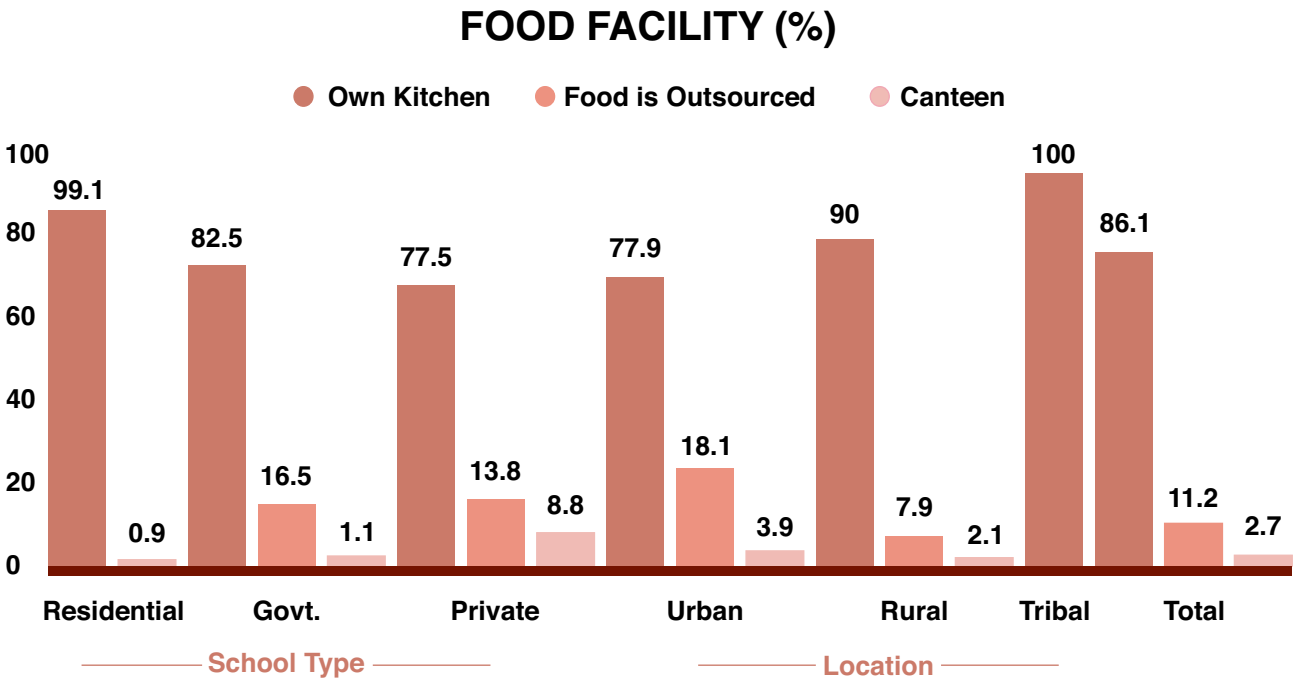
Note: Among those schools where meal program available (354)

Theme 2: Meal preparation and cooking infrastructure

Cooking facilities and structure

Most schools surveyed had an in-house kitchen, with 86.1% reporting on-site food preparation. This was highest in tribal (100%) and residential schools (99.1%), followed by government (82.5%), and private (77.5%). Food outsourcing was relatively uncommon overall (11.2%), but more frequently observed in urban schools (18.1%) and government schools (16.5%). Very few schools operated in canteen facilities (2.7%) and mostly in private schools.

Figure 3: Type Of Food Facility In Schools (kitchen Tool)



Regarding kitchen infrastructure, most kitchens operated with a small team, with 61.9% employing three staff members (a head cook, helper, and serving staff). About 26.6% had a larger team of five, while 8.9% had more than seven staff members. In terms of meal volume, schools commonly served 100–300 children daily, with 33.1% serving 100–200 students and 28.2% serving 200–300. A quarter of the schools served fewer than 100 students, while 13% served more than 400. Meal preparation practices varied: 58.8% of schools cooked one meal per day (lunch), while a notable 24.8% prepared four meals (breakfast, lunch, snacks, and dinner), reflecting more extensive services in some schools—likely residential settings. Smaller proportions prepared two meals (5.6%) or three meals (8.4%) daily (Table 7).

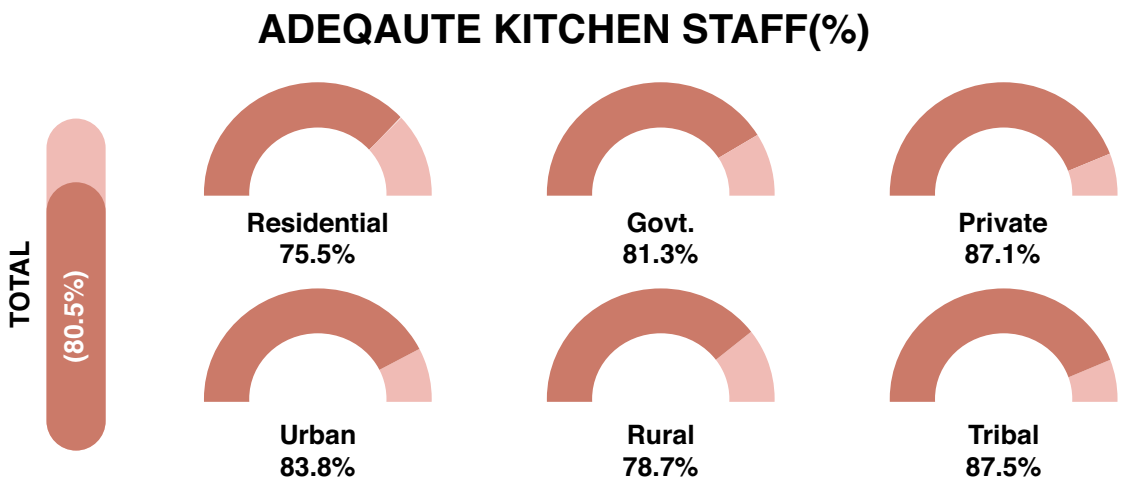
Table 7: Kitchen structure and meal preparation in schools (Kitchen tool)

Kitchen infrastructure	%	n
No. of staff		
3 (Head cook, Helper, Serving member)	61.9	200
5 (2 Head cooks, 1 helper, 2 serving members)	26.6	86
More than 7 staff	8.9	29
Don't know	2.5	8
No. of children served daily		
<100 students	25.1	81
100-200 students	33.1	TO98L107
200-300 students	28.2	91
More than 400 students	13.0	42
Don't know	0.6	2
No. of meals cooked daily		
One meal (lunch only)	58.8	190
Two meals (breakfast and lunch)	5.6	18
Three meals (breakfast, lunch and evening snacks)	8.4	27
Four meals (breakfast, lunch, snacks and dinner)	24.8	80
Don't know	2.5	8
Total	**323**	

Note: Among those where kitchen is available (247)

Overall, 80.5% of schools reported having adequate kitchen staff. Adequacy was slightly higher in private schools (87.1%), while residential schools (75.5%) reported comparatively lower adequacy. Government schools (81.3%) were close to the overall average, and tribal schools (87.5%) had higher staff adequacy (Figure 4).

Figure 4: Perceived adequacy of kitchen staff by school type and location (kitchen tool)

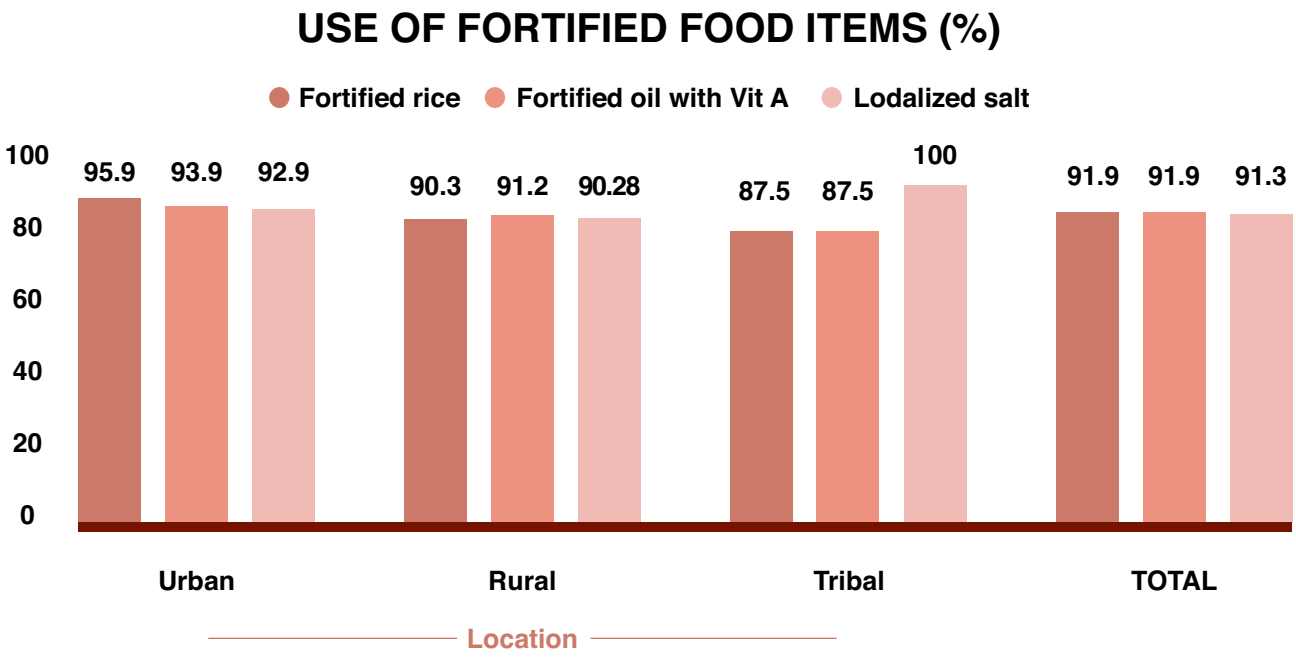


Note: Among those where kitchen is available (247)

Use of fortified items in cooking

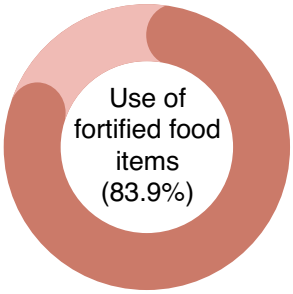
The use of fortified food items is high across all school locations. Fortified rice usage ranges from 87.5% in tribal schools to 95.9% in urban schools, with an overall prevalence of 91.9%. Fortified oil with Vitamin A shows a similar pattern, ranging from 87.5% in tribal schools to 93.9% in urban areas, also averaging 91.9%. The use of iodized salt is consistently high, reaching 100% in tribal schools and above 90% in both urban and rural locations, with an overall rate of 91.3% (Figure 6).

Figure 5: Use of fortified rice, oil and iodized salt in meals (kitchen tool)



Overall, 83.9% of schools reported using fortified food items. Among those who use fortified cooking items, the majority (85.6%) use them always, while 13.2% use them depending on availability. Only a small proportion (1.2%) were unsure about usage. Regarding supply, just over half of the schools (51.4%) reported receiving a regular supply, whereas 36.9% experienced irregular supply. A smaller share (8.9%) noted regular supply but with quality issues, and 2.7% did not know about the supply conditions.

Table 8: Use and supply of fortified food items (reported by school administrator)

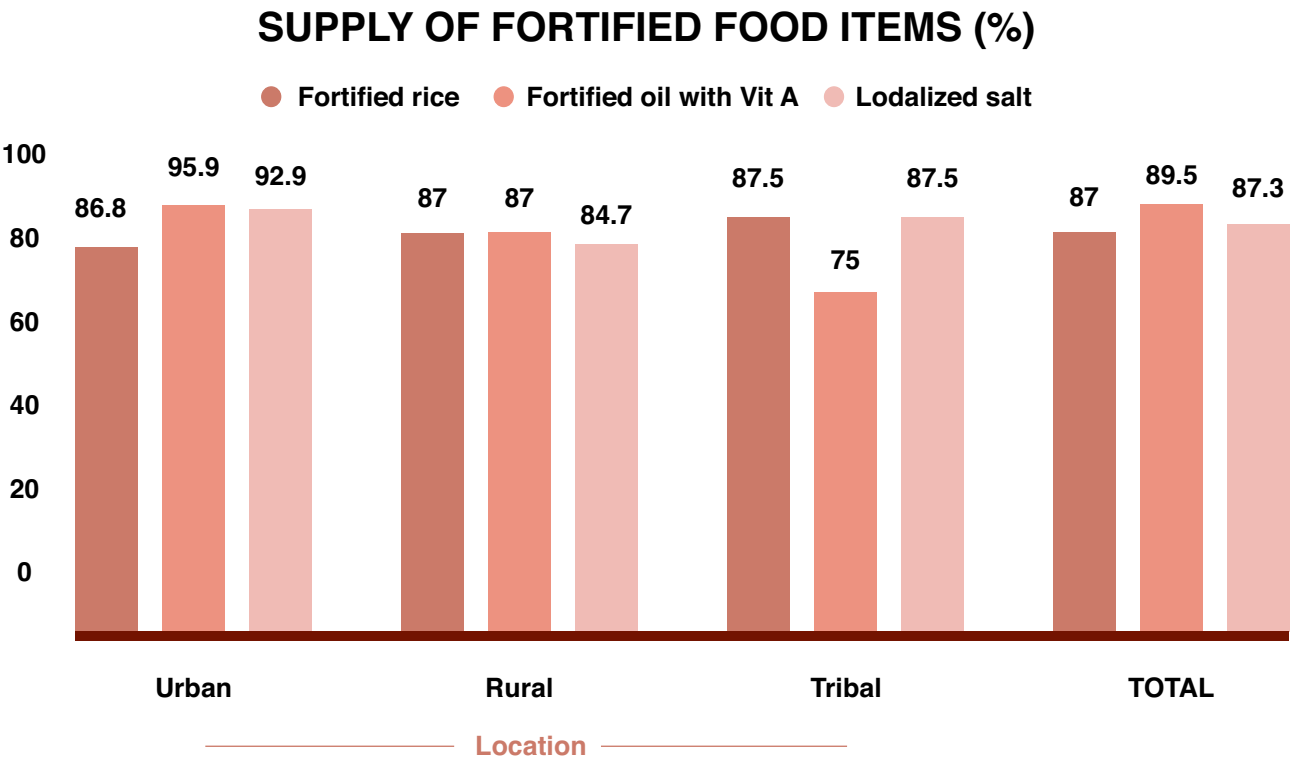


Use of fortified items	%	n
Frequency		
Use always	85.6	220
Depends on availability	13.2	34
Don't know	1.2	3
Supply		
Irregular supply	36.9	95
Regular supply	51.4	132
Regular supply but quality issues	8.9	23
Don't know	2.7	7

Note: Among those who use fortified cooking items (257)

Researcher also observed high use of fortified items in schools across locations, though patterns vary by product. Fortified rice usage is consistent (87–88%) across urban, rural, and tribal schools. Fortified oil with Vitamin A shows the greatest variation, with very high use in urban schools (96%), moderate use in rural schools (87%), and substantially lower use in tribal schools (75%). Iodized salt use remains high overall but is slightly lower in rural areas (85%) compared to urban and tribal schools (93% and 88%, respectively) (Figure 7).

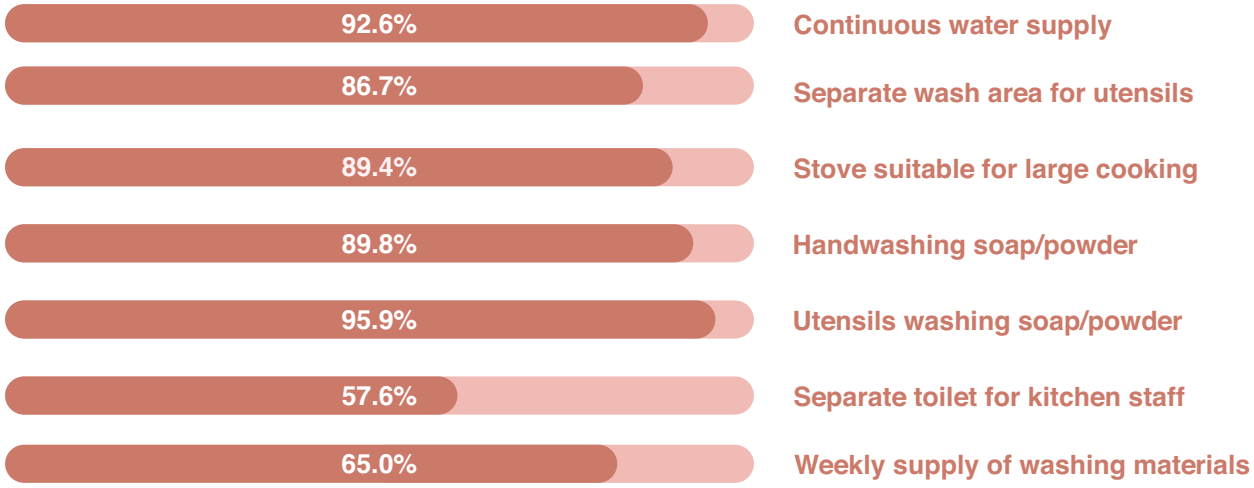
Figure 7: Use of fortified rice, oil and iodized salt (Researcher observation)



Kitchen equipment and sanitation facilities (Kitchen tool)

The majority of kitchens reported having continuous water supply (92.6%), a separate wash area for utensils (86.7%), and a stove suitable for large-scale cooking (89.4%). Availability of handwashing soap or materials (89.8%) and utensil washing soap or powder (95.9%) was also very high, indicating generally good support for hygiene practices. However, only 57.6% of kitchens had a separate toilet for kitchen staff and just 65.0% reported receiving a weekly supply of washing materials (Figure 8).

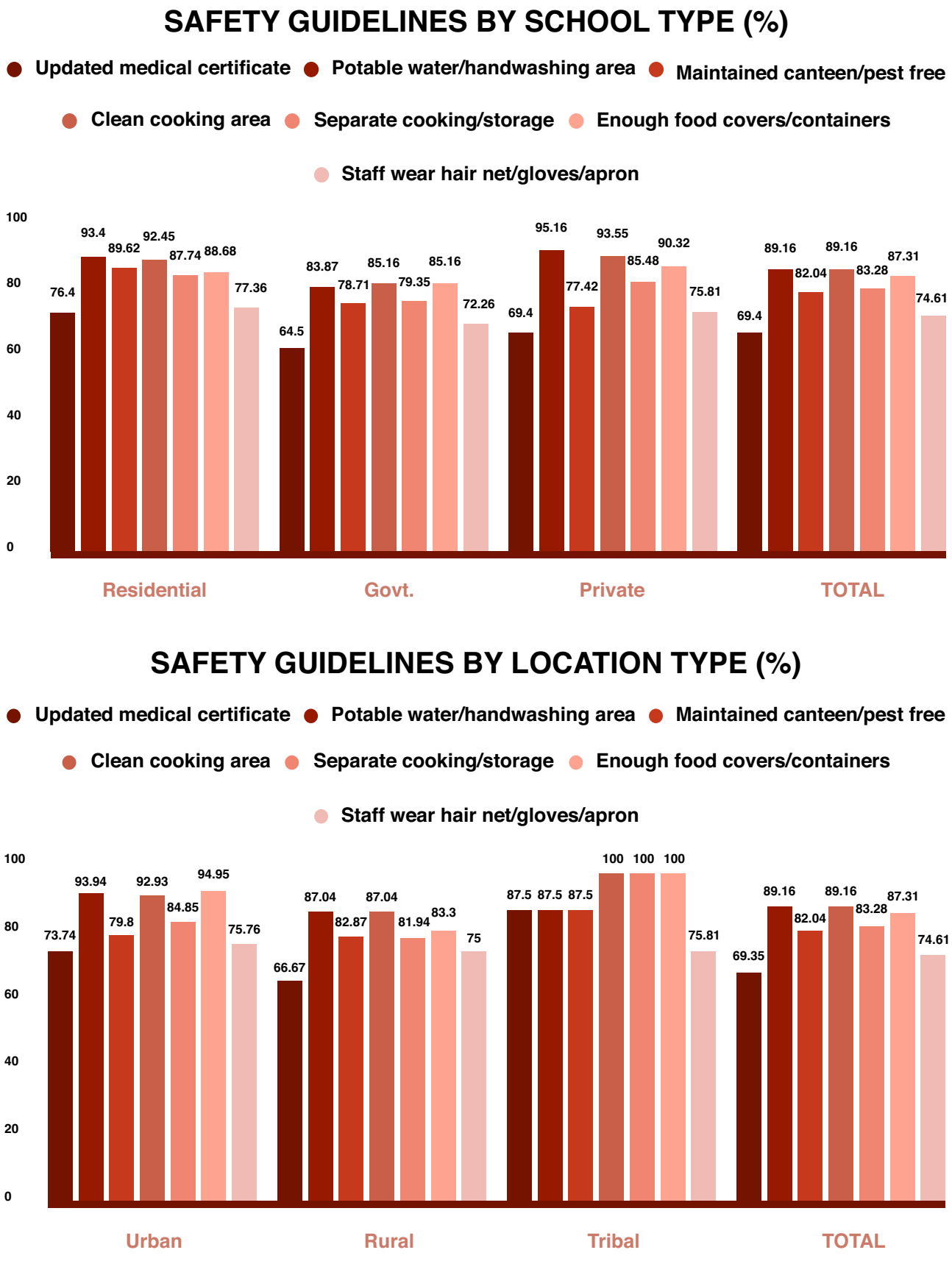
Figure 8: Facilities available in school kitchen (kitchen tool)



Adherence to safety guidelines in kitchen

Overall, adherence to safety standards is high across school types and locations, but there are noticeable differences. Residential and private schools tend to perform better than government schools, with coverage for potable water and handwashing points, well-maintained canteens, and clean cooking spaces generally exceeding 85–90%. However, Government and rural schools fall behind on updated medical certificates for staff and the use of hair nets, gloves, or aprons, indicating priority areas for improvement (Figure 9).

Figure 9: Adherence to safety guidelines in kitchen (Researcher observation)



Designated area to eat meals

Overall, 36% of schools had a proper dining hall with chairs and tables. Residential schools were best equipped, with 80.5% providing dining halls with chairs and tables, whereas only 20.4% of government schools and 31.8% of private schools had similar facilities. A notable proportion of students in government (31.9%) and private schools (31.8%) ate in dining halls but sat on the floor. In contrast, a small percentage of students had no proper place to eat, with 13.7% of schools reporting meals taken in classrooms. Eating in open playgrounds was observed in 21.7% of schools, particularly in government (31.5%) and Madrasas (33.3%) (Table 9).

Table 9: Availability of designated place to eat meals (Admin observation)

Infrastructure to eat	Residential	Govt.	Private	Madrasa	N
Dining hall with chairs and tables	80.5	20.4	31.8	33.3	36.0
Dining hall but students sit on floor to eat	15.9	31.9	31.8	0.0	28.5
No proper place, students take meals in classes	0.9	16.3	17.5	33.3	13.7
Open playground, students sit on ground and eat meals	2.7	31.5	19.1	33.3	21.7
Total	**113**	**270**	**189**	**3**	**575**

Management of outsourced food

The management of outsourced food in schools showed considerable variation in storage, serving, utensil use, and hygiene practices (Table 10). Half of the schools served food immediately without storage, while 42.9% used insulated utensils to serve food directly, and only a few stored and reheated meals later. Most students (54.8%) ate in open areas, with fewer schools using large halls, dining areas in batches, or classrooms for serving. About half of the schools had sufficient utensils (52.4%) for each meal, while others relied on limited or insulated utensils, with washing practices ranging from cleaning after each meal to returning utensils to the provider. Hygiene practices were relatively well-maintained, with nearly half of the schools ensuring clean, ventilated, and pest-free storage, over half using environment-friendly packaging, and many adhering to high standards of food handling, including protective gear for food handlers.

Table 10: Management of outsourced food in schools (kitchen)

Outsourced food management	%	n
Storage process		
No storage- served hot fresh meals	50.0	
Stored in kitchen, reheated and served later	4.8	2
Served directly in insulated utensils without re-heating	42.9	18
Don't know	2.4	1
Serving place		
Dining area where students come in batches	16.7	7
Large hall, all students come once and served meals	21.4	9
Students take the meals to their classes from the kitchen	4.8	2
Meals served in classes	2.4	1
Students sit in open area in school	54.8	23
Availability of utensils		
Sufficient utensils for each meal serving	52.4	22
Limited utensils, clean every time before next meal	16.7	7
No serving utensils used and use of insulated utensils	26.2	11
Don't know	4.8	2
Handling of utensils		
Utensils are washed after each meal	44.8	13
Utensils are cleaned with water and sent back to provider	27.6	8
Clean utensils with soap/water and providers take them back	27.6	8
Guidelines for packed meals (researcher observation)		
Well-ventilated, clean, and pest-free storage area for the received food packs	47.6	20
Food products are hygienically packed in environment-friendly bags	58.5	24
Highest standard of hygiene in the preparation and serving of food is being practiced	52.4	22
Feeding activities commence as soon as food stocks are received from the suppliers	52.4	22
Food handlers wear hair net, face mask/mouth shield, apron, disposable plastic gloves	42.9	18

Note: Of those where food is outsourced (42); Schools where utensils were used (29)

Management of leftover food

Practices for managing leftover food differed notably between in-house and outsourced food (Table 11). In schools with in-house kitchens, the majority (82.9%) prepared food according to the headcount of students, minimizing leftovers, while only a small proportion of food was taken home by kitchen staff (8.1%) or served to the community (2.5%). In contrast, schools receiving outsourced food prepared meals less precisely, with only 30.9% made according to student numbers. A larger share of outsourced food was taken home by kitchen staff (42.9%) or distributed in the community (26.2%).

Table 11: Practices to manage leftover food in schools (Kitchen)

Provision of leftover food	In-house kitchen		Outsourced food	
	%	n	%	n
The food is made according to head count of students	82.9	268	30.9	13
The kitchen staff takes it home	8.1	26	42.9	18
The food is served in the community	2.5	8	26.2	11
Don't know	6.5	21	0.0	0
Total		232		42

Management of school canteen

Canteen management in schools showed that most food items (n=8) were prepared on-site, with a small proportion relying on reheated snacks (n=1) or ready-to-eat items (n=1). The canteen offered a mix of traditional meals such as samosa, vada, bonda, idli/dosa, rice, dal, roti, and sabji (2-3 schools), while all schools stocked packaged snacks, chocolates, chips, and cold drinks. Healthy options were limited: only 2 canteens provided fresh idli/dosa, 4 offered basic meals like rice and dal/sabji, and 2 had only fried or ready-made items. Observations on hygiene and management revealed that most canteens maintained high standards, with 8 following proper food preparation and serving hygiene, 7 keeping premises clean, well-ventilated, and pest-free, and 6 ensuring food handlers had updated health certificates. Half of the canteens required handlers to wear protective gear such as hair nets, masks, aprons, and gloves.

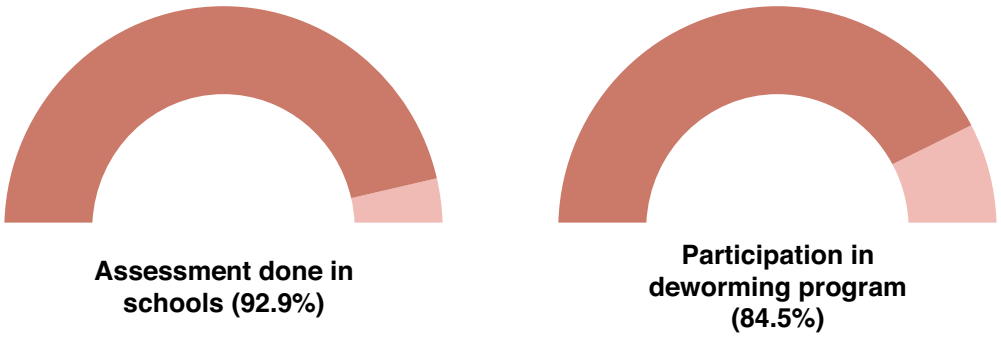
Table 12: Canteen food preparation, hygiene and management (kitchen tool)

Canteen management	n
Food preparation in canteen	
All the food items available are prepared in the canteen	8
Only snacks available, reheated and served	1
Readymade snacks are available which require no cooking	1
Food available in canteen	
Samosa, Vada, Bonda	3
Idli/dosa	2
Rice, dal, roti and sabji	3
All kinds of chips and murukku	10
Chocolates, candies	10
Cold drinks, fruit juices, soda	10
Buttermilk, fresh lemon water	2
Bisibele bath	1
Healthy food items	
Yes, fresh idli dosa is available	2
No, only fried items available	2
Fried items and readymade items available	2
Basic lunch like rice, dal/sabji available	4
Guidelines for canteen (researcher observation)	
Updated health/medical certificate of food handlers	6
Well-maintained, clean, well-ventilated, and pest-free	7
Highest standard of hygiene in preparation and serving of food	8
Food handlers wear hair net, face mask/mouth shield, apron, disposable plastic gloves	5
Total	10

Nutritional assessment

The majority of schools conducted student assessments, with 92.9% reporting that assessments were done in schools. Participation in deworming programs was also high, with 84.5% of schools involved (Figure 10).

Figure 10: Status of health/nutritional assessment (Admin)



Health and nutritional assessments were commonly conducted in schools, with weight and height measurements being the most prevalent (90.5%), followed by general health check-ups (73%), hemoglobin testing (50.2%), eye examinations (52.6%), and dental examinations (41.4%). In terms of frequency, nearly half of the schools (46.3%) carried out assessments biannually, 38.6% conducted them once a year, and 14% assessed students every two months. A small proportion of respondents (1.1%) were unsure about the assessment frequency (Table 13).

Table 13: Health and nutritional assessments conducted in schools (Admin)

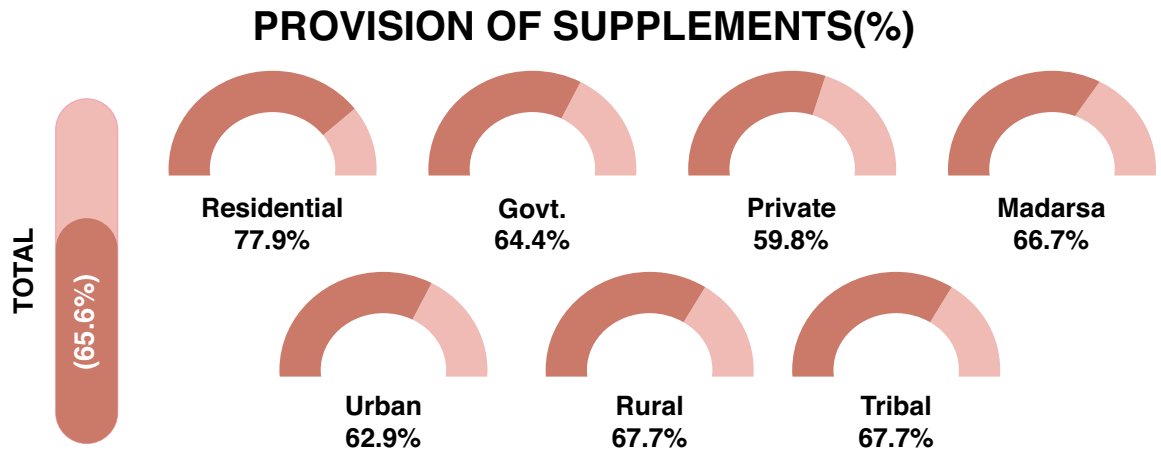
Nutritional/health assessment	%	n
Type of assessment		
Weight and height	90.5	483
HB count	50.2	268
General health check ups	73.0	406
Eye examination	52.6	281
Dental examination	41.4	221
Frequency of assessment		
Biannually	46.3	247
Once a year	38.6	206
Every two months	14.0	75
Don't know	1.1	6

Note: Amongst schools where health assessment is done (534)

Provision of micronutrient supplements

Overall, about two-thirds of schools (65.6%) reported providing supplements. Provision was highest in residential schools (77.9%) and lower in Government schools (64%), Madrasas and tribal schools (both around 66–67%). By location, provision was slightly higher in rural areas (67.7%) than in urban areas (62.9%) (Figure 11).

Figure 11: Percentage of schools providing micronutrient supplements



Micronutrient supplementation was widely implemented in schools, with iron-folic acid (IFA) tablets provided in 79.6% of schools and calcium tablets in 71.9%. Other supplements, such as multiple micronutrients (15.9%) and multivitamins (1.3%), were less commonly offered. The frequency of supplementation varied, with 37.9% of schools administering it weekly, 24.9% bi-yearly, 18% once a year, and smaller proportions providing supplements monthly or every two months. Most beneficiaries (87.5%) were all students with parental consent, while only 9.3% of schools targeted supplementation to malnourished students (Table 14).

Table 14: Provision and frequency of micronutrient supplementation (Admin tool)

Micronutrient supplements	%	N
Type of supplements		
Calcium tablets	71.9	271
IFA tablets	79.6	300
Multiple micronutrient supplements	15.9	60
Multivitamin	1.3	5
Frequency		
Every week	37.9	143
Once a year	18.0	68
Bi-yearly	24.9	94
Once a month	8.2	31
Once in two months	7.9	30
Don't know	2.9	11
Beneficiaries		
All students with consent	87.5	330
Only malnourished students with consent	9.3	35
Don't know	3.2	12
Total	**377**	

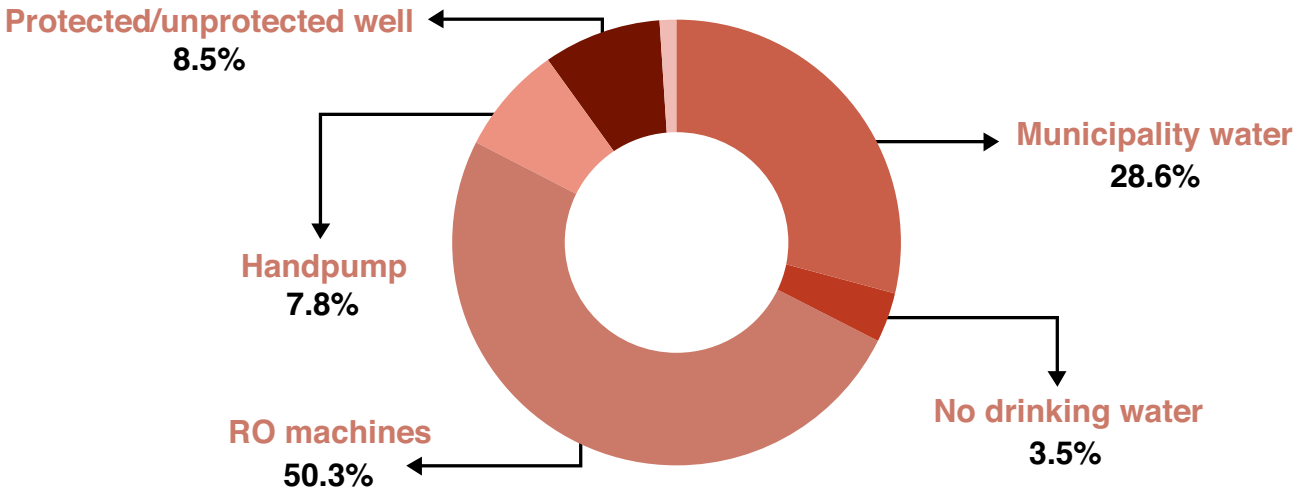
Note: Among those where micronutrient supplements were available

Theme 4: WASH components – Water availability, Sanitation practices

Water facilities

Most schools relied on RO machines for drinking water, accounting for 50.3% of sources. Municipality water supplied 28.6% of schools, while protected or unprotected wells and handpumps contributed 8.5% and 7.8% respectively. A small proportion of schools, 3.5%, reported having no drinking water source available (Figure 12).

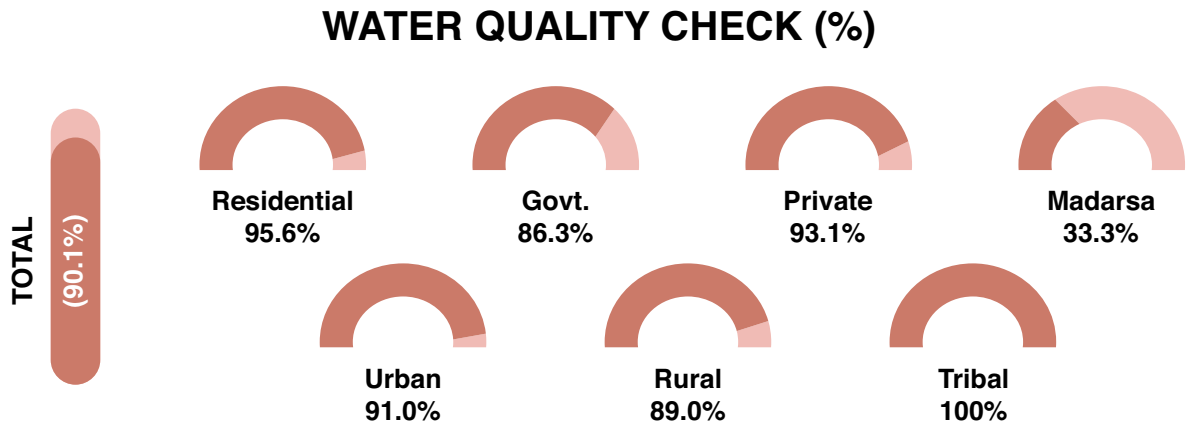
Figure 12: Main source of drinking water in schools (Admin)

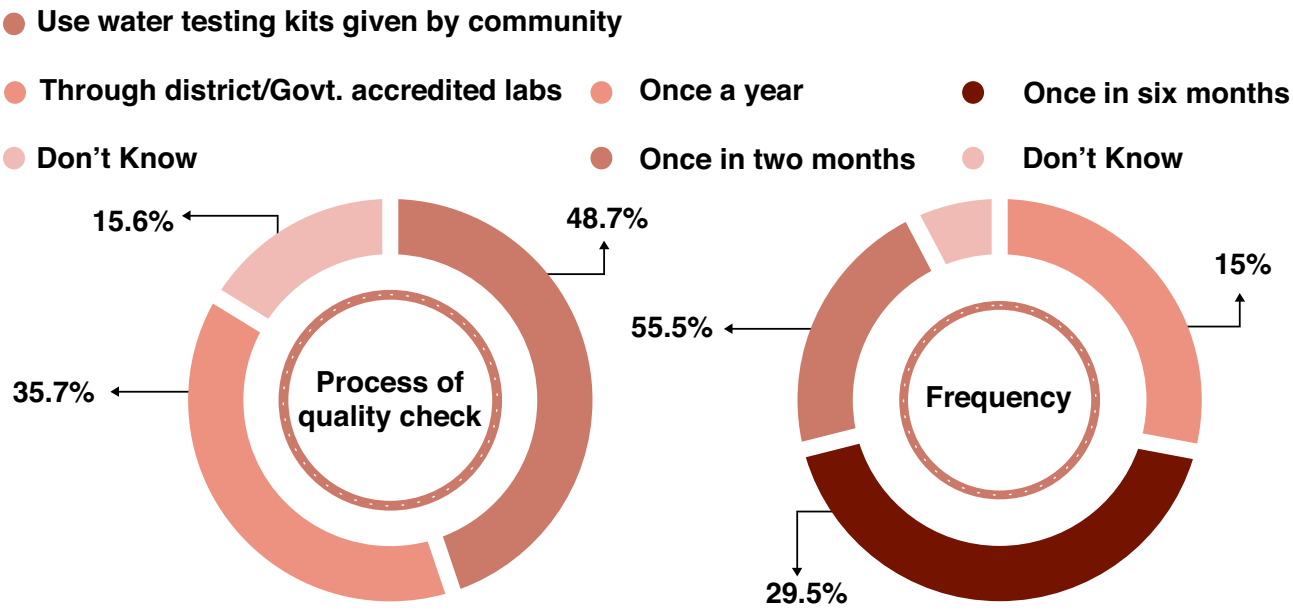


Overall, water quality testing was conducted in 90.1% of schools. Residential (95.6%) and private schools (93.1%) had particularly high coverage, followed by government schools (86.3%). By location, all tribal schools reported water quality checks (100%), while coverage was also high in urban (91.0%) and rural (89.0%) areas, but substantially lower in Madrasas (33.3%) (Figure 13)..

Most schools that conducted water quality testing relied on community-provided testing kits, used by 48.7% of schools, while 35.7% accessed district or government-accredited laboratories and 15.6% were unsure of the method used. Regarding testing frequency, over half of schools (55.5%) checked water quality once in six months, 29.5% did so once every two months, 15% tested only once a year, and a small proportion did not know how often testing occurred.

Figure 13: Provision of checking water quality by school type and location (Admin tool)





Note: Among those where water quality in checked

Handwashing facilities

Handwashing facilities were generally available across schools, with 82.1% having designated handwashing stations, although some schools relied on buckets or basins (8.4%), handwashing in toilets (2.6%), or handpumps (1.7%), and 5.2% had no proper place. Availability of both water and soap was observed in 68.2% of schools, while 28.2% had water but no soap, and a small proportion (3.7%) lacked both. Tribal schools showed the highest coverage of handwashing stations (100%) and availability of water with soap (88.9%), whereas urban and rural schools had slightly lower coverage (Table 15).

Table 15: Handwashing facilities in schools (admin)

Handwashing facilities	Urban	Rural	Tribal	Total (N)
Place of washing hands				
Handwashing station	86.7	77.8	100.0	82.1
Bucket/mug, basin/mug	7.4	9.4	0.0	8.4
Handwashing in toilet/bathroom	2.3	2.9	0.0	2.6
Handpump	0.8	2.6	0.0	1.7
No proper place	2.7	7.4	0.0	5.2
Availability of water and soap				
Both water and soap available	67.2	68.4	88.9	68.2
Water available but no soap	29.3	27.7	11.1	28.2
No water and soap is available	3.5	3.9	0.0	3.7
Total	**256**	**310**	**9**	**575**

Toilet facilities

Toilet facilities in schools primarily consisted of squatting toilets, available in 75.8% of schools, while Western-style commodes were less common (8%), and 13.9% had both types. A small proportion of schools, particularly tribal schools (11.1%), lacked proper toilets, requiring students to use open areas. The student-toilet ratio was generally adequate, with 63.4% of schools providing one toilet for 50 students or fewer, 17.4% accommodating 50–100 students per toilet, and 15.5% exceeding 100 students per toilet. Cleaning practices varied, with 60.2% of schools cleaning toilets daily, 12.2% every other day, 9.7% twice a week, and 17.9% once a week, while tribal schools reported the highest daily cleaning frequency (88.9%) (Table 16).

Table 16: Toilet facilities in schools (Admin tool)

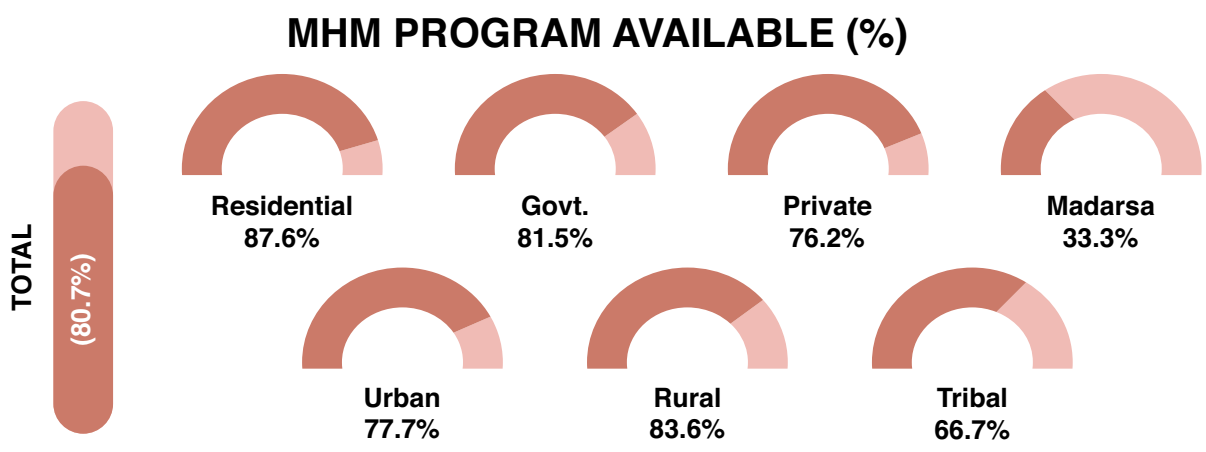
Toilet facility	Urban	Rural	Tribal	Total (N)
Type of toilet				
Western toilet/commode	8.2	8.1	0.0	8.0
Squatting toilet	73.4	78.7	44.4	75.8
No toilet (bush, field, river)	1.2	2.9	11.1	2.3
Both western and Indian toilet	17.2	10.3	44.4	13.9
Student toilet ratio*				
100 students or higher per toilet	18.2	13.6	0.0	15.5
50 to 100 students per toilet	17.4	17.3	25.0	17.4
50 students or less per toilet	61.3	64.8	75.0	63.4
Don't know	3.2	4.3	0.0	3.7
Frequency of cleaning				
Daily	63.7	56.5	88.9	60.2
Every other day	12.9	11.9	0.0	12.2
Twice a week	10.2	9.7	0.0	9.7
Once a week	13.3	21.9	11.1	17.9
Total	**256**	**310**	**9**	**575**

Note:Among those where toilet facility was available

Menstrual health management

Menstrual hygiene management (MHM) programs were available in 80.7% of schools overall. Availability was highest in residential (87.6%) and rural schools (83.6%), followed by government (81.5%), urban (77.7%), private (76.2%), and tribal schools (66.7%), while Madrasas schools showed notably low coverage at 33.3% (Figure 14).

Figure 14: Availability of MHM program in schools



Menstrual hygiene management (MHM) services varied across school types. The most common service, provided in 53.4% of schools overall, was the free monthly provision of sanitary napkins combined with MHM education, offered by most residential (63.6%) and government schools (57.7%), as well as all Madrasas. A smaller proportion of schools provided only gender-focused MHM education once a year (38.6% overall), particularly in private schools (45.8%). Few schools offered sanitary napkins twice a year without accompanying MHM education (7.3%), and a negligible number of respondents were unaware of the services (Table 17).

Table 17: Type of services available under menstrual hygiene program

MHM program services	Type of school				Total (N)
	Residential	Govt.	Private	Madrasa	
Only gender MHM education once a year	3.3	36.4	45.8	0.0	179
Free provision of sanitary napkins monthly with MHM education	63.6	57.7	39.6	100	248
Provision of sanitary napkins twice a year without MHM education	3.0	5.9	12.5	0.0	34
Don't Know	0.0	0.0	2.1	0.0	3
Total	**99**	**220**	**144**	**1**	**464**

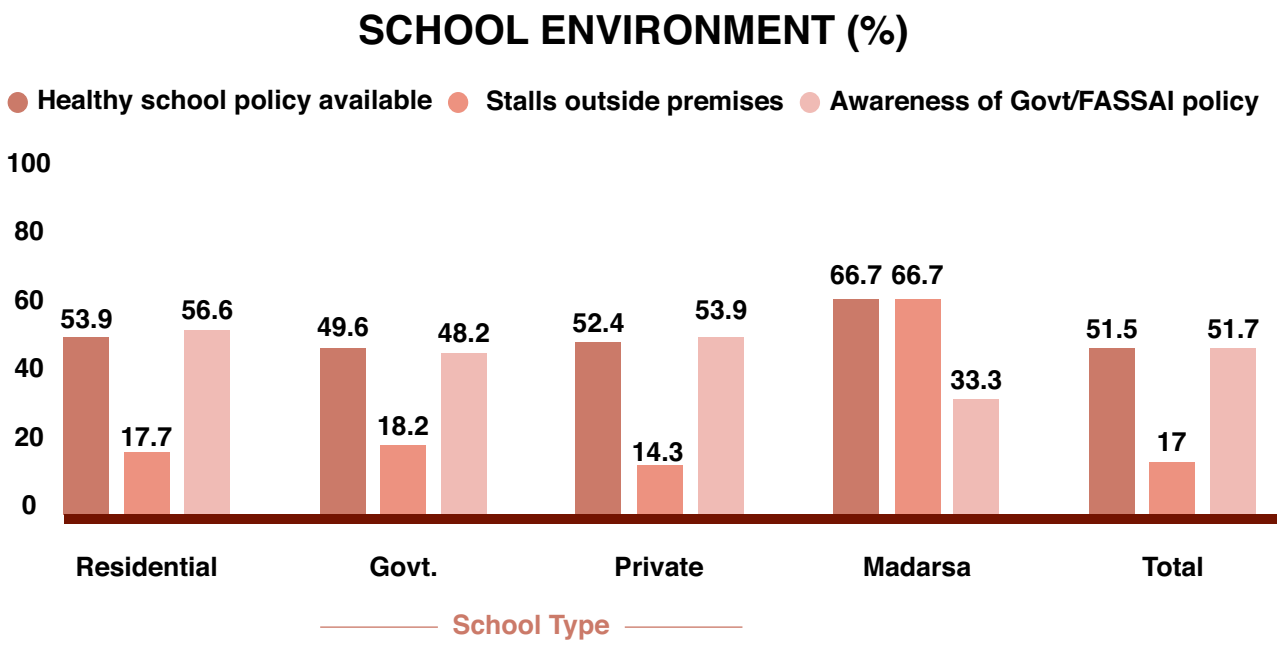
Note: Among those schools where menstrual hygiene program available (464)

Theme 5: Healthy environments around school –Availability of unhealthy foods outside the school, access of healthy foods to students

Healthy school food and physical environment

Overall, about half of schools reported having a healthy school policy (51.5%) and a similar proportion were aware of government or FSSAI guidelines (51.7%). Residential and private schools showed higher awareness of government/FSSAI policy (56.6% and 53.9%, respectively) compared with government schools (48.2%) and Madrasas (33.3%). Madrasas, however, had the highest proportion reporting a healthy school policy (66.7%) and also the highest presence of food stalls outside school premises (66.7%), whereas stalls were less common around residential (17.7%), government (18.2%), and private schools (14.3%) (Figure 15).

Figure 15: Healthy food policy and environment around schools (Admin tool)



Food outlets around schools included a mix of small vendors, shops, and mobile stalls. According to administrative reports, small bandis selling fried foods (58.2%) and shops offering chips, fried snacks, tetra pack juices, and chocolates (59.2%) were most common, followed by seasonal fruit vendors (36.7%), ice-cream carts (29.6%), and bakeries (24.5%).

Researcher observations showed slightly different patterns, with fresh vegetable/fruit markets (19.8%) and bakeries (19.7%) being the most frequently observed, along with traditional small stores/kirana shops (17.9%), mobile/street food vendors (13%), and fast-food outlets like pizza and burger shops (6.6%) (Table 18).

Table 18: Type of food stalls/shop available outside schools (Admin tool)

Type of Food stalls/shop	%	N
Reported by Admin		
Small bandis selling fried food items	58.2	41
Shops selling seasonal fruits	36.7	36
Small shops selling chips, fried snacks, tetra pack juices chocolates	59.2	58
Ice-cream carts, seasonal ice gola etc.	29.6	29
Bakeries selling biscuits, cakes, parties, pastry, samosa, puffs etc.	24.5	24
Total	**98**	
Observed by researcher		
Local bandis selling fried food items	33.3	80
Traditional small food stores, kirana shops	42.9	103
Mobile vendors/ street food vendors	31.2	75
Fresh vegetable/ fruit market	47.5	114
Fast food restaurants (ex. Pizza hut, burger shops etc.)	15.8	38
Bakery selling biscuits, puffs, pastry, cakes etc.	47.1	113
Total	**240**	

Note: Multiple response

Policies on outside food and healthy food availability varied across schools. Only 11.8% of schools allowed students to purchase food or snacks from outside stores, while 43.1% prohibited it on campus and 35.1% of residential schools did not allow it at all. A small proportion (9.9%) did not monitor individual purchases. Most schools (78.4%) informed parents about the nutritional quality of outside food, but only a quarter (25.4%) ensured the availability of healthy food at affordable prices (Table 19).

Table 19: Policies related to outside food and healthy food availability in schools

Policy about outside food	%	N
Students allowed to		
Purchase food/snacks from food stores outside school	11.8	68
Not allowed while in campus	43.1	248
Not allowed at all (residential schools)	35.1	202
Don't monitor individual purchases	9.9	57
Inform parents about nutritional quality of outside food		
Yes	78.4	451
No	21.6	124
Ensure availability of healthy food at cheaper prices		
Yes	25.4	146
No	74.6	429
Total	**575**	

Nutrition education

Nutrition education was widely integrated in schools, with 73% having a nutrition curriculum and 65.2% providing nutrition education to parents at least once a year. Celebrations such as Poshan Maah were observed in 39.1% of schools to promote awareness. In most schools, nutrition education was delivered by teachers not specifically trained in nutrition (54.8%), followed by health and nutrition teachers (40.7%) and local health personnel such as PHC medical officers, ASHAs, or ANMs (30.7%). The frequency of education sessions varied, with 35.2% conducted twice a year, 26.2% once a year, 19.3% every two months, and 18.1% quarterly. Monitoring of these sessions was carried out in 83.6% of schools annually, though 13.5% reported no specific monitoring schedule (Table 20).

Table 20: Availability of nutrition education curriculum and delivery (Admin tool)

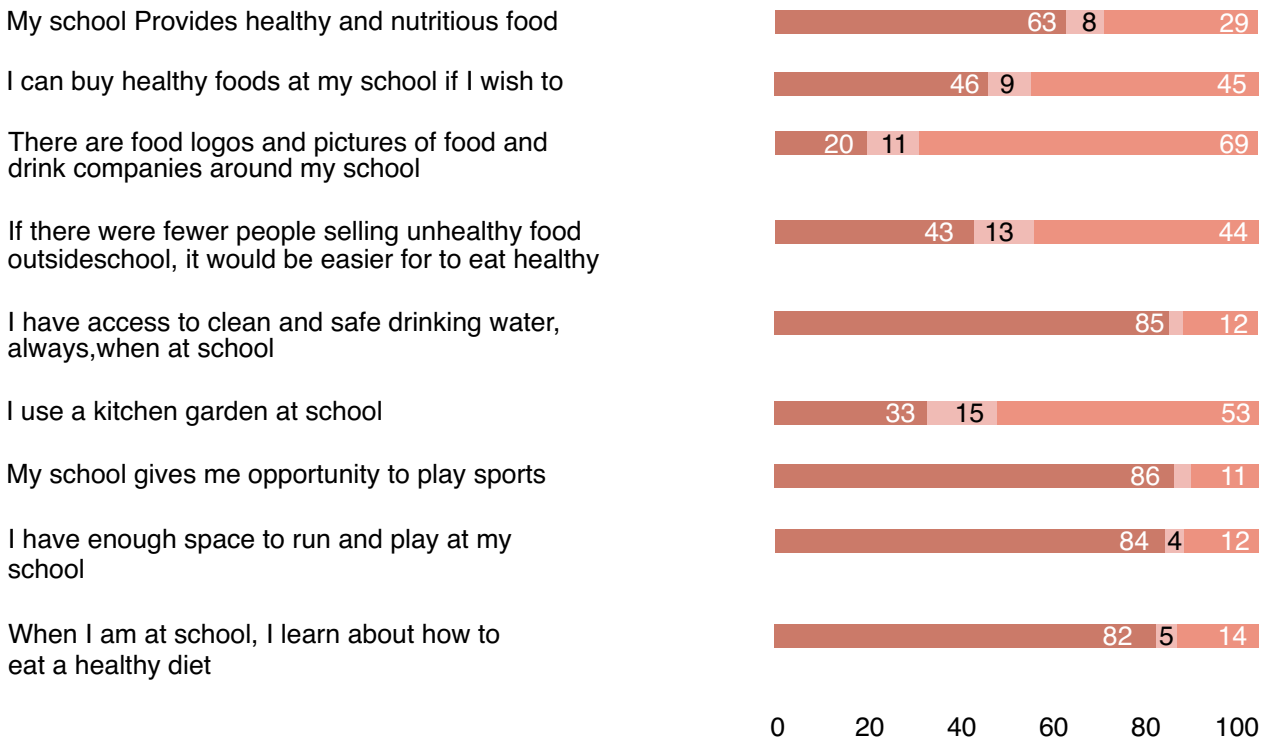
Nutrition education	%	N
Nutrition curriculum available	73.0	420
Nutrition education to parents at least once yearly	375	65.2
Celebration of poshan maah	39.1	225
Source of nutrition education		
School teacher not trained in nutrition	54.8	230
Health and nutrition teacher	40.7	171
Local PHC medical officer/ASHA/ANM/AWT	30.7	129
Nutrition education is not delivered	0.7	3
Frequency*		
Yearly once	26.2	110
Yearly twice	35.2	148
Once every quarter	18.1	76
Once in every two months	19.3	81
Don't Know	1.2	5
Monitoring of education sessions*		
Yes, every year	83.6	352
No specific schedule for monitoring	13.5	57
Don't Know	2.9	11

Note: Among those where nutrition education curriculum was available (420); #Multiple response

Student's perception on school environment

Figure 16 shows that most students perceived their school environment as broadly supportive of healthy eating and physical activity, but important gaps remain. A large majority agreed that they have access to clean and safe drinking water (85%) and opportunities to play sports (86%), and that school helps them learn about healthy diets (82%). In contrast, fewer students felt that their school provides healthy and nutritious food (63%) or allows them to buy healthy foods if they wish (46%), and only one-third reported using a kitchen garden (33%), while many noted the presence of food logos and pictures (69% disagreeing with the statement that such marketing is absent) and unhealthy food sellers outside school, indicating external commercial influences that may hinder healthy choices.

Figure 16: Student's opinion on school food and physical environment

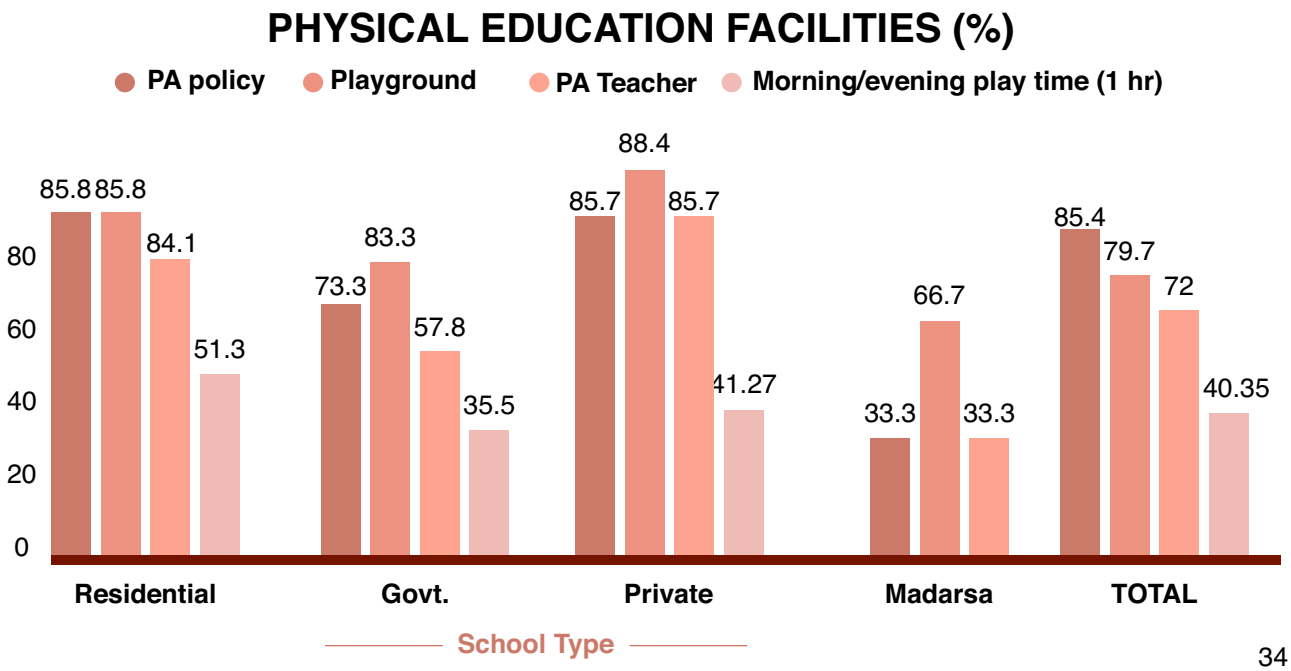


Theme 6: Physical education – Availability / accessibility of physical education exercise environments

Physical education

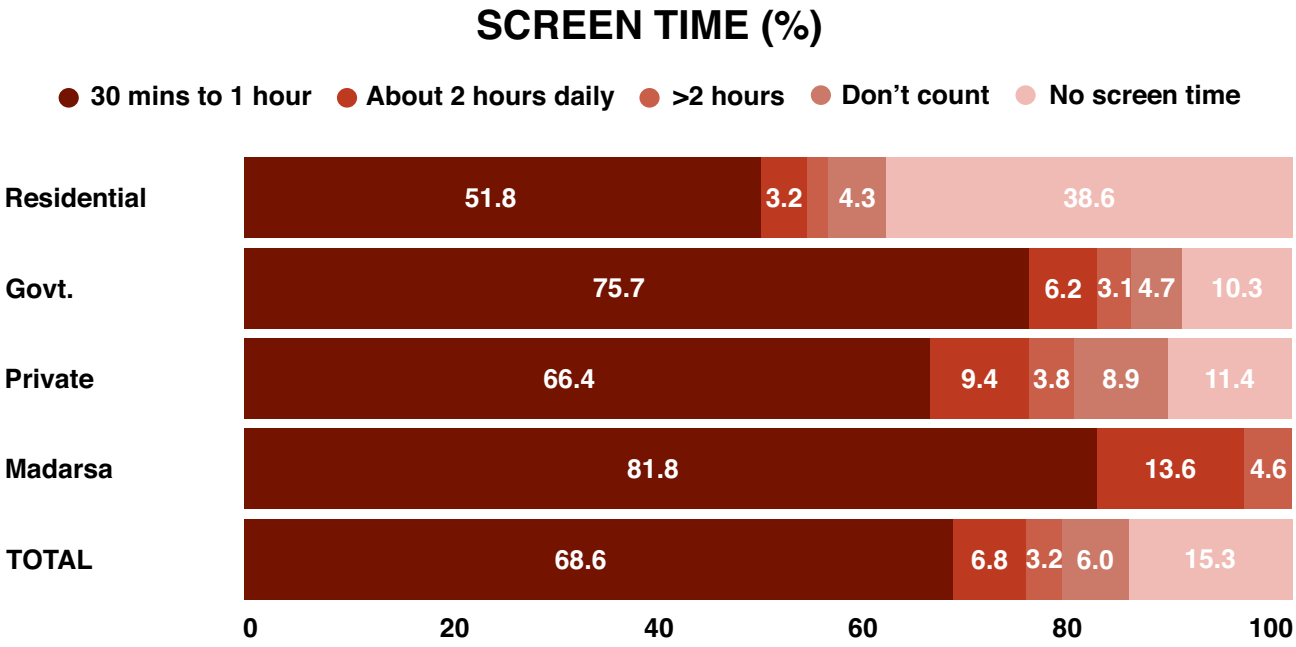
Across all schools, most reported having a playground (85.4%), a physical activity (PA) teacher (72.0%), and a PA policy (79.7%), but only 40.4% offered 1 hour of morning/evening play time. Residential and private schools had the most supportive environments, with high availability of PA policy (85.8% and 85.7%), playground (85.8% and 88.4%), and PA teacher (84.1% and 85.7%), whereas Madrasas showed the lowest provision of PA policy (33.3%), PA teacher (33.3%), and dedicated play time (41.3%).

Figure 17: Physical education and activities policy in schools (Admin)



Across school types, most students reported daily screen time of 30 minutes to 1 hour, ranging from 51.8% in residential schools to 81.8% in Madarsa, with an overall proportion of 68.6%. A smaller proportion reported about 2 hours of screen time daily (overall 6.8%), more than 2 hours (3.2%), or not counting their screen time (6.0%), while 15.3% of students reported having no screen time (Figure 18).

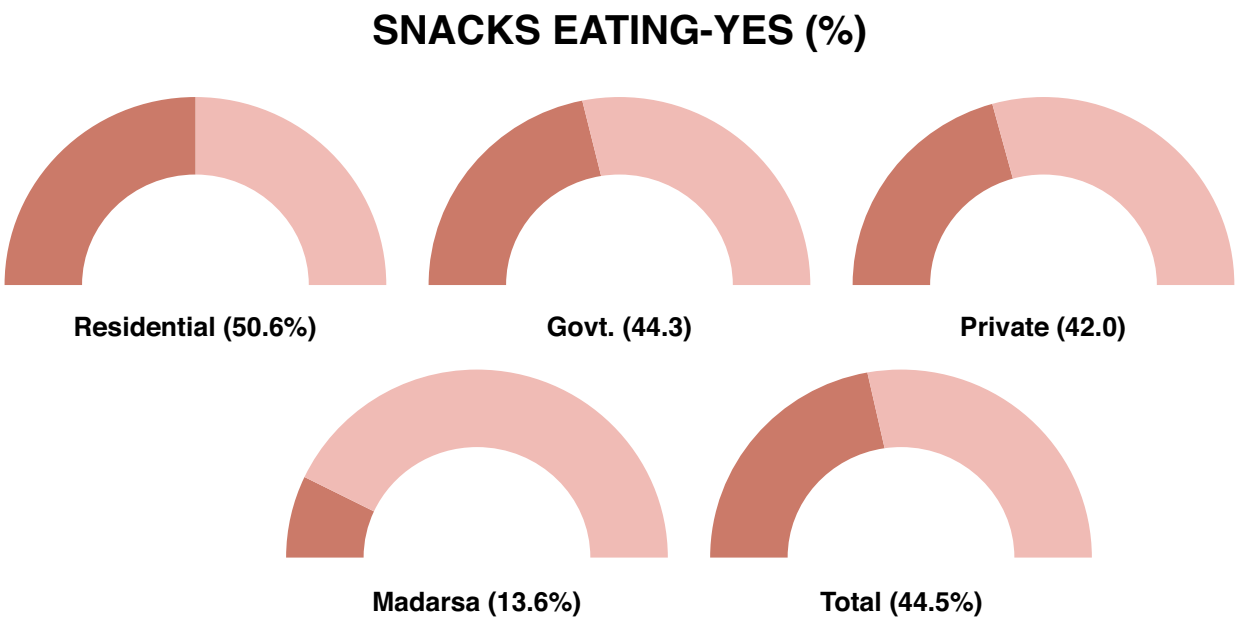
Figure 18: Screen time reported by students



Theme 7: Student's eating habits, knowledge and perception towards healthy eating Snacks eating among students

Overall, 44.5% of students reported eating snacks, with the highest proportion in residential schools (50.6%), followed by government (44.3%) and private schools (42.0%), while only 13.6% of students in Madarsa reported consuming snacks (Figure 19).

Figure 19: Snacks eating behaviour among students



Students consumed a mix of both unhealthy and healthier snack options. Packaged snacks such as biscuits (58.9%), chips like Lays or Bingo (37.9%), chocolates/toffees (33.5%), and carbonated drinks or fruit juices (13.7%) were commonly consumed. Fried and local snacks like murukku (20.9%) and items such as Gobi Manchurian or Chinese foods (18.1%) were less frequent. Healthier options, including fresh fruits (43.2%) and homemade snacks (42.2%), were also popular among students. Additionally, occasional treats like ice gola/ice creams (19.8%), cakes/pastries/puffs (12%), and cotton candy (7.3%) were reported (Table 21).

Table 21: Type of snacks consumed by students (Student tool)

Snacks	%	N
Chips, lays, bingo etc.	37.9	1138
Biscuits	58.9	1772
Coke/sodas/fruit juice	13.7	412
Ice Gola, ice creams	19.8	594
Cake, pastry, puffs	12.0	362
Cotton candy	7.3	219
Fresh fruits	43.2	1299
Chocolate/toffies	33.5	1006
Homemade snacks	42.2	1269
Murukku, local fired snacks	20.9	627
Gobi Manchurian, Chinese	18.1	544
Total	**3007**	

Note: Among those who reported eating snacks (3007); Multiple responses

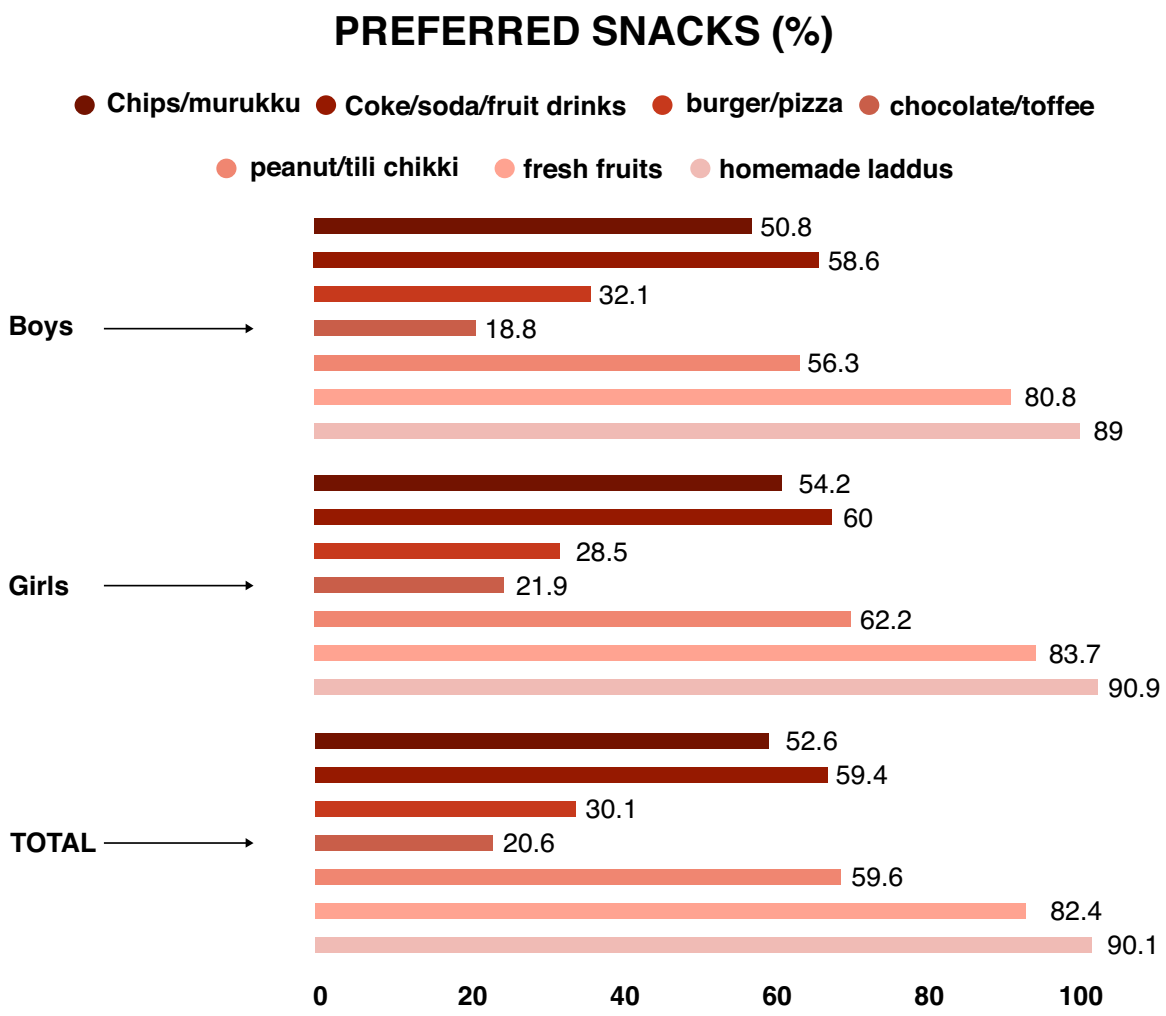
Students' snacking practices varied in frequency, source, and expenditure. About one-third of students (34.6%) consumed snacks every day, while others ate snacks every alternate day (20.4%), twice a week (20.6%), or once a week (21%), and a small proportion (3.4%) rarely snacked. More than half of the students (53.2%) brought snacks from home, 35.1% purchased them from outside the school, and a smaller proportion received snacks from parents or friends. Regarding spending, 42.7% of students received Rs. 50 per week for snacks, 33.1% received Rs. 100 or more per week, and 22.1% received Rs. 50 twice a week (Table 22).

Table 22: Snacking practices among students

Snacking behaviour	%	N
Frequency		
Everyday	34.6	1041
Twice a week	20.6	619
Once a week	21.0	632
Every alternate day	20.4	614
Rarely	3.4	101
Source		
Buy from outside the school	35.1	1055
Bring from home	53.2	1599
Parents buy everyday	3.5	104
Friends	5.9	176
Parents but whenever I want to eat	2.4	73
Total		
Amount received to buy snacks		
Rs. 50 per week	42.7	1285
Rs. 100 or more per week	33.1	994
Rs. 50 twice a week	22.1	665
Not reported	2.1	62
Total	**3007**	

Figure 20 showed that homemade laddus (90.1%) and fresh fruits (82.4%) were the most preferred snacks among students, followed by chocolate/toffee (59.6%) and Coke/soda/fruit drinks (59.4%). Chips/murukku (52.6%) and burger/pizza (30.1%) were less frequently preferred, while peanut/tili chikki (20.6%) was the least preferred snack overall.

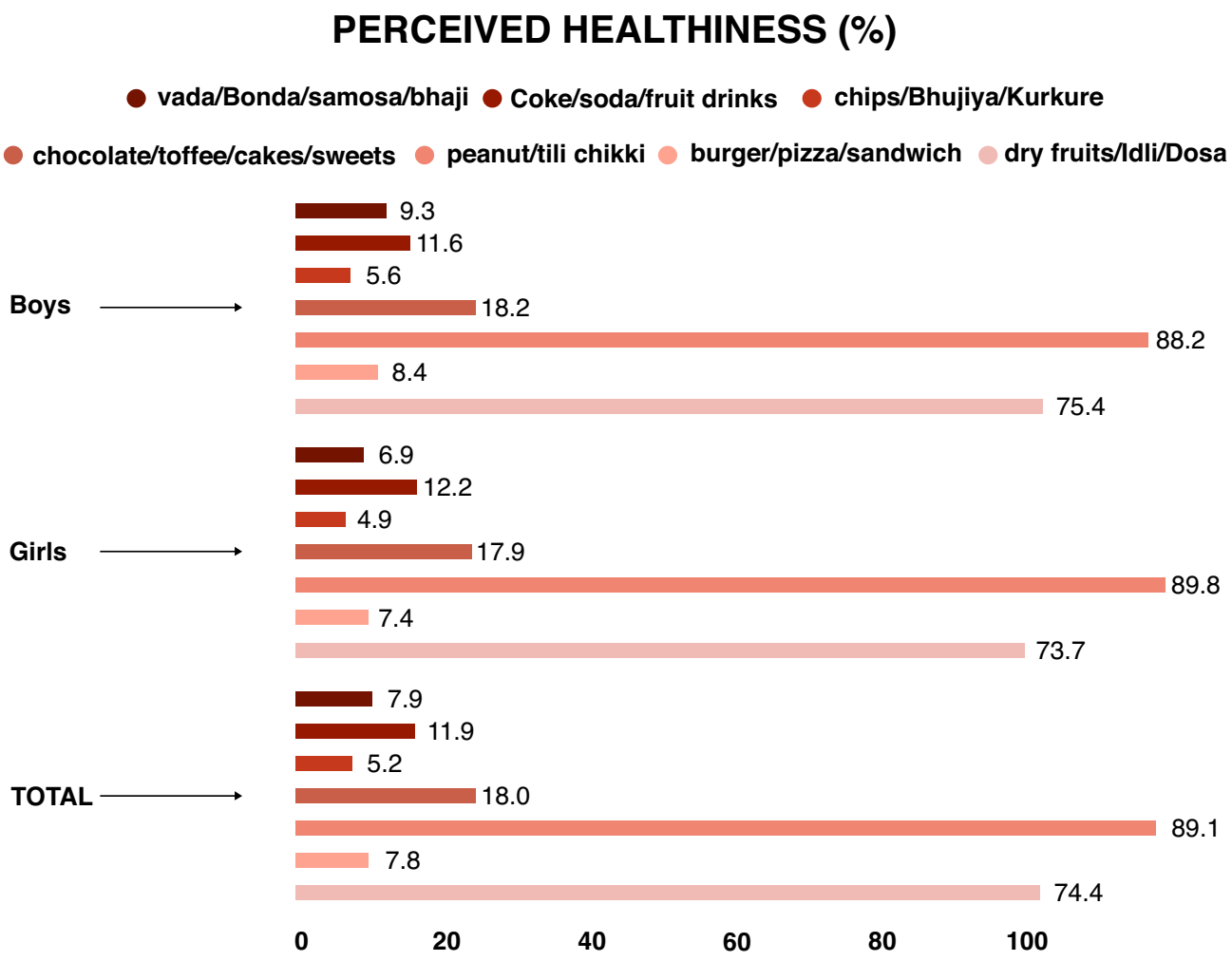
Figure 20: Preferred types of snacks among students



Awareness on healthy food items

Overall, most adolescents perceived dry fruits/Idli/Dosa as healthy (89.1%), and only a minority regarded burgers/pizza/sandwich (7.8%), chips/Bhujiya/Kurkure (5.2%), Coke/soda/fruit drinks (11.9%), or vada/Bonda/samosa/bhaji (7.9%) as healthy. No major differences were observed in perception of adolescents by gender.

Figure 21: Perception of studntes on healthiness of different snack items



Qualitative analysis from Focused Group Discussions

A total of 8 Focus Group Discussions (FGDs) were conducted across four selected districts with both heterogeneous and homogeneous groups of adolescent boys and girls. Participants were randomly selected from grades 6 to 12, with approximately 10 students included in each FGD. The discussions were guided by a semi-structured framework and explored key domains including individual food choices, dietary preferences and their underlying determinants, snacking patterns and frequency, as well as eating behaviours within school and home environments.

Findings: Adolescent dietary habits

The FGD findings indicate a clear disconnect between nutrition awareness and dietary practices among adolescents. Students in residential schools reported limited access to on-campus snacks due to stricter regulations; however, they frequently consume processed and packaged foods during home stays, often daily. While approximately 80% of adolescents demonstrate awareness of the distinction between healthy and unhealthy foods, consumption patterns continue to be driven by taste preferences and habitual behaviours. A significant proportion (80%) correctly identified items such as chips, bhujiya, and similar snacks as unhealthy, yet 85% reported a strong preference for these foods. Similarly, although 63% recognized sweets and bakery products (e.g., chocolates, biscuits, cakes) as unhealthy, their consumption remains high due to taste appeal. Notably, 50% of respondents perceived such items as healthy or moderately healthy, often attributing this to the presence of ingredients like dry fruits, indicating gaps in nutritional understanding. Additionally, around 45% of adolescents considered fruit juices, colas, and sodas to be healthy, largely due to the perception that they contain real fruit, reflecting misconceptions regarding processed beverages. Overall, the findings highlight the persistence of misperceptions and the dominant influence of taste over knowledge in shaping adolescents' food choices with influence from TV advertisements, celebrity endorsements and increasing penetration of food delivery apps even in rural areas and widespread availability of fast food near residential as well as school areas driving the food choices and preferences of adolescent children.

CONCLUSION

The School Food Environment Assessment in Karnataka provides comprehensive evidence that while foundational nutrition and health systems are largely in place, critical quality, consistency, and environmental gaps continue to influence adolescent dietary behaviours.

The study reveals that Karnataka has achieved substantial institutional coverage of school-based nutrition and health interventions. Most schools implement meal programmes under government schemes, and fortified staples such as rice, oil, and iodized salt are widely used. Health assessments, deworming, and micronutrient supplementation—particularly iron and folic acid—are operational in most schools. WASH infrastructure is broadly available, and menstrual hygiene management services reach a large proportion of adolescent girls. Physical education policies and playground access are also widely reported. These findings demonstrate strong policy intent and system-level commitment.

However, implementation variability and quality gaps limit the full impact of these efforts.
External laboratory testing of food quality is rare, and irregular supply of fortified items affects nutritional consistency. Dining infrastructure remains inadequate in many government and private schools, potentially affecting hygiene and dignity.

Micronutrient supplementation coverage is substantial, yet haemoglobin testing is conducted in only half of the schools. Given the high burden of anaemia and micronutrient deficiencies in Karnataka, this indicates a gap between supplementation delivery and effective monitoring of nutritional outcomes.

The surrounding food environment presents one of the most significant challenges. A large proportion of schools are located near vendors selling energy-dense, nutrient-poor foods. Although most schools prohibit on-campus purchases from outside vendors, enforcement beyond school boundaries remains weak.

Adolescent snacking behaviour reflects this environmental exposure. Daily consumption of packaged snacks, biscuits, chips, chocolates, and sugary drinks remains high, despite relatively good awareness of what constitutes healthy food. Taste preferences, peer influence, availability, and pocket money patterns appear to drive food choices more strongly than knowledge alone. This underscores the gap between awareness and behaviour.

Nutrition education is present in most schools; however, over half of sessions are delivered by teachers without formal nutrition training, and structured monitoring of session quality varies. Similarly, while physical education policies exist, structured playtime is not consistently implemented, particularly in academically pressured settings.

The evidence indicates that improving adolescent nutrition in Karnataka will require moving beyond programme availability toward improving programme quality, environmental regulation, behavioural reinforcement, and accountability mechanisms.

By integrating meal quality reforms, stronger regulatory enforcement, improved monitoring systems, and adolescent-centered engagement strategies, Karnataka can transition from coverage-driven implementation to impact-driven nutrition outcomes—ultimately contributing to healthier growth, improved learning capacity, and long-term human capital development.

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