



BASELINE SURVEY ON THE NUTRITIONAL STATUS OF PRIMARY SCHOOL-AGE CHILDREN AND ITS DETERMINANTS IN CENTRAL JAVA PROVINCE FINAL REPORT

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Abbreviations and acronyms

BAPPEDA	<i>Badan Perencanaan Pembangunan Daerah</i> (Regional Development Planning Body)
BIAS	<i>Bulan Imunisasi Anak Sekolah</i> (School Child Immunization Month)
BMI	Body mass index
BPOM	<i>Badan Pengawasan Obat dan Makanan</i> (National Agency of Drug and Food Control)
DE	Design effect
DoE	District of Education
FFQ	Food frequency questionnaire
FGD	Focus group discussion
HFIAS	Household Food Insecurity Access Scale
IDI	In-depth interview
IDDS	Individual dietary diversity score
IEC	Information education communication
IFA	Iron folic acid
KAP	Knowledge attitude practices
MoECRT RI	Ministry of Education, Culture, Research and Technology Republic of Indonesia
MoH RI	Ministry of Health Republic of Indonesia
MoRA	Ministry of Religious Affairs
MI	<i>Madrasah Ibtidaiyah</i>
PHBS	<i>Pola Hidup Bersih dan Sehat</i> (Healthy and Clean Lifestyle)
Puskesmas	<i>Pusat Kesehatan Masyarakat</i> (Primary Health Center)
TEM	Technical error of measurement
TPG	<i>Tenaga Pelaksana Gizi</i> (nutritionist)
TP UKS/M	<i>Tim Pembina Usaha Kesehatan Sekolah/Madrasah</i> (Coordinating Team for School Health Program)
SD	Standard deviation
SD	<i>Sekolah Dasar</i> (elementary school)
SDN	<i>Sekolah Dasar Negeri</i> (public elementary school)
SDS	<i>Sekolah Dasar Swasta</i> (private elementary school)
SEAMEO RECFON	Southeast Asia Ministry of Education Organization-Regional Centre for Food and Nutrition
SKI	<i>Survei Kesehatan Indonesia</i> (Indonesian Health Survey)
SOP	Standard operating procedure
SPSS	Statistical Package for the Social Sciences
SSB	Sugar-sweetened beverages
UKS/M	<i>Usaha Kesehatan Sekolah/Madrasah</i> (School Health Program)
UNICEF	United Nations Children's Fund
VIM	Variable indicator matrix
WHO	World Health Organization

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EXECUTIVE SUMMARY

BACKGROUND

Ensuring optimal nutrition for school-age children is vital given the associated short- and long-term benefits to health, including better physical development, increased educational attainment, and decreased vulnerability to non-communicable diseases in later life. Yet, in Indonesia as in many other low- and middle-income countries, malnutrition in this age group remains widespread, with persistent rates of undernutrition and micronutrient deficiency increasingly accompanied by growing rates of overweight and obesity. Unhealthy diets and poor health practices are common drivers of all forms of malnutrition and demand immediate attention.

To respond to these challenges, UNICEF Indonesia and the ministries of health, education, and religious affairs launched a pilot intervention in Tegal District in 2022. The intervention focused on improving the nutritional status of primary school children by increasing awareness and uptake of healthy lifestyles and advocating for healthier food environments at schools. Building on the promising results of this pilot, the programme pilot

expanded in scope from 2023 to 2024 to cover four areas in Central Java (Semarang, Surakarta, Tegal, and Kudus), and to incorporate specific components focused on strengthening local health and school systems for childhood obesity prevention.

This report presents results from the baseline survey implemented by UNICEF and SEAMEO-RECFON to assess the nutritional status of primary school-age children and its determinants before implementing the intervention. The study employed a mixed-methods and cross-sectional survey design, collecting data from 40 elementary schools across the four targeted areas. Quantitative data were gathered from 798 Grade 4 children and their parents. Qualitative approaches included focus group discussions (FGDs) and key informant interviews with various stakeholders, including school canteen staff, healthcare workers, and street food vendors, as well as direct observations of schools' food environments.

KEY RESULTS

Health and socio-economic characteristics

- The survey overall revealed no significant differences between intervention and control schools in age, gender distribution, daily pocket money, prevalence of morbidity, or parental demographics. School facilities and the implementation of health-related activities were also similar between groups.
- Regarding nutritional status, 60 per cent of students had normal BMI-for-age, with 11.9 per cent classified as thin or severely thin and 13.3 per cent and 15.2 per cent as overweight and obese, respectively. Overweight and obesity rates were higher compared to average national and province data. Median BMI-for-age z-score was higher in intervention schools and cities, with male students showing a higher prevalence of obesity (19 per cent) compared to females (11 per cent).

Knowledge, attitudes, and practices on balanced nutrition and obesity

- No significant differences in knowledge, attitudes, and practices (KAP) on balanced nutrition were found between students and parents in intervention and control schools. Overall, 64 per cent of students and 48.6 per cent of parents had poor knowledge, 33.2 per cent of students and 43.7 per cent of parents had poor attitudes, and 72.1 per cent of students and 3 per cent of parents had poor practices.
- Students demonstrated good knowledge about overweight/obesity causes and prevention but limited understanding of breakfast, dietary diversity, and food label reading. Their attitudes supported maintaining ideal weight but struggled with reducing the consumption of salty snacks and instant noodles. Poor practices included inadequate water intake, lack of handwashing, and physical inactivity, with 2 in 3 (64 per cent) students exercising less than 3 times per week. Most students also reported rarely reading food labels of packaged foods, primarily because they did not understand the information presented. Such practices were more prevalent among students with poor knowledge and attitudes.
- Similarly, parents' knowledge and attitudes correlated with their practices. While they understood aspects like sweet drink energy content and dietary diversity, they lacked knowledge on obesity prevention, with only 1 in 4 (25 per cent) able to correctly answer related questions. Concerns included insufficient vegetable intake, frequent sweet food/drink consumption, and children skipping breakfast, with less focus on overweight/obesity.
- Multivariate analysis identified factors associated with students' overweight/obesity risk: mother's education/employment, family economic status, students' dietary practices, and parental attitudes towards balanced nutrition. An inverse association between parents' attitudes and overweight/obese students suggests heightened concern among parents with overweight or obese children.



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Qualitative findings

Various stakeholders involved in the UKS/M programme, such as teachers, school committee members, canteen managers, TP UKS/M representatives, coordinators, and nutritionists at puskesmas levels, participated in FGDs and key informant interviews. Highlights from qualitative findings include:

- **Referral systems for children with obesity:** While some schools made initial efforts to address obesity cases, overall, UKS/M teachers and coordinators noted the lack of a strong referral system for obesity or other malnutrition cases among students. Puskesmas primarily focused on dental and ear examinations during health screenings, with limited follow-up on nutritional status. Schools rarely received detailed nutrition reports even when screening based on nutritional status was conducted, which made it difficult to assess differences among students (including specifically for students with disabilities). Tracking referrals for students with nutritional issues also posed challenges, as the health facility conducting the school-based health screening was not always the same one providing follow-up care—for example, due to students often seeking follow-up treatment or advice at facilities closer to their homes.
- **School food environments:** The food environment in and around schools was generally unhealthy, with widespread availability of foods high in sugar, salt, and unhealthy fats, and food safety concerns related to frequent use of additives and colourants. While most schools had some canteen regulations, they mainly focused on food safety rather than nutrition. Even when nutritional regulations were present, enforcement was lacking. Challenges in improving the school food environment included children's preferences for unhealthy foods, the presence of outside food vendors, limitations in enforcing regulations, resource constraints, and families' food habits. Many schools expressed a strong desire for assistance from health authorities in promoting healthy practices, engaging with vendors, conducting regular visits, and educating parents about healthy food choices.
- **Implementation of the UKS/M programme:** Progress was reported in implementing the first pillar of the UKS/M programme, focusing on nutrition and health education, though delivery was irregular due to health centres awaiting

school invitations for sessions. The second pillar, emphasizing health services, demonstrated high effectiveness with broad routine coverage.

Recommendations and the way forward

Findings from this baseline study will be used with those from an endline survey scheduled for late 2024/early 2025 to assess the impact of the pilot intervention led by UNICEF in collaboration with the Government of Indonesia. Some initial recommendations to enhance the health and nutritional status of primary school children include:

1. Enhance the school food environment by empowering schools to enforce canteen regulations and regulate vendors outside the canteen, promoting the sale of healthier foods and drinks.
2. Utilize routine health screening data effectively for obesity screening, and a robust referral system, to ensure service delivery to children with or at risk of overweight, obesity, and other forms of malnutrition.
3. Implement regular and engaging nutrition education for obesity prevention, emphasizing the importance of a diverse diet, healthier snacks, and reduced sedentary activity.
4. Disseminate practical, simple nutrition information to parents through existing media channels such as WhatsApp Groups and other digital platforms.
5. Strengthen the capacity of UKS/M teachers and puskesmas staff to deliver interactive nutrition education to promote behavioural change among students.





1. Introduction

1.1 BACKGROUND

Ensuring good nutrition during childhood is crucial for optimal growth, health, and well-being. This is especially important given the substantial proportion of school-aged children worldwide. The global population of school-age children (6 to 11 years) was estimated at 820 million in 2023 (Statista Research Department, 2023). Adequate nutrition not only promotes physical development but also enhances academic performance and educational outcomes, contributing to the economic and social progress of nations (WHO, 2020). However, malnutrition issues remain high in this age group, particularly in low- and middle-income countries where longstanding challenges of undernutrition and micronutrient deficiency are now increasingly accompanied by a rise in overweight and obesity (Wrottesley et al., 2022). According to the World Health Organization (WHO), over 390 million children and adolescents aged 5 to 19 years were classified as overweight or obese in 2022, marking a 2.5-fold increase from 8 per cent in 1990 to 20 per cent in 2022 (WHO, 2022). In parallel to these trends, data show an increased global shift towards unhealthy dietary patterns characterized by the overconsumption of energy-dense, ultra-processed foods high in fats, sugar, and salt, with little nutritional value (Wrottesley et al., 2022).

Indonesia faces a similar situation. Recent data from the Indonesia Health Survey (SKI) 2023 reveal that 11 per cent of school-age children aged 5 to 12 years are underweight, while 19.7 per cent suffer from overweight or obesity (MoH RI, 2024). Evidence suggests that school-age children in Indonesia generally have poor eating habits and lead sedentary lifestyles. The national survey also showed that 9 in 10 (97 per cent) children aged 5 to 19 consumed fewer than 5 portions of fruits and vegetables per day, and 1 in 2 (55 per cent) consumed one or more sugary drinks per day. SKI data also suggest low levels of physical activity, with only 1 in 2 children aged 10 to 19 (54 per cent) engaging in less than 30 minutes of physical activity per day. Childhood malnutrition poses a serious risk to health and well-

being later in life, as dietary behaviours established in childhood often persist into adulthood. In addition to having severe impacts on the health and well-being of children, childhood malnutrition can also affect national socio-economic development due to lost productivity and the increased prevalence of non-communicable diseases, which burden national health and economic systems with the need for costly, lifelong treatment. Strengthening the coverage and quality of health services and developing an enabling environment to prevent all forms of malnutrition, including overweight, in this age group is therefore a key development priority for Indonesia.

Primary school enrolment in Indonesia from 2015 to 2021 ranged between 91 and 93 per cent (Statista Research Department, 2023), which indicates that a large proportion of children can be reached through schools. The school environment is therefore an ideal platform for children to acquire habits, skills, and knowledge related to healthy lifestyles (WHO, 2020), as evidenced by numerous global and national commitments and policies aiming to implement school-based health and nutrition promotion programmes. According to the Nutrition-Friendly Schools Initiative (NSFI) Framework by WHO (2020), there are five essential components for ensuring the design of integrated school-based programmes that can help address the burden of all forms of malnutrition simultaneously: (i) school nutrition policies; (ii) awareness and capacity building of the school community; (iii) nutrition and health-promoting curricula; (iv) a supportive school environment for good nutrition; and (v) supportive school nutrition and health services.

In 2023, UNICEF launched a pilot intervention to support the prevention of all forms of malnutrition among primary school children and to assist the ministries of education and health in strengthening the school/madrasah health effort (UKS/M) programme for this age group. The intervention focuses on delivering nutrition education through

engaging games and learning resources, promoting physical activity, and enhancing the school food environment by advocating for healthier school canteens and school gardening. The first pilot phase, targeting 48 schools in Tegal District, Central Java, was successfully completed in 2023. In 2024, UNICEF is supporting government partners in scaling up the programme to three additional locations, now four intervention areas focus on integrating activities related to the prevention of overweight. The expanded pilot builds on learnings from the first phase and includes specific components dedicated to the

prevention of overweight, such as learning activities for children and capacity building for school staff and health workers on the detection, referral, and counselling of children with or at risk of, overweight.

As part of the pilot expansion phase, a baseline survey was conducted from 20 to 28 January 2024, prior to the implementation of the intervention, to assess the nutritional status of primary school children in the selected areas and its associated determinants. This report provides details on the study background, objectives, methodology, and key results.

1.2 OBJECTIVES

The overall objective of the study was to perform a baseline survey to collect and analyse data on the nutritional status of school-age children and its associated determinants in the four districts/cities in Central Java Province targeted by the UNICEF pilot programme. The baseline study aimed to:

1. Assess the socio-demographic characteristics of primary school children in the Grade 4 target age group, household food security status, morbidity status, and health-seeking behaviours.
2. Examine the nutritional status and assess the KAP among children regarding balanced nutrition.
3. Investigate the KAP of parents, UKS/M teachers, and members of the school community (including school canteen managers and food vendors) concerning children's balanced nutrition and overweight and obesity prevention.
4. Identify the current referral system for children with overweight to community health centres (puskesmas).
5. Identify the nutrition services and programmes available for children, including any existing programmes focused on preventing overweight and obesity.
6. Assess the KAP of puskesmas staff and the UKS/M programme management team (TP UKS/M) at the city/district level regarding the implementation of the programme, with particular emphasis on obesity prevention.

Results from the study, along with those from the endline survey to be implemented after the pilot, will serve to assess the impact of the intervention and advocate for its scale-up and continued implementation with national and local stakeholders.





2. Method

2.1 STUDY DESIGN AND AREA

This study was a cross-sectional baseline survey, utilizing both quantitative and qualitative approaches. Data were collected from primary schools in two cities (Kota Semarang and Kota Surakarta) and two districts (Kabupaten Tegal and Kabupaten Kudus) in Central Java

Province, which are targeted by the pilot intervention. In each location, five schools were designated as intervention schools, and five schools were assigned to the control group.

2.2 TARGET RESPONDENTS

The target respondents included Grade 4 primary school children, parents, UKS/M teachers, puskesmas staff, school canteen managers and food handlers, street food vendors around schools, local stakeholders at district/

city level involved in overweight and obesity prevention programme (particularly, district TP UKS/M and staff from the local Indonesian Food and Drugs Control Agency (BPOM) offices.

2.3 SAMPLE SIZE CALCULATION

The sample size was calculated using the formula for group comparison based on the study hypothesis, assuming the estimated proportion to be equal for each group. Since the baseline data will be used to evaluate the effectiveness of the pilot programme, the sample size was calculated based on three key outcomes of

interest: physical activity behaviour, consumption of sugar-sweetened beverages (SSBs), knowledge of healthy eating (Oddo et al., 2022), and knowledge of optimal diet (Solis et al., 2015). The sample size calculation formula used for this clustered randomized controlled trial (RCT) was:

$$n1 = DE * (Z_{1-\alpha/2} + Z_{1-\beta})^2 \frac{p1(1 - p1) + p2(1 - p2)}{(p1 - p2)^2}$$

$$DE = 1 + \rho (m - 1)$$

In a clustered RCT, the sample size must be adjusted by a coefficient calculated based on a fixed number of clusters. In the current study, the total number of clusters per arm was 20 schools in four cities/districts. The average number of students per grade, per school in the four cities/districts ranged from 18 in Kudus to 26 in Tegal (*see Table 1*) (MoECRT – RI, 2023). To ensure participation in the study of an adequate number of students, we only included schools with at least

two classes per grade or a minimum of 20 students in Grade 4. Therefore, in the sample size calculation, we determined 36 (18 students * two classes) as the fixed number of individuals per cluster. As there were no available data on the number of students in Islamic schools (madrasah), coordination with the local offices of the Ministry of Religious Affairs (MoRA) ensured that the number of subjects in the selected madrasah was sufficient for the study.

Table 2.3.1 Number of students in the four cities/districts, based on MoECRT database

CITIES/DISTRICTS	AVERAGE NUMBER OF STUDENTS IN EACH SCHOOL (A)	AVERAGE NUMBER OF CLASSES IN EACH SCHOOL (B)	AVERAGE NUMBER OF STUDENTS PER CLASS (A/B)	ESTIMATED NUMBER OF STUDENTS PER CLASS [(A/B) X 2]
Kudus	108	6	18	36
Semarang	247	10	25	50
Surakarta	222	10	23	46
Tegal	187	7	26	52

Source: MoECRT (2023)

Based on a 95 per cent confidence interval, 80 per cent power of the study, 0.03 intra-cluster correlation, 15 per cent effect size, and 10 per cent attrition rate, 790 Grade 4 students were required as subjects in this study (395 subjects in the intervention group and 395 subjects in the control group). To ensure practicality, the total sample was rounded up to 800 subjects (400 subjects in each intervention and control group). With a total of 20 schools per arm in four cities/districts, this equates to 100 subjects per city/district and 20 subjects per school. Detailed sample size calculations are reported in Table 2.

The sample size for the study was calculated to facilitate comparisons between intervention and control schools, aligning with the primary objective of the baseline survey to assess the effectiveness of the pilot intervention. The sample size was also deemed sufficient to conduct statistical comparisons between cities and districts, and between boys and girls. However, it is important to note that the study and sample do not allow the comparison of the four study areas.

Table 2.3.2 Sample size calculation

INDICATORS	PHYSICAL ACTIVITY BEHAVIOUR	SSB CONSUMPTION	KNOWLEDGE OF HEALTHY EATING	OPTIMAL DIET
Proportion of outcome in control group (p1) *: based on references (Oddo et al., 2022; Solis et al., 2015).	23%	63%	41%	43%
Proportion of outcome in intervention group (p2): based on references (Oddo et al., 2022; Solis et al., 2015).	41%	39%	66%	52%
Estimated proportion of outcome in intervention group (p2) based on researchers' judgement	38%	48%	56%	58%
Effect size	15%	-15%	15%	15%
Level of significance (α)	0.05	0.05	0.05	0.05
Power (1- β)	0.8	0.8	0.8	0.8
Z alpha value	1.96	1.96	1.96	1.96
Z beta value	0.84	0.84	0.84	0.84
Sample size group 1 (n1)	144	168	175	162
Sample size group 2 (n2)	144	168	175	162
Sample size for both group (n1+n2)	288	337	350	323
Intraclass correlation ρ	0.03	0.03	0.03	0.03
Number of individuals in each cluster (m)**	36	36	36	36
Design Effect (DE)	2.05	2.05	2.05	2.05
Required minimum sample size (n) for both arms	590	690	718	662
Attrition rate	10%	10%	10%	10%
Sample size + attrition rate for both arms	649	759	790	729
Sample size per arm	325	380	395	364

* Based on the proportion at the baseline.

** Estimated minimum number of Grade 4 students in the four cities/districts based on MoECRT (2023).

2.4 SAMPLING DESIGN AND CLUSTER/SCHOOL SELECTION

In total, 40 schools (20 intervention and 20 control schools) across the four cities/districts were included, resulting in five intervention and five control schools per city/district. To ensure representation from various types of schools, including public elementary schools (Sekolah

Dasar Negeri, SDN), private elementary schools (Sekolah Dasar Swasta, SDS), and Islamic primary schools (Madrasah Ibtidaiyah, MI), a proportional sampling selection method was employed (see Table 3).

Table 2.4.1 Proportional sampling school selection adjusted to ensure representation of all school types

CITIES/ DISTRICTS	PROPORTION OF SCHOOLS BY TYPE (%) *				PROPORTIONAL SAMPLING PER DISTRICT PER ARM (N)				TOTAL
	MI		SD		MI		SD		
	PUBLIC	PRIVATE	PUBLIC	PRIVATE	PUBLIC	PRIVATE	PUBLIC	PRIVATE	
Semarang	.2	15.1	54.1	30.6	0	1	3	1	5
Surakarta	0.0	3.9	59.8	36.2	0	1	3	1	5
Kudus	.2	25.4	69.5	4.9	0	1	3	1	5
Tegal	.3	20.6	74.9	4.1	0	1	3	1	5

Source: MoECRT (2023) and MoRA (2023).

The sampling procedures were conducted in three stages (Figure 1):

- 1. City/district selection:** Four districts/cities were selected by UNICEF based on discussions with local stakeholders and data showing high prevalence, or concerning trends, for childhood overweight: Semarang, Surakarta, Kudus District, and Tegal District.
- 2. School selection:** UNICEF obtained a list of all elementary schools in the four study areas. From these, 10n schools (five intervention and five control) were chosen at random for each city/district. To account for the possibility that schools may decline participation in the study, reserve schools were also randomly selected for each study area (three for

intervention schools and three for control schools). Where a certain type of school was not available from the list, random selection was conducted using data from MoERCT (2023), for public and private elementary schools (SDN and SDS), and from MoRA (2023) for Islamic elementary schools (MI). Finally, the list of selected schools was shared with district offices of MoECRT and MoRA for review and approval (see Table 2.4.2).

- 3. Student selection:** Based on the sample size calculation outlined earlier, 20 subjects were needed in each school. These were chosen at random from the student lists obtained from each of the selected schools. Efforts were made where possible to maintain an equal proportion of boys and girls.

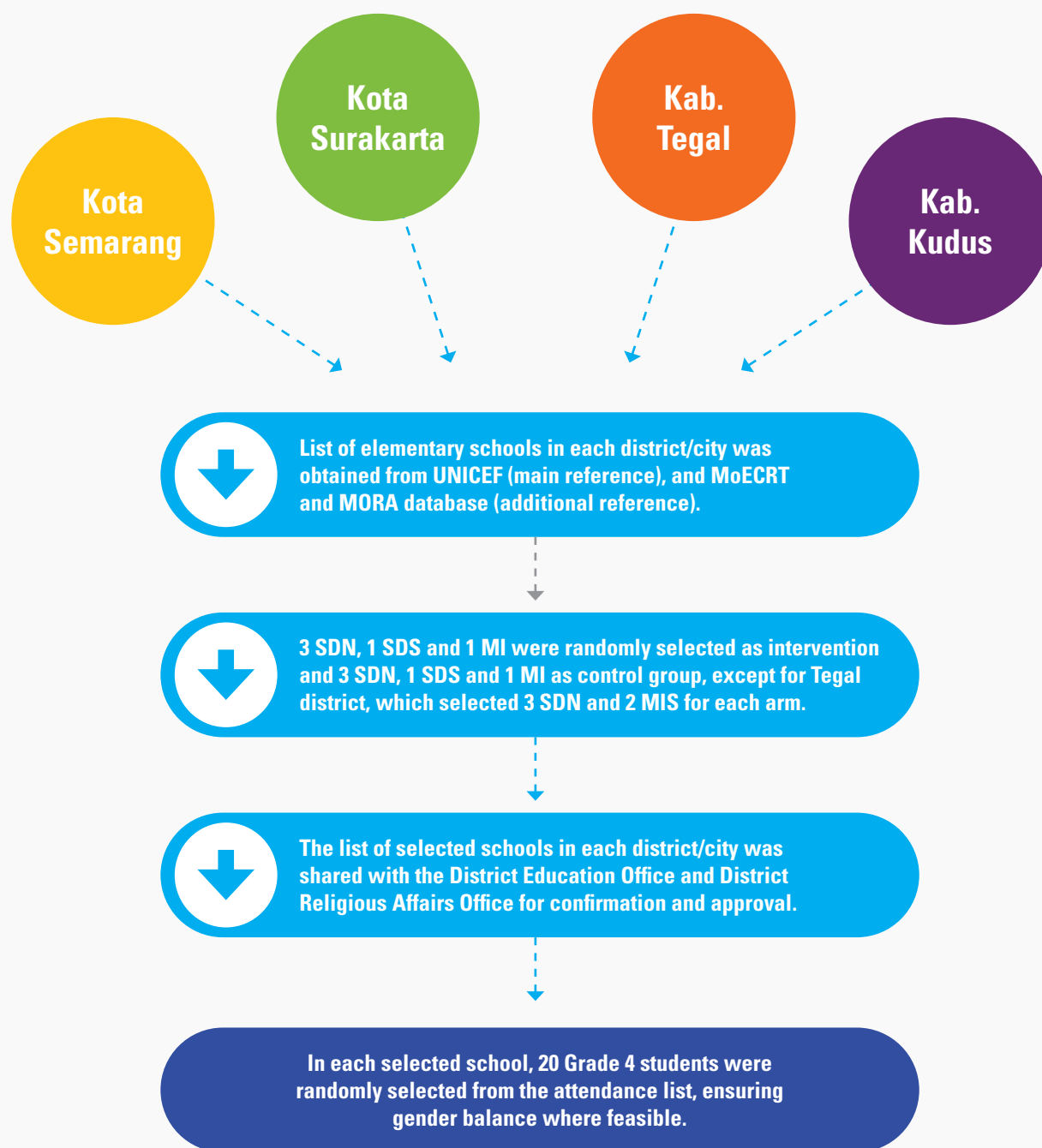


Figure 1 Sampling procedure

Table 2.4.2 List of selected schools

NO	NAME OF SCHOOLS	SUB-DISTRICT	SCHOOL TYPE	SCHOOL CATEGORY
SEMARANG CITY				
1	SD Lamper Kidul 01	Semarang Selatan	Public School	Intervention
2	SD Pekunden	Semarang Tengah	Public School	Intervention
3	SD Tlogosari Wetan 01	Pedurungan	Public School	Intervention
4	SD Islam Al Azhar 29	Mijen	Private School	Intervention
5	MI Nashrul Fajar	Tembalang	Islamic Private School	Intervention
6	SD N Bulu Lor	Semarang Utara	Public School	Control
7	SD N Pleburan 03	Semarang Selatan	Public School	Control
8	SD Sendangmulyo 01	Tembalang	Public School	Control
9	SD St. Antonius 02	Banyumanik	Private School	Control
10	MI Taufiqiyah	Tembalang	Islamic Private School	Control
SURAKARTA CITY				
11	SDN Harjodipuran	PasarKliwon	Public School	Intervention
12	SDN Kedunglumbu	PasarKliwon	Public School	Intervention
13	SD Al Azhar Syifa Budi Solo	Laweyan	Private School	Intervention
14	MIS Tamirul Islam	Laweyan	Islamic Private School	Intervention
15	SDN Sampangan	PasarKliwon	Public School	Control
16	SDN Sabranglor No 78	Jebres	Public School	Intervention
17	SDIT Luqman Al Hakim	Jebres	Private School	Control
18	SDN Begalon I	Laweyan	Public School	Control
19	SDN Danukusuman	Serengan	Public School	Control
20	MIS TTQ Mitqum	Banjarsari	Islamic Private School	Control

NO	NAME OF SCHOOLS	SUB-DISTRICT	SCHOOL TYPE	SCHOOL CATEGORY
KUDUS DISTRICT				
21	SD 1 Wergu Wetan	Kota	Public School	Intervention
22	SDN 1 Purwosari	Kota	Public School	Intervention
23	SD 7 Gondosari	Gebog	Public School	Intervention
24	SD Muhammadiyah 1	Kota	Private School	Intervention
25	MI Muhammadiyah Jati Kulon	Jati	Islamic Private School	Intervention
26	SD 1 Jati Kulon	Jati	Public School	Control
27	SD 3 Demaan	Kota	Public School	Control
28	SD 4 Jekulo	Jekulo	Public School	Control
29	SD NU Tanwirul Qulub	Kota	Private School	Control
30	MI NU Raudlatus Shibyan 01	Bae	Islamic Private School	Control
TEGAL DISTRICT				
31	SDN Kalisapu 01	Slawi	Public School	Intervention
32	SDN Bogares Kidul 02	Pangkah	Public School	Control
33	SDN Muncanglarang 01	Bumijawa	Public School	Intervention
34	MI Miftahul Ulum Bumijawa	Bumijawa	Islamic Private School	Intervention
35	MI Islamiyah Brekat	Tarub	Islamic Private School	Intervention
36	MI Ikhsaniyah Kebandingan	Kedungbanteng	Islamic Private School	Control
37	SD Muhammadiyah Karangdawa Margasari	Margasari	Private School	Control
38	SDN Kepandean 03	Dukuhturi	Public School	Control
39	SDN Kemantran 01	Kramat	Public School	Intervention
40	SDN Karanganyar 01	Kedungbanteng	Public School	Control

2.5 PROPOSED ASSESSMENT FRAMEWORK OF COMBINED PACKAGE OF NUTRITION INTERVENTIONS FOR SCHOOL-AGE CHILDREN

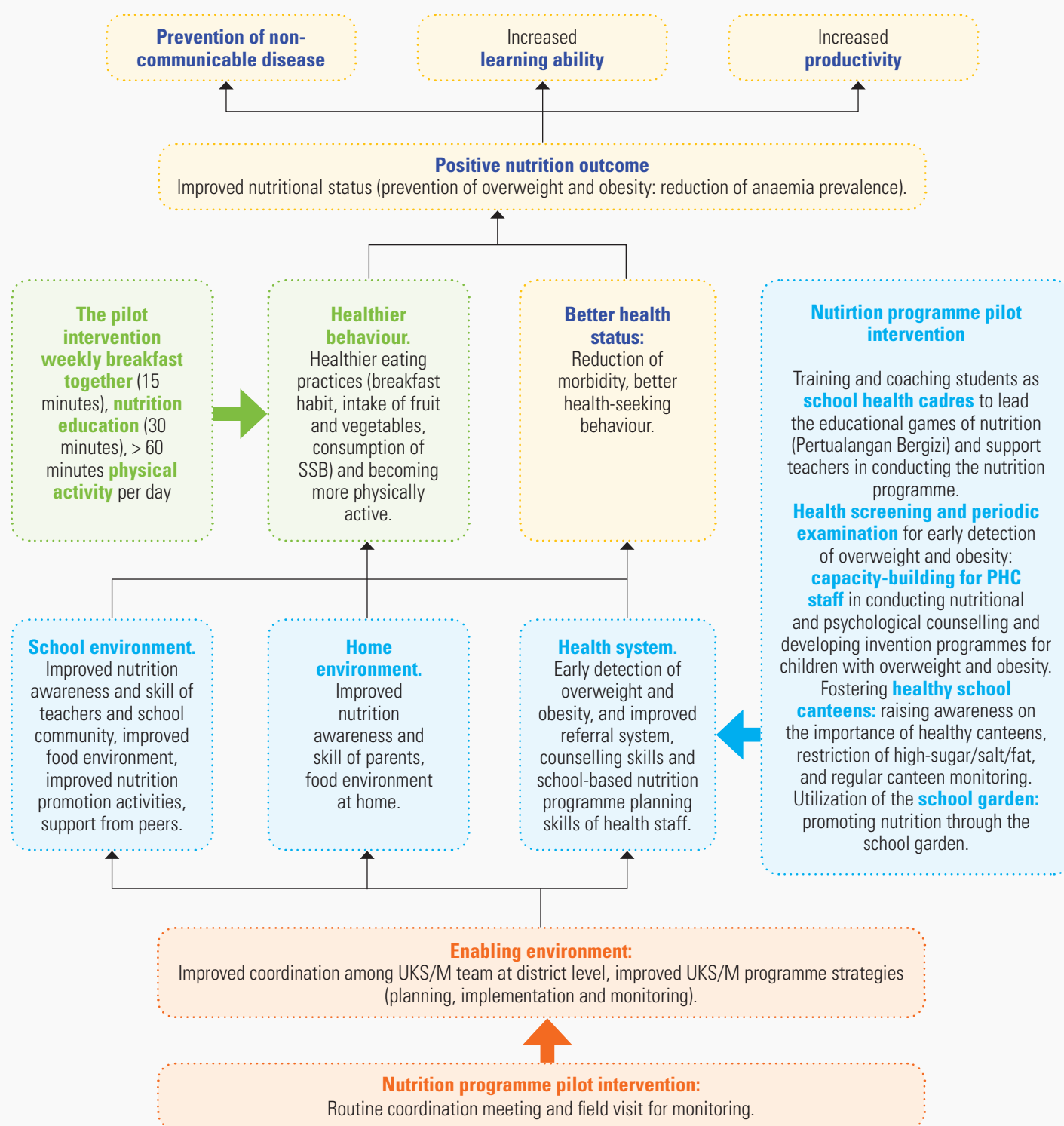


Figure 2 Proposed assessment framework of combined package of nutrition interventions for school-age children

(The figure is modified from UNSCN, 2017.)

2.6 VARIABLE INDICATOR MATRIX (VIM)

Table 2.6.1 Variable Indicator Matrix (VIM)

NO	VARIABLE	INDICATORS	METHODS	SUBJECT
1	Child demographic characteristics	- Age (years) - Gender - Pocket money per week	Structured questionnaire	Grade 4 student
2	Sociodemographic characteristics of the children's household	- Age (years) of parents - Educational background of parents - Occupation of parents - Number of household members - Economic condition (DHS wealth index: ownership of selected assets, housing condition, and types of water access.)	Structured questionnaire	Parents of Grade 4 student
3	Food security status of the household	Food security status of household in the past month	Structured questionnaire using Household Food Insecurity Access Scale (HFIAS)	Parents of Grade 4 student
4	Nutritional status of school-age children	Nutritional status based on WHO 2006: - Severely thin: BMI for Age z-score <-3 SD - Thin: BMI for Age z-score -3 SD to <-2 SD - Normal: BMI for Age z-score -2 SD to +1 SD - Overweight: BMI for Age z-score >+1 to +2 SD - Obesity: BMI for Age z-score and >+2 SD	Anthropometric assessment (body weight and height)	Grade 4 student
5	Knowledge, attitudes, and practices (KAP) related to balanced nutrition and overweight/obesity prevention	a. Knowledge of balanced nutrition - General nutrition, consuming diverse diet - Limiting consumption of unhealthy foods (sugar-sweetened beverages, salty foods, fried foods) - Breakfast - Food safety - Physical activity - Healthy and hygienic practices (PHBS) - Body weight monitoring	Structured questionnaire	Grade 4 student
		b. Attitudes toward balanced nutrition and overweight prevention - Diverse diet, including consumption of fruits and vegetables - Limiting consumption of unhealthy foods (sugar-sweetened beverages, salty foods, fried foods) - Breakfast - Food safety - Physical activity - PHBS - Body weight monitoring	Structured questionnaire using Likert scale of 1 to 3	Grade 4 student

NO	VARIABLE	INDICATORS	METHODS	SUBJECT
		c. Practices towards balanced nutrition and overweight prevention • Overall dietary diversity • Consumption of each core food group (staples, nuts and beans, dairy products, flesh foods, eggs, vitamin A-rich fruits and vegetables, other fruits and vegetables) • Consumption of unhealthy foods, including sugar-sweetened beverages, snacks high in salts and/or unhealthy fats, sweets high in sugar • Breakfast habit • Food safety • Physical activity for 60 min/day during prior 7 days • Types of extracurricular enrolled in at school • Ways and time needed to go to school • Use of social media (access to at least one social media account) • Screen time duration per day • PHBS • Frequency of body weight monitoring	(Single 24-hour dietary recall, FFQ for the past one week, structured questionnaire)	Grade 4 student
6	Child morbidity and health-seeking behaviour	• Child morbidity (diarrhoea, cough, common cold, and fever) in the 2 weeks prior the survey • Child health-seeking behaviour	Structured questionnaire	Grade 4 student
			Focus group discussion (FGD)	Parents (school committee members)
7	School characteristics	• Facilities, food sold, and management of canteen • Availability and food sold by street food vendors • Available facilities for physical activity and gardening • Existing health/nutrition programmes implemented at school	Observation, FGD	UKS/M teachers
8	Referral system of overweight/obesity cases	Existing referral system to public health centre (puskesmas) for children with overweight/obesity	FGD, document review	UKS/M teachers
			In-depth interview, document review	PHC staff
9	KAP of UKS/M teachers related to children's balanced nutrition and overweight/obesity prevention	• KAP and exposure to information on balanced nutrition and overweight/obesity among school children • Exposure to training on nutritional and psychological counselling and overweight/obesity prevention • Perceived UKS/M programme implementation at school, and its role in promoting balanced nutrition practices of students • Nutrition education at school: topics, issues discussed during nutrition education sessions, and IEC materials on overweight/obesity prevention	Structured questionnaire, FGD, document review	UKS/M teachers

NO	VARIABLE	INDICATORS	METHODS	SUBJECT
10	KAP of canteen manager, food handlers and street vendors around school related to health and safety foods	- Knowledge and exposure to information on nutrition, food safety and school canteen management - Attitude towards providing health and safety foods at school - Practices: School canteen regulation and monitoring - Perceived roles of school canteen in overweight/obesity prevention - Provision of monitoring and coaching from PHC/others	FGD	Canteen manager
		- Knowledge and exposure to information on health and safety foods - Perception on foods being sold for school children's health - Attitude toward selling healthier foods for children - Practice: foods sold by the vendors and their reasons - Provision of monitoring and coaching from puskesmas/others	In-depth interview	Food handlers and street vendors around school
11	KAP of parents related to children balanced nutrition and overweight/obesity prevention	- Awareness of the overweight/obesity problem among school children - Perception of children's dietary practices and physical activity - Perception of food environment at school (school canteen and street food vendors) and at home (family habit and regulation) - Challenges to implementing balanced nutrition practices at home	FGD	Parents of Grade 4 student (school committee members), FGD
12	Services and programmes provided at puskesmas	- Existing services and programmes provided at puskesmas related to the overweight/obesity prevention programme at school - Existing programmes to improve the delivery of nutritious foods and limit the sale of unhealthy foods in school canteens and from street food vendors around school premises - Perceived roles of puskesmas in overweight/obesity prevention programme for school children - Good practices, challenges, and recommendations to cope with challenges and improve the existing programme - Existing IEC materials on overweight/obesity prevention for school children	In-depth interview, document review	Puskesmas staff

NO	VARIABLE	INDICATORS	METHODS	SUBJECT
13	KAP of puskesmas staff related to overweight and obesity prevention	- Perceived overweight and obesity problem among school children and its determinant factors in their respective areas - Knowledge and exposure to information on overweight/obesity prevention programme among school children - Attitude towards overweight/obesity prevention programme - Exposure to training on nutritional and psychological counselling and overweight/ obesity prevention	In-depth interview, document review	Puskesmas staff
14	KAP of local stakeholders on overweight and obesity prevention	- Perceived overweight and obesity problem among school children and its determinant factors in their respective areas - Existing policy, including budgeting, and how to translate existing policy into programme implementation to support the overweight/obesity prevention programme among school children - Perceived roles of UKS/M programme for overweight/obesity prevention programme among school children - Perceived implementation of overweight/ obesity prevention programme among school children in their respective areas - Challenges and recommendations to cope with challenges and improve the situation	FGD	District/city TP UKS/M: Health office, education and religious affairs offices
		- Perceived overweight and obesity problem among school children and its determinant factors in their respective areas - Multisectoral collaboration on overweight/obesity prevention programme among school children in their respective areas - Challenges and recommendation to cope with challenges and improve the situation		District/city TP UKS/M: BAPPEDA
		- Perceived overweight and obesity problem among school children and its determinant factors in their respective areas - Existing programme to improve the delivery of nutritious foods and limit the sale of unhealthy foods in school canteens and from street food vendors around school premises - Challenges and recommendations to cope with challenges and improve the situation		District/city BPOM

2.7 ETHICAL CONSIDERATIONS AND LOCAL AUTHORITIES PERMIT

This study received ethical clearance from the ethical committee at the Faculty of Medicine, Universitas Indonesia (KET-68/UN2.F1/ETIK/PPM.00.02/2024 with protocol number 23-12-2032). Prior to seeking respondents' written consent to participate in the study, they were given information about the study, its objectives, procedures, and their rights. For student participants, written consent was also obtained from their parents. The identity of the participants will be kept confidential and will only be used for the purpose of this study. Additionally, approval from local education offices and schools was obtained before the data collection was carried out.

2.8 QUANTITATIVE DATA COLLECTION

Quantitative data was collected from students using a pre-tested structured questionnaire covering sociodemographic and economic characteristics, child morbidity, health-seeking behaviour, and KAP related to balanced nutrition and overweight/obesity prevention. Additionally, parents filled out a self-administered questionnaire regarding age, educational background, attitudes, and practices related to balanced nutrition, and household food security status. Anthropometric and dietary assessments were also conducted for the students.

Measurements of students' weight and height were recorded to ± 0.1 kg and 0.1 cm, respectively, with an average of two values used for analysis. Body weight was measured using a calibrated SECA 770 weighing scale, and height was measured using a Shorr Board, following standard methods for anthropometric assessment (WHO, 2006). Overweight and obesity were defined as a body mass index (BMI)-for-age Z-score >1 and >2 of the World Health Organization (WHO) growth standard, respectively.

A single 24-hour dietary recall was conducted to calculate the Individual Dietary Diversity Score (IDDS) (FAO, 2010), summing-up the number of



food groups consumed by the individual respondent over the recall period. Nine food groups¹ were used to calculate the IDDS, with no established cut-off points for adequate or inadequate dietary diversity. A single 24-hour recall and a food frequency questionnaire (FFQ) for the seven days preceding the survey were also used to assess the consumption of unhealthy foods, including sugar-sweetened beverages (SSBs), salty snacks, and sweets.

Each interview lasted approximately 30 to 45 minutes and took place at school according to a schedule proposed by the study team and agreed upon by the school. Trained enumerators with experience in conducting nutrition surveys conducted the interviews, including anthropometry and dietary assessment. Prior to data collection, enumerators received training from the Principal Investigator (PI)/Co-PI and field coordinator. Written consent from parents was obtained, and a week before data collection, area coordinators in each district/city coordinated with selected schools to explain the sampling process and obtain informed consent from parents of selected subjects. This allowed sufficient time for schools to inform students and parents and to identify extra subjects in case of refusals from main subjects.

¹(1) Starchy staples; (2) Dark green leafy vegetables; (3) Other vitamin A-rich fruits and vegetables; (4) Other fruits and vegetables; (5) Organ meat; (6) Meat and fish; (7) Eggs; (8) Legumes, nuts, and seeds; and (9) Milk and milk products.

2.9 QUALITATIVE DATA COLLECTION

Focus group discussions

The focus group discussions (FGDs) involved four groups of participants: UKS/M teachers, district TP UKS/M, and representatives from the Indonesian FDA (BPOM) and the sub-national development planning agency (BAPPEDA), school committee members, and school canteen managers. FGDs were conducted separately for each group. Participant selection was coordinated with schools and the local offices of MoECRT and MoRA and was guided by several criteria (see Table 5). Key criteria included ensuring variation in school type — a requirement that was automatically addressed as informants were selected from all the schools included

— and in participants' gender. Selection based on gender was relevant particularly when selecting school committee members (for example, there is usually only one UKS/M teacher per school, which limits the possibility of having different genders represented). These were purposively selected based on gender (fathers and mothers may have different experiences and insights), their child's gender (boys and girls may have specific issues relevant to obesity prevention), and mother's occupational status (working and non-working mothers may offer different perspectives and experiences).

Table 2.9.1 Criteria of qualitative participants

	SCHOOL COMMITTEE MEMBERS	UKS/M TEACHERS	SCHOOL CANTEEN MANAGERS	DISTRICT TP UKS/M AND BPOM
Criteria for participants	Parent of a Grade 4 student who is a member of the school committee	Teacher assigned by the school head as the UKS/M coordinator	The main person responsible for school canteen operation, including canteen regulation and monitoring	Local government staff: One UKS/M staff member from each of the education, religious affairs, health, and district/city offices Local BPOM staff: A staff member responsible for health and nutrition issues of school children, including providing education, regulation, and monitoring of the food environment at school BAPPEDA staff: A staff member in charge of multisector coordination related to school health and nutrition
Number of participants	1 per school	1 per school	1 per school	1 per institution
Variation of the characteristics	Gender of parents (male and female), gender of children (boys and girls), mother's occupation (working/non-working)	None	None	None
Number of FGD per district/city	1	1	1	1

A total of four FGDs were organised in each district: one each for school committee members, UKS/M teachers, school canteen managers, and district TP UKS/M and BPOM representatives. The FGDs were conducted face-to-face, moderated by an experienced facilitator, with a note-taker present to ensure comprehensive coverage of all topics discussed. The discussions were guided by a set of questions developed to explore respondents' opinions and experiences, referring to indicators outlined in the variable-indicator matrix table. The moderator encouraged participants to elaborate on their responses and share relevant information beyond the questions listed in the guide.

Each FGD session lasted approximately 60 to 90 minutes and took place at the District of Education

(DoE) office for Semarang, Surakarta, and Kudus, and the Religious Affairs office for Tegal. The schedule was arranged by the study team and confirmed by the respective schools/puskesmas/institutions. Participants were asked for permission to record the discussion for analysis purposes and provided informed consent by signing a consent form. Additionally, they were asked to complete a form detailing their demographic information such as name, age, gender, and duration of working/assignment in their current position. The moderator explained the rules of the FGD and emphasized that the discussions were based on participants' opinions and experiences and there were no correct or incorrect responses.

Key informant interviews

Key informants for in-depth interviews were purposively selected based on the objectives of the study across three groups: puskesmas staff, food handlers in school canteens, and street food vendors. For PHC staff, selection criteria included being responsible for the UKS/M programme at the selected schools and for nutrition issues related to school children. In PHCs where the UKS/M staff differed from the nutrition officer (Tenaga Pelaksana Gizi/TPG), both staff members were invited — the UKS/M staff since the intervention for obesity prevention is conducted within the UKS/M programme framework, and the TPG, given the focus on nutrition. It is worth noting that the UKS/M staff at puskesmas may not always be well-versed in nutrition.

Food handlers in the school canteen and street food vendors around the school premises, or nearby vendors popular among students, were individually interviewed during visits to selected schools. In cases where there were multiple food handlers and street food vendors,

additional selection criteria considered variations in the types of food sold, such as packaged and non-packaged foods and beverages, snacks, or cooked meals. For street vendors, the type of activity (mobile vs. permanent) was also considered.

Interviews were led by trained interviewers who followed interview guides tailored to each informant group. Interviews lasted between 30 to 60 minutes and were conducted at either the puskesmas (for puskesmas officers) or the school (for food handlers and street food vendors). Before starting the interview, the interviewer sought permission from the informant to record the discussion for analysis purposes and requested their signature on an informed consent form. Additionally, informants were asked to provide demographic information such as name, age, gender, the name of their school/puskesmas, and the duration of their tenure in their current position.

Field observations

Field observations were conducted in the four study areas to evaluate various school characteristics such as the condition of the canteen, street food vendors outside the school premises (including nearby residences that sell food and beverages to students), facilities for physical activity and gardening, personal hygiene and sanitation amenities, informative material about

nutrition, and the UKS/M room. A field observation checklist guided these observations, documenting the availability and condition of each aspect, noting whether they were functioning properly. Additionally, photographs were taken to provide visual context and enhance the interpretation of the checklist data.

Document review

A document review was also conducted to examine the reports on the referral system to the respective puskesmas for school children with overweight, as well as the reports on regular monitoring of school canteens. At schools, referral system reports were obtained

from the UKS/M teachers. At PHCs, the reports were requested from the UKS/M staff, in addition to the school canteen monitoring report and information from the sanitarian staff.

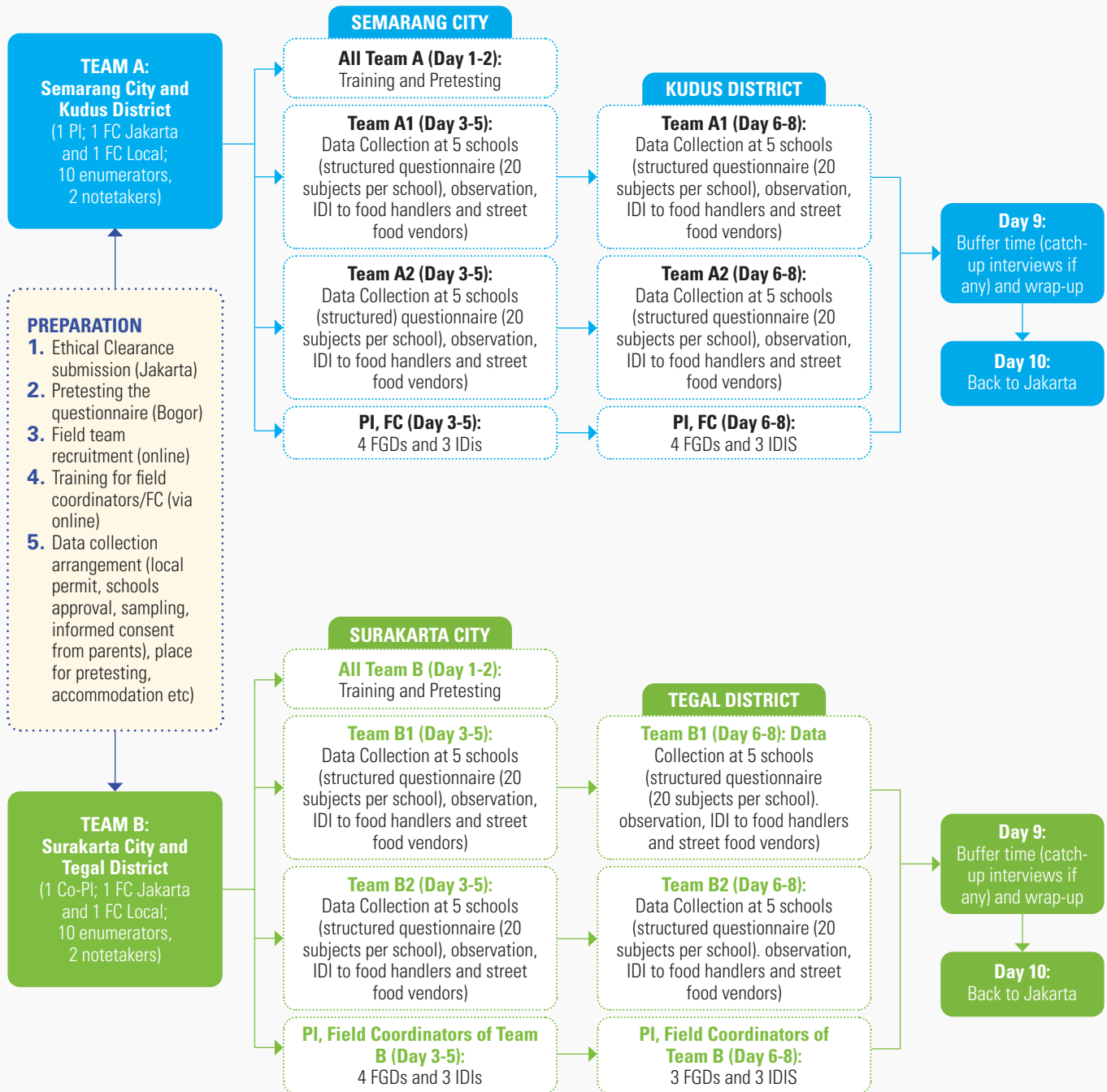


Figure 3 Data collection flow

2.10 QUALITY ASSURANCE

Quality assurance measures included pre-testing the data collection instruments, selecting experienced team members, providing training, conducting anthropometry standardization assessments for all enumerators, establishing small monitoring teams, organizing daily review meetings during data collection, and performing double data entry to minimize errors. This section offers detailed information on two of these strategies: the pre-testing and anthropometry standardization procedures.

Pre-testing, validity, and reliability checking of the questionnaire

The pre-testing, validity, and reliability checking of the questionnaire were conducted in two phases: first in Bogor District and Depok City on 15 and 16 December 2023, and then at the study sites in the cities of Semarang and Surakarta on 20 and 21 January 2024, respectively. The pre-testing in Bogor and Depok involved 30 respondents to ensure comprehension among Grade 4 students — the primary target respondents — and to assess the validity and reliability of questions on knowledge and attitudes regarding balanced nutrition. The interviews were conducted by the research team, comprising the principal investigator, co-principal investigator, and one field coordinator.

Overall, the questionnaire was well understood by the Grade 4 students, and some probing techniques were used to aid their recall during the 24-hour recall interviews. For the food frequency questionnaire, respondents were given examples of food items for each food group to enhance understanding. Additionally, some questions were paraphrased, modified, or supplemented with new relevant options during the interviews.

The original nutritional knowledge questions comprised 24 items, including 13 true/false and 11 multiple-choice questions. The Cronbach alpha score, calculated to evaluate the internal consistency of these questions in measuring nutritional knowledge, fell below the acceptable threshold (0.48 vs. a suggested ≥ 0.7). As a result, four questions with poor validity were excluded, which improved the Cronbach Alpha to 0.66, leaving 18 questions. Additionally,



three new questions on obesity knowledge were added, bringing the total to 21 questions to assess knowledge of balanced nutrition.

The attitude questions comprised 18 items with 'agree-disagree' options for each statement, yielding a Cronbach alpha score of 0.816, indicating good reliability. One question that showed poor validity was modified, while three additional questions on mental health and the perceived severity of obesity were included. Therefore, 21 questions were used to assess students' attitudes towards nutrition.

The pre-testing at the study sites, conducted during training sessions for team members, involved 10 Grade 4 students (five males and five females) in each location. This allowed enumerators to become familiar with the questionnaire and gain experience conducting interviews with respondents, in addition to role-playing exercises during training. Enumerators received the questionnaire one week before the training session to allow ample time to learn and address any questions or concerns.



The anthropometric measurement standardization test

The anthropometric measurement standardization test was conducted during the training to ensure that all enumerators followed a standardized procedure. This test aimed to assess two aspects of the measurements: precision, or how similar the values were for repeated measurements made by enumerators, and accuracy, or how close the measurements taken by enumerators were to the true value, established by the lead anthropometrist (field coordinator).

Ten subjects were involved in the standardization test, with each enumerator independently measuring each subject twice. The first set of measurements was recorded and set aside until the second set

was taken. The lead anthropometrist also conducted measurements as a reference. The same equipment used during the standardization test (a SECA digital scale for body weight and a Shorr board for height assessment) was utilized in the survey.

Following the test, all measurement records were compiled in an Excel file to calculate the Technical Error of Measurement (TEM), which quantifies the difference between the first and second measurements by the enumerator (precision), and bias, which measures the difference between the mean measurements of the enumerators and the lead anthropometrist (accuracy). This measure was also used to evaluate the quality of the measurements (i.e., good, fair, or poor) based on established guidelines (Zerfas, 1985)².

Results indicated that the precision (TEM) of the lead anthropometrist in teams A and B was good (0.0-0.01 for body weight and 0.01-0.02 for body height) (see Table 7). For body weight measurement, both teams demonstrated good precision and accuracy. The average TEM for body weight measurements was 0.12 kg for group A and 0.01 kg for group B, with bias scores of 0.04 kg and 0.0 kg, respectively. For body height measurement, both groups showed good accuracy. The average bias scores were 0.21 cm for group A and 0.03 cm for group B. Group A also showed good precision, with an average TEM of 0.1 cm. Group B, however, only showed fair precision with an average TEM of 0.9 cm for height assessment.

Notably, one enumerator in group B had a wide range of TEM scores between her first and second measurements, which affected the team's average TEM score. Excluding her scores, the average TEM for group B would be 0.47 cm, which is categorized as good. To address this issue, the field coordinator provided closer supervision for this enumerator during the first few days of data collection. Additionally, according to standard operating procedure (SOP) for anthropometry assessment, a third measurement was taken if the difference between the first and second measurements exceeded 0.5 cm. Despite the initial variance, this enumerator performed well during data collection. Overall, the results of the anthropometric assessment in the baseline survey are considered valid and reliable.

² Difference thresholds for weight (kg): 0-0.19 (good), 0.20-0.29 (fair), 0.30-0.49 (poor). Difference thresholds for height (cm): 0-0.5 (good), 0.6-0.9 (fair), 1.0-1.9 (poor).

Table 2.10.1 Results of anthropometric standardization

VARIABLE	INDICATOR	TEAM A	TEAM B
BODY WEIGHT			
Precision	TEM (kg)	0.12 (good)	0.01 (good)
Accuracy	Bias (kg)	0.04 (good)	0.00 (good)
BODY HEIGHT			
Precision	TEM (cm)	0.10 (good)	0.91 (fair)*
Accuracy	Bias (cm)	0.21 (good)	0.03 (good)



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2.11 DATA ANALYSIS PROCEDURES

Quantitative data

Data entry, cleaning, and statistical analysis were conducted using the Statistical Package for the Social Sciences (SPSS) for Windows Version 28.0. Double data entry ensured accuracy, and checks for missing data, extreme values, and consistency were performed. Normality distribution was assessed using the Kolmogorov-Smirnov test, with $p > 0.05$ indicating normally distributed data. Descriptive analysis was performed using univariate tests. Continuous data were presented as mean or median depending on normality,

while categorical data were presented as frequency and percentage. Between intervention and control groups, bivariate analysis using t-tests or chi-square tests depending on data type, compared students' knowledge, attitude, and practices regarding food consumption, physical activity, and personal hygiene. Multivariate analysis was conducted using logistic regression to assess factors associated with knowledge, attitude, and practices. **Table 8** presents the scoring system used for analysis.

Table 2.11.1 Scoring system and categorization of main variables

RESPONDENT	VARIABLE	SCORING SYSTEM	CATEGORIZATION
Children	Knowledge	Based on 21 questions assessing nutritional knowledge. Each correct answer was awarded 1 point, resulting in a maximum possible score of 21. The correct answers are detailed in the Results Section (Table 3.5.1).	Poor: <60% of max score Medium: 60-80% of max score Good: >80% of max score
	Attitudes	Based on 21 questions assessing attitudes toward balanced nutrition. Each favourable attitude scored 1, for a maximum possible score of 21. The correct answers are listed in the Results Section (Table 3.6.1).	
	Practices	Based on 10 questions covering various practices related to eating and physical activity. Each good practice scored 1, for a maximum possible score of 10. Good practices are listed in the Results Section (Table 3.7.1).	
Parents	Knowledge	Based on 5 questions. Each correct answer scored 1, for a maximum possible score of 5. The correct answers are listed in the Results Section (Table 3.8.1).	Poor: <60% of max score Medium: 60-80% of max score Good: >80% of max score
	Attitudes	Based on 10 questions. Each favourable attitude scored 1, for a maximum possible score of 10. Favourable attitudes are listed in the Results Section (Table 3.9.1).	
	Practices	Based on 7 questions. Positive practices included the availability of vegetables and fruit, with correct scores given to those who chose 'always' or 'sometimes'. Negative practices included the availability of fried food, sugary drinks, sweet snacks, salty snacks, and instant noodles, with correct scores given to those who chose 'never', 'rarely,' or 'sometimes'. Each correct answer scored 1, for a maximum possible score of 7.	

Qualitative data (FGDs and key informant interviews)

Data analysis was conducted in two distinct stages. The first stage occurred in the field and focused on organizing summaries of responses from each informant into matrices, with a separate matrix developed for each type of respondent/informant. The primary objective was to ensure data completeness and confirm that each topic outlined in the variable indicator matrix (VIM) had been thoroughly explored by the respondent/informant. This phase also aimed to uncover preliminary findings regarding key issues of interest, including initial patterns in terms of similarities and differences across respondents. Note-takers were tasked with creating the summary response matrices during the FGDs or in-depth interviews. The matrices then underwent

review and discussion by the PI/Co-PI, moderator/interviewer, and note-taker, while the team was still in the field.

The second stage involved a desk-based analysis of the results. This step was guided by the study objectives presented in the VIM and focused on verifying information in the summary matrix and providing more detailed explanations of the observed findings and preliminary patterns. Verification and more detailed information were obtained by reviewing the transcription of the FGDs and in-depth interviews. Patterns were also analysed by comparing data across cities/districts and between intervention and control schools, among other methods.



3. RESULTS – quantitative findings

3.1 RESPONSE RATE

The study collected data from 798 Grade 4 students, 790 parents, 40 schools, 35 food sellers at school canteens and 29 food vendors outside school premises. Additionally, the study collected qualitative data through four FGDs with 22 members from district TP UKS/M, Bappeda, and BPOM, four FGDs with 40 UKS/M teachers, four FGDs with 39 school committee members, four FGDs attended by 39 school canteen managers, and 12 key informant interviews with puskesmas staff, involving two to three staff members

per interview, which included nutritionists, UKS/M staff, and sanitarians.

The study aimed to interview one food seller at the school canteen and one street food vendor who sold drinks/foods outside the premises of each school. However, there were five schools (three intervention and two control schools) without a school canteen, and 11 schools (five intervention and six control schools) where no food vendor was observed during data collection.

Table 3.1.1 Summary of total number of respondents, FGDs, IDIs and observation

NO	TYPE OF DATA AT SCHOOL LEVEL	ACTUAL NUMBER OF SUBJECTS/ACTIVITIES													Target	ACHIEVEMENT
		Semarang			Surakarta			Tegal			Kudus			Grand Total		
		I	C	Total	I	C	Total	I	C	Total	I	C	Total			
1	Grade 4 student questionnaire	100	98	198	100	100	200	100	100	200	100	100	200	798	800	99,8%
2	Parent questionnaire	99	96	195	100	100	200	98	99	197	100	98	198	790	800	98,8%
3	Observation check list of school facilities including food environment	5	5	10	5	5	10	5	5	10	5	5	10	40	40	100,0%
4	In-depth interview with food seller at school canteen	5	5	10	4	5	9	3	3	6	5	5	10	35	40	87,5%
5	In-depth interview with food vendors outside school premises	4	3	7	3	4	7	5	2	7	4	4	8	29	40	72,5%
NO	TYPE OF DATA AT CITY/DISTRICT LEVEL	ACTUAL NUMBER OF SUBJECTS/ACTIVITIES													Target	ACHIEVEMENT
		Semarang			Surakarta			Tegal			Kudus			Total		
1	FGD with district TP UKS/M	1			1			1			1			4	4	100%
2	FGD with UKS/M teacher	1			1			1			1			4	4	100%
3	FGD with school committee	1			1			1			1			4	4	100%
4	FGD with school canteen manager	1			1			1			1			4	4	100%
5	IDI with puskesmas staff	3			3			3			1			12	12	100%

(Note: I: Intervention school; C: Control school.)

3.2 CHARACTERISTICS OF THE STUDY POPULATION



This study involved data collection from 798 students divided into two groups: 400 students in the intervention group and 398 students in the control group. **Table 3.2.1** shows the sociodemographic characteristics of students stratified by treatment group. Statistical analysis indicates no significant differences in age, gender distribution, daily pocket money, or prevalence of student morbidity between intervention and control schools. However, significant differences were observed in health-seeking behaviours, particularly with more students (5.3 per cent) in the control schools not seeking any medication during illness compared to students in the intervention schools (2 per cent). There were no significant differences in disability status related to vision, hearing, mobility,

cognition, self-care, and communication between the two groups.

Demographically, the students at baseline comprised 51.1 per cent boys, with an average age of 9.7 years and a median daily pocket money of IDR 7,000 (USD 0.43). A large proportion (68.5 per cent) of students reported experiencing morbidity within the preceding two weeks. The majority (62.7 per cent) sought treatment at healthcare facilities during illness, while approximately one-third (33.7 per cent) took medicine purchased by parents from pharmacies, stalls, or convenience stores, and/or received traditional massage. Additionally, most students (>95%) reported no difficulties in seeing, hearing, walking, and self-care, although some students (10 to 30 per cent) reported difficulties in remembering or concentrating and communicating.

Table 3.2.1 Student characteristics by treatment group

VARIABLE	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE ¹
Age (years), mean±SD	9.71±0.57	9.71±0.58	9.71±0.58	1.000
Gender, n(%)				0.127
Boys	202 (50.5)	206 (51.8)	408 (51.1)	
Girls	198 (49.5)	192 (48.2)	390 (48.9)	
Pocket money per day (IDR), median(min-max)	7,000 (0-50,000)	7,000 (0-50,000)	7,000 (0-50,000)	1.000
Child morbidity in the 2 weeks prior to the survey, n(%)	284 (71.0)	263 (66.1)	547 (68.5)	0.121
Child health-seeking behaviour, n(%)				0.045
Sought treatment in health facility	257 (64.2)	243 (61.1)	500 (62.7)	
Took medicine purchased by parents and/or received traditional massage	135 (33.8)	134 (33.7)	269 (33.7)	
Not seeking any medication	9 (2.0)	21 (5.3)	29 (3.6)	
DISABILITY SCREENING				
VISION. Wearing glasses, n(%)				0.129
Yes	33 (8.3)	22 (5.5)	55 (6.9)	
No.	367 (91.8)	376 (94.5)	743 (93.1)	

VARIABLE	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE ¹
VISION. Difficulty in seeing, n(%)				0.766
No difficulty	381 (95.3)	383 (96.2)	764 (95.7)	
Some difficulty	17 (4.3)	13 (3.3)	30 (3.8)	
A lot of difficulty	2 (.5)	2 (.5)	4 (.5)	
Cannot do at all	0 (.0)	0 (.0)	0 (.0)	
HEARING. Wearing a hearing aid, n(%)				0.519
Yes	4 (1.0)	6 (1.5)	10 (1.3)	
No.	396 (99.0)	392 (98.5)	788 (98.7)	
HEARING. Difficulty in hearing, n(%)				0.358
No difficulty	390 (97.5)	385 (96.7)	775 (97.1)	
Some difficulty	9 (2.3)	11 (2.8)	20 (2.5)	
A lot of difficulty	0 (.0)	2 (.5)	2 (.3)	
Cannot do at all	1 (.3)	0 (.0)	1 (.1)	
MOBILITY. Difficulty in walking, n(%)				0.274
No difficulty	387 (96.8)	390 (98.0)	777 (97.4)	
Some difficulty	13 (3.3)	8 (2.0)	21 (2.6)	
A lot of difficulty	0 (.0)	0 (.0)	0 (.0)	
Cannot do at all	0 (.0)	0 (.0)	0 (.0)	
COGNITION. Difficulty in remembering or concentrating, n(%)				0.615
No difficulty	255 (63.8)	251 (63.1)	506 (63.4)	
Some difficulty	126 (31.5)	133 (33.4)	259 (32.5)	
A lot of difficulty	19 (4.8)	14 (3.5)	33 (4.1)	
Cannot do at all	0 (.0)	0 (.0)	0 (.0)	
SELF-CARE. Difficulty in self-caring, n(%)				0.502
No difficulty	386 (96.5)	385 (96.7)	771 (96.6)	
Some difficulty	14 (3.5)	11 (2.8)	25 (3.1)	
A lot of difficulty	0 (.0)	1 (.3)	1 (.1)	
Cannot do at all	0 (.0)	1 (.3)	1 (.1)	
COMMUNICATION. Difficulty in communicating, n(%)				0.935
No difficulty	350 (87.5)	351 (88.2)	701 (87.8)	
Some difficulty	44 (11.0)	42 (10.6)	86 (10.8)	
A lot of difficulty	6 (1.5)	5 (1.3)	11 (1.4)	
Cannot do at all	0 (.0)	0 (.0)	0 (.0)	

¹ p-value <0.05 indicates a statistically significant difference between intervention and control groups.



PARENTS

Table 3.2.3 outlines the sociodemographic characteristics of parents and households, stratified by treatment group. Statistical analysis indicates no significant disparities in age, educational attainment, occupational status, household size, socioeconomic standing, or food security status between the intervention and control schools. Regarding parental demographics, the mean age of fathers and mothers was recorded at 42.1 and 38.4 years, respectively. Most fathers and mothers had completed education up to senior high school (37.5 per cent and 38.2 per cent respectively) and university levels (25.2 per cent and 27.6 per cent respectively). Approximately half the fathers (52.5 per cent) were employed in the private

sector, while mothers predominantly were housewives or not working (40.4 per cent). The average household size was 4.8 members. Noteworthy findings include a high prevalence of food security among households (77.3 per cent), with a small proportion experiencing moderate (6.8 per cent) or severe (5.3 per cent) food insecurity.

Further analyses comparing cities and districts show significant differences in several areas: The educational background of both fathers and mothers was significantly higher in the city compared to the district, with more fathers in districts working as entrepreneurs. Households in the cities were more food secure and had more household members than those in districts. Detailed results are presented in **Annex 7.7**.

Table 3.2.2 Parents' and household sociodemographic characteristics by treatment group

VARIABLE	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE ¹
Age (years) of father, mean±SD	42.07±6.08 (n=374)	41.12±6.32 (n=362)	42.09±6.19 (n=736)	0.919
Age (years) of mother, mean±SD	38.29±5.47 (n=382)	38.46±5.56 (n=379)	38.38±5.51 (n=761)	0.669
Educational background of father, n(%)				0.215
• No school	7 (1.8)	2 (0.5)	9 (1.1)	
• Elementary school	66 (16.5)	40 (10.1)	106 (13.3)	
• Junior high school	63 (15.8)	70 (17.6)	133 (16.7)	
• Senior high school	133 (33.2)	166 (41.7)	299 (37.5)	
• University (under or postgraduate)	107 (26.8)	94 (23.6)	201 (25.2)	
• Not answering	24 (6.0)	26 (6.5)	50 (6.3)	
Educational background of mother, n(%)				0.223
• No school	5 (1.2)	1 (0.3)	6 (0.8)	
• Elementary school	64 (16.0)	37 (9.3)	101 (12.7)	
• Junior high school	63 (15.8)	68 (17.1)	131 (16.4)	
• Senior high school	138 (34.5)	167 (42.0)	305 (38.2)	
• University (under or postgraduate)	113 (28.2)	107 (26.9)	220 (27.6)	
• Not answering	17 (4.2)	18 (4.5)	35 (4.4)	
Occupation of father, n(%)				0.781
• Not working	52 (13.0)	52 (13.1)	104 (13.0)	
• Government employee	23 (5.8)	27 (6.8)	50 (6.3)	
• Private sector	216 (54.0)	203 (51.0)	419 (52.5)	
• Farmer	4 (1.0)	2 (.5)	6 (.8)	
• Entrepreneur	105 (26.3)	114 (28.6)	219 (27.4)	
Occupation of mother, n(%)				0.069
• Not working	174 (43.5)	148 (37.2)	322 (40.4)	
• Government employee	18 (4.5)	11 (2.8)	29 (3.6)	
• Private sector	110 (27.5)	111 (27.9)	221 (27.7)	
• Farmer	1 (.3)	0 (.0)	1 (.1)	
• Entrepreneur	97 (24.3)	128 (32.2)	225 (28.2)	
Number of household members, mean±SD	4.75±1.42	4.82±1.46	4.78±1.44	0.528
Household socioeconomic status, n(%) (based on DHS wealth index: ownership of selected assets, housing condition, and types of water access)				0.206
• Highest tertile	145 (36.2)	121 (30.4)	266 (33.3)	
• Medium tertile	135 (33.8)	143 (35.9)	278 (34.8)	
• Lowest tertile	120 (30.0)	134 (33.7)	254 (31.8)	
Household socioeconomic status, n(%)				0.378
• Food secure	319 (79.8)	298 (74.9)	617 (77.3)	
• Mildly food-insecure	36 (9.0)	49 (12.3)	85 (10.7)	
• Moderately food-insecure	25 (6.3)	29 (7.3)	54 (6.8)	
• Severely food-insecure	20 (5.0)	22 (5.5)	42 (5.3)	

¹ p-value <0.05 indicates significant difference between intervention and control groups.



GENERAL CHARACTERISTICS OF SCHOOLS

In the study areas, no statistically significant differences were found between intervention and control schools regarding their general characteristics.

Most (60 per cent) of the schools surveyed were public, followed by religious (22 per cent) and private schools (17 per cent). On average, schools had 340 students (176 boys and 164 girls), 20 teachers, and 13 classrooms.

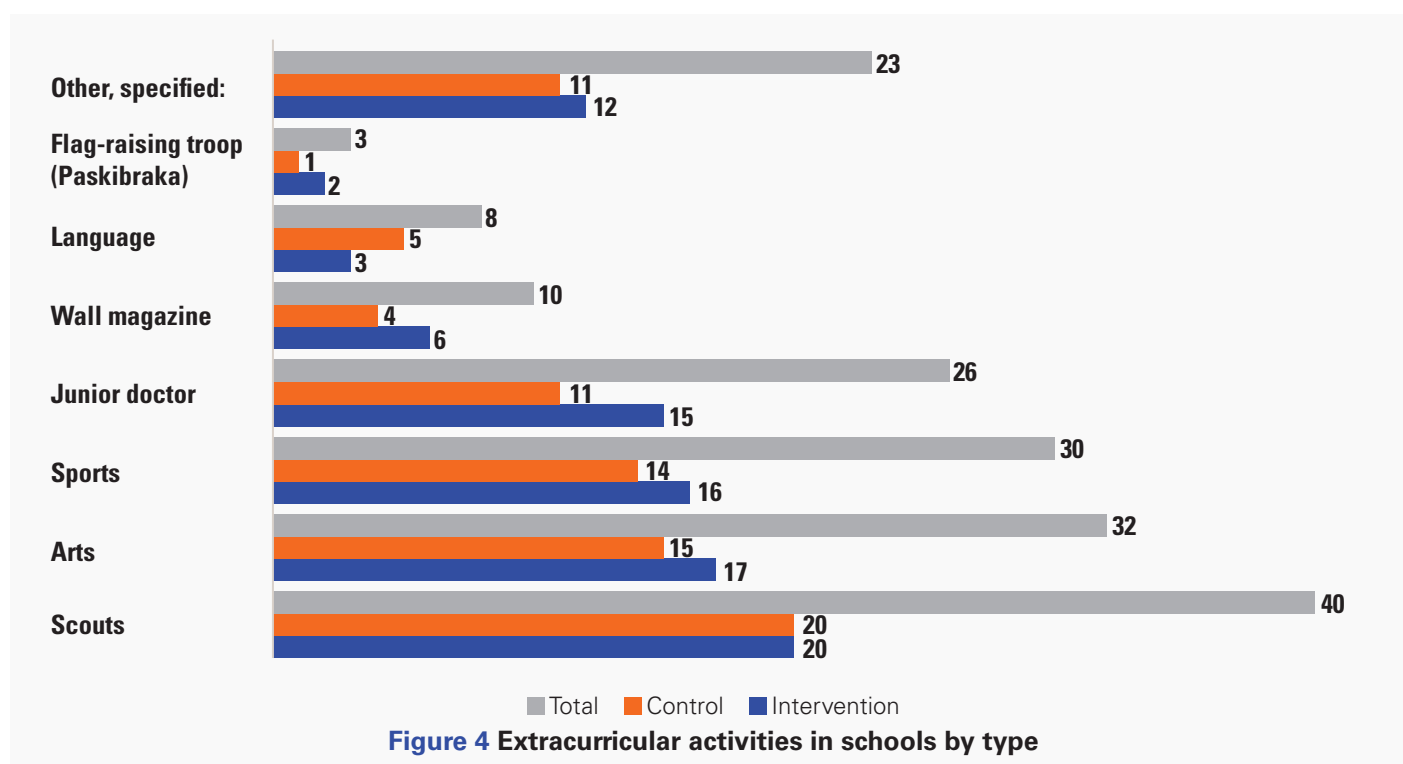
Table 3.2.3 School characteristics by treatment group

VARIABLE	INTERVENTION (N=20)	CONTROL (N=20)	TOTAL (N=40)	P-VALUE ¹
Type of school, n(%)				0.881
Public school	12 (60)	12 (60)	24 (60.0)	
Private school	3 (15)	4 (20)	7 (17.5)	
Religious school	5 (25)	4 (20)	9 (22.5)	
Number of students, mean±SD				
Total students	350±218	330±145	340±183	0.737
Boys	183±114	168±75	176±96	0.620
Girls	165±98	162±73	164±86	0.921
Number of classes, mean±SD	13±7	12±6	13±6	0.824
Number of teachers, mean±SD	20±11	20±10	20±11	0.932

¹ p-value <0.05 indicates significant difference between intervention and control groups.

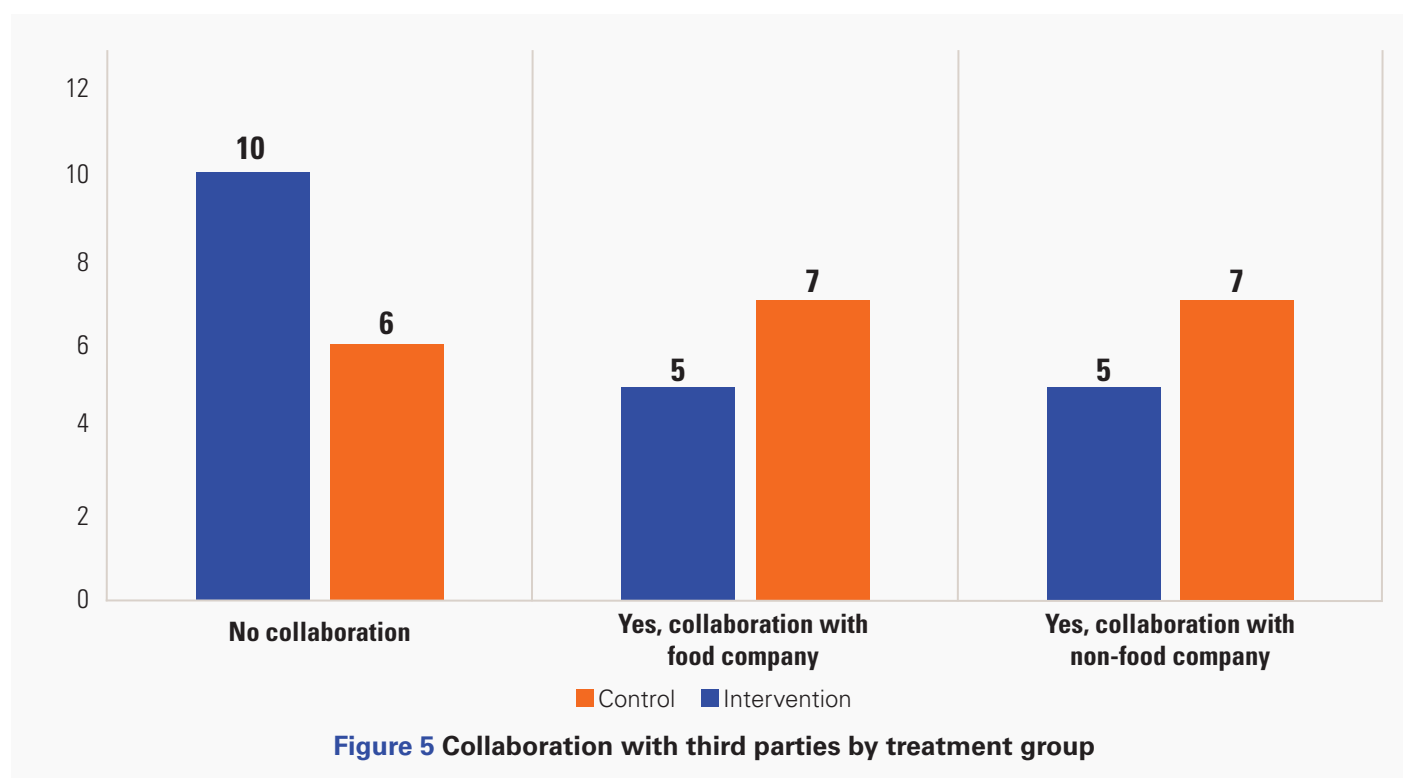
The most common types of extracurricular activities provided in schools were Scouts, arts, sports, and junior

doctors. Other activities included computer lessons, Quranic studies, math, and science (see Figure 4).



In terms of collaboration with third parties, more schools in the control group had partnerships with both food and

non-food companies, compared to those in the intervention group.



UKS/M PROGRAMME IN SCHOOLS

Overall, the average number of UKS/M teachers per school was two, although control schools had a slightly higher number (two teachers) compared to intervention schools (one teacher). Most UKS/M teachers were sports teachers (65 per cent), followed by homeroom teachers (27 per cent) and language/counselling teachers (8 per

cent). Among the surveyed schools, 85 per cent did not know their schools' current UKS/M level. Those who knew their level fell in the minimum (one intervention school in Kudus and one control school in Semarang) or standard (two intervention schools in Surakarta and Tegal; two control schools in Surakarta and Kudus) level.

Table 3.2.4 Activities by UKS/M component (in the previous 12 months) by treatment group

ACTIVITIES BASED ON UKS/M PILLARS	INTERVENTION (N=20)	CONTROL (N=20)	TOTAL (N=40)
Health education			
Personal hygiene	17	18	35
Physical activity	17	18	35
Nutrition education	17	14	31
Bringing meal from home	14	14	28
Health literacy	12	14	26
Reproductive health education	11	15	26
School health cadres	13	13	26
Healthy living skills education	11	14	25
Breakfast together	9	11	20

ACTIVITIES BASED ON UKS/M PILLARS	INTERVENTION (N=20)	CONTROL (N=20)	TOTAL (N=40)
Health services			
Immunization	20	20	40
Deworming	20	20	40
Heath screening	20	19	39
First aid	19	19	38
Counselling	10	8	18
Distribution of IFA tablets	7	7	14
Healthy environments			
School sanitation management	19	18	37
Utilization of school garden	17	13	30
Eradicating mosquito nests	17	15	32
Implementation of smoking-free areas	14	16	30
School canteen monitoring	12	13	25
Street food vendors monitoring	4	4	8
School's UKS/M level			
Minimum	1	1	2
Standard	2	2	4
Do not know	17	17	34

Schools reported organising several activities related to the UKS/M programme 'triad', covering health education, health services delivery, and healthy environments. Health-related activities conducted by schools in the past 12 months included health education on personal hygiene, physical activities, and nutrition, and providing meals from home. All schools administered immunizations and deworming, nearly all conducted health screenings and provided first aid, but, only half offered counselling services related to health and mental health. Common healthy environment initiatives included managing school sanitation, eradicating mosquito breeding sites, and implementing smoking-free zones. Notably, the monitoring of school canteens and street food vendors was lacking: only 25 out of 40 schools in the intervention group and 8 out of 40 schools in the control group conducted these activities.



SCHOOL FACILITIES

There were no significant differences in school facilities between intervention and control schools. Almost all schools had functioning handwashing facilities and access to clean water, but only 77 per cent had clean running water and provided soap at handwashing facilities. All schools had toilets, with at least one toilet for teachers in most schools, and 82.5 per cent had

sufficient toilet-to-student ratios for boys and girls. Almost all schools had proper toilet infrastructure including walls, roofs, clean water supply, toilet seats, and lockable doors; however, only 55 per cent of schools had trash cans and complete handwashing facilities in the toilets. Moreover, only one school had toilet facilities for children with disabilities.

Table 3.2.5 School facilities by treatment groups

SCHOOL FACILITIES*	INTERVENTION (N=20)	CONTROL (N=20)	TOTAL (N=40)	P-VALUE ¹
Availability of handwashing facilities, n(%)				
Functioning handwashing facilities	18 (90)	20 (100)	38 (95)	0.147
Clean water	20 (100)	19 (95)	39 (97)	0.311
Clean running water and soap	17 (85)	14 (70)	31 (77)	0.256
Toilet, n(%)				
Toilet for teachers (min.1)	18 (90)	18 (90)	36 (90)	1.000
Ratio toilets to girl is 1:50	17 (85)	16 (80)	33 (82.5)	0.677
Ratio toilets to boy is 1:60	16 (80)	17 (85)	33 (82.5)	0.677
The area of 1 toilet unit is 2 m ²	19 (95)	15 (75)	34 (85)	0.077
Toilet has a wall	20 (100)	20 (100)	40 (100)	-
Toilet has a roof	20 (100)	20 (100)	40 (100)	-
Lockable toilet	20 (100)	19 (95)	39 (97.5)	0.311
Clean water available in the toilet	20 (100)	19 (95)	39 (97.5)	0.311
Toilet seat (gooseneck) available in the restroom	20 (100)	20 (100)	40 (100)	-
Trash cans available	11 (55)	11 (55)	22 (55)	0.589
Handwashing facilities completely available (water and soap)	11 (55)	9 (45)	20 (50)	0.527
Toilet accessibility for children with disabilities	1 (5)	0 (0)	1 (2.5)	0.311
Facilities for physical activity, n(%)				
Min. area 20 m x 15 m	16 (80)	12 (60)	28 (70)	0.168
Flat surface	19 (95)	19 (95)	38 (95)	1.000
There are no waterways or other objects that can interfere with exercise activities	20 (100)	19 (95)	39 (97.5)	0.311
Not used for parking lot	13 (65)	17 (85)	30 (75)	0.144
Volleyball equipment	20 (100)	17 (85)	37 (92.5)	0.072
Soccer equipment	18 (90)	17 (85)	35 (87.5)	0.633
Gymnastic equipment	19 (95)	19 (95)	38 (95)	1.000
Athletic equipment	18 (90)	17 (85)	35 (87.5)	0.633
Cultural arts and skills equipment	19 (95)	18 (90)	37 (92.5)	0.220
School garden available	14 (70)	11 (55)	25 (62.5)	0.327

¹p-value <0.05 indicates significant difference between intervention and control groups.

*Based on MoECRT (2007).

3.3 NUTRITIONAL STATUS OF STUDENTS

Approximately 60 per cent of students showed normal nutritional status based on the BMI-for-age indicator. Notably, 11.9 per cent of students were classified as thin or severely thin, while 13.3 per cent and 15.2 per cent were categorized as overweight and obese, respectively. Comparing these figures to the prevalence rates reported in the 2023 Indonesia Health Survey (SKI) for children aged 5 to 12 years in Central Java Province, we found similar rates for severely thin or thin (10.4 per cent

in the national survey compared to 11.9 per cent in our study) and overweight (13 per cent in the national survey compared to 13.3 per cent in our study). However, the prevalence of obesity in our study was notably higher than the provincial obesity rate reported as 8.3 per cent among school-age children (Ministry of Health Indonesia, 2023), compared to 15.2 per cent in our study (see Figure 6).

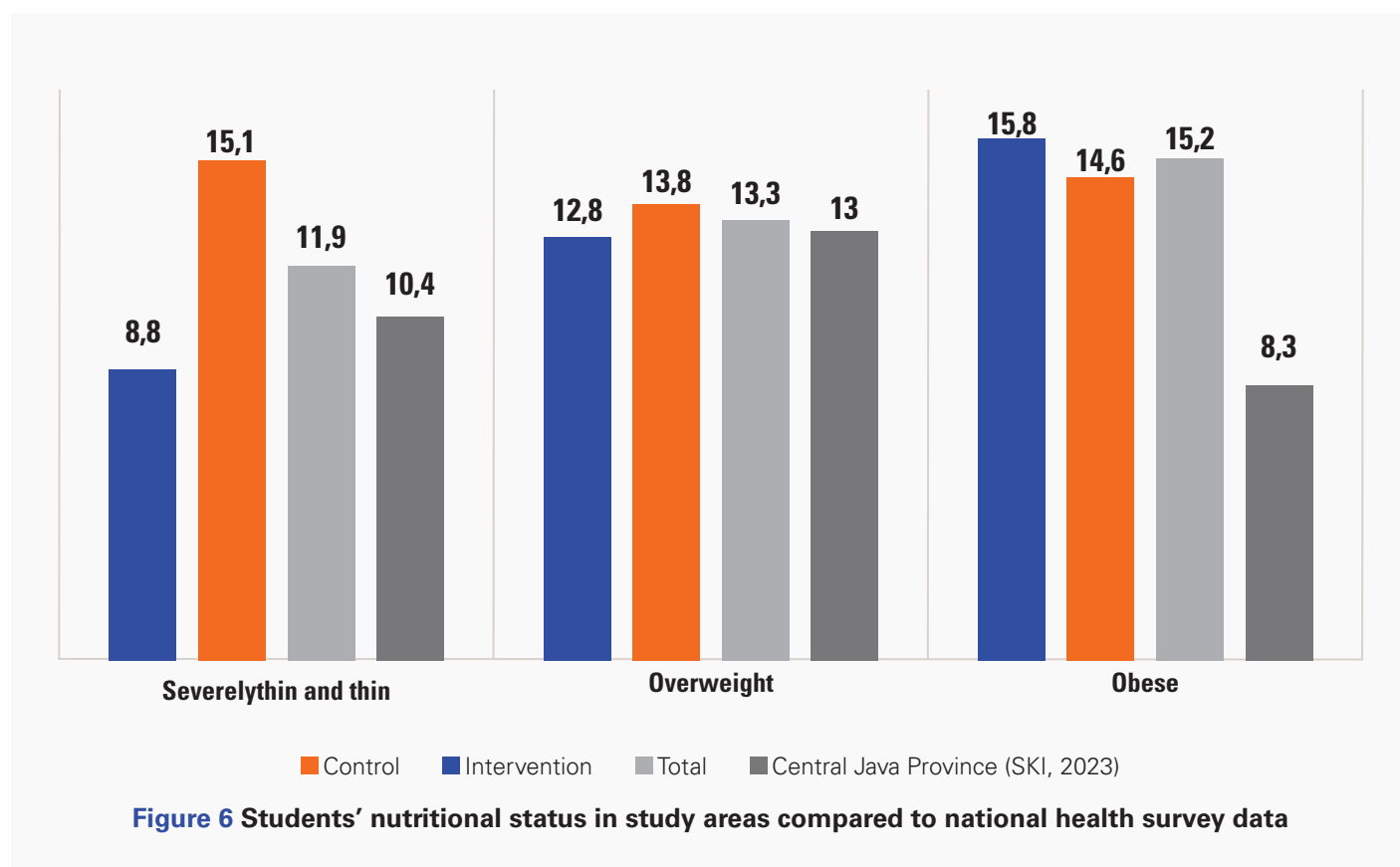


Table 3.3.1 presents the nutritional status of students based on BMI-for-age indicators, categorized by treatment group, gender, and city/district. The median BMI-for-age z-score was significantly higher for students in intervention schools compared to those in control schools. While the differences in nutritional status were not statistically significant, the p-value indicated borderline significance ($p = 0.065$). Similarly, students in cities had a significantly higher median BMI-for-

age z-score compared to those in districts ($p=0.037$), although their nutritional status did not show significant differences. In contrast, there was no significant difference in the median BMI-for-age z-score between male and female students ($p = 0.435$). However, nutritional status exhibited a significant difference, with male students displaying a higher prevalence of obesity (19 per cent) compared to female students (11 per cent).

Table 3.3.1 Nutritional status of students based on BMI-for-age indicator (WHO, 2006)

NUTRITIONAL STATUS BY TREATMENT GROUP	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE ¹
BMI-for-age z-score, median(Q1-Q3)	-0.2 (-1.2 to 1.2)	-0.5 (-1.5 to 1.3)	-0.3 (-1.4 to 1.2)	0.029
Nutritional status based on BMI- for-age z-score, n(%)				0.065
Severely thin	8 (2.0)	10 (2.5)	18 (2.3)	
Thin	27 (6.8)	50 (12.6)	77 (9.6)	
Normal	251 (62.8)	225 (56.5)	476 (59.6)	
Overweight	51 (12.8)	55 (13.8)	106 (13.3)	
Obesity	63 (15.8)	58 (14.6)	121 (15.2)	
NUTRITIONAL STATUS BY CITY/DISTRICT	CITY (N=398)	DISTRICT (N=400)	TOTAL (N=798)	P-VALUE ²
BMI-for-age z-score, median(Q1-Q3)	-0.2 (-1.3 to 1.3)	-0.5 (-1.4 to 1.1)	-0.3 (-1.4 to 1.2)	0.037
Nutritional status based on BMI- for-age z-score, n(%)				0.189
Severely thin	4 (1.0)	14 (3.5)	18 (2.3)	
Thin	39 (9.8)	38 (9.5)	77 (9.6)	
Normal	236 (59.3)	240 (60.0)	476 (59.6)	
Overweight	56 (14.1)	50 (12.5)	106 (13.3)	
Obesity	63 (15.8)	58 (14.5)	121 (15.2)	
NUTRITIONAL STATUS BY GENDER	BOYS (N=408)	GIRLS (N=390)	TOTAL (N=798)	P-VALUE ³
BMI-for-age z-score, median(Q1-Q3)	-0.2 (-1.3 to 1.4)	-0.3 (-1.3 to 1.0)	-0.3 (-1.4 to 1.2)	0.435
Nutritional status based on BMI- for-age z-score, n(%)				0.003
Severely thin	12 (2.9)	6 (1.5)	18 (2.3)	
Thin	44 (10.8)	33 (8.5)	77 (9.6)	
Normal	229 (56.1)	247 (63.3)	476 (59.6)	
Overweight	45 (11.0)	61 (15.6)	106 (13.3)	
Obesity	78 (19.1)	43 (11.0)	121 (15.2)	

¹ p-value <0.05 indicates significant difference between intervention and control groups.

² p-value <0.05 indicates significant difference between cities (Semarang and Surakarta) and districts (Tegal and Kudus).

³ p-value <0.05 indicates significant difference between boys and girls.

3.4 SUMMARY OF STUDENTS' AND PARENTS' KAP RELATED TO BALANCED NUTRITION AND OVERWEIGHT

Students in both intervention and control schools displayed similar levels of KAP practices regarding balanced nutrition, with no statistically significant differences observed. Most students in both groups exhibited poor knowledge (64 per cent), medium attitudes (46 per cent), and poor practices (72 per cent). Comparable findings were evident in the assessment

of parents' KAP regarding balanced nutrition, with no statistically significant difference between groups. Nearly half of the parents in both groups demonstrated poor knowledge (49 per cent) and poor attitudes (44 per cent) toward balanced nutrition. However, 65 per cent of parents in both groups demonstrated good practices related to balanced nutrition.

Table 3.4.1 Summary of students and parents on balanced nutrition by treatment group

KNOWLEDGE, ATTITUDE, AND PRACTICES (KAP) RELATED TO BALANCED NUTRITION	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE ¹
STUDENTS				
Knowledge				
Knowledge score, <i>median (Q1-Q3)</i>	11.5 (3-20)	11.0 (2-18)	11.0 (2-20)	0.175
Knowledge level, <i>n(%)</i>				
Good > 80%	16 (4.0)	14(3.5)	30 (3.8)	0.572
Medium 60-79%	135 (33.8)	122(30.7)	257 (32.2)	
Poor < 60%	249 (62.3)	262(65.8)	511 (64.0)	
Attitudes				
Attitude score, <i>median (Q1-Q3)</i>	14.0 (2-21)	14.0 (3-20)	14.0 (2-21)	0.191
Attitude level, <i>n(%)</i>				
Good > 80%	83 (20.8)	81 (20.4)	164 (20.6)	0.669
Medium 60-79%	190 (47.5)	179 (45.0)	369 (46.2)	
Poor < 60%	127 (31.8)	138 (34.7)	265 (33.2)	
Practices*				
Practice score, <i>median (Q1-Q3)</i>	5.0 (1-8)	5.0 (1-9)	5.0 (1-9)	0.180
Practice level, <i>n(%)</i>				
Good > 80%	11 (2.8)	7 (1.8)	18 (2.3)	0.615
Medium 60-79%	104 (26.0)	101 (25.4)	205 (25.7)	
Poor < 60%	285 (71.3)	290 (72.9)	575 (72.1)	
PARENTS				
Knowledge				
Knowledge score, <i>median (Q1-Q3)</i>	2.5 (0-5)	3 (0-5)	3 (0-5)	0.381
Knowledge level, <i>n(%)</i>				
Good > 80%	88 (22.0)	90 (22.6)	178 (22.3)	0.717
Medium 60-79%	112 (28.0)	120 (30.2)	232 (29.1)	
Poor < 60%	200 (50.0)	188 (47.2)	388 (48.6)	
Attitudes				
Attitude score, <i>median (Q1-Q3)</i>	6 (0-10)	6 (0-10)	6 (0-10)	0.119
Attitude level, <i>n(%)</i>				
Good > 80%	101 (25.3)	88 (22.1)	189 (23.7)	0.281
Medium 60-79%	135 (33.8)	125 (31.4)	260 (32.6)	
Poor < 60%	164 (41.0)	185 (46.5)	349 (43.7)	
Practices*				
Practice score, <i>median (Q1-Q3)</i>	6 (5-7)	6 (5-7)	6 (5-7)	0.605
Practice level, <i>n(%)</i>				
Good > 80%	266 (66.5)	252 (63.3)	518 (64.9)	0.208
Medium 60-79%	119 (29.8)	137 (34.4)	256 (32.1)	
Poor < 60%	15 (3.8)	9 (2.3)	24 (3.0)	

¹p-value <0.05 indicates significant difference between intervention and control groups.

* Practices were scored as follows: Meal frequency (**good**: 3 times); breakfast habits (**good**: breakfast every day before 9am); snack habits (**risky**: consumption of sweet foods and drinks, including carbonated soft drinks, salty snacks, fried foods); drinking water (**good**: >7 glasses per daily); reading food labels (**good**: always); handwash and hygienic practices (**good**: wash hands in at least 4 of the 6 occasions mentioned); physical activity (**good**: exercise 3 to 6 times a week with minimum of 30 minutes per session); sedentary activities (**risky**: recreational screen time >=120 minutes per day) and bodyweight monitoring (**good**: bodyweight was measured in the previous 6 months).

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Table 3.4.2 presents the assessment of students' and parents' KAP regarding balanced nutrition when cities and districts were compared. Regarding students' KAP, a significant difference was observed in knowledge scores and levels. Students attending schools in cities demonstrated significantly higher scores in balanced nutrition knowledge compared to those in districts. Moreover, a higher proportion of students in districts exhibited poor knowledge (<60% correct answers) in balanced nutrition compared to students in cities, although this difference was not statistically significant.

Conversely, attitudes towards balanced nutrition were significantly more favourable among students in district areas compared to those in cities, while no significant difference was found in practice scores and levels between the two areas.

Among parents, both knowledge and attitudes were significantly better among those whose children attended schools in cities, compared to those in districts. However, there were no significant differences in the levels of practices related to balanced nutrition among parents in city and district areas.

Table 3.4.2 KAP summary of students and parents on balanced nutrition by city and district

KNOWLEDGE, ATTITUDE, AND PRACTICES (KAP) RELATED TO BALANCED NUTRITION	UNDERWEIGHT (THIN – SEVERELY THIN) (N=95)	NORMAL (N=476)	OVERWEIGHT– OBESE (N=227)	P-VALUE ¹
STUDENTS				
Knowledge, n(%)				0.816
Good > 80%	3 (10.0)	18 (60.0)	9 (30.0)	
Medium 60-79%	30 (11.7)	147 (57.2)	80 (31.1)	
Poor < 60%	62 (12.1)	311 (60.9)	138 (27.0)	
Attitudes, n(%)				0.037
Good > 80%	30 (18.3)	84 (51.2)	50 (30.5)	
Medium 60-79%	37 (10.0)	232 (62.9)	100 (27.1)	
Poor < 60%	28 (10.6)	160 (60.4)	77 (29.1)	
Practices*, n(%)				0.210
Good > 80%	1 (5.6)	13 (72.2)	4 (22.2)	
Medium 60-79%	30 (14.6)	127 (62.0)	48 (23.4)	
Poor < 60%	64 (11.1)	336 (58.4)	175 (30.4)	
PARENTS				
Knowledge, n(%)				0.201
Good > 80%	18 (10.1)	113 (63.5)	47 (26.4)	
Medium 60-79%	37 (15.9)	129 (55.6)	66 (28.4)	
Poor < 60%	40 (10.3)	234 (60.3)	114 (29.4)	
Attitudes, n(%)				0.004
Good > 80%	13 (6.9)	107 (58.6)	69 (36.5)	
Medium 60-79%	31 (11.9)	151 (58.1)	78 (30.0)	
Poor < 60%	51 (14.6)	218 (62.5)	80 (22.9)	
Practices*, n(%)				0.192
Good > 80%	54 (10.4)	309 (59.7)	155 (29.9)	
Medium 60-79%	37 (14.5)	150 (58.6)	69 (27.0)	
Poor < 60%	4 (16.7)	17 (70.8)	3 (12.5)	

¹ p-value <0.05 indicates significant difference between intervention and control groups.

* Practices were scored as follows: Meal frequency (**good**: 3 times); breakfast habits (**good**: breakfast every day before 9am); snack habits (**risky**: consumption of sweet foods and drinks, including carbonated soft drinks, salty snacks, fried foods); drinking water (**good**: >7 glasses per daily); reading food labels (**good**: always); handwash and hygienic practices (**good**: wash hands in at least 4 of the 6 occasions mentioned); physical activity (**good**: exercise 3 to 6 times a week with minimum of 30 minutes per session); sedentary activities (**risky**: recreational screen time >=120 minutes per day) and bodyweight monitoring (good: bodyweight was measured in the previous 6 months).

Table 3.4.3 presents the assessment of students' and parents' KAP regarding balanced nutrition when cities and districts were compared. Regarding students' KAP, a significant difference was observed in knowledge scores and levels. Students attending schools in cities demonstrated significantly higher scores in balanced nutrition knowledge compared to those in districts. Moreover, a higher proportion of students in districts exhibited poor knowledge (<60% correct answers) in balanced nutrition compared to students in cities, although this difference was not statistically significant.

Conversely, attitudes towards balanced nutrition were significantly more favourable among students in district areas compared to those in cities, while no significant difference was found in practice scores and levels between the two areas.

Among parents, both knowledge and attitudes were significantly better among those whose children attended schools in cities, compared to those in districts. However, there were no significant differences in the levels of practices related to balanced nutrition among parents in city and district areas.



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Table 3.4.3 KAP summary of students and parents on balanced nutrition by city and district

KNOWLEDGE, ATTITUDE, AND PRACTICES (KAP) RELATED TO BALANCED NUTRITION	CITY (N=398)	DISTRICT (N=400)	TOTAL (N=798)	P-VALUE ¹
STUDENTS				
Knowledge				
Knowledge score, <i>median (Q1-Q3)</i>	12 (10-14)	11 (9-13)	11 (10-13)	0.005
Knowledge level, <i>n(%)</i>				
Good > 80%	15 (3.8)	15(3.8)	30 (3.8)	0.076
Medium 60-79%	143 (35.9)	114(28.5)	257 (32.2)	
Poor < 60%	240 (60.3)	271(67.8)	511 (64.0)	
Attitudes				
Attitude score, <i>median (Q1-Q3)</i>	13 (11-16)	14.0 (12-16)	14 (12-16)	0.001
Attitude level, <i>n(%)</i>				
Good > 80%	66 (16.6)	98 (24.5)	164 (20.6)	0.002
Medium 60-79%	179 (45.0)	190 (47.5)	369 (46.2)	
Poor < 60%	153 (38.4)	112 (28.0)	265 (33.2)	
Practices*				
Practice score, <i>median (Q1-Q3)</i>	4 (3-5)	5 (4-5)	5 (3-5)	0.061
Practice level, <i>n(%)</i>				
Good > 80%	10 (2.5)	8 (2.0)	18 (2.3)	0.877
Medium 60-79%	101 (25.4)	104 (26.0)	205 (25.7)	
Poor < 60%	287 (72.1)	288 (72.0)	575 (72.1)	
PARENTS				
Knowledge				
Knowledge score, <i>median (Q1-Q3)</i>	3 (2-4)	2 (2-3)	3 (2-3)	0.001
Knowledge level, <i>n(%)</i>				
Good > 80%	108 (27.1)	70 (17.5)	178 (22.3)	0.004
Medium 60-79%	113 (28.4)	119 (29.8)	232 (29.1)	
Poor < 60%	177 (44.5)	211 (52.8)	388 (48.6)	
Attitudes				
Attitude score, <i>median (Q1-Q3)</i>	6 (5-8)	6 (4-7)	6 (4-7)	0.001
Attitude level, <i>n(%)</i>				
Good > 80%	108 (27.1)	81 (20.3)	189 (23.7)	0.018
Medium 60-79%	134 (33.7)	126 (31.5)	260 (32.6)	
Poor < 60%	156 (39.2)	193 (48.3)	349 (43.7)	
Practices*				
Practice score, <i>median (Q1-Q3)</i>	6 (5-7)	6 (5-7)	6 (5-7)	0.058
Practice level, <i>n(%)</i>				
Good > 80%	266 (66.8)	252 (63.0)	518 (64.9)	0.272
Medium 60-79%	118 (29.6)	138 (34.5)	256 (32.1)	
Poor < 60%	14 (3.5)	10 (2.5)	24 (3.0)	

¹ p-value <0.05 indicates significant difference between intervention and control groups.

* Practices were scored as follows: Meal frequency (**good**: 3 times); breakfast habits (**good**: breakfast every day before 9am); snack habits (**risky**: consumption of sweet foods and drinks, including carbonated soft drinks, salty snacks, fried foods); drinking water (**good**: >7 glasses per daily); reading food labels (**good**: always); handwash and hygienic practices (**good**: wash hands in at least 4 of the 6 occasions mentioned); physical activity (**good**: exercise 3 to 6 times a week with minimum of 30 minutes per session); sedentary activities (**risky**: recreational screen time >=120 minutes per day) and bodyweight monitoring (good: bodyweight was measured in the previous 6 months).

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3.5 STUDENTS' KNOWLEDGE OF BALANCED NUTRITION AND OVERWEIGHT

Questions on balanced nutrition included topics such as breakfast, dietary diversity, drinking water, the consumption of high-sugar, high-salt, and high-fat foods, personal hygiene, physical activity, and nutritional status including overweight/obesity (Table 3.5.1). Overall, there were no statistically significant differences in knowledge about balanced nutrition between students in the intervention and control groups. The only significant value was observed for handwashing, where students in the intervention group demonstrated significantly better knowledge about critical handwashing times compared to those in the control group (64 per cent vs. 54.5 per cent, respectively).

Most students (>80%) provided correct answers to questions on overweight, particularly the causes behind this condition and possible ways to prevent it. However, only 50.5 per cent could identify the risks associated with obesity, and significant gaps were evident in their knowledge of practices that affect the risk of obesity. For example, one in three students did not correctly identify the frequent consumption of sugary drinks as a potential driver of obesity, and about 40 per cent believed that physical activity is only needed when one is overweight. Notably, students showed a particular lack of knowledge

on food labels, with only 27.7 per cent answering correctly.

Knowledge gaps were also evident in other healthy dietary practices, including breakfast habits and the misconception that only drinking milk at breakfast ensures good nutrient intake, with only about 30 per cent of students responding correctly. Students' understanding of dietary diversity varied depending on the question. The highest proportion of correct answers related to the characteristics of healthy food (77.7 per cent), while the lowest proportion related to the misconception that fruits can replace vegetables due to similar nutritional content, with only 9 per cent of students answering correctly.

Out of 21 questions, students in cities had a significantly higher proportion of correct answers for eight questions, most of which pertained to the causes and risks of obesity. Additionally, students in cities demonstrated significantly better knowledge in areas such as examples of physical activity, personal hygiene practices, snacking habits, and identifying foods high in carbohydrates (detailed results of the comparison between cities and districts are provided in **Annex 6.5**).

Table 3.5.1 Students' knowledge of balanced nutrition by treatment group

NO	QUESTION	CORRECT ANSWER	STUDENT WITH CORRECT ANSWER			
			INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=398)	P-VALUE
1.	If you are not used to having breakfast, you can replace it with a larger lunch	False	133 (33.3)	125(31.4)	258(32.3)	0.578
2.	If we don't like vegetables, we can replace them with fruit because the nutritional content is the same	False	32 (8.0)	40(10.1)	72(9.0)	0.312
3.	Only drinking milk at breakfast is enough because milk contains all the nutrients our bodies need	False	116 (29.0)	139(34.9)	255(32.0)	0.073
4.	Consuming sugary foods and drinks too often can cause obesity	True	262 (65.5)	256(64.3)	518(64.9)	0.727
5.	We should drink at least 7 glasses of water per day	True	311 (77.8)	286(71.9)	597(74.8)	0.055
6.	We need to do physical activity only when we are overweight	False	240 (60.0)	235(59.0)	475(59.5)	0.784

NO	QUESTION	CORRECT ANSWER	STUDENT WITH CORRECT ANSWER			
			INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=398)	P-VALUE
7.	Cleaning the house and gardening are examples of physical activity	True	318 (79.5)	311(78.1)	629(78.8)	0.638
8.	We wash our hands only when they look dirty	False	256 (64.0)	217(54.5)	473(59.3)	0.006
9.	We can know our nutritional status based on our weight and height	True	312 (78.0)	306(76.9)	618(77.4)	0.706
10.	At the very top of the Balanced Nutrition Guideline are foods that should be restricted in consumption, except	Fibre	114 (28.5)	100(25.1)	214(26.8)	0.282
11.	In the My Plate guide, the portion of staple food consumption should be equal to the portion of	Vegetables	225 (56.3)	201(50.5)	426(53.4)	0.104
12.	Example of diverse eating at its best	Rice, fried fish, spinach vegetable, banana	207 (51.8)	189(47.5)	396(49.6)	0.229
13.	One of the characteristics of healthy food	Safe	299 (74.8)	303(76.1)	602(75.4)	0.651
14.	Being overweight can be caused by	Frequent consumption of sugary drinks	235 (58.8)	253(63.6)	488(61.2)	0.163
15.	Apart from rice, staple foods that contain a lot of carbohydrates are	Potatoes and cassava	176 (44.0)	182(45.7)	358(44.9)	0.623
16.	The following are the benefits of breakfast	All are correct (energy source, increase concentration, prevent obesity)	76 (19.0)	92(23.1)	168(21.1)	0.154
17.	Examples of unhealthy snacking practice	Choosing sugary soft drinks as snacks	313 (78.3)	307(77.1)	620(77.7)	0.705
18.	Information on the food label of a packaged food/drink must contain the following information, except	Food/drink prices	120(30.0)	96(24.1)	216(27.1)	0.062
19.	Risks of overweight and obesity	Increase risk of chronic condition/reduce quality of life/premature death)	211(52.8)	192(48.2)	403(50.5)	0.203
20.	Causes of overweight and obesity	Increased/excessive intake of energy-dense foods/lack of or decreased physical activity	341(85.3)	330(82.9)	671(84.1)	0.367
21.	How to prevent overweight and obesity	Reduce energy or fatty and sugary foods intake/eat more often vegetables and fruits - legume - wholegrain products/ increase physical activity level/engage in regular physical activity	362(90.5)	346(86.9)	708(88.7)	0.111

P<0.05 indicates significant differences between intervention and control schools.

3.6 STUDENTS' ATTITUDES RELATED TO BALANCED NUTRITION AND OVERWEIGHT

Table 3.6.1 indicates that students' attitudes toward balanced nutrition were generally similar between the intervention and control groups, with a few exceptions. Significantly more students in the intervention group felt capable of drinking at least seven glasses of water per day compared to the control group (71 per cent vs. 63.1 per cent). Additionally, more students in the intervention group believed that the food in the school canteen suited their preferences (63.8 per cent vs. 55.3 per cent) and that it was healthy and safe (70 per cent vs. 60.8 per cent). Positive attitudes (>80 per cent) were observed in areas such as maintaining an ideal body weight for optimum health (88.5 per cent) and not judging friends based on their physical appearance (80.1 per cent).

However, attitudes toward several other elements of balanced nutrition and overweight were less positive. Nearly half of the students found it difficult to reduce their consumption of salty snacks and instant noodles (45.4 per cent and 46.1 per cent, respectively), eat a variety of foods (56.3 per cent), and eat fruit at least twice a day (55.9 per cent). Similarly, about half of the students found it difficult to engage in physical activity daily for at least 30 minutes (52.9 per cent), and about one in three preferred playing with digital devices like phones and tablets rather than engaging in active games and activities.

Table 3.6.1 Attitude of students on balanced nutrition by group of treatment

NO	ATTITUDE ON BALANCED NUTRITION	FAVOURABLE ATTITUDE	STUDENT WITH FAVOURABLE ATTITUDE			
			INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
1.	I find it difficult to eat breakfast every day	Disagree	270(67.5)	258(64.8)	528(66.2)	0.424
2.	I find it difficult to eat a variety of foods (such as staple foods, animal protein side dishes, vegetable protein, vegetables, and fruit) at every meal	Disagree	226(56.5)	223(56.0)	449(56.3)	0.894
3.	I find it difficult to eat vegetables at every meal	Disagree	267(66.8)	255(64.1)	522(65.4)	0.426
4.	I feel like almost all vegetables taste good	Agree	315(78.8)	305(76.6)	620(77.7)	0.473
5.	I find it difficult to eat fruit at least twice a day	Disagree	215(53.8)	231(58.0)	446(55.9)	0.222
6.	I can drink at least 7 glasses of water every day	Agree	284(71.0)	251(63.1)	535(67.0)	0.017
7.	I find it difficult to choose water over sweet drinks	Disagree	253(63.3)	243(61.1)	496(62.2)	0.523
8.	I can easily reduce my consumption of fried foods	Agree	280(70.0)	285(71.6)	565(70.8)	0.617

NO	ATTITUDE ON BALANCED NUTRITION	FAVOURABLE ATTITUDE	STUDENT WITH FAVOURABLE ATTITUDE			
			INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
9.	I find it difficult to reduce the consumption of salty foods/snacks, such as chips	Disagree	189(47.3)	173(43.5)	362(45.4)	0.283
10.	I find it difficult to reduce my consumption of instant noodles	Disagree	178(44.5)	190(47.7)	368(46.1)	0.359
11.	The food available in my school canteen matches my preferences	Agree	255(63.8)	220(55.3)	475(59.5)	0.015
12.	The food sold in my school canteen is healthy and safe food	Agree	280(70.0)	242(60.8)	522(65.4)	0.006
13.	I find it difficult to do routine physical activity every day for at least 30 minutes	Disagree	202(50.5)	220(55.3)	422(52.9)	0.177
14.	I prefer playing with digital devices (cell phone, tablet, computer) in my free time compared to cycling or playing outside with friends	Disagree	290(72.5)	268(67.3)	558(69.9)	0.112
15.	I find it not difficult to wash my hands with soap and running water before eating	Agree	300(75.0)	306(76.9)	606(75.9)	0.533
16.	Maintaining a normal body weight is important for our optimal health	Agree	361(90.3)	345(86.7)	706(88.5)	0.115
17.	I feel like my weight is good	Agree	261(65.3)	243(61.1)	504(63.2)	0.219
18.	I can easily sleep at least 8 hours every day	Agree	262(65.5)	273(68.6)	535(67.0)	0.353
19.	When we feel depressed and sad, we can tell our family and friends	Agree	314(78.5)	309(77.6)	623(78.1)	0.769
20.	We should not label (judge/call) our friends based on their physical appearance	Agree	319(79.8)	320(80.4)	639(80.1)	0.818
21.	Seriousness of overweight and obesity	Agree	250(62.5)	254(63.8)	504(63.2)	0.699

P<0.05 indicates significant differences between intervention and control schools.

3.7 STUDENTS' PRACTICES RELATED TO BALANCED NUTRITION AND OVERWEIGHT

Table 3.7.1 shows that students' practices related to balanced nutrition were fairly good for meal frequency, breakfast habits, and the consumption of diverse foods. Unfortunately, these good eating habits were accompanied by high rates of snacking ($\geq 85\%$) involving sweet, salty, and fried foods, and low proportions of students regularly drinking enough water (24.7 per cent), reading food labels when buying packaged foods and drinks (16.8 per cent), washing their hands at least four times at critical moments (2.1 per cent), and engaging

in sufficient physical activity (19.5 per cent). Additionally, low physical activity was coupled with sedentary habits, with over 30 per cent of students spending more than two hours per day on digital devices. Regarding the fourth pillar of balanced nutrition (regularly monitoring body weight), only about 62 per cent of students had their weight measured in the last six months, with a significantly higher proportion in intervention schools compared to control schools.

Table 3.7.1 Summary of students' balanced nutrition practices by treatment group

NO	VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
1.	Meal frequency Students have 3 times in a day	282(70.5)	267(67.1)	549(68.8)	0.298
2.	Breakfast habit Have breakfast every day before 9 am	290(72.5)	273(68.6)	563(70.6)	0.226
3.	Snacking habit Consume any sweet foods and sugary drinks, salty snacks, or fried foods in the past 7 days	340(85.0)	351(88.2)	691(86.6)	0.186
4.	Drinking water consumption Consume water (≥ 7 glasses per day)	116(29.0)	81(20.4)	197(24.7)	0.005
5.	Reading food label Always read food labels when buying/consuming packaged food/drinks	56(14.0)	78(19.6)	134(16.8)	0.034
6.	Handwash and hygienic practices Minimally 4 out of 6 mentioned times	8(2.0)	9(2.3)	17(2.1)	0.798
7.	Physical activity Exercise 3 to 6 times a week with minimum of 30 minutes per exercise session	81(20.3)	75(18.8)	156(19.5)	0.617
8.	Sedentary activity Recreational screen time ≥ 2 hours	149(37.3)	133(33.4)	282(35.3)	0.257
9.	Body weight monitoring Body weight was measured in the last 6 months	265(66.3)	227(57.0)	492(61.7)	0.007
10.	Dietary diversity Met minimum dietary diversity score	327(81.8)	314(78.9)	641(80.3)	0.310

P<0.05 indicates significant differences between intervention and control schools.



DIETARY DIVERSITY

Based on the results of the single 24-hour dietary recall (**Table 3.7.2**), students in the survey consumed an average of five out of 10 main food groups. Approximately 60 per cent of students in the intervention and control schools met the minimum dietary diversity score (five out of 10 food groups), with no significant difference between the two groups. The most consumed food groups included grains, white roots, and tubers (99.9 per cent), meat, poultry, and fish (88.3 per cent), eggs (60 per cent), and pulses (52.9 per cent). Vegetables and fruits were consumed by around 40 per cent of students. Only one-third of students (31.2 per cent) consumed milk and milk products, while nuts

and seeds were the least consumed food group (2.1 per cent). Meats were the primary source of iron-rich food for most students (71 per cent), followed by fish and seafood (22 per cent), with only a small percentage consuming offal as a source of iron (1.4 per cent). Additionally, 15 per cent of students reported taking vitamin or mineral supplements, including appetite booster supplements. In terms of less healthy foods, sweetened beverages and foods were commonly consumed by 73 per cent and 52 per cent of students, respectively. Fried foods and salty snacks were consumed by 43 per cent and 39 per cent of students, respectively, while instant noodles were consumed by 28 per cent of students.

Table 3.7.2 Students' dietary diversity based on 24-hour dietary recall by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Number of food groups consumed, median(Q1-Q3)	5 (4-6)	5 (4-6)	5 (4-6)	0.470
Met minimum dietary diversity score, n(%)	247(61.8)	235(59.0)	482(60.4)	0.435
Consumed the following food group, n(%)				
Grains, white roots, tubers, plantains	399 (99.8)	398 (100.0)	797 (99.9)	0.318
Pulses (beans, peas, and lentils)	215 (53.8)	207 (52.0)	422 (52.9)	0.622
Nuts and seeds	6 (1.5)	11 (2.8)	17 (2.1)	0.214
Milk and milk products	137 (34.3)	111 (28.0)	248 (31.2)	0.055
Meat, poultry and fish	356 (89.0)	349 (87.7)	705 (88.3)	0.564
Eggs	246 (61.5)	233 (58.5)	479 (60.0)	0.394
Dark green leafy vegetables	181 (45.4)	158 (39.7)	339 (42.5)	0.106
Other vitamin A-rich fruits and vegetables	187 (46.8)	172 (43.2)	359 (45.0)	0.316
Other vegetables	172 (43.0)	159 (40.1)	331 (41.5)	0.398
Other fruits	168 (42.0)	156 (39.2)	324 (40.6)	0.420
Consumed the following iron-rich foods, n(%)				
Offal	5 (1.3)	6 (1.5)	11 (1.4)	0.952
Meats	279 (69.8)	291 (73.1)	570 (71.4)	0.369
Fish and seafood	98 (24.5)	80 (20.1)	178 (22.3)	0.328
Consumed the following vitamin and mineral supplements, n(%)				
Vitamin supplements	57 (14.3)	47 (11.8)	104 (13.0)	0.306
Mineral supplements	3 (.8)	4 (1.0)	7 (.9)	0.699
Appetite booster supplements	5 (1.3)	11 (2.8)	16 (2.0)	0.127
Consumed the following less healthy foods, n(%)				
Sweet foods	207 (51.8)	211 (53.0)	418 (52.4)	0.721
Sweet beverages	296 (74.0)	284 (71.4)	580 (72.7)	0.402
Fried foods	166 (41.5)	176 (44.2)	342 (42.9)	0.437
Salty snacks	160 (40.0)	148 (37.2)	308 (38.6)	0.443
Instant noodles	111 (27.8)	113 (28.4)	224 (28.1)	0.840

P<0.05 indicates significant differences between intervention and control schools.



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Table 3.7.3 displays the frequency of students' food consumption for 15 food groups over the previous week, categorized as: always, often (4 to 6 days per week), rarely (1 to 3 days per week), and never. Students in the intervention and control schools generally exhibited similar eating practices, except for milk and dairy products, other fruits, and sweet foods, which were consumed more often by students in the intervention schools. Staple sources of carbohydrates, grains, white roots, or tubers were consumed almost daily by all students. Pulses, serving as plant-based protein sources, were mostly consumed one to three days a week (53.8 per cent). Red meat, poultry, and fish were consumed at similar frequencies, with 45 to 50 per cent of students consuming them one to three times per week.

Regarding vegetable consumption, students mostly consumed dark green leafy vegetables, other vitamin A-rich vegetables, and 'other' vegetables one to three days a week (ranging from 46.5 per cent to 51.0 per cent). The least consumed were 'other' vegetables, with 30 to 35 per cent of students never consuming them. Other fruits and vitamin A-rich fruits like papaya and mango were also rarely consumed, especially in control schools. Among less healthy foods, sweetened beverages were the most frequently consumed, with approximately one-third of students having them daily or four to six times a week. Similar consumption patterns were observed for sweet and fried foods and salty snacks, with around half of students consuming them one to three times per week and around a quarter consuming them four to six times per week.

Table 3.7.3 Habitual food consumption of students in the past week, by treatment group

VARIABLES	GROUP	NEVER	RARELY (1-3 DAYS/WEEK)	OFTEN (4-6 DAYS/WEEK)	ALWAYS (EVERYDAY)	P-VALUE
CONSUMED THE FOLLOWING MAIN FOOD GROUP						
Grains, white roots, tubers, plantains	Intervention	0(.0)	1(.3)	5(1.3)	394(98.5)	0.439
	Control	1(.3)	1(.3)	2(.5)	394(99.0)	
Pulses (beans, peas, and lentils)	Intervention	52(13.0)	215(53.8)	100(25.0)	33(8.3)	0.860
	Control	58(14.6)	212(53.3)	100(25.1)	28(7.0)	
Nuts and seeds	Intervention	314(78.5)	71(17.8)	13(3.3)	2(.5)	0.409
	Control	306(76.9)	82(20.6)	7(1.8)	3(.8)	
Milk and milk products	Intervention	89(22.3)	165(41.3)	72(18.0)	74(18.5)	0.006
	Control	112(28.1)	181(45.5)	62(15.6)	43(10.8)	
Meat, poultry, and fish	Intervention	9(2.3)	176(44.0)	148(37.0)	67(16.8)	0.233
	Control	13(3.3)	199(50.0)	130(32.7)	56(14.1)	
Eggs	Intervention	20(5.0)	186(46.5)	143(35.8)	51(12.8)	0.795
	Control	22(5.5)	197(49.5)	133(33.4)	46(11.6)	
Dark green leafy vegetables	Intervention	48(12.0)	204(51.0)	111(27.8)	37(9.3)	0.955
	Control	49(12.3)	201(50.5)	115(28.9)	33(8.3)	
Other vitamin A-rich fruits and vegetables	Intervention	66(16.5)	201(50.3)	107(26.8)	26(6.5)	0.721
	Control	46(11.6)	238(59.8)	97(24.4)	17(4.3)	
Other vegetables	Intervention	142(35.5)	186(46.5)	65(16.3)	7(1.8)	0.858
	Control	127(31.9)	210(52.8)	54(13.6)	7(1.8)	
Other fruits	Intervention	63(15.8)	162(40.5)	112(28.0)	63(15.8)	0.009
	Control	71(17.8)	197(49.5)	82(20.6)	48(12.1)	
CONSUMED THE FOLLOWING LESS HEALTHY FOODS						
Sweet foods	Intervention	40(10.0)	226(56.5)	107(26.8)	27(6.8)	0.017
	Control	65(16.3)	219(55.0)	93(23.4)	21(5.3)	
Sweet beverages	Intervention	22(5.5)	153(38.3)	125(31.3)	100(25.0)	0.436
	Control	31(7.8)	162(40.7)	115(28.9)	90(22.6)	
Fried foods	Intervention	50(12.5)	209(52.3)	93(23.3)	48(12.0)	0.100
	Control	65(16.3)	200(50.3)	102(25.6)	31(7.8)	
Salty snacks	Intervention	68(17.0)	204(51.0)	97(24.3)	31(7.8)	0.779
	Control	67(16.8)	194(48.7)	110(27.6)	27(6.8)	
Instant noodles	Intervention	70(17.5)	279(69.8)	47(11.8)	4(1.0)	0.773
	Control	75(18.8)	279(70.1)	42(10.6)	2(.5)	

P<0.05 indicates significant differences between intervention and control schools.



MEAL FREQUENCY AND BREAKFAST

No statistically significant differences were observed between intervention and control schools regarding meal frequency and breakfast habits (Table 3.7.4). Most students reported consuming breakfast daily (72.4 per cent), typically before 9 a.m. (92.4 per cent), mainly at home (89.7 per cent).

Breakfast consisted primarily of rice, side dishes, and vegetables (51.3 per cent), or alternatively, rice and side dishes (34.5 per cent). Among students who did not have breakfast daily, reasons cited included time constraints, lack of accustomedness, and absence of breakfast preparations at home. For students reporting fewer than three meals per day, 46.3 per cent admitted to skipping breakfast, 24.2 per cent to skipping lunch, and 34.9 per cent to skipping dinner.

Table 3.7.4 Meal frequency and breakfast habit of students by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Frequency of meal in a day				0.575
• <3 times	71(17.8)	78(19.6)	149(18.7)	
• 3 times	282(70.5)	267(67.1)	549(68.8)	
• >3 times	47(11.8)	52(13.1)	99(12.4)	
Breakfast habit				0.351
• Every day	297(74.3)	281(70.6)	578(72.4)	
• Occasionally (4 to 6 times a week)	51(12.8)	55(13.8)	106(13.3)	
• Rarely (1 to 3 times a week)	41(10.3)	43(10.8)	84(10.5)	
• Never	10(2.5)	19(4.8)	29(3.6)	
Usual breakfast time				0.115
• Before 9 a.m.	n=390 375(96.2)	n=376 360(95.7)	n=766 736(95.9)	
• 9 a.m. and after	15(3.8)	16(4.3)	30(4.1)	
Usual place to have breakfast				0.163
• At home	n=390 368(94.4)	n=376 348(92.6)	n=766 716(93.5)	
• At school by bringing meal from home	11(2.8)	14(3.7)	25(3.2)	
• At school by buying food in the canteen/other places	11(2.8)	14(3.7)	25(3.2)	
Foods that students usually have for breakfast				0.589
• Rice, side dishes and vegetables	n=390 218(55.9)	n=376 191(50.8)	n=766 409(53.4)	
• Rice and side dishes	131(33.6)	144(38.3)	275(35.9)	
• Rice and vegetables	8(2.0)	10(2.5)	18(2.3)	
• Bread/cakes and drinks	11(2.8)	10(2.5)	21(2.7)	
• Drink tea/milk/water only	4(1.0)	5(1.3)	9(1.1)	
• Instant noodles with/without rice	4(1.0)	5(1.3)	9(1.1)	
• Instant noodles and eggs/other side dishes	2(0.5)	3(0.8)	5(0.6)	
• Fried foods	1(0.3)	0(0)	1(0.1)	
• Others	11(2.8)	10(2.5)	21(2.7)	

P<0.05 indicates significant differences between intervention and control schools.



SNACKING

The snacking habits of students in the intervention schools were not significantly different from those of students in control schools regarding the frequency of purchasing snacks, the types of snacks bought and the place of purchase. The only difference detected was in the proportion of students purchasing specifically packaged chips as snacks, which was

higher in control schools (55.7 per cent) compared to intervention schools (48 per cent). Most students bought snacks daily (51.9 per cent) or frequently (four to six times per week; 29.4 per cent). Unhealthy options high in fats, sugar, and salt, such as sweet snacks (41.6 per cent), sugary drinks (60.8 per cent), and chips (51.9 per cent), were preferred by more students compared to full ready-made meals (24.7 per cent) like rice dishes.

Table 3.7.5 Snacking habits of students by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Frequency of buying snacks at school/home				0.061
• Every day	211(52.8)	203(51.0)	414(51.9)	
• Often (4 to 6 times in a week)	104(26.0)	131(32.9)	235(29.4)	
• Rarely (one to three times in a week)	77(19.3)	61(15.3)	138(17.3)	
• Never	8(2.0)	3(.8)	11(1.4)	
Snacks most frequently bought by students				
• Sweet snacks	165 (41.4)	166(41.9)	331(41.6)	0.871
• Biscuits	24 (6.0)	32 (8.1)	56 (7.0)	0.263
• Bread, cake	59 (15.6)	74 (18.9)	133(17.3)	0.224
• Sugary drinks	253 (63.6)	230(57.9)	483(60.8)	0.104
• Milk, yogurt	39 (9.8)	32 (8.1)	71 (8.9)	0.384
• Carbonated soft drinks	4 (1.1)	4 (1.0)	8 (1.0)	0.947
• Chips snacks	192 (48.2)	221(55.7)	413(51.9)	0.036
• Fried snacks (fried banana, fritter)	72 (18.0)	90 (22.8)	162(20.4)	0.098
• Fried foods (chicken roll, egg roll)	136 (34.2)	123(31.1)	259(32.7)	0.363
• Ready-made full meals (porridge, burgers, spaghetti, rice and dish, fried rice, yellow rice, instant noodles, chicken noodle, meatball, <i>soto</i> , <i>batagor</i> , <i>siomay</i> , <i>kebab</i> , <i>seblak</i> , <i>pempek</i>)	98 (24.5)	99 (24.9)	197(24.7)	0.902
Usual place where the students buy snacks				0.091
• In the school canteen	171(42.8)	155(38.9)	326(40.9)	
• At the food vendors outside/around the school	64(16.0)	57(14.3)	121(15.2)	
• At the food vendors near the house	145(36.3)	175(44.0)	320(40.1)	
• Purchased by parents	12(3.0)	9(2.3)	21(2.6)	

P<0.05 indicated significant differences between intervention and control schools.



Most students (>80%) in both intervention and control schools favoured water as their most frequently consumed beverage, citing taste and guidance from parents/teachers as main factors. The share of students in the intervention group who adhered to recommended water intake levels (≥ 7 glasses per day) was significantly higher than in the control group (29 versus 20.4 per cent). This was consistent with observations

related to students' KAP regarding water consumption, with intervention group students demonstrating better KAP compared to the control group, a statistically significant difference ($p < 0.05$). Although knowledge only approached significance ($p = 0.055$), the trend toward improved understanding in the intervention group was evident. However, no notable difference in activity levels between intervention and control students was noted, thus limiting support to the possibility of the two groups having different consumption behaviours.

Table 3.76 Drinking water habits of students, by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Type of beverage most frequently consumed				0.942
• Water	341(85.3)	334(83.9)	675(84.6)	
• Sweet tea	37(9.3)	39(9.8)	76(9.5)	
• Other sweetened beverages (in sachets/ ready-to-drink packets)	15(3.8)	18(4.5)	33(4.1)	
• Milk	7(1.8)	7(1.8)	14(1.8)	
The main reason for drinking that beverage				0.297
• Taste	138(34.5)	150(37.7)	288(36.1)	
• Told by parents/teachers	109(27.3)	91(22.9)	200(25.1)	
• Others	96(24.0)	83(20.9)	179(22.4)	
• Commonly available at home/school	53(13.3)	67(16.8)	120(15.0)	
• Price	4(1.0)	6(1.5)	10(1.3)	
Average amount of water usually consumed by students				0.009
• ≤ 3 glasses	108(27.0)	106(26.6)	214(26.8)	
• 4 to 6 glasses	176(44.0)	211(53.0)	387(48.5)	
• ≥ 7 glasses	116(29.0)	81(20.4)	197(24.7)	

$P < 0.05$ indicates significant differences between intervention and control schools.



A considerable proportion of students (62.9 per cent) reported that they rarely, or never, read food labels. The primary reason cited was a lack of understanding regarding the information conveyed on packaged foods/drinks, which accounted for 30.5 per cent of responses. Among those who did peruse food labels occasionally or regularly, the details most frequently consulted were the products' expiration date (44.6 per

cent) and ingredient list (23.1 per cent). Conversely, students overall did not pay attention to energy (9.7 per cent), vitamin (8.4 per cent), or sugar content (12 per cent). Differences in the influence of food label information on consumption decisions among students who responded 'always', 'sometimes', or 'not at all' were not significant in either intervention or control schools. Students who did not routinely read food labels cited a lack of understanding regarding label interpretation and insufficient time as their primary reasons.

Table 3.7.7 Reading food labels: Habits of students by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Frequency of reading food labels when buying/consuming packaged food/drinks, <i>n</i>(%)				0.004
• Always	56(14.0)	78(19.6)	134(16.8)	
• Sometimes	86(21.5)	76(19.1)	162(20.3)	
• Rarely	90(22.5)	56(14.1)	146(18.3)	
• Never	168(42.0)	188(47.2)	356(44.6)	
Information usually read on food labels by students, <i>n</i>(%)	n=232	n=210	n=442	0.396
• Expiration date	138(34.5)	150(37.7)	288(36.1)	
• Energy content	109(27.3)	91(22.9)	200(25.1)	
• Vitamin content	96(24.0)	83(20.9)	179(22.4)	
• Sugar content	53(13.3)	67(16.8)	120(15.0)	
• Ingredient/food ingredient	4(1.0)	6(1.5)	10(1.3)	
Whether the food label influences students to consume/buy or not consume/buy a packaged food/drink, <i>n</i>(%)	n=232	n=210	n=442	0.249
• Yes, most of the time	96(41.4)	75(35.7)	171(38.9)	
• Yes, sometimes	73(31.4)	72(34.3)	145(32.8)	
• No or not really	63(27.2)	59(28.0)	121(27.3)	

P<0.05 indicates significant differences between intervention and control schools.

**PERSONAL
HYGIENE**

Among the six critical times for handwashing that were highlighted, students predominantly washed their hands in connection with eating activities, particularly before

(76.9 per cent) and after (51.9 per cent) meals. About half also reported handwashing after disposing of trash (44.6 per cent). However, few students (<5%) washed their hands at other key moments, such as after petting animals or playing.

Table 3.7.8 Personal hygiene practices of students by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
The time when students usually wash their hands with clean running water and soap				
• Before meals	302(75.5)	312(78.4)	614(76.9)	0.332
• After meals	213(53.3)	201(50.5)	414(51.9)	0.437
• After taking out the trash	176(44.0)	180(45.2)	356(44.6)	0.728
• After attending toilet (urination/defecation)	34(8.5)	21(5.3)	55(6.9)	0.074
• After holding an animal	20(5.0)	19(4.8)	39(4.9)	0.889
• After playing	11(2.8)	25(6.3)	36(4.5)	0.016
• Can't be determined (no specific time)	18(4.5)	17(4.3)	35(4.4)	0.863

P<0.05 indicates significant differences between intervention and control schools.

**PHYSICAL
ACTIVITY**

Almost all students (95 per cent) engaged in light physical activities during the previous week, such as house or classroom cleaning (**Table 3.7.9**). A smaller proportion (75.1 per cent) participated in moderate and vigorous physical activity, such

as fast walking, cycling, or playing sports like soccer or basketball. Typically, students engaged in each level of physical activity twice a week. Notably, a significantly higher proportion of students in intervention schools engaged in vigorous physical activity, compared to those in control schools (79.3 vs. 71.9 per cent).

In terms of type of physical activity, most students participated in aerobic exercises (e.g., fast walking, running, cycling) and muscle-strengthening exercises such as sit-ups, push-ups, and gymnastics. Fewer students engaged in bone-strengthening activities (e.g., jump rope, basketball, tennis, badminton). Activities were typically performed once or twice a week, with no significant difference in the type or frequency of activity between students in intervention and control groups.

The frequency of exercise over the previous week showed no significant difference between students in intervention and control schools. Most (63.8 per cent) exercised fewer than three times a week for at

least 30 minutes per session, with an average of once a day. Among the 9.1 per cent of students who did not exercise during the study period, reasons included being unaccustomed to it, feeling lazy, lack of encouragement, or absence of a friend or family member to exercise with.

During class breaks, the most common activities were purchasing drinks or food from the school canteen (34.7 per cent) or engaging in physical activities like playing ball or basketball with friends (32.7 per cent). Interestingly, students in intervention schools were slightly less active during breaks compared to those in control schools, with more of them opting to sit and chat alone or with friends (28.5 vs. 22.1 per cent). Additionally, significantly more students in control schools participated in scouting as an extracurricular activity (63.3 per cent) compared to those in intervention schools (51.5 per cent). Conversely, arts-related activities were more common among students in intervention schools than those in control schools.

Approximately half of respondents did not have social media accounts (51.3 per cent in intervention schools and 52.5 per cent in control schools). Among those who did, TikTok was the most prevalent platform (74.7 per cent), followed by Instagram (33.3 per cent), YouTube (22.4 per cent), and Facebook (12.5 per cent).

Table 3.7.9 Physical activity of students by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Physical activity by level				
Light physical activity (%)	375(93.8)	383(96.2)	758(95.0)	0.108
Frequency of doing light physical activity (median, Q1-Q3)*	2 (1-4)	2 (1-4)	2(1-4)	0.651
Moderate physical activity (%)	304(76.0)	295(74.1)	599(75.1)	0.540
Frequency of doing light physical activity (median, Q1-Q3)*	2(1-5)	2(1-4)	2(1-5)	0.576
Vigorous physical activity (%)	317(79.3)	286(71.9)	603(75.6)	0.015
Frequency of doing light physical activity (median, Q1-Q3)*	2(1-4)	2(1-5)	2(1-4)	0.734
Physical activity by type				
Aerobics (%)	249(62.3)	240(60.3)	489(61.3)	0.752
Frequency of doing aerobics (median, Q1-Q3)*	2(1-6)	2(1-5)	2(1-6)	0.389
Muscle-strengthening (%)	259(64.8)	244(61.3)	503(63.0)	0.201
Frequency of doing muscle-strengthening (median, Q1-Q3)*	1(1-2)	1(1-1)	1(1-2)	0.163
Bone-strengthening (%)	140(35.0)	149(37.4)	289(36.2)	0.772
Frequency of doing bone-strengthening (median, Q1-Q3)*	1(1-2)	1(1-2)	1(1-2)	0.665
Frequency of exercise in a week				0.512
• Never	39(9.8)	34(8.5)	73(9.1)	
• <3 days a week	248(62.0)	262(65.8)	510(63.9)	
• 3 to 6 days a week	82(20.5)	68(17.1)	150(18.8)	
• Every day	30(7.5)	34(8.5)	64(8.0)	
Frequency of exercise in a day, (median, Q1-Q3)*	1(1-1)	1(1-1)	1(1-1)	0.642
Average time for each exercise				0.625
• Not used to it	7(1.8)	3(0.8)	10(1.3)	
• Too lazy to do it	8(2.0)	6(1.5)	14(1.8)	
• No one told me to do so	6(1.5)	9(2.3)	15(1.9)	
• No time	1(0.3)	0(0.0)	1(0.1)	
• No friends/family to go with	5(1.3)	5(1.3)	10(1.3)	
• No venues/tools to do exercise	0(0.0)	0(0.0)	0(0.0)	
Main activity during class breaks at school				0.012
• Buying drinks/food at the school canteen	140(35.0)	137(34.4)	277(34.7)	
• Play ball/basketball/chase with friends	124(31.0)	137(34.4)	261(32.7)	
• Sitting alone/with friends, chatting	114(28.5)	88(22.1)	202(25.3)	
• Doing schoolwork	7(1.8)	3(0.8)	10(1.3)	
• Viewing cell phone	1(0.3)	2(0.5)	3(0.4)	
Ways to go to school				0.077
• Get a motorcycle/car ride	272(68.0)	273(68.6)	545(68.3)	
• Walking	65(16.3)	46(11.6)	111(13.9)	
• Ride a bike	44(11.0)	64(16.1)	108(13.5)	
• Take public transportation	2(0.5)	4(1.0)	6(0.8)	
Type of participation in extracurricular at school				
• Scout	206(51.5)	252(63.3)	458(57.4)	0.002
• Sports	87(21.8)	77(19.3)	164(20.6)	0.401
• Arts	91(22.8)	54(13.6)	145(18.2)	0.001
• Science club	16(4.0)	8(2.0)	24(3.0)	0.628
• Language	11(2.8)	12(3.0)	23(2.9)	0.823
• Flag hoisting troop (<i>paskibraka</i>)	7(1.8)	5(1.3)	12(1.5)	0.311
Ownership of cell phone				0.389
• Yes, share it with sibling	155(38.8)	141(35.4)	296(37.1)	
• Yes, for my own use	216(54.0)	219(55.0)	435(54.5)	
• No	29(7.3)	38(9.5)	67(8.4)	

* Number of respondents based on those who answer 'yes' to the previous related question.

p<0.05 indicates significant differences between intervention and control schools.

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SEDENTARY ACTIVITY

The amount of sedentary activity did not significantly differ between intervention and control groups (**Table 3.7.10**). Most students slept eight to nine hours per night. Regarding

specific sedentary activities, students spent on average around five hours a day studying at school (excluding time for class breaks and lunch breaks), one hour a day using cell phones or laptops for recreational activities, one hour a day watching TV, and another hour studying at home.

Table 3.7.10 Sedentary activity of students by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Duration of sleep a day				
• <8 hours a day	38(9.5)	44(11.1)	82(10.3)	0.747
• 8 to 9 hours a day	243(60.8)	252(63.3)	495(62.0)	
• 10 hours a day	76(19.0)	66(16.6)	142(17.8)	
• >10 hours a day	42(10.5)	35(8.8)	77(9.6)	
Time spent on sedentary activities				
• Study at school (hours, rounded up)	5 (5-6)	5 (5-6)	5 (5-6)	0.813
• Using a cell phone/laptop/ computer for playing games and entertainment	60(30-120)	60(30-120)	60(30-120)	0.464
• Watching TV	60(30-120)	60(30-120)	60(30-120)	0.734
• Study at home	60(30-90)	60(30-120)	60(30-120)	0.179
Total time spent on sedentary activities (hours)	8.5 (7.3-10.3)	9 (7.5-10.4)	8.7 (7.5-10.3)	0.280

p<0.05 indicates significant differences between intervention and control schools.



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The data revealed that 61.7 per cent of students had their body weight measured in the last six months, while 49.7 per cent had their height measured within the same timeframe (**Table 3.7.11**). For weight measurement, these proportions were significantly higher among students in the intervention schools (66.3 per cent) compared to those in the control schools (57 per cent). The primary location for measuring body weight (49 per cent) and height (64.5 per cent) was at school, although some students had measurements conducted at

healthcare facilities (e.g., doctor's clinics, health centres, hospitals) or sports clubs. Despite the prevalence of body weight and height measurements, it is noteworthy that about 72 per cent of these students were aware of their results. Although the proportion of students who had received body weight and height assessments in the past six months was relatively low (50 to 60 per cent), it is encouraging to note that the majority (72 per cent) of those assessed were informed about their assessment results. Based on our experience – although this was not formally studied – students were often not informed about their weight and height measurements after the assessment.

Table 3.7.11 Routine body weight and height measurements of students by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Students' body weight was measured in the past 6 months	265(66.3)	227(57.0)	492(61.7)	0.007
Location of body weight measurement in the last 6 months	n=265	n=227	n=492	0.140
• At school	135(50.9)	106(46.7)	241(49.0)	
• At home	51(19.2)	53(23.3)	104(21.1)	
• At school and at home	7(2.6)	6(2.6)	13(2.6)	
• Other (please specify)	66(24.9)	64(28.4)	133(27.3)	
Students' height was measured in the past 6 months	213(53.3)	184(46.2)	397(49.7)	0.091
Location of height measurement in the last 6 months	n=213	n=184	n=397	0.017
• 1. At school	149(69.9)	107(58.2)	256(64.5)	
• 2. At home	26(12.2)	29(15.8)	55(13.9)	
• 3. At school and at home	1(.4)	5(2.7)	6(1.5)	
• 4. Other	38(17.8)	43(23.3)	81(21.1)	
Students knew results of their body weight and height measurement	n=265 187(70.6)	n=227 171(75.3)	n=492 358(72.8)	0.002

p<0.05 indicates significant differences between intervention and control schools.

3.8 PARENTS' KNOWLEDGE OF BALANCED NUTRITION

There was no significant difference in parents' knowledge of balanced nutrition between intervention and control schools (**Table 3.8.1**). Out of the five questions asked, parents' knowledge was particularly good on the topic of energy content in packaged sweet drinks, with 90.5 per cent of parents correctly identifying that packaged tea contains energy from sugar. Another

well-understood topic was dietary diversity, with 81.3 per cent of parents correctly answering that vegetables and fruits need to be consumed in sufficient quantities and cannot replace one another. However, parents' knowledge on obesity, including how to prevent it and its impacts, was lacking. Less than 25 per cent of parents answered obesity-related questions correctly.

Table 3.8.1 Parents' knowledge of balanced nutrition by treatment group

NO	KNOWLEDGE	CORRECT ANSWER	PARENTS WITH CORRECT ANSWER (N, %)			
			INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
1.	A child whose parents are not obese will have no risk of overweight/ obesity	False	181(45.3)	174(43.7)	355(44.5)	0.663
2.	Reduced quality of life is one impact of obesity	True	82(20.5)	86(21.6)	168(21.1)	0.701
3.	The key to preventing obesity is having a balanced intake and expenditure of energy	True	83(20.8)	104(26.1)	187(23.4)	0.073
4.	If a child does not like vegetables, we can replace it with fruits because they have similar nutrient content	False	322(80.5)	327(82.2)	649(81.3)	0.547
5.	In general, packaged tea does not contain energy	False	360(90.0)	362(91.0)	722(90.5)	0.646

p<0.05 indicates significant differences between intervention and control schools.

3.9 PARENTS' ATTITUDES REGARDING BALANCED NUTRITION

In general, parents in intervention and control schools had similar attitudes regarding balanced nutrition (**Table 3.9.1**), with one exception: a higher percentage of parents in intervention schools did not find it difficult to ask their children to eat breakfast with a complete menu every day, compared to parents in control schools (66 vs. 59 per cent). Of the 10 attitude statements evaluated,

five require special attention because less than half of parents had favourable attitudes. These included parents' perceptions of their ability to regulate their children's eating habits (such as snack consumption and vegetable and fruit intake) and exercise habits, as well as the perceived seriousness of the impact of overweight/obesity on elementary school children.

Table 3.9.1 Parents' attitudes regarding balanced nutrition, by treatment group

NO	KNOWLEDGE	CORRECT ANSWER	PARENTS WITH FAVOURABLE ATTITUDE (N, %)			
			INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
1.	It is not difficult for me to prepare breakfast for my child every day with a complete meal (rice, side dishes, vegetables)	Agree	292(73.0)	281(70.6)	573(71.8)	0.452
2.	It is not difficult for me to ask my child to have breakfast every day with a complete meal (rice, side dishes, vegetables)	Agree	264(66.0)	235(59.0)	499(62.5)	0.042
3.	It is not difficult for me to regulate my child's snack habits (frequency of snacks and types of food/drinks purchased)	Agree	206(51.5)	188(47.2)	394(49.4)	0.228
4.	It is not difficult for me to get my child to eat vegetables at every meal	Agree	189(47.3)	181(45.5)	370(46.4)	0.616
5.	It is not difficult for me to get my child to eat fruit twice every day	Agree	188(47.0)	192(48.2)	380(47.6)	0.726
6.	It is not difficult for me to get my child to exercise at least 3 to 5 days a week	Agree	156(39.0)	151(37.9)	307(38.5)	0.758
7.	Obesity among elementary school children is a nutrition issue	Agree	299(74.8)	275(69.1)	574(71.9)	0.075
8.	How likely do you think your child is to become overweight/obese	Likely	345(86.3)	337(84.7)	682(85.5)	0.528
9.	How serious do you think the impact of obesity on elementary school children is	Serious	137(34.3)	125(31.4)	262(32.8)	0.393
10.	Obesity is preventable	Agree	220(55.0)	208(52.3)	428(53.6)	0.438

p<0.05 indicates significant differences between intervention and control schools.

3.10 PARENTS' PRACTICES RELATED TO BALANCED NUTRITION

Statistical analysis revealed no significant differences in balanced nutritional practices among parents in intervention and control schools (**Table 3.10.1**). Most parents (47.9 per cent) provided food by cooking at home, and most (59.3 per cent) had not purchased food via online applications in the past week. The most frequently used sources of information on nutrition and health were the internet and social media (49.5 per cent). Healthy food availability at home was reported as 'always' for vegetables (58 per cent) and 'sometimes' for fruit (49.9 per cent). For unhealthy foods/drinks,

most parents reported availability as 'sometimes' for fried foods (41.1 per cent), sweet drinks (36.2 per cent), sweet snacks (46.4 per cent), and salty snacks (43.3 per cent). For instant noodles, most parents indicated 'rarely' (44.5 per cent) or 'sometimes' (35.6 per cent). The top nutritional concerns identified by parents included a lack of vegetable consumption (45 per cent), frequent consumption of sweet foods and drinks (12.8 per cent), and children's habit of skipping breakfast (10.4 per cent). Only 3.4 per cent of parents reported concern about overweight/obesity.

Table 3.10.1 Parents' practices related to balanced nutrition by treatment group

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Source of foods in the household				0.405
Cook at home*	180(45.0)	202(50.8)	382(47.9)	
Cook at home (main meal), buy (snacks)	176(44.0)	154(38.7)	330(41.4)	
Purchase (main meal and snacks)	11(2.8)	12(3.0)	23(2.9)	
Frequency of buying ready-made food online last week				0.642
Almost every day (5 to 7 days)	4(1.0)	6(1.5)	10(1.3)	
Occasionally (1 to 4 days)*	135(33.8)	119(29.9)	254(31.8)	
Never	231(57.8)	242(60.8)	473(59.3)	
Availability of vegetables in the house during the last week				0.573
Always*	237(59.3)	226(56.8)	463(58.0)	
Sometimes	99(24.8)	99(24.9)	198(24.8)	
Rarely	21(5.3)	16(4.0)	37(4.6)	
Never	2(5)	3(8)	5(6)	
Availability of fruits in the house during the last week				0.308
Always*	97(24.3)	94(23.6)	191(23.9)	
Sometimes	205(51.3)	193(48.5)	398(49.9)	
Rarely	45(11.3)	54(13.6)	99(12.4)	
Never	7(1.8)	2(5)	9(1.1)	
Availability of fried foods in the house during the last week				0.092
Always	53(13.3)	71(17.8)	124(15.5)	
Sometimes	179(44.8)	149(37.4)	328(41.1)	
Rarely	115(28.8)	119(29.9)	234(29.3)	
Never*	7(1.8)	3(8)	10(1.3)	
Availability of sugary drinks in the house during the last week				0.504
Always	115(28.8)	111(27.9)	226(28.3)	
Sometimes	141(35.3)	148(37.2)	289(36.2)	
Rarely	89(22.3)	72(18.1)	161(20.2)	
Never*	7(1.8)	10(2.5)	17(2.1)	

VARIABLES	INTERVENTION (N=400)	CONTROL (N=398)	TOTAL (N=798)	P-VALUE
Availability of sweet snacks in the house during the last week				0.601
Always	45(11.3)	38(9.5)	83(10.4)	
Sometimes	189(47.3)	181(45.5)	370(46.4)	
Rarely	116(29.0)	114(28.6)	230(28.8)	
Never*	8(2.0)	11(2.8)	19(2.4)	
Availability of salty snacks in the house during the last week				0.344
Always	36(9.0)	28(7.0)	64(8.0)	
Sometimes	177(44.3)	169(42.5)	346(43.4)	
Rarely	125(31.3)	128(32.2)	253(31.7)	
Never*	20(5.0)	15(3.8)	35(4.4)	
Availability of instant noodles in the house during the last week				0.418
Always	20(5.0)	12(3.0)	32(4.0)	
Sometimes	141(35.3)	143(35.9)	284(35.6)	
Rarely	182(45.5)	173(43.5)	355(44.5)	
Never*	13(3.3)	13(3.3)	26(3.3)	
Source of nutritional and health information mostly used by parents				0.191
Internet (including social media)	196(49.0)	199(50.0)	395(49.5)	
From health workers	96(24.0)	91(22.9)	187(23.4)	
Family/friends	57(14.3)	39(9.8)	96(12.0)	
Television	13(3.3)	19(4.8)	32(4.0)	
Other (specify)	1(3)	4(1.0)	5(6)	
Child's nutritional practices/conditions that are of concern to parents (based on two preferred answers)	(n=800)	(n=796)	(n=1596)	0.512
Don't eat enough vegetables	187 (23.4)	172(21.6)	359(22.5)	
Don't eat enough fruit	39 (4.9)	40 (5.0)	79 (4.9)	
Often skip breakfast	77 (9.6)	94 (11.8)	171(10.7)	
Frequently consume sweet drinks/food	107 (13.4)	107(13.4)	214(13.4)	
Often eat salty foods	55 (6.9)	62 (7.8)	117 (7.3)	
Don't want to/rarely does physical activity	55 (6.9)	68 (8.5)	123 (7.7)	
Underweight	97 (12.1)	77 (9.7)	174(10.9)	
Overweight	28 (3.5)	27 (3.4)	55 (3.4)	
Other	18 (2.3)	25 (3.1)	43 (2.7)	

* Correct answer (note: some questions may not have correct answer as they are for descriptive information purposes only).
p<0.05 indicates significant differences between intervention and control schools.

3.11 BIVARIATE AND MULTIVARIATE ANALYSIS

Table 3.11.1 shows the association between students' knowledge and attitude levels and their practice levels concerning balanced nutrition. The data reveal that students' knowledge and attitudes are significantly associated with their practices. Notably, poor practices were significantly more

prevalent among students with poor knowledge compared to those with good knowledge (76.3 vs. 60 per cent, respectively). Similarly, poor practices were significantly more common among students with poor attitudes compared to those with good attitudes (79.6 vs. 61 per cent, respectively).

Table 3.11.1 Students' knowledge and attitude levels associated with practice level

		STUDENTS' PRACTICE LEVEL						P-VALUE
		POOR		MEDIUM		GOOD		
		n	%	n	%	n	%	
Students' knowledge level	Poor	390	76.3%	114	22.3%	7	1.4%	0.004
	Medium	167	65.0%	80	31.1%	10	3.9%	
	Good	18	60.0%	11	36.7%	1	3.3%	
Students' attitude level	Poor	211	79.6%	52	19.6%	2	0.8%	<0.001
	Medium	264	71.5%	97	26.3%	8	2.2%	
	Good	100	61.0%	56	34.1%	8	4.9%	

p<0.05 indicates significant differences between intervention and control schools.

Similarly, parents' knowledge and attitude were significantly associated with their practices. Good practices were significantly more common among parents with good knowledge compared to those with

poor knowledge (72.5 vs 58.8 per cent, respectively) and among those with good attitudes compared to those with poor attitudes (72.5 vs 58.7 per cent, respectively).

Table 3.11.2 Parents' knowledge and attitude levels associated with students' practice level

		PARENTS' PRACTICE LEVEL						P-VALUE
		POOR		MEDIUM		GOOD		
		n	%	n	%	n	%	
Parents' knowledge level	Poor	10	2.6%	150	38.7%	228	58.8%	0.004
	Medium	8	3.4%	63	27.2%	161	69.4%	
	Good	6	3.4%	43	24.2%	129	72.5%	
Parents' attitude level	Poor	13	3.7%	131	37.5%	205	58.7%	0.017
	Medium	8	3.1%	76	29.2%	176	67.7%	
		3	1.6%	49	25.9%	137	72.5%	

p<0.05 indicates significant differences between intervention and control schools.

Table **3.11.3** illustrates the results of both bivariate and multivariate analyses conducted to identify factors significantly associated with the nutritional status of students, categorized into two groups: (i) not overweight/obese; and (ii) overweight/obese. The 'not overweight/obese' group includes students with normal nutritional status (59.6 per cent), those classified as thin (9.6 per cent), and very thin (2.3 per cent). In the bivariate analysis, 19 variables across four groups were examined for their relationship with students' nutritional status. The four groups include demographic characteristics of students (four variables), household socio-demographic characteristics (nine variables), student KAP variables (three variables), and parental KAP variables (three variables).

Of the 19 variables examined, eight demonstrated a p-value of less than 0.25, warranting their inclusion in the multivariate analysis. These eight variables (and related assumption for inclusion) were:

1.	The amount of pocket money students received (higher allowances correlated with a higher prevalence of overweight/obesity).
2.	The educational attainment of fathers (parents with higher education levels tend to have children with a higher prevalence of overweight/obesity).
3.	The educational attainment of mothers (as above).
4.	The employment status of mothers (working mothers tend to have children with a higher prevalence of overweight/obesity).
5.	The economic status of the family (students from higher economic backgrounds tend to exhibit a greater prevalence of overweight/obesity);
6.	The dietary practices of students (poor dietary habits correlate with a higher prevalence of overweight/obesity).
7.	Parental attitudes towards nutrition (parents with more supportive attitudes tend to have children with a higher prevalence of overweight/obesity).
8.	The dietary practices of parents (parents with better dietary habits tend to have children with a higher prevalence of overweight/obesity).

The eight variables were not significantly correlated, except for the education levels of mothers and fathers. In the multivariate logistic regression analysis, the father's education level was not included in the final model because it was no longer significant. This suggests

that the mother's education is a more dominant risk factor for obesity in children than the father's education. These eight variables were further examined through multivariate analysis, to check whether they had any significant association with the nutritional status of students when considered simultaneously.

Five factors demonstrated significant associations with the risk of students being overweight or obese:

1.	The educational level of the mother.
2.	The employment status of the mother.
3.	The economic status of the family.
4.	The dietary practices of students.
5.	Parental attitudes towards balanced nutrition.

Mothers with a higher level of education had a 1.8-fold increased likelihood of having children classified as overweight or obese, compared to mothers with lower educational attainment. Similarly, maternal employment status showed a parallel risk, with employed mothers displaying a 1.8-fold higher likelihood of having overweight or obese children compared to non-working mothers. Higher maternal education and employment are often linked with better socio-economic conditions, including food security. However, as the multivariate analysis already controls for socio-economic status, the significance of the link between maternal education and employment, and childhood overweight/obesity risk, suggests that these factors influence the risk through pathways other than socioeconomic status. While the exact pathway behind this relationship cannot be determined by this study, findings from FGDs revealed that working mothers, particularly those in occupations requiring them to leave home early, faced challenges in preparing food for their children, leading them to provide pocket money instead. This may have contributed to children purchasing less healthy foods at school, including those high in sugar, salt, and fat.

Moreover, children from families with better economic status had a 1.6-fold heightened risk of being overweight or obese, compared to those from lower socio-economic backgrounds. Students adhering to good balanced nutrition practices (with practice scores equal to or exceeding 80 per cent) and those with moderate practices (scoring between 60 and 79 per cent) exhibited a 60 per cent and 40 per cent reduced risk of overweight or obesity, respectively, compared to students with poor balanced nutrition practices.

Divergent outcomes were apparent regarding parental attitudes towards balanced nutrition and the risk of childhood overweight or obesity. Parents who displayed very supportive and moderately supportive attitudes were found to have a 2.2-fold and 1.5-fold higher risk, respectively, of having overweight or obese children. One possible explanation for this contradictory association is that parents whose children are overweight or obese may exhibit greater concern or awareness about the issue, leading to

more positive attitudes. This hypothesis finds support in the data, which indicates that parents with overweight or obese children hold significantly more favourable attitudes towards statements related to overweight or obesity, compared to parents with non-overweight or obese children. Although not statistically significant, parents with overweight or obese children tend to exhibit more favourable attitudes towards other statements related to overweight or obesity, such as its preventability.

Table 3.11.3 Associated factors linked to students' nutritional status

VARIABLES	NOT OVERWEIGHT- OBESE (N=571)	OVERWEIGHT- OBESITY (N=227)	P-VALUE BIVARIATE	P-VALUE REGRESSION	ADJUSTED OR (CI 95%)
STUDENTS' CHARACTERISTICS					
Gender					
Male	285 (69.9)	123 (30.1)	0.276		
Female	286 (73.3)	104 (26.7)			
Pocket money per day					
Lower	238 (74.4)	82 (25.6)	0.111	0.240	
Medium	115 (74.2)	40 (25.8)			
Higher	218 (67.5)	105 (32.5)			
Use of social media					
Don't have	299 (72.2)	115 (27.8)	463(58.0)		
Have minimum 1 account	272 (70.8)	112 (29.2)	198(24.8)		
Frequency of exercise					
Never	52 (69.9)	22 (30.1)	0.883		
<3 days a week	371 (72.7)	139 (27.3)			
3 to 6 days a week	104 (69.3)	46 (30.7)			
Every day	44 (68.8)	20 (31.3)			
District/city					
City	279 (70.1)	119 (29.9)	0.364		
District	292 (73.0)	108 (27.0)			
HOUSEHOLD CHARACTERISTICS					
Age (years) of father					
< 40 years old	191 (71.5)	76 (28.5)	0.994		
> 40 years old	380 (71.6)	151 (28.4)			
Age (years) of mother					
< 40 years old	324 (70.7)	134 (29.3)	0.555		
> 40 years old	247 (72.6)	93 (27.4)			
Education of father					
Lower	193 (77.8)	55 (22.2)	0.039	0.706	
Medium	208 (69.6)	91 (30.4)			
High	137 (68.2)	64 (31.8)			
Education of mother					
Lower	189 (79.4)	49 (20.6)	0.002	0.012	Ref
Medium	216 (70.8)	89 (29.2)			1.7 (1.2-2.7)
High	143 (65.0)	77 (35.0)			1.8 (1.1-2.9)

VARIABLES	NOT OVERWEIGHT- OBESE (N=571)	OVERWEIGHT- OBESITY (N=227)	P-VALUE BIVARIATE	P-VALUE REGRESSION	ADJUSTED OR (CI 95%)
Occupation of father					
Not working	72 (69.2)	32 (30.8)	0.573		
Working	499 (71.9)	195 (28.1)			
Occupation of mother					
Not working	249 (77.3)	73 (22.7)	0.003	0.001	Ref
Working	322 (67.6)	154 (32.4)			1.8 (1.3-2.6)
Number of household members					
< 4	275 (70.7)	114 (29.3)	0.600		
> 4	296 (72.4)	113 (27.6)			
Socio-economic status of household					
Highest tertile	206 (77.4)	60 (22.6)	0.024	0.042	1.6 (1.1-2.6)
Medium tertile	195 (70.1)	83 (29.9)			1.5 (1.0-2.3)
Lowest tertile	170 (66.9)	84 (33.1)			Ref
Household food security status					
Food secure	438 (71.0)	179 (29.0)	0.746		
Mildly food insecure	62 (72.9)	23 (27.1)			
Moderately food insecure	38 (70.4)	16 (29.6)			
Severely food insecure	33 (78.6)	9 (21.4)			
HOUSEHOLD CHARACTERISTICS					
Students' knowledge					
Good > 80%	21 (70.0)	9 (30.0)	0.481		
Medium 60-79%	177 (68.9)	80 (31.1)			
Poor < 60%	373 (73.0)	138 (27.0)			
Students' attitude					
Good > 80%	114 (69.5)	50 (30.5)	0.700		
Medium 60-79%	269 (72.9)	100 (27.1)			
Poor < 60%	188 (70.9)	77 (29.1)			
Students' practices related to balanced nutrition					
Good > 80%	14 (77.8)	4 (22.2)	0.135	0.05	0.4 (0.1-1.5)
Medium 60-79%	157 (76.6)	48 (23.4)			0.6 (0.4-0.9)
Poor < 60%	400 (69.6)	175 (30.4)			Ref
PARENTS' KAP RELATED TO BALANCED NUTRITION					
Parents' knowledge					
Good > 80%	131 (73.6)	47 (26.4)	0.767		
Medium 60-79%	166 (71.6)	66 (28.4)			
Poor < 60%	274 (70.6)	114 (29.4)			
Parents' attitude					
Good > 80%	120 (63.5)	69 (36.5)	0.003	0.001	2.2 (1.4-3.3)
Medium 60-79%	182 (70.0)	78 (30.0)			1.5 (1.0-2.2)
Poor < 60%	269 (77.1)	80 (22.9)			Ref
Parents' practice					
Good > 80%	363 (70.1)	155 (29.9)	0.147	0.310	
Medium 60-79%	187 (73.0)	69 (27.0)			
Poor < 60%	21 (87.5)	3 (12.5)			





4. RESULTS – Qualitative findings

General characteristics of respondents

The respondents comprised various stakeholders involved in the UKS/M programme including teachers, school committee members, school canteen managers, TP UKS/M representatives at district and city levels,

UKS/M coordinators, and nutritionists at puskesmas. These stakeholders participated in FGDs and in-depth interviews (IDIs) as outlined in the qualitative methodology section.



1. UKS/M teachers:

Among the 40 surveyed schools, 39 UKS/M teachers participated in the FGDs, including 22 females and 17 males. Most of them held positions as physical education teachers and homeroom teachers.



2. School committee members:

Representatives from 38 out of 40 surveyed schools took part in the FGDs (nine males and 29 females). Half of them identified as housewives, while others were teachers and private employees.



3. School canteen managers:

Nearly all school canteen managers were female (30 out of 39 participants). More than half of them also served as teachers, while some were members of the school cooperative or worked as school helpers/cleaners.



4. TP UKS/M at district/city level:

More than half of TP UKS/M members were female. The 20 TP UKS/M members represented various agencies such as the Regional Development Planning Agency (Bappeda), Department of Education, Department of Health, and Ministry of Religious Affairs. District government representatives were present in Semarang and Kudus districts, while representatives from the Indonesian FDA (BPOM) attended from Surakarta and Semarang (representing Semarang city and the districts of Kudus and Tegal).



5. UKS/M coordinator at puskesmas:

27 individuals (18 females and nine males) participated in the key informant interviews conducted in the four study areas. Nearly half of them served as UKS/M coordinators at puskesmas, with roles such as dental nurses and midwives. Other informants included nutritionists, environmental health workers, and health promotion officers.



4.1 KAP ON BALANCED NUTRITION AND OBESITY PREVENTION AMONG SCHOOL COMMUNITY

Key findings

1. Most UKS/M teachers and school committee members understood the importance of consuming a diverse range of foods. However, some still adhered to the former slogan '*4 Sehat, 5 Sempurna*', and lacked awareness of the additional dimensions of balanced nutrition such as physical activity and weight management.
2. Overall, UKS/M teachers and school committees recognized that overweight and obesity in school-age children stem from dietary patterns and physical activity levels, citing factors such as unhealthy eating habits and sedentary behaviour.
3. Puskesmas, in collaboration with schools, have regularly conducted health screening activities. All school communities noted that cases of obesity among school-age children were not common across all four study areas. However, instances of undernutrition among students were still observed, albeit with low prevalence.
4. School stakeholders perceived no significant differences in the nutritional status of male and female students, and between students with and without disabilities.
5. Skipping breakfast, limited dietary diversity, and unhealthy snacking habits were the main concerns of school communities.] Physical activity levels among school children were not identified as a significant concern.
6. Two key challenges to balanced nutrition practices at home were children's food preferences and parenting style.
7. The main sources of information on balanced nutrition among the UKS/M teachers and UKS/M coordinators at puskesmas were the internet and social media. Training and seminars/webinars were identified as preferable resources by the UKS/M coordinator. Educational materials on nutrition for school children mainly focus on balanced nutrition or general topics, with no specific information about obesity.
8. The topic of obesity was not necessarily highlighted in the training received by UKS/M teachers or the UKS/M coordinator at puskesmas. Moreover, there was still a lack of regular training in all four study areas regarding the UKS/M programme and the nutrition of school-age children.

Knowledge of balanced nutrition and obesity

Most UKS/M teachers and school committee members exhibited a similar level of understanding regarding balanced nutrition. They grasped the importance of consuming a diverse range of foods encompassing various food groups (staples as carbohydrate sources, vegetables and fruits as vitamin and mineral sources, and animal and plant protein sources), and recognized the significance of portion control.

However, a few still adhered to the former slogan '4 Sehat, 5 Sempurna'³ when conceptualising balanced nutrition.

"Consumption of four healthy, five perfect foods, including fruits and vegetables."

– UKS/M teacher, control school, Kudus district

Notably, not all were acquainted with additional dimensions of balanced nutrition, such as the importance of physical activity, personal hygiene, and sanitation (PHBS), and weight management. Only a few UKS/M teachers in Surakarta City and school committee members in Tegal District mentioned other aspects of balanced nutrition, such as physical activity, in addition to diverse diets.

"In the past, we were familiar with the concept of 'four is healthy, five is perfect'. Nowadays, [the concept] is different, resembling a pyramid. A balanced diet should include various food groups containing essential nutrients such as carbohydrates, protein, minerals, vitamins, and additionally, water. The intake and expenditure of these nutrients in the body should be balanced, meaning our activities should align with our dietary intake to maintain balance."

– School committee member, intervention school in Tegal District.

Regarding obesity, both UKS/M teachers and school committee members agreed that the causes of overweight and obesity were related to dietary patterns and physical activity. Unhealthy eating habits, such as excessive consumption of sweet drinks, sweet or high-sugar foods, high-carbohydrate foods, and salty foods high in fat and preservatives, were cited as factors

that can lead to overweight and obesity in school-age children. Additionally, insufficient physical activity and sedentary behaviour, such as lack of exercise, being inactive, and excessive phone use, were mentioned as factors contributing to overweight and obesity in school-age children.

During discussions with UKS/M teachers in Semarang City, it was mentioned that not only high-sugar, salt, and fat (SSF) foods can cause obesity, but also habits such as skipping breakfast, which can result in more frequent snacking. Additionally, discussions with school committee members in Semarang City and Tegal District highlighted that genetic factors also played a role in the occurrence of obesity in children. School committee members in Surakarta City said that eating dinner close to bedtime and changes in eating habits during the pandemic were other factors contributing to obesity in school-age children.

"Nowadays, kids consume a lot of those big portions of sweet tea, which means they're getting more calories. Hmm. So, when they come home from school, sometimes they'll ask their moms, 'Mom, buy me that tea!' Because it's sweet."

– UKS/M teacher, control school, Semarang City

"As for the food, it's all sweet and fried, like doughnuts. The doughnuts are fried and then coated with sweet white powdered sugar. There's also martabak, and what else? Cilok, cilok, all sorts of fried snacks like that."

– UKS/M teacher, intervention school, Semarang City

"Because there's no control over food consumption, sometimes coupled with a lack of physical activity. After eating, for instance, children might just lie down and relax, as sometimes their parents don't enforce rules. Moreover, children rarely engage in physical movement, spending a lot of time on their phones."

– UKS/M teacher, intervention school, Tegal district

³The slogan '4 is healthy, 5 is perfect' refers to four essential food groups (staple foods, protein-rich foods, fruit, and vegetables) and one recommended group (milk and milk products). Originating from Indonesian health promotion efforts in the 1950s, it has since been replaced by the 'balanced nutrition' (gizi seimbang) concept but remains memorable and is frequently cited in communities across the country.

PERCEIVED CAUSES OF OBESITY IN SCHOOL-AGE CHILDREN, BY SCHOOL COMMUNITIES

DIETARY PATTERN-RELATED	PHYSICAL ACTIVITY-RELATED	OTHER
Excessive consumption of: - Sweet drinks (teas, packaged powdered drinks, milk) - Sweet foods (candies, chocolate) - High-carbohydrate foods (fritters, fried doughnut with sugar, double carbohydrate meals (e.g., noodles with rice) - Salty foods high in fat and preservatives (noodles, fast-food, sausages, deep fried foods, salty snacks/<i>chiki/cilok</i>)	- Insufficient physical activity - Lack of exercise - Sedentary behaviour - Excessive phone use	- Skipping breakfast - Genetic predisposition - Mealtimes (e.g., eating dinner close to bedtime) - Changes in eating habits during the COVID-19 pandemic - Side effects of medical treatment

Perceptions on children's health and nutritional problems

Schools and puskesmas reported regularly conducting health screening activities. These screenings involve collaboration between the puskesmas, represented by the nutritionist (TPG) and UKS/M coordinator, and the schools. Students are gathered in one location for anthropometric measurements, which are taken by the nutritionist. Subsequently, general health screenings are conducted using forms provided by the UKS/M team. These screenings include eye examinations, assessments for colour blindness, earwax checks, hair and skin evaluations, mental health assessments that focus on communication skills, and dental and oral health examinations.

During these screenings, weight and height measurements are taken to assess the students' nutritional status. Overall, school stakeholders noted that cases of obesity among school-aged children in their area were not very common. Most respondents perceived relatively low obesity rates, with only

"Health screening from the health centre is always conducted in all schools at the beginning of the new academic year. The nutritional status issues include underweight, obesity (one to two students per school), dental caries, and students getting injured or ill at school."

– UKS/M teacher, intervention school, Surakarta City

one or two children in each school classified as obese based on BMI-for-age indicators. However, undernutrition among students was still observed, albeit with low prevalence. Anaemia screening was not routinely performed on elementary school children unless they exhibited clinical symptoms.

"Based on the nutritional status results (weight and height), the average tends to indicate normal, with some tending towards underweight. The prevalence of obesity exists but is not very high, and there is no significant increase in prevalence (the obesity data remains relatively stable each year, with minor fluctuations). The incidence of undernutrition tends to be higher than obesity."

– UKS/M coordinator, puskesmas, Semarang City

Discussions with puskesmas staff in Kudus revealed some variations in practices. One staff member mentioned that several schools independently conduct measurements and determine the nutritional status of students. The puskesmas received this data from the schools. Before conducting the 'School Children Immunization Month' (BIAS – Bulan Imunisasi Anak Sekolah), UKS/M teachers were briefed during annual coordination meetings on how to assess the nutritional status of school-age children.

“If the health screening is for new students, then it is conducted by puskesmas staff. We check personal hygiene, dental health, and ear cleanliness. For height and weight measurements, we leave it to the school to conduct weighing, assuming that since it's part of the annual programme, they are capable of handling it.”

– UKS/M coordinator, puskesmas, Kudus district

Interviews with puskesmas staff in Semarang City highlighted that students' nutritional status results were consistently reported to the schools. The puskesmas used Excel files, which automatically calculated and displayed the nutritional status results based on weight and height measurements. Consequently, schools were informed about students with nutritional issues, and comprehensive records of the nutritional status of all measured students were maintained. The puskesmas promptly requested signatures from school representatives after the health screenings, and in some cases, schools generated copies of the screening results for their records.

Additionally, puskesmas staff in Surakarta City mentioned that screening data for elementary school children involved anthropometric measurements using a BMI calculator, with results being immediately accessible on-site. These results were documented in a 'student Health Report Book' obtained from the district health office. Each student was required to bring their Health Report Book during the health screening sessions, as it was filled out by the puskesmas staff.

“If we use anthropometric tables, it's quite challenging, especially in the field. So, we use a BMI calculator specifically designed for elementary school children. We don't use standard deviations. With this calculator, we can immediately identify if a child is underweight, overweight, or obese. We don't keep records there. Usually, we record the information in the child's report book. So, during the screening or periodic check-ups, the child needs to bring their report book. We ask various questions that we then write down and compile.”

– Nutritionist, puskesmas, Surakarta City

According to puskesmas staff, the assessment revealed no significant differences in the nutritional status of male and female students or students with and without disabilities. Similarly, UKS/M teachers did not perceive disparities in the nutritional status of male and female students. However, the teachers were unable to provide precise details, since the specific results of their students' nutritional status measurements were not reported to schools by the puskesmas.

Most schools in the four areas were not designated as 'inclusive schools', meaning they did not enrol special needs students. Among the schools that were inclusive, teachers did not observe any distinctions and were uncertain about differences in the nutritional status of students with and without disabilities. This uncertainty was mainly due to the lack of detailed reports on nutritional status assessments from the puskesmas. During the visit to the puskesmas, the study team was also unable to obtain a sample of the nutritional status report from the health screening.

Regarding the nutritional status data resulting from health screenings, there were discrepancies in the information provided by the puskesmas staff and the UKS/M teachers at the schools, including:

1. Puskesmas indicated that they disseminated reports to schools in various formats, including: (i) a roster of students exhibiting malnutrition (either under- or over-nutrition); (ii) nutritional status data integrated into students' 'My Health Report' booklets; and (iii) tabulated nutritional status data provided in Excel format. However, the study team was unable to access the latest health screening reports, particularly the students' nutritional status data that resulted from the screenings.
2. Some puskesmas mentioned that they did not share the nutritional status data from health screenings with the schools and did not offer clear explanations for this omission. Additionally, there were puskesmas that assigned schools to independently conduct weight and height measurements and the calculation of student nutritional status, without assistance.. Further exploration revealed that the teachers did not necessarily receive relevant training and were not equipped with Excel tools to compute students' nutritional status from the collected data. Consequently, the schools' capacity to assess students' nutritional status and the puskesmas' oversight of data quality remained uncertain.

3. Most schools, as reported by the UKS/M teachers during the FGDs, indicated that they did not receive students' nutritional status reports from the respective puskesmas. As a result, they remained uninformed about the students' nutritional status.
4. Very few schools acknowledged receiving information about students' nutritional status, and it was typically only for students with nutritional problems. This information usually prompted schools to notify parents and encourage them to seek further treatment at health centres.

Discrepancies in information from health centres and schools highlights the need for standardized reporting and better communication between puskesmas and schools to ensure accurate and comprehensive tracking of students' nutritional status.

Perceptions of children's dietary practices

Highlights of key findings regarding the dietary practices of school children that were of concern to school communities in four study areas:

1. Skipping breakfast

Skipping breakfast is prevalent among school children in rural districts. Economic constraints faced by parents, many of whom are farmers or traders, affect their ability to provide nutritious breakfast options. When children do eat breakfast, it often lacks nutritional value as it typically consists of rice mixed with noodles, fried tempeh, and occasionally, eggs.

"Many children in rural areas don't have breakfast. Their parents are mostly farmers, but some are traders, so they're often out of the house early in the morning. Economic factors also play a role. So, their breakfast is simple, not necessarily nutritionally balanced as we recommend. Most of them have 'rames', a mixed dish with rice and noodles, sometimes without vegetables, just with fried tempeh or similar. If they have some extra money, they might add an egg."

– Nutritionist at puskesmas, Tegal district

2. Limited dietary variety

Students preferred familiar foods that they liked and avoided consuming vegetables, which resulted in a lack of dietary diversity.

"For lunch, there's a vendor who provides the meal. But it's not mandatory, so children can bring their own meals from home. There are also some catering services for schools. What's very noticeable is that children still find it very difficult to eat vegetables, even though they are available on the lunch menu. The same goes for the packed lunches brought from home. Parents intend to include vegetables in the meals they prepare, but most children tend to avoid them."

– UKS/M teacher, intervention school, Surakarta City

3. Unhealthy snacking

School canteens often offered limited healthy food options and rarely sold fruits. Some food samples in the study areas tested positive for textile dyes, indicating poor food safety practices. Common unhealthy snacks include instant noodles, sweetened beverages, and fried foods.

"We see that the snacks available to elementary school students are indeed unhealthy. They contain excessive amounts of sugar, salt, and fat. The difficulty lies mainly with the vendors, especially those outside the school. While we can provide guidance within the school premises, it's a bit challenging with vendors outside because there are more of them compared to those inside the school. [The students] prioritise snacks based on taste, filling portions, and affordable prices."

district health officer, TP UKS/M, Tegal District

4. Low physical activity

While physical activity levels among school children were not a major concern, sedentary behaviour and excessive screen time were perceived as significant issues in Semarang City.

"After classes, [the children] often play at school before heading home. Teachers are aware that perhaps their homes lack space, so they prefer the school's open areas. That's for the afternoon. In the morning, during break time, they usually run around, being active."

– UKS/M teacher, intervention school, Surakarta City

"Alhamdulillah, in my school, the children are all normal (nutritional status of the students). They engage in plenty of physical activities, and we have sports once a week. Additionally, we have life skills activities every Thursday, so, God willing, there are no issues."

UKS/M teacher, intervention school, Surakarta City

Most school communities perceived no significant disparities in dietary practices between male and female students. However, in Semarang, teachers noted that female students were more consistent in bringing packed meals from home, while male students were more physically active. In Tegal, it was observed that female students in grades 3 to 6 displayed larger body sizes, which the respondents attributed to menstruation.

Perceived challenges to implementing balanced nutrition practices at home

The points below describe the two main challenges to implementing balanced nutrition practices at home, as perceived by school committees and UKS/M teachers in the four study areas, namely (i) children's food preferences; and (ii) parenting style.

1. Children's food preferences: Children's preferences for certain food types pose a significant challenge in promoting healthy eating patterns. Observations from parents and teachers indicate that most children are reluctant to consume vegetables due to their 'bitter' taste, preferring carbohydrates and protein-rich foods. Despite efforts to provide meals that align with balanced

nutrition principles, parents struggle to persuade children to eat nutritious foods, as they tend to choose practical, familiar, and tasty options.

"Children do not like vegetables. They find it difficult to eat them because they taste bitter."

– School committee member, intervention school, Semarang City

"The difficulty lies in persuading the children, as they are often somewhat stubborn and want things their own way. They tend to believe that whatever they want to eat is what they should get. When we offer vegetables, which parents consider nutritious, the children sometimes don't like them. Even though parents prepare the best options, such as fruits and vegetables, the children prefer foods that are convenient to eat, like instant meals."

– School committee member, control school, Surakarta City

Additionally, the school committee said that children tend to skip breakfast because they prefer buying snacks at school. The food environment around the school also has an impact, particularly as many food vendors outside the school are easily accessible to children. In one of the control schools in Kudus district, it was observed that children were allowed to buy snacks outside the school during break time. This poses a challenge, as children can easily access unhealthy food options in their surroundings.

"Children rarely have breakfast and prefer buying snacks at school."

– School committee member, intervention school, Surakarta City

"Children prefer snack foods such as 'cilor' (fried flour coated with egg, served with spicy powder) and 'sostel' (fried sausage coated with egg, served with spicy powder) but find it difficult to eat vegetables."

– School committee member, control school, Surakarta City

“Outside the school, there are many food vendors selling snacks, so when children finish class, they want to buy snacks. During break time, children are also free to buy snacks outside the school.”

– School committee member, control school, Kudus district

2. Parenting style: Another challenge in implementing balanced nutrition practices at home is related to the family habit of preparing nutritious food and encouraging physical activities. Firstly, while children are asked to bring packed meals from home, these meals often consist of carbohydrates and protein, but no vegetables.

“Children are asked to bring packed meals from home, but there are often no vegetables in the meal. The meals mainly consist of carbohydrates and protein.”

– UKS/M teacher, control school, Semarang City

Secondly, busy parents tend to give pocket money to their children because they do not have time to prepare breakfast at home. This is especially common among parents with lower to middle socio-economic status such as factory workers, farmers, or sellers who start work early in the morning.

“Very busy parents usually give their children pocket money because they don't have time to prepare breakfast at home. For children who don't have the habit to have breakfast, it's usually just a few (the same ones). Breakfast habits heavily depend on the parents.”

– UKS/M teacher, control school, Semarang City

“Middle- to lower-class parents, especially those working in factories who have to leave for work as early as 5 a.m., often don't have time to prepare packed meals or healthy food.”

– UKS/M teacher, intervention school, Kudus district

Some parents caution their children against purchasing snacks outdoors, whereas others permit it. However, the alignment between lessons taught in school and behaviours at home has yet to be fully realized. Despite educators emphasising the importance of regular breakfast consumption, many parents still do not prioritise providing breakfast for their children.

“The discipline of parents to advise their children not to buy snacks outside is sometimes lacking, as there are still parents who allow their children to buy snacks outside.”

– UKS/M teacher, intervention school, Kudus district

“The consistency between what children have been taught at school and the practices at home – for example, the provision of breakfast – is still lacking in attention from parents.”

– UKS/M teacher, intervention school, Tegal district

Children's physical activity practices are also influenced by their parents' habits, as recognized by the UKS/M teachers during discussions. For example, if a father plays video games, the child is also likely to participate in this activity. Some teachers said that parents should take the initiative to engage their children in physical activities, not only in the form of exercise but also in household chores that involve movement. This was perceived as an effective way to promote an active lifestyle for children, even if it does not occur on a sports field. However, proactive engagement is rare, especially among younger parents, who tend to prefer playing games with their children rather than engaging them in physical activities.

“The father is busy playing games, and the child will follow it. So ideally, for example, in a day, for a few hours, we should take our child for a walk, engage them in activities like cleaning or washing dishes, which are also physical activities. It doesn't have to be on a sports field, but nowadays, parents like that are rare. Especially among younger fathers. They usually play games together with their children.”

– UKS/M teacher, intervention school, Tegal district

Exposure to information on balanced nutrition and obesity among school children

Most UKS/M teachers reported that they usually looked for information on the internet, particularly YouTube and social media. Another source of information was puskesmas, which teachers contacted for health education materials. Education materials at puskesmas covered balanced nutrition, oral and dental health, reproduction, and drugs, but there was no specific information regarding obesity.

"From YouTube. I also have contacts at puskesmas."

— UKS/M teacher, intervention school, Surakarta City

"If I understand correctly, the materials provided by the puskesmas usually about reproductive health, substance/drugs abuse, and dental hygiene."

— UKS/M teacher, intervention school, Surakarta city

Some teachers said they had not actively sought information because the UKS/M programmes in their schools were still in the initiation stage. Consequently, they had not yet considered seeking specific information related to nutrition and obesity prevention.

Health and nutrition information was primarily obtained by health workers at puskesmas. The main sources of information for UKS/M coordinators included: (i) Training from the District of Education Office (DEO); (ii) attending seminars/webinars, particularly on specific events such as National Nutrition Day; and when unable to attend these events, receiving materials from their fellow health workers through WhatsApp groups; and (iii) accessing the internet, such as the Ministry of Health websites for credible information, and other sources including social media. It is important to note that respondents were aware that information found online may not always be reliable, which prompted them to cross-check.

Most UKS/M coordinators at puskesmas reported that educational materials on nutrition for schoolchildren mainly focused on balanced nutrition or general topics, with no specific information about overweight/obesity.

Exposure to training on nutritional and psychological counselling and obesity prevention

In Tegal, five surveyed schools were designated as pilot schools for a UNICEF programme aimed at enhancing nutrition practices among elementary school children. As part of this initiative, these schools participated in training organized by UNICEF, which encompassed

"Yes, that was the nutrition programme training conducted by UNICEF last year. It covered topics such as nutritious foods, stunting, and the UKS TRIAS programme."

— UKS/M teacher, intervention school, Tegal district

topics such as the significance of healthy and nutritious foods, strategies to address malnutrition, and the implementation of the Three Pillars of the UKS/M programme.

In Kudus district, certain schools reported receiving training sessions on UKS/M from either puskesmas or the Health Promotion Unit of the DEO. However, the content of these sessions was varied and broad, lacking specific focus on overweight or obesity. Similarly, in Semarang, a UKS/M teacher noted that training sessions at puskesmas were primarily organized in conjunction with school health competitions or events, resulting in uneven access to training among schools. Additionally, in Surakarta, one school reported receiving training on managing a healthy canteen and providing nutritious food, which was organized by the National Agency of Drug and Food Control (BPOM) in collaboration with a local non-government organisation.

Across all four study areas, there was a notable absence of regular training for UKS/M teachers and coordinators at puskesmas that specifically addressed overweight and obesity. In Tegal, the focus of training sessions centred on addressing issues like bullying, raising awareness about sexual harassment, and educating students about reproductive health, including puberty.

4.2 REFERRAL SYSTEM OF OBESITY CASES

All UKS/M teachers unanimously confirmed the absence of a referral system for obesity cases among students. Typically, puskesmas only conduct weight and height measurements during health screening sessions, without a specific mechanism for following up on nutritional status results. The existing referral system emphasises dental and ear examinations.

"Usually, the health centre provides reports to us, which we then convey to the parents. These reports often pertain to dental health issues, such as cavities and other dental problems, as well as ear problems like earwax build-up. Consequently, nutritional status has not been a primary concern thus far. Follow-up actions usually involve scheduling check-ups at the health centre."

– UKS/M teacher, control school, Surakarta City

Interviews with UKS/M coordinators at puskesmas revealed similar information, indicating that the referral system for the nutritional status of school-aged children, particularly obesity, was not fully operational. However, some efforts were initiated by puskesmas to address obesity cases, including offering on-site education to children with under- or over-nutrition status during health screening sessions and providing schools with referral letters to enable them to independently report referrals.

In puskesmas where follow-up efforts for referral cases of children with nutritional status issues were established (such as in Tegal and Surakarta), the procedure typically included:

1. Conducting initial screenings to re-measure the students' body weight and height.
2. Recalculating nutritional status based on Ministry of Health guidance.
3. Conducting counselling sessions, which involved evaluating dietary patterns through dietary recall methods, and educating on balanced nutrition guidelines and physical activities. For obesity cases, referrals were made for the evaluation of physical activity and exploration of food menus to ensure healthy snacking habits. After counselling, a verbal agreement was made with the nutritionist

regarding readiness to implement the discussed recommendations at home. The puskesmas also scheduled monthly visits to monitor progress.

Given that referral health facilities were not consistently the same puskesmas that conducted health screenings, it was challenging to track whether students with nutritional issues had sought follow-up treatment or advice. Some puskesmas endeavoured to address this by asking schools to furnish details regarding the number of students who sought attention at healthcare facilities, as recommended in the referral.

"If a child shows indications of obesity, we usually provide a referral form to the UKS teacher, who then distributes it to the parents. Subsequently, it can be followed up with the health centre. For students with overweight or obesity, we typically offer counselling involving both the child and the parents. Often, we educate parents for a follow-up consultation along with rechecking the weight. However, some parents do not bring their children back for reassessment at the health centre because they don't feel like their child is sick. They often say things like, 'Oh, my child isn't sick, why should we go back?' It's a common occurrence."

– UKS/M coordinator, puskesmas, Surakarta City

One significant factor that contributed to the effectiveness of the referral system, as reported by a puskesmas in Tegal district, was the accreditation of the health centre. The accreditation process, which involved periodic reassessment, incorporated the nutritional referral system as one of its evaluation components.

4.3 FOOD ENVIRONMENT AT SCHOOLS

Key findings

1.	Five schools did not have a school canteen, and 11 schools did not have food vendors outside the school premises.
2.	The primary factors influencing food sellers regarding their food selection were student preferences, adherence to school regulations (particularly for food vendors in the school canteen), and ease of preparation.
3.	The food environment in intervention and control schools mirrored each other. Foods and drinks high in sugar, salt, and fat were prevalent. A notable food safety concern was the use of sauce with a striking red colour in many types of snacks.
4.	Most schools had regulations governing their school canteens, and some focused solely on food safety issues such as the absence of preservatives, avoidance of striking colours, possession of BPOM permits for packaged foods, serving food in covered containers, and maintaining the cleanliness of the area. Other schools extended to encompassing nutrition concerns, particularly regarding sugar, salt, and fat content in food.
5.	Certain private schools had more robust regulations regarding the food environment compared to public schools and were perceived to have better resources overall.
6.	Five main challenges were identified in providing healthier and safer foods for students: (i) children's strong preferences for less healthy and safe foods and beverages; (ii) the presence of food sellers outside school premises; (iii) schools' limited ability to enforce canteen regulations; (iv) resource constraints; and (v) family food habits.
7.	While schools considered the regulation of their canteens as manageable, they deemed the regulation of food vendors outside the premises as beyond their authority and responsibility.
8.	Most schools had not received training or coaching on school canteens from puskesmas or local authorities. Some schools had visits from puskesmas for food sample laboratory assessments.
9.	Schools expressed the expectation for puskesmas to assume a more active role, including the socialization of healthy school canteen practices to food sellers, both within and outside school premises, facilitating dialogue with street food vendors, visiting schools on a more regular schedule, and disseminating information about healthy foods to parents.

General information on the school food environment in the study areas

"For example, selling instant noodles because children like them. We once stopped selling noodles because the school authorities prohibited it, but parents protested because these children didn't have time to eat breakfast at home, and there were no other 'hearty' food options available for breakfast at school."

– School canteen vendor, intervention school, Semarang City

Overall, the food environment inside and outside intervention and control schools appeared similar (Table 3.14.1). Food sellers in school canteens mentioned that the foods and beverages they sold came from various sources, and included homemade items, contributions from teachers and parents, vendors from outside the school, and packaged foods and beverages purchased from markets. Popular items favoured by students included rice with chicken, fried rice, chicken noodles, instant noodles, meatball satay, mini burgers, sandwiches, chocolate

bread, iced tea, and powdered sugary drinks. Among street food vendors, student favourites included fried frozen foods and egg-coated fried flour with powdered spicy seasoning.

While food sellers in school canteens and those outside school had many reasons for selecting the foods they sold, primary reasons included student preferences, adherence to school regulations (for canteen vendors), and ease of preparation. Other factors included offering unique items to attract students, affordability of ingredients, continuation of practices from previous sellers (such as parents of the current seller), assurance of halal ingredients, and the popularity of certain foods or drinks on social media, which would likely appeal to students.

"I sell 'krondok' sausages. The sausages are coated with breadcrumbs and eggs, then fried. I also sell nuggets, sausages, 'otak-otak' (fish cake served with peanut sauce), crispy mushrooms, and powdered ice drinks. Because the capital needed is minimal, and children like it."

– Street food vendor, control school, Tegal district



Table 4.1.1 Food environment characteristics at schools, by treatment group

NO	CHARACTERISTICS	INTERVENTION (N)	CONTROL (N)	NOTES
1	Canteen/cooperative is available at school	17	18	In some schools, the food suppliers are not in the form of a school canteen, but school cooperative (open every day) or market day (open only on Saturday).
TYPE OF BEVERAGES SOLD BY THE SCHOOL				
2	Sugary drinks (all drinks with added sugar)	17	18	Iced tea, syrup ice, orange ice, Milo, chocolate/strawberry flavoured UHT milk, tea in bottles/cartons/cups, Pop ice, tea juice, fruit juice, fruit ice, popsicle, fruit juice, yogurt.
3	Powdered drinks with added sugar (drink usually made by mixing the powder with liquid)	10	9	Pop ice, tea juice, fruit juice, Nutrisari.
4	Artificially sweetened beverages (drinks containing artificial sweeteners)	12	11	Pop ice, tea juice, fruit juice, Nutrisari, bottled tea.
5	100% fruit juice (no added sugar)	0	0	
6.	Fresh milk (milk with no added flavour and/or aroma)	2	1	White full cream milk, flavourless Real Good milk
7.	Mineral water	9	8	
8.	Flavoured water	0	1	Isoplus
TYPE OF FOODS SOLD BY THE SCHOOL				
9.	Meal (light/heavy)	13	13	Heavy: Fried rice, yellow rice, grilled rice, smoked fish rice, smashed/shredded chicken rice, mixed rice, fried noodles, Aceh noodles, meatball noodles, meatballs, chicken soup, instant noodles Light: Kebab, sandwich, toasted bread, cup instant noodles, spaghetti, dumplings, Takoyaki, rice cake rolls, mini burgers
10.	Fritters/fried foods	14	16	Rissoles, rolled omelette, cireng (fried tapioca balls), crispy tofu, skin crisps, chicken fritters, chocolate-covered banana, crispy mushrooms, fried tempeh, vegetable fritters, fried wontons, crispy banana, mendoan (crispy fried tempeh)
11.	Salty packaged/processed foods	14	14	Chiki, sausages, macaroni/noodle sticks with spicy savoury seasoning, instant noodles, nuggets
12.	Sweet packaged foods	16	14	Chocolate wafer, sweet biscuits, assorted jam- and chocolate-filled bread, chocolate bar, candies, ice cream
13.	Sweet non-packaged foods	5	4	Brownies, donuts, sweet pancakes, homemade jelly/pudding, sweet sponge cake, chocolate banana ice, steamed buns

NO	CHARACTERISTICS	INTERVENTION (N)	CONTROL (N)	NOTES
14	Fresh fruit	0	1	Fruit skewers with or without chocolate dipping
TYPE OF FOODS AND BEVERAGES SOLD OUTSIDE THE SCHOOL PREMISES				
15	Foods high in fat	15	13	Rolled eggs, fried dough fritters, crispy mushrooms, assorted fried snacks, round tofu
16	Foods high in salt	14	11	Chicken balls, fried dough fritters/rice vermicelli with savoury powder seasoning, instant noodles, sausages, various chips with savoury seasoning, basreng (fried crispy meatballs), assorted packaged chips with various brands
17	Foods and beverages high in sugar	15	13	Various brands of powdered drinks, iced tea, syrup ice, cotton candy/candies, chocolate wafer, assorted flavours of bubble tea
18	Marketing of unhealthy/less healthy foods and beverages	4	4	Two branded beverages in 2 schools. The rest were names of non-branded foods (mostly fried flour and frozen foods with powdered spices, written by the sellers and clearly seen by the potential consumers)

Table 4.1.2 Characteristics of schools with no school canteen or food sellers outside school

SCHOOLS THAT DID NOT HAVE SCHOOL CANTEEN	SCHOOLS WITH NO FOOD VENDORS OUTSIDE THE SCHOOL PREMISES
Intervention school: 3 Control school: 2	Intervention school: 5 Control school: 6
Reasons - Meals and snacks were provided by a catering service. - Limited budget. - Limited human resources (to monitor and supervise the canteen). - Felt sorry for food vendors outside the school premises who were parents of some students in the respective school.	Reasons - Schools' locations were not conducive (located in a very busy street, no pavement, or surrounded by spacious rice field/area). - The school prohibits food vendors outside the premises, and students are not allowed to bring pocket money except on Saturdays (market day or for purchasing at the cooperative). - Students are not permitted to leave the school premises during school hours and break times and are asked to purchase snacks only at the school canteen. Over time, the number of vendors outside the school gradually decreases until there are none.
Notes: Some schools had a different type/arrangement of school canteen For example: - School provided meals and snacks via catering service from Monday to Friday. The students only brought pocket money on Saturday to buy food prepared by their parents' team on Market Day (1 intervention school, 1 control school). - School had a cooperative which sold packaged foods/beverages only on Saturday (1 control school). The school also used a catering service to provide meals and snacks for students from Monday to Saturday.	

Two private Islamic schools in Surakarta and one private school in Kudus opted for catering services to provide meals, typically lunch, and snacks for their students. However, two out of these three schools permitted students to bring pocket money to purchase food every Saturday during Market Day. On Market Day,

"Here, the parents are like that (highly educated), so we can't just serve any kind of food for the children. Even for the fried foods we sell, they inquire about who fried them, what oil was used, and how many times the oil has been used. Eventually, we had to find a third party to handle it. We convey what is needed. If you (the caterer) are capable, then we agree. In one month, let's say January, the menu is presented. So, the parents already know, 'Oh, my child will be eating like this for this month.'"

– Canteen manager, intervention school, Surakarta City)

the schools offered foods – predominantly homemade – that were agreed upon and prepared by parents. The catering menus underwent school review and approval to meet the high expectations of parents regarding the quality of the food provided to their children.

Two schools that previously had canteens opted to close them a year before this study due to limited human resources to manage daily operations. Interestingly, one school mentioned closing the canteen not only due to staffing issues, but out of concern for street food vendors outside the school.

The school believed

that maintaining a canteen would diminish the income of street vendors who primarily consisted of parents of students.

Overall, 10 schools reported there were no food vendors outside their premises. Some schools restricted students from bringing pocket money as they utilized catering services from Monday to Friday. On Saturdays, students purchased food from the school cooperative or food bazaar during Market Day, preventing them from being targeted by street food vendors.

One private school in Semarang shared its approach to prevent students from purchasing food from street vendors:



"In the past, there were many vendors in front of the school gate, like a market. So, we (the school) agreed to establish regulations. Students are not allowed to buy food from outside because most of what's sold there is unhealthy. So, snacks for the students are provided in the canteen. We socialize this to parents at the beginning of each year because at the start of the year, parents are invited to be informed about all school regulations. Thank God, because we (the school and parents) agreed together, eventually the students also complied. If we let others manage the vendors, it would be problematic. We also regularly inspect the canteen. We are not allowed to sell coloured drinks and popsicles because they are considered unhealthy. The National Agency of Drug and Food Control (BPOM) also comes to inspect. So, how do we make parents believe (that the canteen is safe)?"

– UKS/M teacher, control (private) school, Semarang City

Another reason for the absence of street food vendors outside schools was the perceived inconvenience or lack of safety in the school's location. Some schools were situated on busy streets, intersections without

pavements, or in remote areas surrounded by rice fields and spacious grass fields. One school highlighted that its location on a bustling street had led to a student accident while purchasing food from a street vendor.

"There are no sellers in front of our school. Because the street is busy. So, when picking up, parents are asked to enter the school. We convey that if the students bought food outside, the risk is borne by themselves. Because there have been incidents where children bought snacks on the roadside while having a joke with a friend. So, until now, thankfully, there are no sellers. Because if there are no buyers, then there are no sellers."

– School canteen manager, control (public) school, Surakarta City

Table 4.1.3 Characteristics of food sellers at school canteens and outside school premises who participated in key informant interviews

CHARACTERISTIC	FOOD SELLER AT SCHOOL CANTEEN	FOOD SELLER OUTSIDE SCHOOL PREMISES
Age	20 to 30 years old: 6 31 to 40 years old: 10 41 to 50 years old: 13 >50 years old: 4	20 to 30 years old: 5 31 to 40 years old: 3 41 to 50 years old: 8 >50 years old: 13
Gender	10 male, 23 female	14 male, 15 female
Type of facility	Permanent: 17 Semi-permanent: 6 Non-permanent: 10	Mobile vendors: 24 Permanent (stall): 5
Duration as food seller in the respective school/place	<1 year: 4 1 to 5 years: 15 6 to 10 years: 5 >10 years: 9	<1 year: 7 1 to 5 years: 10 6 to 10 years: 4 >10 years: 8
Status of respondent	Tenants of stalls in the canteen, school guards or wives who serve as food vendors, school staff assigned to manage the canteen, external employees paid to supervise the canteen, cooperative caretakers, cooperative coordinators, and school teachers who also serve as vendors.	

Canteens with permanent structures generally had dedicated areas – sometimes with kitchens for cooking – and areas for students to eat or drink. Kitchen sizes varied, ranging from a spacious area for food preparation activities, to a narrow space that only accommodated for one stove for frying. A few schools with spacious canteens also had areas for washing utensils, preparing food, and a dining area with tables and chairs for customers.

Canteens with semi-permanent structures were made of bamboo, wood, or partition walls with a combination of plywood and concrete. These types of canteens may or may not be equipped with kitchens and generally lack dining areas. Meanwhile, non-permanent canteens typically consisted only of tables, onto which food or drinks could be placed. These could be found within the school premises such as in motorbike parking areas, in one corner of the school, at the edge of the school field, or in corridors between classroom buildings.

Based on observations made by the study team, vendors outside the school sold a variety of foods and drinks, including:

- **Ready-made full meals**, including fried rice, rice with fried chicken and sambal, ketoprak (tofu, rice cake, and vegetables), dumplings with eggs, potatoes, vegetables, and rice with brambang asem (water spinach with spicy seasoning).
- **Snacks**, including chocolate-filled bread, toasted bread with various spreads, branded biscuits and wafers, green bean porridge, black glutinous rice, homemade donuts and brownies, agar-agar jelly with basil seeds and syrup, nuggets, sausages, fried meatballs, sticks, cilok (tapioca dumplings), macaroni, fried frozen food with spicy or savoury seasoning, crispy mushrooms with chili powder, instant noodles, stick noodles with spicy seasoning, branded chips, sausages wrapped in flour and eggs, fried foods, rolled eggs, meatballs, and crispy tofu. Some items were fried in dark-coloured oil, indicating frequent use, while others had bright sauces or seasoning, suggesting food colourants and preservatives.
- **Drinks**, including brightly coloured syrup ice with sweetened condensed milk, branded ice cream, homemade orange ice, sugary powdered drinks, and oversized teas (which were sold cheaply and often caused students to cough, likely due to artificial sweeteners).

Knowledge about healthy and unhealthy foods

Almost all food sellers in school canteens and some vendors outside the school had similar knowledge about healthy and unhealthy foods. They believed that healthy food consisted of vegetables, home-cooked meals using natural ingredients such as onions, were fried with fresh cooking oil, and provided a sense of fullness (e.g., bread, chicken and rice) and did not contain preservatives, MSG or artificial colouring. They also emphasized clean food preparation processes and utensils and preparing food on-site to ensure freshness.

On the other hand, unhealthy foods were primarily considered from the perspective of food safety or preparation and processing methods. Foods considered unhealthy included those with added sauces, MSG, frozen foods (sausages, nuggets) due to their long storage and preservative content, salty chips with high MSG content, packaged drinks with preservatives and flavourings, candies, instant drinks with high sugar, and foods or drinks with colourful synthetic colouring.

Perceived challenges to providing healthier and safer foods at school

The schools surveyed had no written regulations to guide operations of their school canteens. However, as reported by food sellers and the school canteen coordinator, most school canteens were regulated in some way, typically through guidance conveyed orally by the school principal and/or head of the foundation (for private schools) to the school canteen coordinator and food sellers. School canteen regulations were grouped into three categories and focused primarily on ensuring food safety. Only some schools had guidance on reducing the sale of foods and drinks based on a consideration of nutritional content.



FOOD SAFETY	NUTRITION ISSUES	OTHER
In most schools - No preservatives. - No striking colour (red chilli sauce). - Sold sealed or in closed containers. - Packaged snacks must have BPOM permit. - Maintain cleanliness of the canteen area.	In most schools Salt content: No foods with MSG/spicy and savoury powdered seasoning.	- Should be environmentally- friendly (no plastic, no Styrofoam). - Should sell different foods/drinks among the sellers. - Affordable for most students. - Not spicy. - Filling.
In some schools - Homemade foods/drinks. - No formalin.	In some schools - No or reduced frequency of sale of instant noodles (all types). - Should sell healthy foods (such as rice and dishes, fruit). - No powdered sugary drinks.	

“For canteens prioritising healthy options, the sale of instant noodles and items with high MSG content is prohibited. Instead, they offer dishes like homemade soto. This decision stems from a concern that children might fall ill after consuming canteen food. To address this, committees and schools collaborate to determine which foods should be restricted. Additionally, they follow advice from health centres, as inspections are occasionally conducted.”

– School canteen manager, intervention (private) school, Semarang City

Several schools did not have specific regulations for canteens, except for guidance on maintaining cleanliness in food handling and the canteen area. Respondents noted that, while not optimal, canteen conditions were generally satisfactory and prioritised student health. However, concerns were expressed regarding the selection of foods sold, prompting efforts to enforce informal regulations.

“We allow parents to sell food, provided they adhere to these regulations. Parents generally support these rules, recognizing their benefits in reducing student illnesses.”

– UKS/M teacher, control (private) school, Tegal district

Despite these efforts, challenges persist in providing healthier and safer foods for students. Based on informant accounts, there are four main obstacles: (i) children's strong preferences for less healthy options; (ii) the prevalence of food vendors outside school premises who offer appealing but less nutritious options; (iii) resource constraints in staffing, creativity, and equipment; and (iv) rooted dietary habits within families.



CHALLENGE 1

Children's preference for less healthy foods and beverages

All informants, including food sellers at school canteens, canteen coordinators, school committee members, UKS/M teachers, and puskesmas staff, highlighted students' preferences for foods with spices or chilli paste/sauce. These included items like fried flour with powdered barbecue/grilled corn/cheese spices, fried frozen foods, and sausages with spicy chilli paste, often featuring striking colours and varying levels of spiciness. Additionally, instant noodles from well-known Indonesian brands, packaged in small or medium cups, were popular choices. Informants expressed concerns about the health implications of these foods, citing their potential to trigger sore throats, coughing, stomach ache, and other long-term health issues such as cancer, due to added preservatives, colouring agents, and flavour enhancers.

"The kids don't gravitate towards healthier options like rice or soto; those dishes often don't sell well. They prefer savoury, spicy, and sweet drinks. We once halted sales of 'XX' (a popular brand of salty chips) when the school participated in the Adiwiyata competition, but our income declined. So, we resumed selling it."

– School canteen vendor, intervention (public) school, Kudus district

"The issue lies in uncontrolled snacking. There's an abundance of preservatives, colouring agents, sauces, and instant noodles. Students prefer convenient and tasty options. Although there should be vegetables and fruits, they're not as appealing to them. So, the main challenge lies in persuading the children because it's all about their taste preferences."

– School committee member, Tegal district

"Reducing students' high preference for instant noodles is challenging. Sometimes parents prioritise their children's desires over ensuring they eat healthier options."

– School committee member, Surakarta City

As for beverages, most students favoured sugary drinks such as powdered sugary drinks, which are prepared by mixing with water and ice cubes. These drinks come in various flavours and offer students many choices. However, informants expressed concern about the health implications of these beverages.

"The instant drinks are loaded with sweeteners like XX (a famous brand). Kids enjoy them because they taste refreshing. However, the long-term effects on children's health can be detrimental. Nowadays, many children suffer from early-onset diabetes."

– School canteen manager, control school, Kudus district

During data collection, a new beverage known as Jumbo Tea emerged in most study sites. It earned its name from being served in large glasses and was widely available and affordable. However, informants raised concerns about its high sugar content and affordability, suggesting the possible use of artificial sweeteners that could harm students' health.

"My child came home with a slight fever after drinking Jumbo Tea. Nowadays, children prefer cheap, large-portion drinks. Changing this habit is difficult because the drink is readily available and inexpensive."

– School committee member, control (religious) school, Tegal district

Vendors outside schools also catered to students' preferences to ensure sales and profitability, despite the health concerns raised by healthcare professionals.

"The doctor says selling snacks like XX (a well-known brand of salty snacks) is unhealthy, but if we sell cassava, it won't sell. My late father used to sell cassava and boiled peanuts, but the school children didn't like it. What matters is that the snacks sell and we make a profit."

– Street food vendor, control (public) school, Tegal district

CHALLENGE 2

Availability of food sellers outside the school premises

At most schools, food sellers typically offered less healthy and safe options. Students frequently bought from these vendors because the foods were tasty, popular, cheap, and varied (see examples on page 77). Schools perceived that these vendors influenced students' preferences and created unhealthy snacking habits. While some schools tried to promote healthier choices in their canteens, students had access to other food and beverage options outside the school. Some schools admitted that the canteen foods were less varied, which led students to prefer visiting outside vendors.

"In my opinion, our school lacks personnel. The canteen staff receives food from the same supplier, so the variety is limited, and there's no one available to cook on-site. Many other parents want to contribute (supply the foods), but there's no space. With more people involved, we could offer a greater variety of food, which the children would enjoy."

– School canteen manager, intervention (public) school, Kudus district

"To be honest, I'm not able to provide such meals (varied meal options) myself. So, the (variety of) food available is limited. If the canteen sells food from parents, there might be more options available."

– School canteen manager, control (public) school, Surakarta City

Some schools were in strategic locations that were particularly appealing to street food vendors. For example, areas with multiple schools made it challenging to stop students from buying food from external sources. Schools mentioned that it was difficult to regulate their students' purchases when other schools nearby allowed their students to buy from street vendors.

"When it's time for them to go home after class, it's unavoidable. They have time while waiting for their parents to pick them up. The area along the Ring Road is long and safe, so there are many vendors there, offering a wide variety of options. It's difficult for the school and the foundation to intervene because that area is not part of the school environment."

– School canteen manager, control (private) school, Surakarta City

Despite concerns about street food vendors, some schools were hesitant to address the issue because some vendors were local residents or parents of students. Other reasons included the potential for arguments, vendor reliance on selling food as a source of income, some operated outside the school's area, and students purchased food outside school hours with their parents' knowledge.

"If the canteen doesn't sell sausages, the students will still buy them outside of school. The school allows the gate to remain open because the school land belongs to the village, and the vendors outside the school are villagers. Therefore, it's not allowed to close the gate because it's feared that it will lead to protests."

– School canteen manager, control (public) school, Kudus district

"If we want to prohibit (street) vendors, the vendors get angry, saying they cannot earn a living. So, in the end, it's a dilemma for the school. That's very common among public schools. The sellers are mostly residents, and the teachers allow it."

– School committee member, control (religious) school, Tegal district

One public school in Semarang, represented by the school committee, once initiated a dialogue about food safety with the street food vendors. This effort was successful for a few months, but the vendors eventually returned due to the lack of regular supervision from the school.

“Before, our committee had a talk with the vendors, and they moved. But now, they’re back again (laughing). Maybe because it’s been a while, one vendor came, and then another one came, and another. So, it’s bustling again. The committee can’t keep watching all the time, you know.”

– School committee member, intervention (public) school, Semarang City

In-depth interviews with street vendors outside the school indicated that most had never been visited by school authorities. If schools did visit vendors, the focus was mostly on maintaining cleanliness, not blocking the school entrance, and the times when students were allowed to purchase snacks. In-depth interviews with street vendors outside the school indicated that most had never been visited by school authorities. If schools did visit vendors, the focus was mostly on maintaining cleanliness, not blocking the school entrance, and the times when students were allowed to purchase snacks.

“There are no regulations. Selling foods here should not be the school’s concern, and the school is not entitled to regulate street vendors.”

– Street food vendor, control (public) school, Semarang City

“There are no regulations regarding food, only requests to maintain cleanliness and not to block the school entrance.”

– Street food vendor, intervention (public) school, Semarang City

“Students are not allowed to go outside the school gate during break time due to the risk of accidents (busy street in front of the school), there are no other regulations.”

– Street food vendor, intervention (public) school, Surakarta City

Two food vendors mentioned that there were rules from the school authorities regarding food that could not be sold.

“Yes, there are rules from the school. I was once reprimanded for selling candy. They said it wasn’t nutritious. There was also someone who was warned by the principal not to sell too many powdered drinks.”

– Street food vendor, intervention (religious) school, Tegal district

“The new principal sometimes comes to have a look around, but there haven’t been any suggestions yet. In the past, almost every morning the previous principal would come and hang out. We were told not to sell instant noodles and XX (one famous brand of salty chips). Previously, we used to sell instant noodles and XX, but now we don’t sell them anymore.”

– Street food vendor, intervention (public) school, Semarang City



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CHALLENGE 3

Lack of schools' ability to enforce canteen regulations

Canteen managers and UKS/M teachers reported that schools found it easier to enforce regulations with vendors, parents, and teachers who supplied food to the canteen. For instance, they could request a reduction in the amount of sauce added to burgers, minimal seasoning for fried snacks, and the avoidance of certain unhealthy sauces or seasoning brands. These suppliers usually complied to prioritise student health and to avoid complaints or reprimands from parents if students became ill from food or drinks purchased in the canteen.

However, schools faced significant challenges in regulating vendors who were tenants and paid rent to sell food in the school canteen.

"In our school, we have two canteens. One is managed by the school and the other is rented out. We strive to keep our canteen healthy by reducing the availability of cup noodles and instant noodles. We sell homemade food items from parents, such as 'nasi ayam geprek' (rice with fried chicken). Bu Kamad (madrasah principal) said that instant noodles are allowed twice a week. Our canteen is okay, but the rented one can't be managed. They can't be intervened regarding the food they sell. Currently, many students go there."

– School canteen manager, control (religious) school, Semarang City

"There are no specific rules. The main thing is that the food is healthy and filling. There have been discussions with the principal. If certain foods are prohibited in the school but are widely sold outside, it will reduce the vendors' income, while they need to pay rent for the canteen. Therefore, the school can't be too strict. We are okay as long as we sell rice with dishes too. It's difficult to regulate too much."

– School canteen vendor, control (public) school, Kudus district



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CHALLENGE 4

Limited resources for providing healthier food options

Limited resources posed a significant challenge for schools to offer healthier food options to students. These limitations included insufficient staff to supervise the canteen effectively, especially given the many students who often queued to buy food during break times. Additionally, there were constraints in terms of skills and the willingness to create healthy and appealing menu items that students would be interested in purchasing.

“New vendors are mostly less creative; they're young, so they buy snacks from the market and receive supplies from outside. The old vendors used to sell different menus for breakfast (soto) and afternoon (rames), making the children happy. But now, the children know that the menu is always the same, and they get bored. So, they keep their money and buy snacks outside after school.”

– School canteen manager, control (public) school, Semarang City

“We want the food sold in the canteen to be healthy, but the canteen only has Pak Kebon (the school guard responsible for physical security) and his wife as vendors. His wife doesn't want to try making new types of food, or maybe she's afraid it won't sell, so she quit. Now, the children buy snacks outside because there's no canteen. So, there is no canteen yet because there's no one available.”

– UKS/M teacher, Tegay district

In some schools, senior teachers perceived junior teachers as less effective in enforcing rules with students, especially with regard to prohibiting them from buying food outside the school during break times. Junior teachers often said they did not want to hinder the income of vendors outside the school and felt sympathy for students who enjoyed the items sold by these vendors, despite knowing they were less healthy.

“Many new young teachers don't enforce the rule against buying snacks outside the school, even though the rule exists. So, it's only me who's strict about prohibiting it. It's difficult for me because there are many students.”

– UKS/M teacher, intervention (public) school, Kudus district

Another significant limitation was the lack of adequate facilities and infrastructure. To sell fruit, for instance, vendors needed a cooler box or refrigerator to keep it fresh and appealing to students. An additional challenge was the limited availability of cabinets and tables for displaying food/drinks supplied by parents and teachers. Schools believed that having parent/teacher-supplied food and drinks would add variety to canteen offerings and prevent students from becoming bored and choosing less healthy options outside the school. However, their current vendors could not vary their offerings due to limitations in quantity and skills.



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CHALLENGE 5

Family habits related to health and nutrition

Another main challenge was the eating habits of students at home, which were influenced by family practices. UKS/M teachers and the school committee noted that time constraints and parents' limited knowledge made nutritional education difficult and required consistent effort from both school and home. Common student habits mentioned by respondents included breakfast routines and snacking, which depend heavily on parental practices and rules.

"My students, some of them aren't provided breakfast from home; they're not asked what they want to have. So sometimes the child is confused, right? From school, they're taught that they should have breakfast, why they should have breakfast, what a good breakfast is like, and the child knows. But when they get home, breakfast isn't prepared for them. If breakfast is provided from school for children who don't have breakfast, the other children might deliberately skip breakfast."

– UKS/M teacher, Tegal district

"Education should be consistent both at home and at school. Rules and parental habits at home need to be conveyed to the school, for example, using a communication book. Because children need education, including food education. If we indulge their desires, they'll always want what's delicious, right? At this age, children are still receptive; they can still be educated by setting examples and educating through dialogue. So, parents can communicate with the school. School also provides education in the same way, so it will be in line."

– School committee member, control (religious) school, Surakarta City

Regarding the students' snack-buying habit, UKS/M teachers and canteen vendors mentioned that parents often allowed their children to buy snacks from vendors outside the school when picking them up. This was acknowledged by school committee respondents, even though parents often lacked confidence in the cleanliness and healthiness of the food and drinks sold by these vendors.



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Efforts made by schools to cope with challenges

Respondents said that some regulations regarding the food sold in school canteens could not be enforced. For example, instant noodles, a favourite among students, remain on sale due to high demand and profitability. However, health concerns prompted schools to implement additional rules, such as allowing instant noodles only on Mondays and Thursdays or limiting sales to 30 portions per day. Interestingly, in one school, parents requested that the canteen sell instant noodles because many students skipped breakfast and relied on the canteen for their first meal of the day. With no other 'full meal' options available, the canteen complied with this request. The canteen also struggled to implement the principal's recommendation to sell traditional cakes

"Previously, the canteen was rarely visited by the students because they bought snacks outside. Now, after I took over the canteen six months ago, I organized the foods sold there. In addition to packaged foods, we prepare foods that children like and that are usually sold by outside vendors. We have instant noodles scheduled for Mondays and Thursdays only. We offer dumplings (siomay) on Tuesdays and Saturdays, corn-based snacks mixed with milk and cheese (Jasuke) on Wednesdays, and chicken noodles on Fridays. For drinks, we package them in cups and put them in the fridge. The kids love it. Now the canteen is bustling. It used to be empty because we only sold packaged food and sausages."

– School canteen manager, Kudus district

and reduce or eliminate packaged foods, because traditional cakes were less popular and did not sell well. Given this situation, the school permitted the canteen to sell packaged foods, provided they also offered homemade meals like rice and side dishes.

To counter the influence of street food vendors outside their premises, schools have made efforts to minimise the negative impact of less healthy foods sold by the vendors. These efforts included locking the school gate during school hours to prevent students from buying food outside, ensuring active teacher supervision during class breaks, offering more varied foods in the school canteen

to attract students, coordinating with parents to provide healthier and varied foods in the school canteen, and setting regulations on foods and drinks sold in the school canteen.

"Parents and teachers also play an active role. If students buy snacks outside, it's not allowed. I note down who buys outside, so the students are afraid. Now, no one goes out anymore."

– UKS/M teacher, control (public) school, Surakarta City

Monitoring and capacity-building for food sellers and school canteen management

Most food vendors in canteens and canteen supervisors reported that they had never received specific training about the canteen either from the school, puskesmas, or other institutions. They mentioned that once a year, puskesmas collected food samples sold in the canteen (such as meatballs, nuggets, sausages, sauces, noodles, and shaved ice) for laboratory testing.

In the schools where food was sampled, some vendors were aware of the analysis results, but others were not informed, as the puskesmas only communicated the results to teachers or the school principal. Most vendors stated that the analysis results were good and there were no safety issues. Those who did not receive the analysis results concluded that their food was fine because they believed they would have been informed if there were any issues. Additionally, canteen food vendors and supervisors did not know if their school had been evaluated by puskesmas using healthy canteen indicators, which is usually conducted by the sanitarian once a year.

Canteen supervisors and food vendors explained that puskesmas sometimes visited the canteen during student health screenings or immunization sessions. During these visits, puskesmas observed the food sold and the canteen area and provided some suggestions. For example, vendors were asked to sell nutritious foods like vegetable soup, provide food in closed containers to prevent flies, use tongs to handle food, wear head coverings and aprons, store cooking utensils in cabinets to protect them from pests, and always wash their hands.

Moreover, some schools received advice from the DOE during visits to the school canteen, which included not selling foods containing preservatives, avoiding foods fried in oil mixed with plastic, and always checking the expiry dates of packaged food and drinks. Some



schools also received advice from BPOM officers, who suggested they sell homemade foods, avoid the use of staples to package food, maintain the cleanliness of the canteen area, regularly check expiry dates, only sell packaged food and drinks with permits, and avoid food and drinks with striking colours. One school in Kudus mentioned being invited by BPOM to a healthy food socialization event that emphasised checking expiry dates and avoiding harmful ingredients like certain colourings, preservatives, and sweeteners.

“Back then, representatives from puskesmas came to check the children's health. They checked ears, mouths, and teeth. They also visited vendors outside the school to take samples of one food and one drink. The results showed that one of the drinks contained some unknown substance, probably from the mixed ice dessert. The other sample, which was tofu, turned out to be safe. The puskesmas staff then provided education to the ice vendors. However, there hasn't been any follow-up from the puskesmas. So, it's still unclear whether the unsafe food item is still being sold.”

– School canteen manager, Semarang City

Almost all street food vendors who participated in this study stated that they had never been visited by puskesmas, school authorities, or parents to discuss the food and drinks they sell. The supervision they received was from the village authorities regarding cleanliness. Vendors who sold food outside schools in Semarang and Kudus mentioned that parents and teachers sometimes bought food and drinks from them. These vendors sold fried rice, rice with fried chicken, sweetened powdered drinks, mixed rice (*nasi rames*), fried snacks, tea, and coffee.

“Teachers usually just come and buy food without monitoring or supervising.”

– Street food vendor, Semarang City

“There was a visit by puskesmas. They asked what items were being sold, and we were once cautioned not to sell unhealthy items like candy. As a follow-up, we reduced the sale of such items.”

– Street food vendor, Tegal district

Canteen managers expressed high hopes for the role of puskesmas in improving canteen conditions, especially with regard to the food sold. These hopes included:

1. Conducting socialization on healthy canteens, aimed at school authorities and vendors outside the school, and facilitating dialogue between street vendors, school authorities, and the canteen. Schools believed that facilitation from puskesmas could reduce the risk of conflict when schools convey rules about the food that street vendors are allowed to sell.
2. Providing support for schools, beyond taking food samples, which includes supervising the food sold in school canteens and increasing the capacity of canteen food vendors to create exciting, healthy menus to compete with the creativity of street food vendors.
3. Conducting regular supervision of school canteens and street food vendors. Long intervals between puskesmas visits and no regular schedule is believed to be less effective because vendors tend to revert to inappropriate practices.
4. Socializing parents because many parents supply food to the school canteen. This socialization is expected to encourage parents to advise their children to choose healthy food and to avoid buying unhealthy snacks from street vendors.

The following are examples of statements from UKS/M teachers and school canteen supervisors regarding their expectations for the role of the DEO and puskesmas in improving the food environment in schools in the interests of student health:

"If the school gate is locked, the students cannot go out. But on one side, the school doesn't have a canteen. It's confusing, you know. So, in the end, we mainly educate those who sell outside. We advise them not to sell this, not to sell that, for the children's health. We're afraid the children might get sick. We hope that DEO will take roles because they know more about the harmful elements in food. If the education is from the school, sometimes the teachers are called fussy or too demanding. If it's from the DEO, they have a basis because it is about health. It can't be negotiated."

– UKS/M teacher, intervention (religious) school, Tegal district

"We want the DEO and Puskesmas to socialize the canteen staff so they can be more creative, change the menu, so the children are happy, not just sell the same foods. Vendors outside the school sell corndogs, which interest the children more because it's not available in the canteen. Maybe we (canteen) could sell it too, but we make a healthier version without the striking red sauce."

– School canteen manager, Kudus district



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Expected improvement in school food environment

Respondents expressed considerable enthusiasm when discussing ways to make the food environment in schools healthier for students. Canteen managers made several suggestions:

1. Add variety to canteen food: Encourage parents to supply homemade, healthy and tasty foods to increase variety and reduce students' desire to buy food outside of school.
2. Close the gate during breaks: Despite possible challenges, closing the school gate during break times can help prevent students from buying snacks outside.
3. Educate students on healthy eating: Educate students about healthy and unhealthy foods and drinks and introduce traditional foods in appealing ways.
4. Socialize on healthy canteens: Ensure the relevant authorities socialize about healthy canteens to all schools, including where there are multiple canteens within one school, to ensure rules are consistently implemented.
5. Increase canteen staff: Increase the number of staff in the canteen to better supervise the food sold and collect payment.
6. Hire permanent staff for canteen oversight: Hiring a permanent staff member to oversee the cleanliness of the canteen area and the food sold would relieve teachers of these responsibilities.

Respondents provided specific examples of their proposals:

"Controlling vendors outside is quite difficult because they also need to make a living. So, it's better to control the children instead. For example, reducing the time for children to buy snacks outside, so the school gate is only open after school hours. Children leave their classes, meet their parents, and are directed to go straight home. Children usually buy snacks while waiting for pick-up."

– UKS/M teacher, Semarang City

"In our canteen, there was once a counselling session, but there hasn't been one since. Hopefully, it can be regular. In our school, there are two canteens. One canteen follows the rules, and one does not. The canteen that doesn't follow the rules makes more profit because the children are more interested, which harms the other canteen. The hope is for counselling from the health department for the school, including both canteens. So, everyone is involved. It should be done every three months or at least twice a year."

– School canteen manager, Semarang City

"The school committee members are usually busy with their work, so it's a bit difficult to communicate. We can only gather during parenting days. So, it's like walking alone, with the committee on one side and the parents on the other. When we gather, we can share with each other. Then, a nutritionist comes to the school once a month or every three months. Perhaps the problems at the school can gradually be resolved in this way."

– School committee member, Tegal district

"The school and the committee must continuously socialize healthy eating to parents. It must be routine and have a clear schedule. There should also be funds to create examples of healthy foods that children like, packaged in a modern way."

– School committee member, Surakarta City

Almost all food vendors outside the school expressed satisfaction with the quality of the food they sold. They asserted that the ingredients are appropriate, and since their products are homemade, they do not contain preservatives. These vendors typically sell out their products within one to two days, eliminating the need

for preservatives. Additionally, the packaged foods they sell have permits from BPOM and are produced in official factories. They also ensure the use of branded cooking oil to fry snacks.

“Food items like sauces and others seem to be fine. There haven't been any stomach aches or other issues. I don't use preservatives because once I make them, they're quickly finished within one to three days.”

– Street food vendor, control (public) school, Semarang City

“It's good because the food doesn't contain preservatives and MSG; only broth seasoning is added. As for seasoning powder, I'm not sure if it contains MSG because it's from the factory. Once I make them, they're used for one to two days because they're stored in the freezer and still fresh.”

– Street food vendor, control (public) school, Semarang City

However, two vendors identified areas for improvement in their offerings:

“We aim to enhance the cleanliness of the bread, but it's challenging due to transportation by motorcycle, which exposes them to dust.”

– Street food vendor, control (public) school, Surakarta City

“We'd like to sell healthier homemade foods like cakes and packed rice, but we can't do it yet because we're alone and also taking care of our grandchild.”

– Street food vendor, intervention (public) school, Surakarta City



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4.4 EXISTING SCHOOL-BASED HEALTH AND NUTRITION PROGRAMMES AND POLICY

Key findings

1.	The implementation of the first pillar of the UKS/M programme, specifically nutrition and health education, has shown progress, albeit also irregularities in its delivery. Health centres often await invitations from schools to conduct nutrition and health education sessions during school events.
2.	Schools and health centres considered the implementation of the second pillar of the UKS/M programme, focused on health services, as highly effective, with routine execution and broad coverage.
3.	While environmental sanitation under the third pillar of the UKS/M programme has seen success, school canteen management has faced challenges, primarily due to vendors favouring affordable food items popular among children.
4.	Some health centres prioritise food safety over nutritional content, overlooking aspects like sugar/salt/fat levels in foods and beverages sold in school canteens.
5.	There is a lack of regular meetings between schools and health centres, with communication mainly concerning routine health programmes such as screenings and immunizations. However, proximity to health centres has facilitated closer relationships between some schools and health centre staff, enabling smoother communication and the implementation of activities
6.	Challenges encountered in implementing the UKS/M programmes include a lack of engaging nutrition education delivery skills, unhealthy food environments in and around schools, and budgetary constraints.
7.	Schools face additional hurdles due to insufficient support from parents and teachers, and limited response to their concerns from health centres. Health centres also grapple with staff shortages.
8.	To foster behavioural change among students, health centres advocate for policies ensuring continuous nutrition education in schools, including curriculum integration, backed by substantial support from the education department.

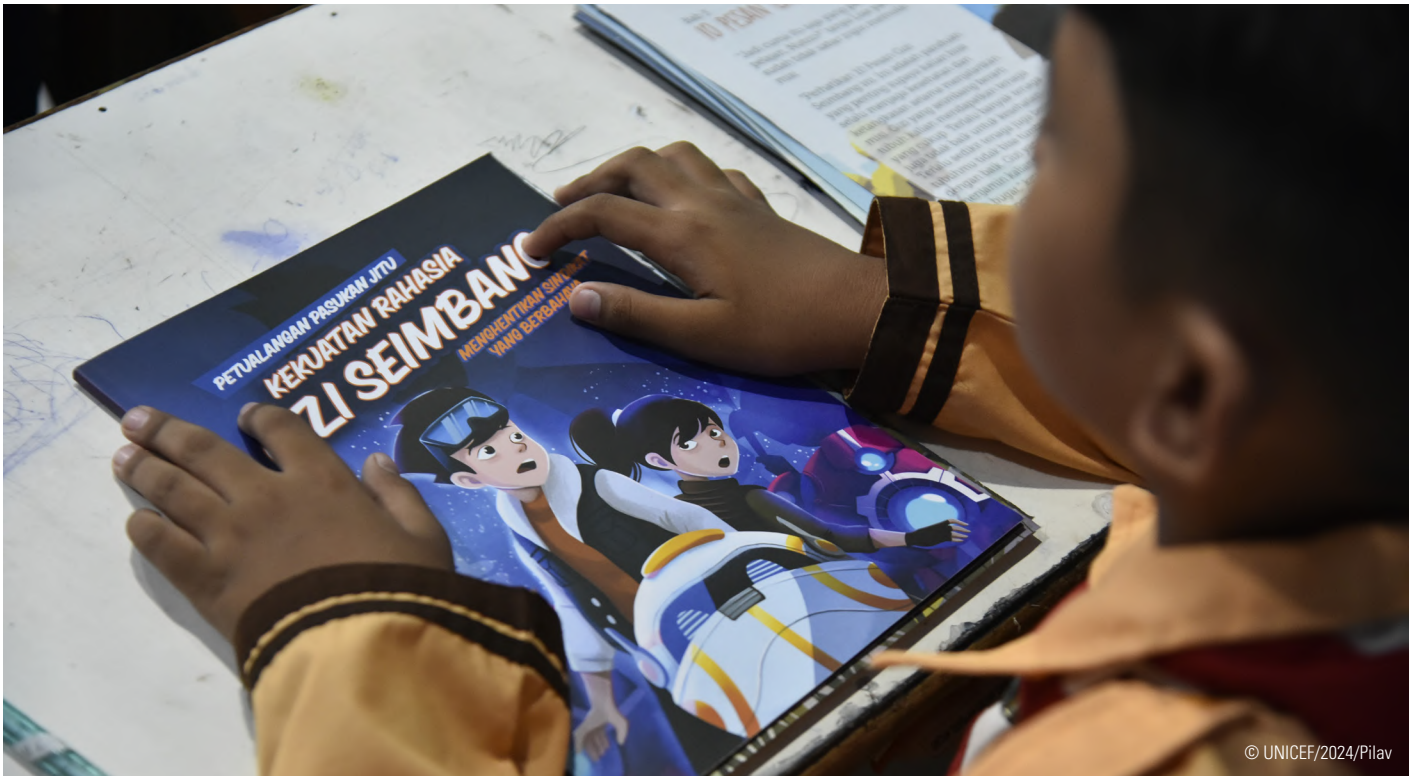
Implementation of the UKS/M programme at schools

In 2023, five schools in Tegal district received nutrition and health interventions for school children from UNICEF. The UKS/M coordinators in these schools reported that some activities had been running smoothly, packaged under the Petualangan Bergizi programme. The first pillar, which focuses on nutrition and health education, was carried out through activities such as breakfast sessions, group exercises, and literacy sessions. Nutrition literacy sessions, facilitated by teachers who were trained by UNICEF Indonesia in 2023, were conducted weekly using habituation sessions (*Jam Pembiasaan*), and employed engaging stories and games.

During physical education classes, students participated in breakfast sessions, and brought meals from home. On Saturdays, group exercise activities and health checks such as nail, hair, and body hygiene assessments, were conducted. To encourage physical activity, schools introduced more songs during group exercise sessions and students were invited to do stretching exercises and sing during class transitions. This aimed to get them to move after prolonged sitting and also served as an icebreaker to maintain enthusiasm for subsequent lessons.

"Breakfast together has been a success. Following UNICEF's recommendation, students refrain from bringing instant noodles. Parents support these activities and express satisfaction, opting for healthier meals like porridge and green beans. Additionally, we've established a small garden in our yard where we cultivate water spinach and tomatoes. The produce is harvested and shared among us. Students typically bring rice, accompanied by tempeh as a side dish, and it turns out that they're very happy with this activity. They actively participate in harvesting and enjoy the experience."

– UKS/M teacher, intervention (public) school, Tegal district



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For schools trained by UNICEF, information, education, and communication (IEC) materials such as engaging books and posters were provided to guide teachers in nutrition education and enhance student awareness.

"Educational materials are already available and very good. However, we need more variety in the types of activities to keep students engaged. Ideally, parents should also be educated to understand, as our role as educators otherwise is limited. Parents may already know that their children should eat healthily. But if we conduct nutrition education, they will learn that there are many factors to consider when preparing healthy meals for their children."

– UKS/M teacher, intervention (religious) school, Tegal district

In other schools, activities under the first pillar included 'Healthy Friday' activities, which involved exercises and walks, and shared meals with a balanced nutrition theme. UKS/M teachers noted that previous activities mainly focused on personal hygiene and physical activities.

"This semester, we're initiating healthy eating activities by bringing packed lunches every Friday. Students alternate between bringing rice, vegetables, and a main dish, and bringing fruits to share at school. This approach aims to encourage students to consume more vegetables and fruits, as they often resist such foods when offered at home but are more receptive to teachers' guidance."

– UKS/M teacher, intervention (public) school, Kudus district

Similar initiatives were implemented in other schools, typically scheduled on Fridays or Saturdays. Personal hygiene education, a component of nutrition education, was commonly integrated into school events such as Orientation Week (MPLS), with speakers often invited from puskesmas. Some schools also engaged external parties, including university students, to educate students on topics such as puberty and the hazards of smoking.

Puskesmas staff highlighted that they waited for invitations from schools to deliver nutrition and health counselling, which resulted in the absence of a planned or routine schedule as part of the puskesmas programme.



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“Our counselling sessions are usually tied to the school's activities. We can't conduct them arbitrarily and are unfamiliar with the school curriculum. Typically, we receive invitations for events, usually during class meetings. The topics covered are broad, focusing on balanced nutrition or nutrition for school-age children.”

– UKS/M coordinator, puskesmas, Surakarta City

“We rely on communication from teachers, who inform us about upcoming events where our expertise is needed. This information is usually shared during parent-teacher meetings, which vary among schools.”

– Nutritionist, puskesmas, Tegal district

The puskesmas expressed concern that counselling sessions conducted for students with nutritional issues, particularly when referred, were not optimal due to their time-consuming nature and clashed with the packed school agenda. Additionally, the puskesmas aimed to minimize disruption to students' learning activities.

“Check-ups and counselling sessions can take away time from students' class time. Ideally, Saturdays would be preferable, but it depends on parental participation. On Saturdays, while schools are closed, the number of patients visiting puskesmas is much higher.”

– UKS/M coordinator, puskesmas, Surakarta City

Regarding the second pillar – health services – most UKS/M teachers expressed satisfaction with its implementation. Activities encompassed height and weight measurements, immunizations, deworming, iodine content checks in salt, providing medical attention to unwell students, referrals to puskesmas when necessary, and ‘Little Doctor’ coaching sessions. Notably, alongside health services, puskesmas also offered counselling, although it was less structured and detailed.

At one of the puskesmas in Surakarta, staff shared insights regarding the District Education Office (DEO) school feeding programme (PMTAS programme), which targets students with malnutrition.

“We operate a supplementary feeding programme (PMT) from the DEO. Schools identified with a high number of malnourished students are eligible for PMT. It's specifically tailored for underweight children, benefiting approximately 50 students across different schools. Often, schools pool their resources to extend the programme's reach, to ensure equitable distribution. Budget allocations are designated within each puskesmas. We collaborate with catering services, and nutritionists design the menu. Typically, it includes milk and a snack, provided either two or threetimes a week, depending on arrangements. We monitor the nutritional status of participants before and after the PMT intervention, which runs annually.”

– UKS/M coordinator, puskesmas, Surakarta City

Regarding the third pillar, UKS/M teachers expressed concerns about the effectiveness of school canteen supervision. Schools without canteens struggled to regulate students' snacking habits, while those with canteens felt there was room for improvement in the variety of foods offered. Echoing these sentiments, puskesmas staff noted that oversight of healthy school canteens fell short, often due to canteens prioritising the sale of popular, albeit unhealthy, food choices.

"Creating a conducive school environment poses challenges, especially concerning infrastructure. School operational funds (BOS) predominantly cater to academic needs. We're concerned by the nutritional quality of snacks sold outside school premises, as they are often full of additives and preservatives. Although we've conducted counselling sessions, vendors tend to prioritise selling foods that children like, even though they are unhealthy. Ultimately, oversight of street vendors (PKL) falls under the responsibility of village or district authorities."

– UKS/M coordinator and nutritionist, puskesmas, Kudus district

"During school visits, we routinely inspect the canteen. While we've endeavoured to educate canteen operators on healthier food options, they often consider student purchasing power and affordability. Although there are existing regulations governing school canteen operations, schools struggle to enforce them, given the canteen's profit-driven nature."

– Nutritionist, puskesmas, Semarang City

Some puskesmas indicated that the implementation of the third pillar of the UKS/M programme has been progressing well. However, it is essential to note that, based on respondents' explanations, the focus of puskesmas tends to be on food safety rather than the nutritional content and sugar/salt/fat content of the foods and drinks sold in school canteens.

"It's been going well. For example, concerning the canteen, previously, food was sold openly, but after our intervention, the food is now packaged and covered. The serving area has also been relocated away from the toilets. Overall, cleanliness has improved."

– UKS/M coordinator, puskesmas, Surakarta City

"We conduct inspections, take food samples from vendors, and test for contaminants like formalin, borax, and non-food colouring. We've conducted extensive inspections in early childhood education centres (PAUD). For primary schools, we initially planned pilot activities in four schools, but due to the hectic schedule around puskesmas accreditation, it hasn't been implemented yet. We collaborate with the Environmental Health Unit as the budget for school canteen oversight falls under their jurisdiction."

– Nutritionist, puskesmas, Tegal district

Successful activities under the third pillar included initiatives to promote environmental cleanliness and establish a green, smoke-free school environment.

"Every Friday, our school hosts a healthy living routine, including exercise and communal meals, alongside checks for nails, hair, clothes, and teeth. Additionally, every Saturday, there's a sewage cleaning activity. Our school promotes the slogan 'TUMIT BUSANTO' (One Minute Throw Trash to the Bin), and students receive rewards like bread and star tokens."

– UKS/M teacher, control (public) school, Tegal district

"We've appointed cleanliness ambassadors, four students from the fourth grade, tasked with inspecting bathrooms for mosquito larvae and keeping them clean. Additionally, there's a monthly mass cleaning campaign for the environment, and regular tasks like bed-making and sweeping in the UKS room are carried out."

– UKS/M teacher, intervention (public) school, Surakarta City

The role of schools in obesity prevention and supporting students' balanced nutrition practices

UKS/M teachers suggested that schools could enhance support by implementing more frequent weight and height measurements, for example, during every physical education class. They also proposed regularly promoting healthy snacks to parents through activities like parenting days and enforcing rules that prohibit students from purchasing snacks outside the school premises. For schools without canteens, educating students on making healthy choices when buying snacks from outside vendors was considered particularly important.

The puskesmas echoed this sentiment and highlighted the significant contribution of schools to students' nutritional well-being. The current school curriculum, particularly the Merdeka Curriculum, was considered key in elevating student activity levels by promoting outdoor learning experiences. This diversification of activities encouraged students to remain active, rather than passively sitting in classrooms. Furthermore, school involvement in health screening initiatives, including routine weight and height measurements, was also considered essential in monitoring and promoting students' overall health.

Support for schools in implementing the UKS/M programme

UKS/M teachers from various schools reported positive communication with their local puskesmas, particularly due to their close proximity. This geographical advantage facilitated strong personal rapport, effective communication and improved the quality of implementation of UKS/M programmes.

"The communication is excellent because our school is directly opposite the puskesmas. The puskesmas frequently visits our school for nutrition and health-related studies, utilising it as a research site and considering it for its internship programme. We have a good familiarity with the staff, which facilitates smooth communication. Disseminating information about nutrition and health is also more straightforward."

– UKS/M teacher, intervention (religious) school, Semarang City

Some schools mentioned that meetings between UKS/M teachers and the puskesmas usually occurred during inspections of the school environment and canteen, or when the puskesmas participated as speakers at new student orientation events. Generally however, schools reported a lack of regular meetings with the puskesmas. The puskesmas typically reached out to schools for activities such as School Immunization Month (BIAS), health screenings, deworming, or UKS/M competitions.

"Usually, the puskesmas contacts us for new events, such as 'small doctor' programmes, BIAS, and health screenings. They only reach out when they require school assistance for programme implementation, in my experience. There aren't any scheduled regular meetings."

– UKS/M teacher, control (religious) school, Semarang City

Among the few schools invited to meetings at the puskesmas, there was notable concern regarding the lack of follow-up from these meetings. This was particularly evident when schools sought assistance from the puskesmas regarding matters such as dealing with food vendors outside school premises who sell unhealthy food and drinks.

"I once sought help regarding snacks sold outside the school. However, the puskesmas couldn't take any action. Instead, we were directed to visit the puskesmas in case of health complaints arising from those snacks. Ideally, it should be the puskesmas taking proactive measures by visiting the school."

– UKS/M teacher, control (public) school, Semarang City

At several puskesmas, staff mentioned that communication with UKS/M teachers at supported schools was suboptimal due to both parties' busy schedules.

"In my area, UKS/M teachers mostly rely on us for information. This may be due to the numerous activities that teachers are involved in. Therefore, we primarily share document reports or activity notifications via WhatsApp."

– UKS/M coordinator, puskesmas, Kudus district

Some puskesmas admitted that communication with schools primarily concerned preparing and reporting routine health programmes such as health screenings, immunizations, deworming, and the distribution of iron tablets for junior high and high schools.

"We have developed a close relationship with UKS teachers and make efforts to connect with them in every school. We have a dedicated WhatsApp group for UKS/M teachers across all schools in our area. However, sometimes they are unable to attend when invited. We conduct a meeting at the beginning of each school year to inform them about upcoming screenings, deworming schedules, iron distribution, and iodized salt examination."

– UKS/M coordinator, puskesmas, Surakarta City

Challenges in supporting students to practice balanced nutrition

Schools shared their perspectives on their challenges in supporting students to adopt balanced nutrition practices. One of these related to parental involvement, either because of insufficient parental support or parents' high expectations of schools.

"Some schools once organized a balanced nutrition competition but encountered resistance from some parents. This was because the activity required financial contributions from parents, as each class was tasked with managing their own funds for providing nutritious meals. Consequently, the menu was standardized across all classes. Parents threatened to report this to the District Education Office."

.– UKS/M teacher, control (public) school, Semarang City

Schools also highlighted the lack of parental support in restricting children from purchasing unhealthy snacks from vendors outside school premises, as some parents also buy snacks from these vendors. Conversely,

in certain schools, parents' expectations were exceedingly high and included requests for the school to manage food vendors outside the premises who sell unhealthy food. Some 'demanded' that the school take responsibility if students fell ill, despite the school's belief that illnesses were often a result of consuming food purchased from street vendors outside school premises, rather than from the school canteen.

Other challenges faced by UKS/M teachers in implementing the UKS/M programme in schools include:

1. A lack of training from puskesmas left the UKS/M teachers feeling ill-equipped to effectively fulfil their roles without the necessary knowledge and skills.
2. Inadequate skills in delivering engaging nutrition education to students hindered teachers' efforts to encourage healthier lifestyles.
3. Insufficient support from other teachers to encourage students to refrain from buying snacks outside school premises. Some teachers believed that vendors were merely earning a living and that the school was absolved of responsibility, since student purchases occurred after school hours.
4. Difficulties in socializing with parents to prevent students from buying snacks outside school were compounded by the fact that some food vendors were parents of school students.
5. Limited responsiveness from the puskesmas regarding issues raised by UKS/M teachers.
6. Financial constraints on school activities due to parents' objections to fundraising, including for joint breakfast activities.

Puskesmas also faced challenges in implementing the UKS/M programme, particularly in nutrition and health education. These included: (i) limited staffing at the puskesmas compared to many ongoing programmes that needed attention; (ii) suboptimal school food environments, especially with the presence of vendors selling unhealthy foods outside schools; (iii) budget limitations for conducting 'Little Doctor' training for children and procuring educational materials on nutrition; and (iv) limited skills among puskesmas staff to deliver engaging and effective nutrition messages to elementary school students.

"Health knowledge is continuously updated, requiring the continuous sharing of updated knowledge with teachers. While we received flipcharts and posters from the District Health Office, distribution to schools was subject to availability. We also created PowerPoint presentations ourselves. However, teachers predominantly focused on providing care to sick students at school, with minimal emphasis on education."

– UKS/M coordinator, puskesmas, Semarang City

"For educational materials, we sourced them ourselves as we had the necessary knowledge from our formal education. However, facilitating student engagement in practical exercises proved challenging. Perhaps a psychological approach would be beneficial."

– UKS/M coordinator, puskesmas, Kudus district

"Developing engaging content about UKS and delivering it to school children has been a challenge. Creating interactive media beyond leaflets, such as drama or dialogues featuring relatable characters, would enhance engagement and comprehension. Nutrition education for elementary school students is particularly challenging."

– UKS/M coordinator, puskesmas, Semarang City

"Nutrition education remains inadequate, typically limited to theoretical instruction within physical education and science subjects. Application of this knowledge is lacking, rendering it more of a formality than a practical aspect of children's education."

– UKS/M coordinator, puskesmas, Semarang City

Key factors in implementing the UKS/M programme, including balanced nutrition education, in schools

UKS/M teachers identified several factors essential to implementing nutrition education in schools. These include allocating specific time in the school schedule for nutrition education, educating students' parents, ensuring adequate facilities and infrastructure within schools, getting parental support in providing meals for students, encouraging active participation from all teachers (not only UKS/M teachers), and fostering cohesion between schools and parents to monitor students' nutrition practices at home and at school.

Puskesmas staff highlighted that some UKS/M programmes were successful, despite challenges, due to several key factors. These included effective coordination among various units within puskesmas to conduct activities in schools (the nutrition, health promotion, environmental health, and UKS/M units), building strong relationships between puskesmas staff and UKS/M teachers in supported schools, and receiving robust support from schools – especially from principals and UKS/M teachers. The coordination among puskesmas units also facilitated the efficient utilization of funds, considering the limited budget available for school visits and activities.

"We usually operate as a unified team. Coordinating back and forth with schools can be cumbersome. Therefore, we synchronise our visiting schedules and share relevant information among units. For instance, if the Health Promotion unit is scheduled to visit, I will ensure pertinent details are communicated to the school. This approach enhances efficiency and convenience."

– UKS/M coordinator, puskesmas, Surakarta City

"We conducted education sessions in 41 schools about healthy snacks and clean and healthy lifestyle (PHBS). Due to budget constraints, we divided tasks accordingly. Grades four to six focused on snacks, while grades one to three emphasised tooth brushing and handwashing. This division saved both time and budget."

– UKS/M coordinator, puskesmas, Kudus district

To ensure the continuity of programme implementation and achieve the desired impact on students' nutrition practices, puskesmas emphasised the need for supportive policies such as adopting the 'giving bait, not fish' principle, integrating nutrition education into the curriculum, and applying 'sufficient pressure' on schools from the District Education Office (DEO).

"The policy from above is actually crucial because it becomes a rule. People at the higher government levels should also be smart. They should know what policies are needed. If we have a slight problem and then they give a directive like PMT, then later they will all jump on it like, 'Oh tomorrow that child will definitely get PMT too.' So, it's better to provide bait instead of fish."

– UKS/M coordinator, puskesmas, Semarang City

"The role of schools is pivotal in preventing child obesity. However, the curriculum in Indonesia lacks nutrition education compared to, for example, Malaysia. Integrating nutrition education into the curriculum could significantly impact students' behaviour. Teachers wield significant influence, often surpassing that of parents. If nutrition education begins from early childhood education, through kindergarten and elementary school, it can profoundly shape children's characters."

– Nutritionist, puskesmas, Tegal district

"There needs to be pressure from the DEO. People tend to act when pressured from above. Schools may not perceive nutrition education as essential without such pressure. With DEO pressure, schools would recognise it as a necessity."

– Nutritionist, puskesmas, Tegal district

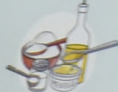


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10 Pesan Gizi Seimbang



Makan makanan bergizi seimbang dan bervariasi



Batasi konsumsi gula, garam dan lemak



Rutin beraktivitas dan menjaga berat badan



Makan makanan berprotein tinggi



Perbanyak konsumsi sayur dan buah



Minum air putih yang bersih dan cukup



Selalu perhatikan label makanan



Cuci tangan pakai sabun selama 60 detik dengan air mengalir



Biasakan sarapan setiap hari



Bersyukur dan menikmati makanan yang kita makan



HARI / TANGGAL :
MATA PELAJARAN :

5. CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

1. There were no significant differences in students' characteristics (age, gender, daily pocket money, morbidity) and parents'/household characteristics (age, educational attainment, occupational status, household size, wealth index, food security status) between intervention and control schools.
2. A total of 59.6 per cent of students had good nutritional status, 11.9 per cent were underweight and severely underweight, 13.3 per cent were overweight, and 15.2 per cent were obese. There was no significant difference in the nutritional status of students in intervention and control schools. By gender, more male than female students experienced malnutrition (both undernutrition and overnutrition).
3. There was no significant difference in knowledge, attitudes, and practices regarding balanced nutrition among students and parents in intervention and control schools.
4. Most students in both groups demonstrated poor knowledge (64 per cent), moderate attitudes (46 per cent), and poor practice (72 per cent) of balanced nutrition. Nearly half of their parents had poor knowledge (49 per cent) and poor attitudes (44 per cent) toward balanced nutrition. However, 65 per cent of parents in both groups demonstrated good practices related to balanced nutrition.
5. Student knowledge that was lacking: breakfast, dietary diversity, and food labelling. Less favourable student attitudes were related to limiting the consumption of salty snacks and instant noodles. Poor student practices were primarily related to the amount of water consumed per day, reading food labels, handwashing with soap at critical times, frequency of physical activity, and sedentary practices.
6. Nearly half of parents had poor knowledge (49 per cent) and attitudes (44 per cent) towards balanced nutrition. Despite this, 65 per cent of parents displayed good practices. Their lack of knowledge related to obesity prevention and the consequences of obesity. Parents' attitudes were less favourable concerning their ability to manage their children's dietary practices (i.e.; snacking habits and fruit and vegetable consumption) and regular exercise, and their perception of the severity of the impact of overweight/obesity on elementary school children.
7. Students' knowledge and attitude significantly associated with their practices. Notably, poor practices were observed more among students with poor knowledge than good knowledge (76.3 vs 60 per cent, respectively) and poor attitude than good attitude (79.6 vs 61 per cent, respectively). Similarly, parents' knowledge and attitude were significantly associated with their practices. Good practices were significantly more observed among parents with good knowledge than poor knowledge (72.5 vs 58.8 per cent, respectively) and good attitude than poor attitude (72.5 vs 58.7 per cent, respectively).
8. Five factors demonstrated significant associations with the risk of students being overweight or obese: the mother's educational level (higher maternal education level increased the risk of child overweight/obesity), the mother's employment status (working mothers had a higher risk of child overweight/obesity), the family's economic status (higher economic status increased the risk of child overweight/obesity), students' dietary practices (better practices reduced the risk of overweight/obesity), and parental attitudes towards balanced nutrition.
9. The 'contradictory' association between parents' attitudes and a higher risk of overweight and obesity among children may have been related to the fact that parents with overweight and obese children had greater awareness and concern regarding their children's nutritional status, leading to a more favourable attitude towards the impact of overweight/obesity among children.

10. Knowledge, attitude, and practices on balanced nutrition

- UKS/M teachers, school committee members, and canteen managers were not necessarily familiar with the term 'balanced nutrition', but they had a good understanding of the criteria for healthy food and drinks for school children in terms of food safety, nutritional content, and sugar/salt/fat content.
- In general, respondents (UKS/M teachers, school committee members, puskesmas staff, and TP UKS representatives) believed that obesity was not a problem in the study area because the number of obese students was very small (based on health screening results and observations).
- Skipping breakfast, limited dietary diversity, and unhealthy snacking habits were the main concerns of respondents regarding the students' dietary practices.
- Respondents believed that among the two causes of obesity, eating habits were more dominant considering that elementary school students generally had high physical activity levels.

11. Food environment at schools

- The food environment in intervention and control schools was similar. Foods and drinks high in sugar, salt, and fat were common. The main food safety issue was the use of sauce with a striking red colour in many types of snacks.
- Most schools had regulations for the school canteen. In some schools the focus was on food safety issues only, while in others, it was on food safety and nutrition issues, particularly sugar, salt, and fat content.
- There were five perceived challenges to providing healthier and safer foods for students: (i) children's strong preference for less healthy and safe foods/beverages; (ii) the presence of food sellers outside school premises; (iii) the lack of schools' ability to enforce canteen regulations; (iv) a lack of resources; and (v) the food habits of the family.
- Schools perceived the regulation of their canteens as manageable but regarded the regulation of food vendors outside their

premises as unmanageable and beyond their authority or responsibility.

- Most schools had never received capacity-building or coaching on canteen best practices from puskesmas or the local authorities. Some schools had visits from puskesmas to take samples of food for laboratory assessment.

12. Existing school-based health and nutrition programmes and policies

- Among the three pillars of UKS/M, the implementation of the first pillar (health education) was considered good although inconsistent. Implementation of the second pillar (health services) was considered very good as coverage was consistent according to targets. The implementation of the third pillar (environmental cleanliness) was considered good, although less satisfactory for fostering a healthy food environment.
- Overall, there were no regular meetings between schools and health centres. Communication mainly occurred during routine health programmes such as health screenings and immunizations. However, some schools located near health centres developed personal relationships with health centre staff, which facilitated smooth communication and the implementation of activities.
- Both schools and health centres experienced challenges in implementing UKS/M programmes, including a lack of skills to deliver engaging nutrition education to students, unhealthy food environments inside and outside schools, and budgetary constraints around the implementation of activities.



5.2 RECOMMENDATIONS

Preventing obesity should receive greater attention given its high and growing prevalence across Indonesia, including the four study areas. Using schools as the primary platform for intervention, strategies to help tackle overweight and obesity, particularly among primary school age children, include the following recommendations:

- 1. Improve the school food environment:** Schools need assistance and empowerment to enforce their existing canteen regulations. Local authorities should play a more active role to regulate food vendors outside schools and take concrete action to ensure they sell healthier food and drinks.
- 2. Strengthen overweight/obesity screening:** Enhance existing annual or bi-annual health screening programmes, followed by functional referral systems for overweight and obese students. Special, personalised approaches should be applied during counselling/education sessions, particularly among elementary school students, considering that overweight and obesity are sensitive issues.
- 3. Create demand for healthier foods:** Disseminate nutrition information and facilitate experiential learning at schools to help students translate acquired knowledge into practice. Nutrition education for obesity prevention should emphasise the general concept of balanced nutrition and focus on consuming a diverse diet, reducing sedentary activities, and choosing healthier snacks (including reading food labels to limit intake of foods/drinks high in sugar, salt, and fat).
- 4. Provide practical nutrition information to parents:** Utilise existing and available media among parents, such as infographics or short videos via WhatsApp groups, to disseminate information about overweight and obesity prevention. Given parents' attitudes and insufficient knowledge, the topic of overweight and obesity prevention should be a priority.
- 5. Strengthen the capacity of UKS/M teachers and puskesmas staff:** Provide training and support, especially in facilitating interactive nutrition education that leads to habituation and behaviour change among students. Building such capacities is crucial to create an overweight/obesity prevention movement as part of the UKS/M programme.





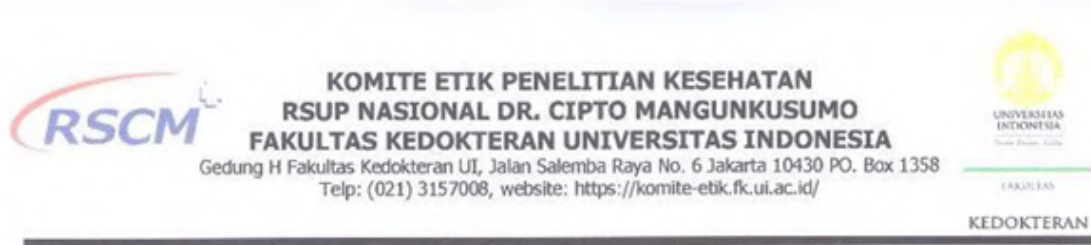
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7. Annex

7.1 ANNEX. ETHICAL APPROVAL LETTER



Nomor : KET- 68 /UN2.F1/ETIK/PPM.00.02/2024

KETERANGAN LOLOS KAJI ETIK ETHICAL APPROVAL

Komite Etik Penelitian Kesehatan Fakultas Kedokteran Universitas Indonesia – RSUPN Dr. Cipto Mangunkusumo dalam upaya melindungi hak asasi dan kesejahteraan subjek penelitian kedokteran, telah mengkaji dengan teliti protokol penelitian yang berjudul:

The Ethics Committee of the Faculty of Medicine, University of Indonesia – Cipto Mangunkusumo Hospital with regards of the Protection of human rights and welfare in medical research, has carefully reviewed the research entitled:

“Survei Awal (baseline) Pengukuran Status Gizi dan Faktor-faktor yang Berkaitan pada Anak Usia Sekolah Dasar di Provinsi Jawa Tengah”

Protocol Number : 23-12-2032

Peneliti Utama : Dr. Luh Ade Ari Wiradnyani, M.Gizi
Principal Investigator

Nama Institusi : SEAMEO RECFON
Name of the Institution

Lokasi Penelitian : 1. Kota Semarang
Site 2. Kota Surakarta
3. Kabupaten Tegal
4. Kabupaten Kudus

Tanggal Persetujuan : 12 JAN 2024
Date of Approval (valid for one year beginning from the date of approval)

Dokumen Disetujui : Proposal Penelitian, Version 01 tanggal 13 Desember 2023
Document Approved Lembar Penjelasan kepada Calon Subjek, Version 01 tanggal 13 Desember 2023

dan telah menyetujui protokol berikut dokumen terlampir.
and approves the above mentioned protocol including the attached document.

Ditetapkan di : Jakarta



** Peneliti berkewajiban

1. Menjaga kerahasiaan identitas subjek penelitian.
2. Memberitahukan status penelitian apabila:
 - a. Setelah masa berlakunya keterangan lolos kaji etik, penelitian masih belum selesai, dalam hal ini *ethical approval* harus diperpanjang. Harap pengajuan perpanjangan etik dilakukan 30 hari sebelum masa aktif lolos kaji etik habis.
 - b. Penelitian berhenti di tengah jalan.
3. Melaporkan kejadian serius yang tidak diinginkan (*serious adverse events*).
4. Peneliti tidak boleh melakukan tindakan apapun pada subjek sebelum protokol penelitian mendapat lolos kaji etik dan sebelum memperoleh *informed consent* dari subjek penelitian.
5. Menyampaikan laporan akhir, bila penelitian sudah selesai.
6. Cantumkan nomor protokol ID pada setiap komunikasi dengan KEPK FKUI-RSCM.
7. Semua prosedur persetujuan dilakukan sesuai dengan standar ICH-GCP

7.2 STUDENTS' QUESTIONNAIRE

QUESTIONNAIRE FOR STUDENTS BASELINE SURVEY OF NUTRITIONAL STATUS AND ASSOCIATED FACTORS IN SCHOOL-AGE CHILDREN IN CENTRAL JAVA

Date of interview : ____/____/2024

Start time :

Finish time :

Duration : _____ minutes

Interviewer code : []

- | | |
|-------------------------|-------------------------------|
| 1. Ainun Permata Shanie | 11. Agita Dianingsih |
| 2. Hanifa Ristianingsih | 12. Aurellia Putri Ardiansyah |
| 3. Lauw Eunike Azalia | 13. Bethrix Angelita S.K |
| 4. Nuristiana Izzatu I. | 14. Dian Marta Khaerani |
| 5. Nyoman Putri A.A | 15. Faniqotul Kauni |
| 6. Olivia Luna Ariawan | 16. Gendis Raka Siwi |
| 7. Puspita Dian Pratiwi | 17. Habibah Alim Anjani |
| 8. Wiki Sari Sinurat | 18. Siti Andhini M. |
| 9. Yohanete Novita A. | 19. Vitri Setyo Rahmadhani |
| 10. Anita Candra K. | 20. Wulan Rahma Dhani |

City/District Code : []

- | | |
|-------------------|--------------------|
| 1. Kota Semarang | 3. Kabupaten Kudus |
| 2. Kota Surakarta | 4. Kabupaten Tegal |

School/Madrasah Code : []

- | | | | |
|--------------------------|----------------------------|---------------------------------|-------------------------------|
| 1. SD Lamper Kidul 01 | 12. SDN Sampangan | 22. SDN 1 Purwosari | 32. SDN Kalisapu 01 |
| 2. SD Pekunden | 13. SDN Sabranglor No 78 | 23. SD 7 Gondosari | 33. SDN Kemantran 01 |
| 3. SD Tlogosari Wetan 01 | 14. SD Al Azhar Syifa Budi | 24. SD Muhammadiyah 1 | 34. MI Islamiyah Brekat |
| 4. SD Islam Al Azhar 29 | Solo | 25. MI Muhammadiyah Jati | 35. MI Miftahul Ulum |
| 5. MI Nashrul Fajar | 15. MIS Tamirul Islam | Kulon | Bumijawa |
| 6. SD N Bulu Lor | 16. SDN Begalon I | 26. SD 1 Jati Kulon | 36. SDN Bogares Kidul 02 |
| 7. SD N Pleburan 03 | 17. SDN Danukusuman | 27. SD 3 Demaan | 37. SDN Karanganyar 01 |
| 8. SD Sendangmulyo 01 | 18. SDN Kedunglumbu | 28. SD 4 Jekulo | 38. SDN Kepandean 03 |
| 9. SD St. Antonius 02 | 19. SDIT Luqman Al Hakim | 29. SD NU Tanwirul Qulub | 39. SD Muhammadiyah |
| 10. MI Taufiqiyah | 20. MIS TTQ Mitqum | 30. MI NU Raudlatul Shiblyan 01 | Karangdawa Margasari |
| 11. SDN Harjodipuran | 21. SD 1 Wergu Wetan | 31. SDN Muncanglarang 01 | 40. MI Ikhsaniyah Kebandingan |

Interviewer's signature

FOR FIELD SUPERVISOR

Checking date : ____/____/2024

Field supervisor code : []

1. Hartanti Sandi Wijayanti
2. Evi Ermayani
3. Mursid Tri Susilo
4. Dewi Shinta

Field supervisor's signature:

A. STUDENT CHARACTERISTICS

1. Student name			
2. Date of birth	(date) (month) (year)		
3. Age	_____ year		
4. Gender	1 Male 2 Female	[]	
5. Amount of pocket money at school per day	: Rp _____		

B. SCREENING QUESTIONS

1. VISION: Do you wear glasses?	1. Yes 2. No	[]
2. VISION. Do you have difficulty seeing, even if wearing glasses? Would you say	1. No difficulty 2. Some difficulty 3. A lot of difficulty 4. Cannot do at all	[]
3. HEARING. Do you wear a hearing aid?	1. Yes 2. No	[]
4. HEARING. Do you have difficulty hearing, even if using a hearing aid? Would you say...	1. No difficulty 2. Some difficulty 3. A lot of difficulty 4. Cannot do at all	[]
5. MOBILITY. Do you have difficulty walking or climbing steps? Would you say...	1. No difficulty 2. Some difficulty 3. A lot of difficulty 4. Cannot do at all	[]
6. COGNITION (REMEMBERING). Do you have difficulty remembering or concentrating? Would you say...	1. No difficulty 2. Some difficulty 3. A lot of difficulty 4. Cannot do at all	[]
7. SELF-CARE. Do you have difficulty with self-care, such as washing all over or dressing? Would you say...	1. No difficulty 2. Some difficulty 3. A lot of difficulty 4. Cannot do at all	[]
8. COMMUNICATION. Do you have difficulty communicating, for example understanding or being understood? Would you say...	1. No difficulty 2. Some difficulty 3. A lot of difficulty 4. Cannot do at all	[]

C. STUDENT CHARACTERISTICS

BW	Body weight (1)		Kg
	Body weight (2)		Kg
	Body weight (3), if the difference between the 1st and 2nd assessment is > 0.1 kg		Kg
BH	Body weight (1)		Cm
	Body weight (2)		Cm
	Body height (3), if the difference between the 1st and 2nd assessment is > 0.5 cm		Cm

D. FAMILY CHARACTERISTICS

1. Father's name	:		3. Father's age	:		Year
2. Mother's name	:		4. Mother's age	:		Year
Education background			Type of work			
1. No schooling 2. Graduated from elementary school 3. Graduated from junior high school 4. Graduated from senior high school 5. Diploma/bachelor's/master's/doctoral degree 88. Don't know 99. Not relevant			1. Housewife 2. Civil servant/police /military 3. Private sector employees 4. Self-employed 5. Farmer (owner) 6. Farmer (worker) 7. Retired		8. Unemployed 77. Others (specified) 88. Don't know 99. Not relevant	
5. Father's highest education	:	[]	7. Father's occupation	:	[]	
			Other father's occupation	:		
6. Mother's highest education	:	[]	8. Mother's occupation	:	[]	
			Other mother's occupation	:		
9. Number of family members at home			: _____ people			
10. Number of siblings at home			: _____ people			

E. FAMILY SOCIO-ECONOMICS

1. What is the main flooring material in your home? (choose one answer option)	1.	Permanent (ceramic, marble, granite, tile, terrazzo, polished wood/parquet)	[]
	2.	Non-permanent (semi-plastered, unpolished wood/board, natural earth/sand floor)	
	88.	Don't know	
2. What is the main material of the roof in your house? (choose one answer option)	1.	Permanent (tile, concrete, tile, ceramic)	[]
	2.	Non-permanent (zinc, asbestos, bamboo, wood, natural thatch/straw roof)	
	88.	Don't know	
3. What is the main material of the walls in your home? (choose one answer option)	1.	Permanent (brick)	[]
	2.	Non-permanent (wood/triple board, bamboo, log, woven bamboo)	
	88.	Don't know	
4. What is the main fuel used for cooking in your home? (choose one answer option)	1.	Electricity	[]
	2.	LPG/Natural Gas (3kg)	
	3.	LPG/natural gas (5 kg or 12 kg)	
	4.	Biogas	
	5.	Kerosene	
	6.	Wood	
	7.	No cooking at home	
	77.	Other (please specify), continue to No. 5	
88.	Don't know		

5. Other main fuel used for cooking in your home?				
6. What is the main source of drinking water in your home? (choose one answer option)	1.	Branded bottled water	[]	
	2.	Refillable water		
	3.	PDAM		
	4.	Well		
	77.	Other (please specify), <i>continue to No. 7</i>		
	88.	Don't know		
7. Other main source of drinking water in your home?				
8. What type of toilet is most commonly used in your home? (choose one answer option)	1.	Private toilet in the house	[]	
	2.	Shared toilet (shared with several other houses)		
	3.	Public toilet		
	77.	Other (please specify), <i>continue to No. 9</i>		
	88.	Don't know		
9. Other type of toilet is most commonly used in your home?				
10. Do you or anyone in your household have any of these items?				
a. Radio	1.Yes	2.No	88. Don't know	[]
b. Television	1.Yes	2.No	88. Don't know	[]
c. Refrigerator	1.Yes	2.No	88. Don't know	[]
d. Cell phone (cell phone, smart phone)	1.Yes	2.No	88. Don't know	[]
e. Landline phone	1.Yes	2.No	88. Don't know	[]
f. Computer/laptop	1.Yes	2.No	88. Don't know	[]
g. Bicycle	1.Yes	2.No	88. Don't know	[]
h. Motorcycle	1.Yes	2.No	88. Don't know	[]
i. Car/truck	1.Yes	2.No	88. Don't know	[]
j. Bank account	1.Yes	2.No	88. Don't know	[]

C. STUDENT CHARACTERISTICS

Now, I will ask you some questions about your sickness history in the last two (2) weeks and where do you usually seek treatment if you are sick.

No.	Question	Answer codes	Answer
	Have you had any of the following illnesses in the last 2 weeks (14 days)?	1=Yes 2=No (go to next disease type)	If yes, how many days have you been sick? Fill in 99 if not relevant
1	Diarrhoea	[]	[]
2	Cough	[]	[]
3	Colds	[]	[]
4	Fever	[]	[]

5	When you are sick, where or to whom do you most often go for treatment?		
	1. Not going for treatment 2. Health Center 3. Hospital 4. Clinic	1. General practitioner/midwife practice 2. not going to health facility, but buy medicine in pharmacy/convenient store/others 77. Others (specified), <i>continue to No. 6</i> 88. Don't know	[]
6	Other ways for health seeking behaviour	:	
7	In the past 6 months , have you taken deworming medication?	1=Yes 2=No	[]

G. STUDENTS' KNOWLEDGE OF BALANCED NUTRITION

Now, I'm going to ask you some questions about what we know about balanced nutrition. There will be 2 types of questions:

Have you had any of the following illnesses in the last 2 weeks (14 days)?

1	I will read out a statement, and then you can answer it with a TRUE or FALSE answer . If you don't know the answer, then you can answer DON'T KNOW (88) .
2	I will read out a question with answer choices, and then you can choose one of the answer choices . If you don't know the answer, then you can answer DON'T KNOW (88) .

INTERVIEWER: READ THE STATEMENTS AND QUESTIONS ONE BY ONE AS WRITTEN ON THE QUESTIONNAIRE.

NO.	STATEMENT	T/F/DK	Score (1: correct. 0: incorrect/ don't know)
1	If you are not used to having breakfast, you can replace it with a larger lunch (F)	[]	[]
2	If we don't like vegetables, we can replace them with fruit because the nutritional content is the same (F)	[]	[]
3	Only drinking milk at breakfast is enough because milk contains all the nutrients our bodies need (F)	[]	[]
4	Consuming sugary foods and drinks too often can cause obesity (T)	[]	[]
5	We should drink at least 7 glasses of water per day (T)	[]	[]
6	We need to do physical activity only when we are overweight (F)	[]	[]
7	Cleaning the house and gardening are examples of physical activity (T)	[]	[]
8	We wash our hands only when they look dirty (F)	[]	[]
9	We can know our nutritional status based on our weight and height (T)	[]	[]
NO.	QUESTION	ANSWER	Score (1: correct. 0: incorrect/ don't know)
10	At the very top of the Balanced Nutrition Guideline are foods that should be restricted in consumption, except a. Fiber b. Sugar c. Salt d. Fat/Oil 88. Don't know	[]	[]
11	In the My Plate guide, the portion of staple food consumption should be equal to the portion of a. Vegetable b. Fruit c. Side dish d. Water 88. Don't know	[]	[]

12	Here's an example of diverse eating at its best a. Noodles, egg, fried chicken, orange b. Rice, noodles, and sunny side up egg, sweet tea c. Rice, fried fish, spinach vegetable, banana d. Rice, carrot bean soup, papaya 88. Don't know	[]	[]
13	One of the characteristics of healthy food is a. Safe b. Satisfying c. Cheap d. It's delicious 88. Don't know	[]	[]
14	Being overweight can be caused by a. consume too many vegetables b. lack of protein intake c. frequent consumption of sugary drinks d. consume too much vitamin C 88. Don't know	[]	[]
15	Apart from rice, staple foods that contain a lot of carbohydrates are a. Potatoes and cassava b. Cauli flower and avocado c. Mushroom and pumpkin d. Tempe and tofu 88. Don't know	[]	[]
16	The following are the benefits of breakfast a. A source of energy in the morning b. Prevents obesity c. Improves concentration d. All are correct 88. Don't know	[]	[]
17	Examples of unhealthy snacking practice is a. Buying snacks sold in closed containers b. Choosing fresh fruits as snacks c. Buying snacks that do not contain a lot of salt d. Choosing sugary soft drinks as snacks 88. Don't know	[]	[]
18	Information in the Food Label of a packaged food/drink should include the following information, except: a. amount of sugar content b. food ingredients used c. food/drink prices d. amount of vitamin content 88. Don't know	[]	[]
19a	<u>Risks of overweight and obesity:</u> What are the health problems that can occur when a person is overweight or obese? [DO NOT READ THE OPTIONS] 1. Increased risk of chronic conditions (such as heart/cardiovascular disease, high blood pressure and diabetes, stroke, certain types of cancer, respiratory difficulties, chronic musculoskeletal problems, skin problems and infertility) 2. Reduced quality of life 3. Premature death 77. Other (specified), <i>continue to No. 19b</i> 88. Don't know	Code: 1.Yes 2.No 1. [] 2. [] 3. [] 77. [] 88. []	
19b	Other health problems that can occur when a person is overweight or obese	:	

19c	Preliminary analysis 1. Knows (at least has 1 correctly answer) 2. Does not know	:
19d	Number of correct responses	[]
20a	Causes of overweight and obesity: Can you tell me the reasons why people are overweight or obese? [DO NOT READ THE OPTIONS] 1. Increased/excessive intake of energy-dense foods that are high in fat and/ or sugar 2. Lack of or decreased physical activity 77. Other (specified), <i>continue to No. 20b</i> 88. Don't know	Code: 1.Yes 2.No 1. [] 2. [] 77. [] 88. []
20b	Other reasons why people are overweight or obese	:
20c	Preliminary analysis 1. Knows (at least has 1 correctly answer) 2. Does not know	[]
20d	Number of correct responses	[]
21a	Prevention of overweight and obesity: How can people prevent overweight and obesity? [DO NOT READ THE OPTIONS] 1. Reduce energy intake (less high-energy foods and drinks)/reduce the intake of fatty and sugary foods 2. Eat vegetables and fruits more often 3. Eat legumes/whole-grain products more often 4. Increase physical activity level/engage in regular physical activity 77. Other (specified), <i>continue to No. 21b</i> 88. Don't know	Code: 1.Yes 2.No 1. [] 2. [] 3. [] 4. [] 77. [] 88. []
21b	Other ways to prevent overweight and obesity	:
21c	Preliminary analysis 1. Knows (at least has 1 correctly answer) 2. Does not know	[]
21d	Number of correct responses	[]

H. STUDENTS' ATTITUDES RELATED TO BALANCED NUTRITION

Now, I am going to ask you some questions about how you **feel** about balanced nutrition practices and healthy lifestyles. I will read out some **statements** about balanced nutrition and healthy lifestyle practices. You can answer either **disagree (1), neutral (2), or agree (3)** according to how you feel about the statements.

Interviewer: Read the statements one by one as written on the questionnaire.

NO.	STATEMENT	ANSWER	Score (1: correct. 0: incorrect/ don't know)
1	Breakfast every day is hard for me to do [1]	[]	[]
2	Consuming a variety of foods (such as staple foods, animal protein side dishes, vegetable protein, vegetables, and fruit) at every meal is difficult for me to do [1]	[]	[]
3	I find it difficult to consume vegetables at every meal [1]	[]	[]
4	Almost all vegetables taste good [3]	[]	[]

5	I find it difficult to consume fruit at least twice a day [1]	[]	[]
6	I can drink at least 7 glasses of water every day [3]	[]	[]
7	I find it hard to choose water over other sugary drinks [1]	[]	[]
8	I can easily reduce my consumption of fried foods [3]	[]	[]
9	I find it difficult to reduce my consumption of salty foods/snacks [1]	[]	[]
10	I find it difficult to reduce my consumption of instant noodles [1]	[]	[]
11	The food available in the school canteen is just what I want [3]	[]	[]
12	The food sold in the school canteen is healthy and safe [3]	[]	[]
13	I find it difficult to do regular physical activity daily at least 30 minutes [1]	[]	[]
14	I prefer to play with my gadgets (cell phone, tablet, computer) during my free time rather than cycling or playing outside with friends [1]	[]	[]
15	Washing my hands with soap and running water before every meal is not difficult for me to do [3]	[]	[]
16	Maintaining normal body weight is important for our optimal health [3]	[]	[]
17	I have an ideal body weight [3]	[]	[]
18	Sleeping at least 8 hours every day is easy for me to do [3]	[]	[]
19	When we feel depressed and sad, we can tell our family and friends [3]	[]	[]
20	We should not label our friend by their physical appearance [3]	[]	[]
21a	Perceived severity How serious do you think it is to be overweight or obese? 1. Not really serious, <i>continue to No. 21b</i> 2. Neutral 3. Serious	[]	[]
21b	<i>If not really serious:</i> Can you tell me the reason why it is not really serious?	:	

H. STUDENTS' ATTITUDES RELATED TO BALANCED NUTRITION

NO.	PRACTICE: MEAL FREQUENCY	
1	How many times do you eat in a day? 1. <3 times 2. 3 times 3. >3 times	[]
2	If you eat <3x a day, what meal times do you usually skip? 1. Breakfast 2. Lunch 3. Dinner. 99. Not relevant (eat ≥3x a day)	[]
NO.	PRACTICE: BREAKFAST HABITS	
1	What is your breakfast habit? 1. Every day 2. Occasionally (4-6 times a week) 3. Rarely (1-3 times a week) 4. Never	[]

2	What time do you usually have breakfast? 1. Before 9 o'clock 2. 9 o'clock and after 99. Not relevant (never had breakfast)	[]
3	Where do you usually have breakfast? 1. At home 2. At school by bringing meal from home 3. At school by buying food in the canteen/other places 99. Not relevant (never had breakfast)	[]
4	What do you usually eat for breakfast? 1. Rice, side dishes and vegetables 2. Rice and side dishes 3. Rice and vegetables 4. Bread/cakes and drinks 5. Drink tea/milk/water only 6. Instant noodles with/without rice 7. Instant noodles and eggs or other side dishes 8. Fried foods 77. Other (specified) 99. Not relevant (never had breakfast)	[]
5	Other type of breakfast menu	:
6	If you don't eat breakfast every day, why? 1. Not used to 2. No food prepared at home 3. No time 77. Others (please specify) 99. Not relevant (breakfast every day)	[]
7	Other reason for not having breakfast everyday	:
NO.	PRACTICES: SNACKS	
1	How many times have you usually bought snacks at school or home? 1. Every day 2. Occasionally (4-6x in a week) 3. Rarely (1-3x in a week) 4. Never	[]
2	What kind of food/drink snacks do you buy most often? [DO NOT READ THE OPTIONS] 1. Sweet snacks (chocolate, wafer) Snacks (chips, chiki) 2. Biscuits 3. Bread, cake 4. Bottled drinks/instant drinks in sachets (tea, coffee, fruit-flavoured drinks) 5. Soft drinks 6. Fried foods (fried banana, fritters) 7. Chicken Sempol, egg rolls, cilok 77. Others (specified) 99. Not relevant, because I never have snacks	Code: 1=Yes 2=No [] [] [] [] [] [] [] []
3	Other type of snacks	:
4	Where do you usually buy snacks? 1. In the school canteen 2. At the food vendors outside/around the school 3. At the food vendors near the house 4. Purchased by parents (not bought by themselves) 99. Not relevant, because I never have snacks	[]

NO.	PRACTICE: DRINK WATER	
1	What type of beverage do you drink most often in a day? 1. Water 2. Sweet tea 3. Milk 4. Other sweetened beverages (in sachets/ready-to-drink packets)	[]
2	What is the main reason for drinking that type of beverage most often? (e.g., taste, price, nothing else is available etc.) 1. Taste 2. Price 3. Most available beverage at home/school 4. Told by parents/teachers 77. Others (specify)	[]
3	Other main reasons for drinking that type of beverage most often	:
4	In an average day, how many glasses of water do you consume? 1. ≤ 3 glasses 2. 4-6 glasses 3. ≥ 7 glasses	[]
NO.	PRACTICE: READING FOOD LABELS	
1	Do you read food labels when buying/consuming packaged food/drinks? 1. Always 2. Sometimes 3. Rare 4. Never	[]
2	When reading food labels, what information do you usually read? [DO NOT READ THE OPTIONS] 1. Expiration date 2. Energy content 3. Vitamin content 4. Sugar content 5. Ingredient / food ingredient 77. Others (please specified), <i>continue to No. 3</i> 99. Not relevant (never read labels)	Code: 1=Yes 2=No [] [] [] [] [] [] []
3	Other information read in the food labels	:
4	Does the food label influence you to consume/buy or not to consume/buy a packaged food/drink? a. Yes, most of the time b. Yes, sometimes c. No or not really 99. Not relevant (never read food label)	[]
5	For those who do not always read food labels, what is the main reason? 1. Do not understand it 2. Have no time 3. Others (specified), continue to No. 6 99. Not relevant (always read food label)	[]
6	Other main reasons for not reading food labels	:
NO.	PRACTICE: HYGIENE PRACTICE	
1	When reading food labels, what information do you usually read? [DO NOT READ THE OPTIONS] 1. Before meals 2. After meals	Code: 1=Yes 2=No [] []

	3. After attending toilet (urination/defecation) 4. After holding an animal 5. After taking out the trash 6. After playing 7. Can't be determined (no specific time)	[] [] [] [] []
NO.	PRACTICE: PHYSICAL ACTIVITY	
1	In the past week, did you do any of the following activities? [You can choose more than 1] 1. Light physical activity (house/classroom cleaning (sweeping, mopping, yard/garden cleaning, other) 2. Moderate physical activity (fast walking, cycling, skateboarding, gymnastics, dancing) 3. Vigorous physical activity (running, swimming, soccer, basketball)	Code: 1=Yes (specify the frequency) 0=No Light PA []; frequency [] Moderate PA []; frequency [] Vigorous PA []; frequency []
2	What exercise did you do this week? [You can choose more than 1] 1. Aerobics (brisk walking, running, cycling, swimming, soccer) 2. Muscle strengthening (sit-ups, push-ups, gymnastics) 3. Bone strengthening (jump rope, basketball, tennis, badminton)	ode: 1=Yes (specify the frequency) 0=No Aerobics []; frequency [] Muscle strengthening []; frequency [] Bone strengthening []; frequency []
3a	In summary, how often have you exercised in the past week? 1. Never 2. <3 days a week 3. 3-6 days a week 4. Every day	[]
3b	If you have exercised in the past week, how many times do you exercise in one day?	:
4	How much time do you spend each time you exercise? 1. <30 minutes 2. ≥30 minutes 99. Not relevant (never exercised)	[]
5	For those who did not exercise last week, what was the main reason? 1. Not used to it 2. Too lazy to do it 3. No one told me to do so 4. No time 5. No friends/family to go with 6. No venues/tools to do exercise 99. Not relevant (did exercise in the past week)	[]
6	During class breaks, what do you do most often? 1. Sitting alone/with friends, chatting 2. Buying drinks/food at the school canteen 3. Play ball/basketball/chase with friends 4. Viewing cell phone 5. Doing schoolwork 77. Others (specified), continue to No. 7	[]
7	Other activities done during class breaks	:
8	How do you usually get to and from school? 1. Walking 2. Ride a bike 3. Get a motorcycle/car ride 4. Take public transportation	[]

9	Name the types of extracurricular activities you participate in at school! [You can choose more than 1] 1. Scout 2. Flag Hoisting Troop 3. Sports (soccer, futsal, basketball, horse-riding, archery, etc.) 4. Arts (music, dance, theatre, etc.) 5. Language 6. Science club 7. Others (please specified), <i>continue to No. 9</i>	Code: 1=Yes 2=No [] [] [] [] [] [] []
10	Other extracurricular activities participated in at school :	
11	Do you have a cell phone? 1. Yes, shared it with sibling 2. Yes, for my own use 3. No	[]
12	Number of social media accounts owned 1. Don't have 2. have 1 account 3. have more than 1 account	[]
13	If you have any social media accounts, please specified :	
NO. PRACTICE: SEDENTARY ACTIVITIES		
1	How long do you usually sleep a day? 1. <8 hours a day 2. 8-9 hours a day 3. 10 hours a day 4. >10 hours a day	[]
2	How much time (in minutes) do you usually spend on the following activities: 1. using a cellphone/laptop/computer for playing games and entertainment 2. watching tv 3. study at school 4. study at home	[]
NO. PRACTICE: MONITORING WEIGHT AND HEIGHT REGULARLY		
1	In the past 6 months, did you measure/get your weight measured? 1. Yes 2. No	[]
2	If yes, where have you weighed in the last 6 months? 1. At school 2. At home 3. At school and at home 4. Others (please specify 99 Not relevant (not measured)	[]
3	In the past 6 months, did you measure/get your height measured? 1. Yes 2. No	[]
4	If yes, where did you have your height measured in the last 6 months? 1. At school 2. At home 3. At school and at home 4. Others (please specify 99 Not relevant (not measured)	[]
5	Do you know the results of your weight and height measurements ? 1. Yes 2. No 99 Not relevant (Did not measure weight and TB	[]

ACTUAL INTAKE PRACTICES: A 24-HR DIETARY RECALL FOR ASSESSING MINIMUM DIETARY DIVERSITY

Now, I'm going to ask you what foods/drinks you consumed all day **Yesterday** in the preceding day.
 Interviewer: Ask for the name of the menu and a description of the food/drink consumed, without having to ask for more details about the number of servings consumed.

TIME	MENU	DESCRIPTION OF FOOD/ BEVERAGE
Breakfast		
Morning Snack		
Lunch		
Afternoon Snack		
Dinner		

Notes:

Be sure to ask about taking **vitamin/mineral supplements**, including appetite enhancing supplements!

MINIMUM DIETARY DIVERSITY

Based on the list of food and beverages consumed by respondents on the previous day that has been recorded in the table above, each type of food and beverage consumed by respondents is grouped according to the list of food groups that have been provided by giving codes:

- code 1 if the food group was consumed on the previous day
- code 0 if the food group was not consumed on the previous day

MAIN FOOD GROUPS

DDS1	Staple foods (cereals (e.g. rice, porridge, noodles, corn, bread, etc.), tubers (e.g. potatoes, yams, etc.))	[]
DDS2	Legumes (red beans, black beans, chickpeas, green beans, peas, soybeans, tofu, tempeh, etc.)	[]
DDS3	Nuts and seeds (almonds, cashews, walnuts, hazelnuts, chia seeds, sunflower seeds, etc.)	[]
DDS4	Milk and animal milk products (liquid/powder milk, yogurt, cheese)	[]
DDS5	Meat (chicken (including feet), fish, red meat, seafood, offal, processed meat/fish, etc.)	[]
DDS6	Eggs (chicken eggs, quail eggs, duck eggs, etc.)	[]
DDS7	Dark green leafy vegetables (spinach, kale, katuk leaves, cassava leaves, moringa leaves, mustard greens, etc.)	[]
DDS8	Other vitamin A-rich vegetables and fruits (carrots, broccoli, yellow squash, red peppers, papaya, mango, tomatoes, etc.)	[]
DDS9	Other vegetables (cabbage, cauliflower, beans, string beans, eggplant, sprouts, cucumber, green peppers, mushrooms, etc.)	[]
DDS10	Other fruits (banana, orange, watermelon, apple, avocado, pear, durian, date, grape, melon, guava, pineapple, rambutan, etc.)	[]

IRON-RICH FOOD SOURCES

Fe1	Offal (such as chicken liver)	[]
Fe2	Meats (chicken, beef)	[]
Fe3	Fish and seafood	[]

VITAMIN AND MINERAL SUPPLEMENTS

Supp1	Vitamin supplements	[]
Supp2	Mineral supplements	[]
Supp3	Appetite-booster supplements	[]

LESS HEALTHY FOODS/DRINKS

ActLH1	Sweet foods (cake, candy, chocolate)	[]
ActLH2	Sugary drinks (sweet tea, syrup, sweetened condensed, ready-to-drink or powdered sweetened drinks, fruit juices with added sugar)	[]
ActLH3	Deep-fried snacks	[]
ActLH4	Salty foods such as chips	[]
ActLH5	Instant noodle	[]

WEEKLY INTAKE PRACTICES: 1-WEEK FOOD FREQUENCY QUESTIONNAIRE (FFQ)

Now, I will ask you what foods/drinks you consumed for the **LAST 1 WEEK**.

Interviewer:

- Ask whether the respondent consumed food/drink from each food group in the last 1 week (7 days).
- If the respondent consumed these foods/drinks in the past week, ask how often (how many days in the past week) they were consumed.
- Mark the answer option [v] according to the frequency of consumption.

No.	FOOD GROUP	FREQUENCY OF CONSUMPTION IN THE PAST WEEK			
		NEVER (0)	RARE (1-3 DAYS/ WEEK) (1)	OFTEN (4-6 DAYS/ WEEK) (2)	EVERY DAY (3)
FFQ1	Staple foods (cereals (e.g. rice, porridge, noodles, corn, bread, etc.), tubers (e.g. potatoes, yams, etc.))				
FFQ2	Legumes (red beans, black beans, chickpeas, green beans, peas, soybeans, tofu, tempeh, etc.)				
FFQ3	Nuts and seeds (almonds, cashews, walnuts, hazelnuts, chia seeds, sunflower seeds, etc.)				
FFQ4	Milk and animal milk products (liquid milk, milk powder, yogurt, cheese)				
FFQ5	Meat (chicken (including feet), fish, red meat, seafood, offal, processed meat/fish, etc.)				
FFQ6	Eggs (chicken eggs, quail eggs, duck eggs, etc.)				
FFQ7	Dark green leafy vegetables (spinach, kale, katuk leaves, cassava leaves, moringa leaves, mustard greens, etc.)				
FFQ8	Other vitamin A-rich vegetables and fruits (carrots, broccoli, yellow squash, red peppers, as well as papaya, mango, tomatoes, passion fruit, etc.)				
FFQ9	Other vegetables (cabbage, cauliflower, beans, string beans, eggplant, cucumber, sprouts, green peppers, mushrooms, etc.)				
FFQ10	Other fruits (banana, orange, watermelon, apple, avocado, pear, durian, date, grape, melon, guava, pineapple, rambutan, etc.)				
LESS HEALTHY FOOD/DRINK					
FFQLH1	Sweet foods (cake, candy, chocolate)				
FFQLH2	Sugary drinks (sweet tea, syrup, sweetened condensed, ready-to-drink or powdered sweetened drinks, fruit juices with other sugar added)				
FFQLH3	Deep-fried snacks				
FFQLH4	Salty foods such as chips				
FFQLH5	Instant noodles				

7.3 PARENTS' QUESTIONNAIRE

QUESTIONNAIRE FOR PARENTS OF STUDENTS BASELINE SURVEY OF NUTRITIONAL STATUS AND RELATED FACTORS ON SCHOOL-AGE CHILDREN IN CENTRAL JAVA

RESPONDENT INFORMATION		
Respondent's name	:	
Respondent's relationship with students (circle one answer option)		1. Father 2. Mother 3. Siblings 4. Grandfather or grandmother 5. Uncle or aunt 6. Others, please specify _____
Respondent's cellphone number	:	
STUDENT INFORMATION		
Student's name	:	
Class	:	
School name	:	
School district/city of origin	:	
PARENTS INFORMATION		
Age of father	:	_____ years old
Age of mother	:	_____ years old
Education of father of student		1. No schooling 2. Graduated from elementary school 3. Graduated from junior high school 4. Graduated from senior high school 5. Diploma/bachelor's/master's/doctoral degree
Education of mother of student		1. No schooling 2. Graduated from elementary school 3. Graduated from junior high school 4. Graduated from senior high school 5. Diploma/bachelor's/master's/doctoral degree
KNOWLEDGE		
Instructions : Circle T if the statement is correct, and F if the statement is incorrect		
1	A child whose parents are not overweight/obese will have no risk of being overweight/obese	T / F
2	Reduced quality of life is one of the health problems that can occur when a person is overweight or obese	T / F
3	The key to prevent overweight/obesity is balancing energy intake and expenditure	T / F
4	Overweight/obesity can be caused by individual factors, and environmental factors	T / F
5	Packaged tea generally contains no/low energy	T / F

PRACTICE

Instructions : Circle the answer choices that you think are most appropriate

1	In general, where does the food come from in your household?	
	a. Cook at home b. Cook at home (main meal), buy (snacks/snacks) c. Purchase (main meals and snacks)	
2	How often did you buy ready-made food online during the last week?	
	a. Almost every day (5-7 days) b. Occasionally (1-4 days) c. Never	
3	How is availability of the following food in your house during the last week? Option: (1) Always (everyday); (2) sometimes (4-6 days); (3) rarely (1-3 days) (4) never (0)	
	a. Vegetable	(1) always; (2) sometimes; (3) rarely; (4) never
	b. Fruit	(1) always; (2) sometimes; (3) rarely; (4) never
	c. Fried foods	(1) always; (2) sometimes; (3) rarely; (4) never
	d. Sugary drink (home-made tea/coffee, ready-to-drink sweet tea/juice, sweet UHT milk, drink powder)	(1) always; (2) sometimes; (3) rarely; (4) never
	e. Sweet snacks (chocolate bar, candy, donuts, sweet cake/biscuit)	(1) always; (2) sometimes; (3) rarely; (4) never
	f. Salty snacks (such as chips)	(1) always; (2) sometimes; (3) rarely; (4) never
	g. Instant noodle	(1) always; (2) sometimes; (3) rarely; (4) never
4	What is the source of nutritional and health information that you most often use ?	
	a. From health workers b. Internet (including social media) c. Family/friends	d. Television e. Others (specify)
5	Your child's nutritional practices/conditions are of concern to you (please choose 2 options)	
	a. Don't want/don't eat enough vegetables b. Don't want/eat less fruit c. Often skip breakfast d. Frequently consume sweet drinks/food e. Often eat salty foods (such as crisps/chips with flavorings)	f. Don't want to/rarely do physical activity, including sports g. Underweight h. Overweight i. Other

ATTITUDE

Instructions : Circle the answer choices that you think are most appropriate.

1	It is not difficult for me to prepare breakfast for my child every day with a complete meal (rice, side dishes, vegetables)	(1) Disagree; (2) Neutral; (3) Agree
2	It is not difficult for me to ask my child to have breakfast every day with a complete meal (rice, side dishes, vegetables)	(1) Disagree; (2) Neutral; (3) Agree
3	It is not difficult for me to regulate my child's snack habits (frequency of snacks and types of food/drinks purchased)	(1) Disagree; (2) Neutral; (3) Agree
4	It's not difficult for me to get my child to eat vegetables at every meal	(1) Disagree; (2) Neutral; (3) Agree
5	It is not difficult for me to get my child to eat fruit twice every day	(1) Disagree; (2) Neutral; (3) Agree
6	It's not difficult for me to get my child to exercise at least 3-5 days a week	(1) Disagree; (2) Neutral; (3) Agree
7	Overweight/Obesity among elementary school children is a nutrition issue	(1) Disagree; (2) Neutral; (3) Agree
8	How likely do you think your child is to become overweight/obese	(1) Disagree; (2) Neutral; (3) Agree
9	How serious do you think impact of obesity to elementary school children	(1) Disagree; (2) Neutral; (3) Agree
10	Overweight/Obesity is preventable	(1) Disagree; (2) Neutral; (3) Agree

FOOD SECURITY (HFIAS)

Instructions : Circle the answer choices that you think are most appropriate.

HAFIAS 1	In the last four weeks, have you ever worried that your family is running out of food or not having enough food?	0 = no (go to question number 2) 1 = yes
HAFIAS 1a.	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)
HAFIAS 2	In the last four weeks, have you or any of your family members been unable to eat? desired food due to lack of food sources?	0 = no (go to question number 3) 1 = yes
HAFIAS 2a	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)
HAFIAS 3	In the last four weeks, have you or any of your family members eaten a variety of foods due to lack of food sources?	0 = no (go to question number 4) 1 = yes
HAFIAS 3a	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)
HAFIAS 4	In the last four weeks, have you or any of your family members ever eaten food you didn't want because of a lack of food sources?	0 = no (go to question number 5) 1 = yes
HAFIAS 4a	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)
HAFIAS 5	In the last four weeks, have you or your family members eaten smaller portions due to lack of food sources?	0 = no (go to question number 6) 1 = yes
HAFIAS 5a	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)
HAFIAS 6	In the last four weeks, have you or your family members eaten less frequently a day ? due to lack of food sources?	0 = no (go to question number 7) 1 = yes
HAFIAS 6a	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)
HAFIAS 7	In the last four weeks, has there been no food at all at home due to a lack of food sources?	0 = no (go to question number 8) 1 = yes
HAFIAS 7a	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)
HAFIAS 8	In the last four weeks, have you or any of your family members ever gone to bed hungry because of a lack of food sources?	0 = no (go to question number 9) 1 = yes
HAFIAS 8a	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)
HAFIAS 9	In the last four weeks, have you or any of your family members ever gone a whole day (all morning and evening) without eating at all because of a lack of food sources?	0 = no (food insecurity questions completed) 1 = yes
HAFIAS 9a	How often does this happen?	1 = rarely (1-2x in the last four weeks) 2 = sometimes (3-10x in the last four weeks) 3 = often (>10x in the last four weeks)

Please give the completed questionnaire sheet to your child to take to school and collected to the child's homeroom teacher. Thank You

7.4 GUIDED QUESTIONS FOR QUALITATIVE INTERVIEWS

FOCUS GROUP DISCUSSION GUIDE PARTICIPANTS: UKS/M TEACHERS

Notes for Discussion Facilitators

1. Before starting, ask participants to fill in their personal data on the prepared form.
2. Open the discussion with introductions. Use these introductions to create a friendly atmosphere among participants.
3. Mention some guidelines during the discussion such as each participant is asked to respect each other's opinions, no opinion is wrong or right, and each participant is asked to participate actively.
4. Seek permission to record the discussion, for the purpose of data analysis.

NO.	QUESTION GUIDE
1	Do you think the students in this school have nutritional problems? Probing: a. (Ask about health screening activities, and results of students' nutritional status) b. If yes - do you see any difference between girls, boys or children with disabilities? c. Are there any student's nutrition practices that concern you? (explore breakfast habits, snacks, physical activity)
2	Knowledge and attitudes related to balanced nutrition and obesity prevention Probing: a. What do you think balanced nutrition is? b. Why do you think children can become overweight/obese? (ask about diet and physical activity) c. What could be the challenges that children face to practice balanced nutrition? Is this any different for girls, boys or children with disabilities? d. What do you think can be done at school to promote balanced nutrition practices and prevent obesity in students? e. Do you think your school can support students to practice balanced nutrition (and prevent obesity in students)? Why?
3	Please describe the UKS/M activities that run in your school. Probing: a. (Asked for each trias UKS/M.) b. How are nutrition education activities conducted in your school (topics (including obesity prevention topics), school sessions used, IEC materials related to obesity prevention)? c. What activities do you think are working well? What are the key factors d. What activities do you think are not working well? Why? What can be done to make it work better?
4	How is the food environment in your school? a. What is the condition of the canteen in your school (ask about the food sold, canteen rules, canteen monitoring) b. What is the condition of food vendors around your school (ask about the food sold, whether there is monitoring from the puskesmas/other) c. What is your opinion on marketing of less healthy foods (high in sugar, salt, fat) in school, and around school?
5	What is the existing referral system for students with under- or over-nutrition (obesity) to the puskesmas? What do you think about it?
6	Role as UKS/M Teacher Probing: a. What sources of information do you usually use to learn about balanced nutrition and obesity prevention in school-age children? b. Have you participated in any capacity building activities (e.g. training) on nutrition and health? Specifically on overweight/obesity prevention? On psychological counselling on obesity prevention in students? c. What assistance do you get from the puskesmas to run the UKS/M (explore the communication media with the puskesmas, about routine meetings of UKS/M teachers with the puskesmas) d. What challenges have you encountered in carrying out your role as a UKS/M teacher? Ask about the role of the school committee and other parents in student nutrition and health activities e. What skills do you need most to fulfil your role as a UKS/M teacher? Why?
7	What do you find most enjoyable about being a UKS/M teacher?

FOCUS GROUP DISCUSSION GUIDE

PARTICIPANTS: SCHOOL COMMITTEE

Notes for Discussion Facilitators

1. Before starting, ask participants to fill in their personal data on the prepared form.
2. Open the discussion with introductions. Use these introductions to create a relaxed atmosphere among participants.
3. Mention some guidelines during the discussion such as each participant is asked to respect each other's opinions, no opinion is wrong or right, and each participant is asked to participate actively.
4. Seek permission to record the discussion, for the purpose of data analysis.

NO.	QUESTION GUIDE
1	Do you think the students in this school have nutritional problems? Probing: a. (Ask what the nutritional problem is, and the contributing factors) b. Are there any student nutrition practices that concern you? (explore breakfast habits, snacks, physical activity)
2	Knowledge and attitudes related to balanced nutrition and obesity prevention Probing: a. What do you think balanced nutrition is? b. Why do you think children can become overweight/obese? (ask about diet and physical activity) c. What sources of information do you usually use to find out about balanced nutrition and obesity prevention efforts in school-age children?
3	The role of schools and school committees Probing: a. What are the current roles of the school committee (in general, and specific to student nutrition and health) b. What do you think schools can do to prevent obesity in students (ask about their knowledge of the implementation of the UKS/M program in schools, including school canteens and food vendors around the school, whether there are activities that involve school committees/parents directly). c. What is your opinion on marketing of less healthy foods (high in sugar, salt, fat) in school, around school and at home? d. In your opinion, has the school fulfilled this role? Why? e. If the school has not yet fulfilled this role, what do you think are the challenges? (also ask about parents' participation in the school) what are the barriers to offer healthier foods alternatives to packaged snacks and drinks. f. What do you think the school committee can do to help it run better (ask about the school canteen, food vendors around the school, nutrition education activities at school) g. Is the school committee able to fulfil this role well? Why? h. How should schools and parents work together in this regard?
4	What do you find enjoyable about being a member of the school committee?

FOCUS GROUP DISCUSSION GUIDE

PARTICIPANTS: DISTRICT TP UKS/M AND BPOM

Notes for Discussion Facilitators

1. Before starting, ask participants to fill in their personal data on the prepared form.
2. Open the discussion with introductions. Use this introduction session to create a relaxed atmosphere among participants
3. Mention some guidelines during the discussion such as each participant is asked to respect each other's opinions, no opinion is wrong or right, and each participant is asked to participate actively.
4. Seek permission to record the discussion, for the purpose of data analysis.

NO.	QUESTION GUIDE
1	What do you think are the nutrition problems among primary school-age children in this district? Probing: a. What is the cause of the problem? b. Is overweight/obesity a problem in primary school children here? Why? c. Are overweight/obesity problems different for girls, boys, or children with disabilities?
2	What school-age child nutrition policies/programs exist in this district? (especially those related to the prevention of overweight/obesity in school children). Probing: a. According to you, how was the implementation and achievement of the program? b. Strengthening program for good food environment at school (school canteens and street vendors around the school). Is there any regulation on marketing of unhealthy foods in/around school? c. If the program implementation works well, what are the key success factors? d. If not, what are the challenges in implementing the program? What do you propose to overcome these challenges? what are the barriers to offer healthier foods alternatives to packaged snacks and drinks
3	In your opinion, how is the implementation of multisectoral collaboration in nutrition programs in general, and overweight/obesity prevention programs in school children in this area? Is there anything that need improvement? How?
4	What do you think is the role of the UKS/M program in preventing overweight/obesity in school children? Probing: a. Has the role worked well? Why? b. What is the role of TP UKS/M to strengthen the implementation of UKS/M in schools? c. What are the main lessons you learned as a UKS/M coach in assisting the UKS/M program in schools, especially obesity prevention.

FOCUS GROUP DISCUSSION GUIDE

PARTICIPANTS: CANTEEN MANAGER

Notes for Discussion Facilitators

1. Before starting, ask participants to fill in their personal data on the prepared form.
2. Open the discussion with introductions. Use these introductions to create a relaxed atmosphere among participants.
3. Mention some guidelines during the discussion such as each participant is asked to respect each other's opinions, no opinion is wrong or right, and each participant is asked to participate actively.
4. Seek permission to record the discussion, for the purpose of data analysis.

NO.	QUESTION GUIDE
1	In your opinion, are there any eating habits of students in this school that are not good? Probing: a. Does the school canteen play a role in improving/enhancing students' eating habits? (ask them to briefly explain their opinion) b. Has the canteen in this school fulfilled this role well? If so, what are the key factors? If not, why not?
2	Canteen condition and management Probing: a. What foods/drinks are sold in your school canteen? (Ask about the students' favourite foods/drinks.) b. Is there anything you would like to improve about the type of food/drink sold? (explore respondents' perceptions of healthy and unhealthy food) c. How is the canteen managed in your school (ask about the rules of the canteen, selection of food/drinks sold, coordination with the school, monitoring)? d. How do you supervise the food vendors in the canteen? Has any warning ever been delivered? e. What are the barriers to offering healthier foods alternatives to packaged snacks and drinks? f. Which aspect of the canteen would you most like to see improved in your school? Why? g. What are the challenges of canteen management? What has been done to overcome these challenges
3	Debriefing and capacity building Probing: a. In carrying out your role as canteen manager, did you receive any socialization/briefing? If yes, from whom and about what? If no, what debriefing is most needed? b. (ask specifically) Does the school receive assistance from the puskesmas regarding canteen management? If yes, what form does it take? c. Has your school canteen ever been assessed by the puskesmas? If so, how often, and what were the results? Is there any follow-up from the puskesmas and the school regarding the results of the assessment? d. What do you think about food vendors outside the school? (Ask about the food sold, have there been any 'problems', what are the suggestions to overcome these problems? e. How should canteen managers, schools and parents cooperate in managing and monitoring the canteen?
4	What do you enjoy about being a canteen manager?

IN-DEPTH INTERVIEW GUIDE

PARTICIPANTS: FOOD VENDORS IN SCHOOL CANTEENS

Notes for Discussion Facilitators

1. Before starting, ask participants to fill in their personal data on the prepared form.
2. Open the interview with introductions. Use this introductory session to create a relaxed atmosphere
3. Seek permission to record the discussion, for the purpose of data analysis.

NO.	QUESTION GUIDE
1	How long have you been selling in this canteen? What foods do you sell? Why did you choose to sell these foods/drinks?
2	Canteen condition and management Probing: a. Is there any notification of canteen rules by the school to each vendor? If so, what are the rules? b. Is there any monitoring/supervision by the school of the food vendors in this canteen? If yes, how often is it done, what is the form of the monitoring activity, what are the results and is there any follow-up on the results of the monitoring? c. Is there anything you would like to improve about the type of food/drink you sell? (explore respondents' perceptions of healthy and unhealthy food) d. What are the challenges of canteen management? what are the barriers to offer healthier foods to the students? What has been done to overcome these challenges? e. What do you think of the food/drinks sold by other vendors in this canteen? f. What do you think about food vendors around the school?
3	Capacity building Probing: a. Have you ever received information about good food/drinks for primary school students to consume? About safe food preparation in the school canteen? b. (ask specifically) Does the school receive assistance from the puskesmas regarding canteen management? If yes, what form does it take? c. Has your school canteen ever been assessed by the puskesmas? If so, how often, and what were the results? Is there any follow-up from the puskesmas and the school regarding the results of the assessment?
4	What do you enjoy about being a canteen manager?
5	OBSERVATION a. Food/drinks observed being sold by respondents b. Note what is already good, and what needs to be improved (e.g. cleanliness, use of lids, good cooking oil (if relevant), presence of clean water, trash, animals such as flies, cats, others, personal hygiene of the seller). c. Food/drink purchased by students

IN-DEPTH INTERVIEW GUIDE

PARTICIPANTS: FOOD VENDORS AROUND THE SCHOOL

Notes for Discussion Facilitators

1. Before starting, ask participants to fill in their personal data on the prepared form.
2. Open the interview with introductions. Use this introductory session to create a relaxed atmosphere
3. Seek permission to record the discussion, for the purpose of data analysis.

NO.	QUESTION GUIDE
1	a. How long have you been selling here? What kind of food do you sell? b. Why did you choose to sell these foods/drinks? c. Where did you learn to make the food/drink?
2	Besides you, what other food vendors are there around this school?
3	Are there any rules from the school for you to be able to sell here? If so, what are these rules?
4	Has there ever been monitoring/supervision by the school for you or other sellers? If yes, how often is it done, what is the form of the monitoring activity? What are the results of the monitoring? Ask the same thing (point b) by the health centre, and by the student's parents
5	Is there anything you would like to improve about the type of food/drink you sell? (Explore respondents' perceptions of healthy and unhealthy food.) What is the estimated barriers that may limit these improvement?
6	OBSERVATION a. Food/drinks observed being sold by respondents b. Note what is already good, and what needs to be improved (e.g. cleanliness, use of lids, good cooking oil (if relevant), presence of clean water, trash, animals such as flies, cats, others, personal hygiene of the seller). c. Food/drink purchased by students

IN-DEPTH INTERVIEW GUIDE

PARTICIPANTS: PRIMARY HEALTH CENTRE (NUTRITIONIST OR UKS/M STAFF)

Notes for Discussion Facilitators

1. Before starting, ask participants to fill in their personal data on the prepared form.
2. Open the discussion with introductions. Use these introductions to create a friendly atmosphere among participants.
3. Mention some guidelines during the discussion such as each participant is asked to respect each other's opinions, no opinion is wrong or right, and each participant is asked to participate actively.
4. Seek permission to record the discussion, for the purpose of data analysis.

NO.	QUESTION GUIDE
1	In your opinion, do students in this puskesmas area have nutritional problems? Probing: a. (Ask about health screening activities, as well as the results of measuring students' nutritional status) b. What is the referral system for students with under- or over-nutrition (obesity) to the puskesmas? c. Are there any student nutrition practices that concern you? (explore breakfast habits, snacks, physical activity)
2	Knowledge and attitudes related to students' balanced nutrition practices and obesity prevention Probing: a. Why do you think children can become overweight/obese? (ask about diet and physical activity) b. Do you think it is possible to prevent obesity in students (ask how difficult/easy, why?) and can schools play a role?
3	Existing nutrition and health programs in the puskesmas area in supporting the implementation of Balanced Nutrition and obesity prevention in students. Probing: a. (Ask about the implementation of the program and its achievements and monitoring.) b. (Specifically ask about UKS/M.) How is the implementation of UKS/M in the schools in your health centre's coverage area? (Ask for each of the trias of UKS/M.) c. How are nutrition education activities carried out in these schools (topics [including obesity prevention topics], school sessions used, IEC materials related to obesity prevention). d. How is the programme to strengthen school canteens and street vendors around the school environment implemented? e. How is the UKS/M reaching more vulnerable girls and boys, including those with disabilities? Are activities adjusted to special needs? f. Are there activities that reach out to parents? How were the results? g. What UKS/M activities do you think are working well? What are the key factors h. What UKS/M activities do you think are not working well? What can be done by the health centre to make these activities run better (including to prevent obesity in students)?
4	Role as TPG or UKS/M Staff Probing: a. What sources of information do you usually use to learn about balanced nutrition and obesity prevention efforts in school-age children? b. Have you participated in any capacity building activities (e.g., training) on nutrition and health? on psychological counselling on obesity prevention in students? c. What assistance do you provide to schools to run UKS/M (explore communication with schools, regular meetings with UKS/M teachers) d. What challenges have you encountered in assisting the implementation of UKS/M? (Ask about capacity building, availability of IEC materials, knowledge and skills of UKS/M teachers, communication with schools) e. What do you think can be done to overcome these challenges? f. Ask about the role of the school committee and other parents in student nutrition and health activities What skills do you need most to fulfil your role as a UKS/M teacher? Why?
5	What are the most enjoyable things you have experienced in assisting the implementation of UKS/M at school?

SCHOOL FACILITY CHECKLIST

BASELINE SURVEY ON SCHOOL-AGE CHILDREN NUTRITIONAL STATUS AND ITS DETERMINANTS IN CENTRAL JAVA PROVINCE

SCHOOL INFORMATION		
Name of school/madrasah	:	
School type	1. State Elementary School 2. Private Elementary School 3. Madrasah Ibtidaiyah (MI) Public 4. Madrasah Ibtidaiyah (MI) Private	
District/city	1. Tegal district 2. Kudus district 3. Semarang City 4. Surakarta City	
Sub-district	:	
Number of students	Total =	
	Male student =	
	Female student =	
Number of classes	:	
Total number of teachers	:	
List of extracurricular at school	1. Scouts 2. Flag-raising troop 3. Junior doctor 4. Sports (football, futsal, basketball, archery, etc) 5. Arts (music, dance, teather, etc) 6. Language 7. Wall magazine 8. Other, specified:	[] [] [] [] [] [] [] []
Other extracurricular at school	:	
Collaboration with third party	1. Yes, with food company 2. Yes, with other than food company 3. No 4. Do not know	[]
Collaborated company	:	

UKS/M PROGRAM ¹			
1	Number of UKS/M teacher	:	
2	The position of the UKS/M teacher in the school: a. Sports teacher b. Home class teacher c. Religion teacher	d. Principal e. Administration Staff f. Others, please specify _____	
3	Activities based on Trias UKS/M (in the last 12 months)		
	Pendidikan Kesehatan	a. Health literacy b. Nutrition education c. Breakfast together d. Bringing meal from home e. Personal hygiene f. Physical activity g. Reproductive health education h. Healthy living skills education i. School health cadres j. Others, specified:	[] [] [] [] [] [] [] [] [] []
	Pelayanan Kesehatan	a. Health screening b. Immunization c. Deworming d. First aid e. Counseling f. Others, specified:	[] [] [] [] [] []
	Pembinaan Lingkungan Sehat	a. School sanitation management b. Utilization of school garden c. Eradicating mosquito nests d. School canteen monitoring e. Street food vendors monitoring f. Implementation of smoking-free areas g. Others, specified:	[] [] [] [] [] [] []
4	UKS/M Level	1. Minimum 2. Standard 3. Optimum 4. Excelent 5. Do not know	[]

SCHOOL FACILITIES²

	Availability of Handwashing Facilities	Yes/No
1	Functioning hand washing facilities (specified the number)	
2	Clean water	
3	Clean running water and soap	
	Toilet	Yes/No
1	Toilet for teachers (min.1)	
2	Number of toilets for female students (ratio 1:50)	
3	Number of toilets for male students (ratio 1:60)	
4	The area of 1 toilet unit is 2 m2	
5	Toilet has a wall	
6	Toilet has a roof	
7	Lockable toilet	
8	Clean water available in the toilet	
9	Toilet seat (gooseneck) available in the restroom	
10	Trash cans available	
11	Hand washing facilities available (water only)	
12	Hand washing facilities (water and soap) available	
13	Is the toilet accessible for children with disabilities (e.g. toilet has a handrail, elevated seat, lowered sink/hand washing facilities)	Yes/No/Not Relevant
	Facilities for Physical Activity	Yes/No
1	Min. area 20 m x 15 m	
2	Flat surface	
3	There are no waterways or other objects that can interfere with exercise activities.	
4	Not used for parking lot	
5	Volleyball equipment (ball, net)	
6	Soccer equipment (ball, goal)	
7	Gymnastic equipment (mat, jumping crate, jump rope, plastic ball, stick)	
8	Athletic equipment (javelin, disk, bullet, relay stick, diving tub)	
9	Cultural arts and skills equipment (customizable)	
10	School garden available	

NO.	HEALTHY SCHOOL CANTEEN INDICATORS ³	OBSERVATION
Pillar 1: Commitment and Management		
1	A written commitment from the school to provide healthy snacks at school	
2	Availability of school canteen monitoring team	
Pillar 2: Human Resources		
3	Sellers / handlers use Personal Protective Equipment (PPE) such as aprons and headgear	
4	Seller / handler is clean (clothes, hands) and has no open wounds and does not wear excessive jewellery	
5	Food sellers/handlers have received training on food hygiene and sanitation or food safety.	
Pillar 3: Facilities and Infrastructure		
6	Permanent canteen building	
7	Spatial layout according to its function so as to avoid pollution	
8	Building floors are watertight, level, dry, and clean	
9	Walls are flat, watertight, and easy to clean	
10	Sufficient ventilation ensures good air circulation	
11	The room lighting is sufficient to effectively perform food processing work and room hygiene activities.	
12	Sufficient clean water available	
13	Wastewater flows smoothly, wastewater disposal system is good, channels are made of impermeable materials, closed wastewater disposal channels	
14	Toilets with sufficient soap and clean water are available.	
15	Closed trash cans are available and trash is disposed of regularly.	
16	Hand washing station with soap and running water available	
17	There is a place to wash equipment equipped with soap and clean running water	
18	Environmental cleaning tools are available and properly stored	
19	There are no animals that can contaminate hawker food, e.g. flies, cockroaches, rats, cats, etc.	
20	There are efforts to keep food/drinks away from pests/insects, e.g. covers, cabinets/stalls, fly catchers, mouse traps, etc.	
21	Kitchen space is clean, adequate size, has a smoke outlet	
22	Clean dining room, adequate size	
23	Washing, drying and storage of cooking utensils and tableware are done properly, and in a clean state before use.	
24	Using safe containers or packaging (not Styrofoam, plastic bags)	
25	Food storage facilities (refrigerator, freezer) are functioning properly	
26	Use food tongs or gloves to avoid contamination	
27	Cooked food is served covered or protected	
Pillar 3: Facilities and Infrastructure		
28	Food allegedly does not contain harmful chemicals such as formalin, borax, textile dyes	
29	At least 2 types/choices of food sources of carbohydrates, protein sources, fruits, and vegetables are available	
30	Limiting foods that are high in sugar, salt, fat (fried foods)	

SCHOOL FOOD ENVIRONMENT ⁴		
1	Schools sell food and/or beverages, for example, through canteens, kiosks or cafeterias	
2	The following drinks are available for purchase at this school today (on the day of the survey)	
	a.	Sugary drinks (includes all drinks with added sugar <i>(using thresholds aligned with national nutrition profile models or national dietary guidelines)</i> , including sweetened carbonated drinks with sugar, fruit juices less than 100%, flavoured milk)
	b.	Powdered drinks with added sugar (drink mixes produced usually by mixing with liquid, e.g. 2-in-1 mixes)
	c.	Artificially sweetened beverages (including those containing artificial sweeteners or non-caloric sweeteners)
	d.	100% fruit juice (no added sugar)
	e.	Fresh milk
	f.	Mineral water
	g.	Shielded bottled water
	h.	Other, please specify
3	The following foods are available for purchase at this school today (on the day of the survey)	
	a.	Fried foods (foods that have been cooked or heated by frying in any oil (for example, fritters, egg rolls, fried chicken or fish))
	b.	Salty packaged foods that contain high amounts of salt (as defined by the national nutrition profile model or national dietary guidelines) and are provided to schools in certain packaged forms (e.g. instant noodles, wafers, chips).
	c.	Sugary packaged foods (foods that contain high amounts of added sugar and come in specific packaging forms (e.g., candy, cookies, ice cream))
4	Fresh fruit is available for sale to students today.	
5	While walking around the perimeter of the school, there was a sale of high-fat foods seen outside the school grounds.	
6	While walking around the perimeter of the school, a salty food vendor was spotted outside the school grounds.	
7	While walking around the perimeter of the school, there were sales of sugary foods and drinks seen outside the school grounds.	
8	Marketing for unhealthy/HFSS foods or drinks clearly visible in/around the school)	
	If yes, please specify	

Reference:

1. Pedoman Pembinaan dan Pengembangan UKS/M (Kemendikbud, 2019)
2. Permendiknas Nomor 24 Tahun 2007 tentang Standar Sarana dan Prasarana Untuk Sekolah Dasar/Madrasah Ibtidaiyah (SD/MI), Sekolah Menengah Pertama/Madrasah Tsanawiyah (SMP/MTS), Dan Sekolah Menengah Atas/Madrasah Aliyah (SMA/MA)
3. Petunjuk Praktis Pengembangan Kantin Sehat Sekolah (SEAMEO RECFON, 2018)
4. School Nutrition Environment Assessment Survey (UNICEF, 2023)

7.5 ANNEX. DETAILS OF ADDITIONAL RESULTS

RESULTS OF PARENTS' AND HOUSEHOLD SOCIODEMOGRAPHIC CHARACTERISTICS BY DISTRICT AND CITY

VARIABLE	CITY	DISTRICT	TOTAL	P-VALUE ¹
Age (years) of father, <i>mean±SD</i>	42.46±6.40 (n=375)	41.71±5.97 (n=362)	42.09±6.19 (n=736)	0.102
Age (years) of mother, <i>mean±SD</i>	38.74±5.52 (n=385)	38.01±5.49 (n=376)	38.38±5.51 (n=761)	0.067
Educational background of father, <i>n</i>(%)				<0.001
• No school	1 (0.3)	8 (2.0)	9 (1.1)	
• Elementary school	28 (7.0)	78 (19.5)	106 (13.3)	
• Junior high school	56 (14.1)	77 (19.3)	133 (16.7)	
• Senior high school	147 (36.9)	152 (38.0)	299 (37.5)	
• University under-postgraduate	145 (36.4)	56 (14.0)	201 (25.2)	
• Not answering	21 (5.3)	29 (7.3)	50 (6.3)	
Educational background of mother, <i>n</i>(%)				<0.001
• No school	4 (1.0)	2 (0.5)	6 (0.8)	
• Elementary school	21 (5.3)	80 (20.0)	101 (12.7)	
• Junior high school	52 (13.1)	79 (19.8)	131 (16.4)	
• Senior high school	158 (39.7)	147 (36.8)	305 (38.2)	
• University under-postgraduate	148 (37.2)	72 (18.0)	220 (27.6)	
• Not answering	15 (3.8)	20 (5.0)	35 (4.4)	
Occupation of father, <i>n</i>(%)				0.020
• Not working	58 (14.6)	46 (11.5)	104 (13.0)	
• Government employee	30 (7.5)	20 (5.0)	50 (6.3)	
• Private sector	215 (54.0)	204 (51.0)	419 (52.5)	
• Farmer	0 (.0)	6 (1.5)	6 (.8)	
• Entrepreneur	95 (23.9)	124 (31.0)	219 (27.4)	
Occupation of mother, <i>n</i>(%)				0.787
• Housewife or not working	164 (41.2)	158 (39.5)	322 (40.4)	
• Government employee	15 (3.8)	14 (3.5)	29 (3.6)	
• Private sector	112 (28.1)	109 (27.3)	221 (27.7)	
• Farmer	0 (.0)	1 (.3)	1 (.1)	
• Entrepreneur	107 (26.9)	118 (29.5)	225 (28.2)	
Number of household member, <i>mean±SD</i>	4.91±1.56	4.66±1.31	4.78±1.44	0.013
Socioeconomic status of household (DHS wealth index: ownership of selected assets, housing condition, and types of water access), <i>n</i> (%)				<0.001
• Highest tertile	157 (39.4)	97 (24.3)	254 (31.8)	
• Medium tertile	135 (33.9)	143 (35.8)	278 (34.8)	
• Lowest tertile	106 (26.6)	160 (40.0)	266 (33.3)	
Food security status of the household, <i>n</i>(%)				<0.029
• Food-secure	325 (81.7)	292 (73.0)	617 (77.3)	
• Mildly food-insecure access	33 (8.3)	52 (13.0)	85 (10.7)	
• Moderately food-insecure access	24 (6.0)	30 (7.5)	54 (6.8)	
• Severely food-insecure access	16 (4.0)	26 (6.5)	42 (5.3)	

RESULTS OF KEY VARIABLES BY STUDY AREAS

NUTRITIONAL STATUS BY STUDY AREA	KOTA SEMARANG (N=198)	KOTA SURAKARTA (N=200)	KABUPATEN KUDUS (N=200)	KABUPATEN TEGAL (N=200)	TOTAL (N=798)	P-VALUE ¹
BMI-for-age, n(%)						
• Severely thin	1(.5)	3(1.5)	10(5.0)	4(2.0)	18(2.3)	0.138
• Thin	20(10.2)	19(9.5)	19(9.5)	19(9.5)	77(9.6)	
• Normal	118(59.9)	118(58.7)	107(53.5)	133(66.5)	476(59.6)	
• Overweight	26(13.2)	30(14.9)	29(14.5)	21(10.5)	106(13.3)	
• Obese	32(16.2)	31(15.4)	35(17.5)	23(11.5)	121(15.2)	
SUMMARY KAP OF STUDENTS BY STUDY AREA	KOTA SEMARANG (N=198)	KOTA SURAKARTA (N=200)	KABUPATEN KUDUS (N=200)	KABUPATEN TEGAL (N=200)	TOTAL (N=798)	P-VALUE ¹
Knowledge related to balanced nutrition						
Knowledge score*	12(10-14)	12(10-13)	11(10-14)	11(9-13)	11(10-13)	<0.001
Knowledge level**						
Good > 80%	10(5.1)	5(2.5)	9(4.5)	6(3.0)	30(3.8)	0.046
Medium 60-79%	76(38.6)	67(33.3)	65(32.5)	49(24.5)	257(32.2)	
Poor < 60%	111(56.3)	129(64.2)	126(63.0)	145(72.5)	511(64.0)	
Attitude related to balanced nutrition						
Attitude score*	14 (12-16)	13 (11-15)	14 (12-16)	15 (12-17)	14 (12-16)	<0.001
Attitude level**						
Good > 80%	43(21.8)	23(11.4)	45(22.5)	53(26.5)	164(20.6)	0.002
Medium 60-79%	87(44.2)	92(45.8)	97(48.5)	93(46.5)	369(46.2)	
Poor < 60%	67(34.0)	86(42.8)	58(29.0)	54(27.0)	265(33.2)	
Practice related to balanced nutrition[^]						
Practice score*	5 (4-6)	5 (4-6)	5 (4-6)	5 (4-6)	5 (4-6)	0.240
Practice level**						
Good > 80%	6(3.0)	4(2.0)	6(3.0)	2(1.0)	18(2.3)	0.767
Medium 60-79%	51(25.9)	50(24.9)	55(27.5)	49(24.5)	205(25.7)	
Poor < 60%	140(71.1)	147(73.1)	139(69.5)	149(74.5)	575(72.1)	
SUMMARY KAP OF PARENTS BY STUDY AREA	KOTA SEMARANG (N=198)	KOTA SURAKARTA (N=200)	KABUPATEN KUDUS (N=200)	KABUPATEN TEGAL (N=200)	TOTAL (N=798)	P-VALUE ¹
Knowledge related to balanced nutrition						
Knowledge score*	3 (2-4)	3 (2-4)	2 (2-3)	2 (2-3)	3 (2-3)	0.004
Knowledge level**						
Good > 80%	52(26.4)	56(27.9)	41(20.5)	29(14.5)	178(22.3)	0.029
Medium 60-79%	59(29.9)	54(26.9)	55(27.5)	64(32.0)	232(29.1)	
Poor < 60%	86(43.7)	91(45.3)	104(52.0)	107(53.5)	388(48.6)	
Attitude related to balanced nutrition						
Attitude score*	6 (5-8)	6 (5-7)	6 (4-7)	6 (4-7)	6 (4-7)	0.008
Attitude level**						
Good > 80%	62(31.5)	46(22.9)	42(21.0)	39(19.5)	189(23.7)	0.044
Medium 60-79%	59(29.9)	75(37.3)	63(31.5)	63(31.5)	260(32.6)	
Poor < 60%	76(38.6)	80(39.8)	95(47.5)	98(49.0)	349(43.7)	
Practice related to balanced nutrition[^]						
Practice score*	6 (5-7)	6 (5-7)	6 (5-7)	6 (5-7)	6 (5-7)	0.687
Practice level**						
Good > 80%	138 (70.1)	128 (63.7)	130 (65.0)	122 (61.0)	518 (64.9)	0.236
Medium 60-79%	51 (25.9)	67 (33.3)	63 (31.5)	75 (37.5)	256 (32.1)	
Poor < 60%	8 (4.1)	6 (3.0)	7 (3.5)	3 (1.5)	24 (3.0)	

¹p-value <0.05 indicates significant difference between intervention and control groups; not overweight-obese and overweight-obese; and study areas.

*|mean+SD or median (Q1-Q3).

**| n(%)

[^]) practice will be scored based on meal frequency (good: 3 times); breakfast habits (good: breakfast every day before 9 am); snack habits (risky: sweet foods and drinks including carbonated soft drinks, salty snacks, fried foods); drinking water (good: >7 glasses per daily); reading food labels (good: always); handwash and hygienic practices (good: wash hands in minimum of 4 of the 6 mentioned times); physical activity (good: exercise 3-6 times a week with minimum of 30 minutes per session); sedentary activities (risky: recreational screen time >=120 minutes per day) and monitoring body weight (good: body weight was measured in the last 6 months).

RESULTS OF KEY VARIABLES BY STUDY AREAS

NO	KNOWLEDGE ON BALANCED NUTRITION	CORRECT ANSWER	STUDENT WITH CORRECT ANSWER			
			CITY (N=398)	DISTRICT (N=400)	TOTAL (N=798)	P-VALUE
1.	If you are not used to having breakfast, you can replace it with a larger lunch	False	119 (29.9)	139 (34.8)	258 (32.3)	0.413
2.	If we don't like vegetables, we can replace them with fruit because the nutritional content is the same	False	37 (9.3)	35 (8.8)	72 (9.0)	0.788
3.	Only drinking milk at breakfast is enough because milk contains all the nutrients our bodies need	False	128 (32.2)	127 (31.8)	255 (32.0)	0.901
4.	Consuming sugary foods and drinks too often can cause obesity	True	282 (70.9)	236 (59.0)	518 (64.9)	<0.001
5.	We should drink at least 7 glasses of water per day	True	293 (73.6)	304 (76.0)	597 (74.8)	0.438
6.	We need to do physical activity only when we are overweight	False	248 (62.3)	227 (56.8)	475 (59.5)	0.110
7.	Cleaning the house and gardening are examples of physical activity	True	297 (74.6)	332 (83.0)	629 (78.8)	0.004
8.	We wash our hands only when they look dirty	False	253 (63.6)	220 (55.0)	473 (59.3)	0.014
9.	We can know our nutritional status based on our weight and height	True	310 (77.9)	308 (77.0)	618 (77.4)	0.764
10.	At the very top of the Balanced Nutrition Guideline are foods that should be restricted in consumption, except	Fiber	114 (28.6)	100 (25.0)	214 (26.8)	0.245
11.	In the My Plate guide, the portion of staple food consumption should be equal to the portion of	Vegetables	214 (53.8)	212 (53.0)	426 (53.4)	0.828
12.	Example of diverse eating at its best	Rice, fried fish, spinach vegetable, banana	190 (47.7)	206 (51.5)	396 (49.6)	0.288
13.	One of the characteristics of healthy food	Safe	302 (75.9)	300 (75.0)	602 (75.4)	0.773
14.	Being overweight can be caused by	Frequent consumption of sugary drinks	266 (66.8)	222 (55.5)	488 (61.2)	0.001
15.	Apart from rice, staple foods that contain a lot of carbohydrates are	Potatoes and cassava	196 (49.2)	162 (40.5)	358 (44.9)	0.013
16.	The benefits of breakfast	All are correct (energy source, increase concentration, prevent obesity)	79 (19.8)	89 (22.3)	168 (21.1)	0.406
17.	Examples of unhealthy snacking practice	Choosing sugary soft drinks as snacks	321 (80.7)	299 (74.8)	620 (77.7)	0.045
18.	Information on the food label of a packaged food/drink must contain the following information, except	Food/drink prices	106 (26.6)	110 (27.5)	216 (27.1)	0.783
19.	Risks of overweight and obesity	Increase risk of chronic condition/ reduce quality of life/ premature death)	216 (54.3)	187 (46.8)	403 (50.5)	0.034
20.	Causes of overweight and obesity	Increased/excessive intake of energy-dense foods/lack of or decreased physical activity	347 (87.2)	324 (81.0)	671 (84.1)	0.017
21.	How to prevent overweight and obesity	Reduce energy or intake of fatty and sugary foods/eat more vegetables often and fruits-legumes-wholegrain products /increase physical activity level/engage in regular physical activity	361 (90.7)	347 (86.8)	708 (88.7)	0.078

RESULTS OF PARENTS' ATTITUDE ON BALANCED NUTRITION, BY NUTRITIONAL STATUS OF STUDENTS

PARENT'S ATTITUDE		OVERWEIGHT-OBESE				P-VALUE
		Not overweight-obese		Overweight-obese		
		N	%	N	%	
#PA1: It is not difficult for me to prepare breakfast for my child every day with a complete meal (rice, side dishes, vegetables)	.00	162	72.0%	63	28.0%	0.861
	1.00	409	71.4%	164	28.6%	
#PA2: It is not difficult for me to ask my child to have breakfast every day with a complete meal (rice, side dishes, vegetables)	.00	216	72.2%	83	27.8%	0.739
	1.00	355	71.1%	144	28.9%	
#PA3: It is not difficult for me to regulate my child's snack habits (frequency of snacks and types of food/ drinks purchased)	.00	290	71.8%	114	28.2%	0.885
	1.00	281	71.3%	113	28.7%	
#PA4: It is not difficult for me to get my child to eat vegetables at every meal	.00	316	73.8%	112	26.2%	0.125
	1.00	255	68.9%	115	31.1%	
#PA5: It is not difficult for me to get my child to eat fruit twice every day	.00	304	72.7%	114	27.3%	0.441
	1.00	267	70.3%	113	29.7%	
#PA6: It is not difficult for me to get my child to exercise at least 3-5 days a week	.00	341	69.5%	150	30.5%	0.096
	1.00	230	74.9%	77	25.1%	
#PA7: Obesity among elementary school children is a nutrition issue	.00	157	70.1%	67	29.9%	0.567
	1.00	414	72.1%	160	27.9%	
#PA8: How likely do you think your child is to become overweight/obese?	.00	90	77.6%	26	22.4%	0.119
	1.00	481	70.5%	201	29.5%	
#PA9: How serious do you think the impact of obesity is for elementary school children?	.00	447	83.4%	89	16.6%	0.001
	1.00	124	47.3%	138	52.7%	
#PA10: Obesity is preventable	.00	275	74.3%	95	25.7%	0.107
	1.00	296	69.2%	132	30.8%	

RESULTS OF STUDENTS' PRACTICE REGARDING BALANCED NUTRITION BY NUTRITIONAL STATUS OF STUDENTS

STUDENT'S PRACTICES		OVERWEIGHT-OBESE				P-VALUE
		Not overweight-obese		Overweight-obese		
		N	%	N	%	
Meal frequency	.00	171	68.7%	78	31.3%	0.225
	1.00	400	72.9%	149	27.1%	
Breakfast habit	.00	156	66.4%	79	33.6%	0.036
	1.00	415	73.7%	148	26.3%	
Snacking habit	.00	74	69.2%	33	30.8%	0.555
	1.00	497	71.9%	194	28.1%	
Drinking water consumption	.00	437	72.7%	164	27.3%	0.205
	1.00	134	68.0%	63	32.0%	
Reading food label	.00	471	70.9%	193	29.1%	0.387
	1.00	100	74.6%	34	25.4%	
Handwash and hygienic practices	.00	558	71.4%	223	28.6%	0.65
	1.00	13	76.5%	4	23.5%	
Physical activity	.00	465	72.4%	177	27.6%	0.266
	1.00	106	67.9%	50	32.1%	
Sedentary activity	.00	361	70.0%	155	30.0%	0.177
	1.00	210	74.5%	72	25.5%	
Body weight monitoring	.00	219	71.6%	87	28.4%	0.994
	1.00	352	71.5%	140	28.5%	
Met minimum DDS	.00	107	68.2%	50	31.8%	0.292
	1.00	464	72.4%	177	27.6%	

RESULTS OF PARENTS' ATTITUDE REGARDING BALANCED NUTRITION BY NUTRITIONAL STATUS OF STUDENTS

KNOWLEDGE ON BALANCED NUTRITION	FAVOURABLE ATTITUDE	PARENTS WITH FAVOURABLE ATTITUDE (N, %)			
		OVERWEIGHT- OBESE	NON- OVERWEIGHT- OBESE	TOTAL	P-VALUE
It is not difficult for me to prepare breakfast for my child every day with a complete meal (rice, side dishes, vegetables)	Agree	409 (71.6)	164 (72.2)	573 (71.8)	0.926
It is not difficult for me to ask my child to have breakfast every day with a complete meal (rice, side dishes, vegetables)	Agree	355 (62.2)	144 (63.4)	499 (62.5)	0.414
It is not difficult for me to regulate my child's snack habits (frequency of snacks and types of food/drinks purchased)	Agree	281 (49.2)	113 (49.8)	394 (49.4)	0.419
It is not difficult for me to get my child to eat vegetables at every meal	Agree	255 (44.7)	115 (50.7)	370 (46.4)	0.346
It is not difficult for me to get my child to eat fruit twice every day	Agree	267 (46.8)	113 (49.8)	380 (47.6)	0.881
It is not difficult for me to get my child to exercise at least 3-5 days a week	Agree	230 (40.3)	77 (33.9)	307 (38.5)	0.004*
Obesity among elementary school children is a nutrition issue	Agree	414 (72.5)	160 (70.5)	574 (71.9)	0.746
How likely do you think your child is to become overweight/obese?	Likely	124 (21.7)	138 (60.8)	262 (32.8)	0.001*
How serious do you think the impact of obesity is for elementary school children?	Serious	296 (51.8)	132 (58.1)	428 (53.6)	0.438
Obesity is preventable	Agree	481 (84.2)	201 (88.5)	682 (85.5)	0.181

RESULTS OF CORRELATION ACROSS THE EIGHT VARIABLES INCLUDED IN MULTIVARIATE ANALYSIS

The correlation matrix below indicates that only the education levels of mothers and fathers are strongly correlated, while there is no correlation between the other independent variables. In advanced multivariate logistic regression analysis, it was found that the

mother's education is more dominant as a risk factor for obesity in children, as it remained significant in the multivariate analysis, whereas the father's education became insignificant.

	EDUCATION FATHER	EDUCATION MOTHER	OCCUPATION MOTHER	INCOME	PARENTS' ATTITUDE LEVEL	PARENTS' PRACTICE LEVEL	CHILD PRACTICE LEVEL
Education father	1.000	-.699	.006	-.085	-.006	-.033	-.019
Education mother	-.699	1.000	-.066	-.112	-.012	-.040	-.013
Occupation mother	.006	-.066	1.000	.037	.080	.012	-.061
Income	-.085	-.112	.037	1.000	.055	.014	-.067
Parents' attitude level	-.006	-.012	.080	.055	1.000	-.060	-.105
Parents' practice level	-.033	-.040	.012	.014	-.060	1.000	-.026
Child practice level	-.019	-.013	-.061	-.067	-.105	-.026	1.000

If using VIF (Variance Inflation Factor), the same result is obtained, indicating a possible collinearity between the education levels of fathers and mothers. The VIF result is only around 2, meaning the collinearity is still low, as the

threshold for strong collinearity is above 10. The negative correlation means that the higher the education level of the father, the lower the education level of the mother, and vice versa.

COEFFICIENTS ^A										
MODEL		UNSTANDARDISED COEFFICIENTS		STANDARDISED COEFFICIENTS	T	SIG.	95.0% CONFIDENCE INTERVAL FOR B		COLLINEARITY STATISTICS	
		B	STD. ERROR	BETA			LOWER BOUND	UPPER BOUND	TOLERANCE	VIF
1	(Constant)	-1.709	.492		-3.473	.001	-2.675	-.743		
	Educational background of parents (father)	-.041	.114	-.019	-.359	.719	-.265	.183	.465	2.150
	Educational background of parents (mother)	.171	.113	.080	1.513	.131	-.051	.393	.466	2.147
	Occupation of parents (mother)	.320	.123	.095	2.610	.009	.079	.561	.982	1.018
	Socioeconomic status of household (tertile)	.158	.077	.076	2.034	.042	.005	.310	.917	1.090
	Parents' attitude level	.322	.077	.153	4.205	.000	.172	.472	.974	1.027
	Parents' practice level	.150	.111	.049	1.354	.176	-.068	.368	.984	1.017
	Child's practice level	-.283	.119	-.086	-2.383	.017	-.516	-.050	.984	1.016
	District/city	-.049	.127	-.015	-.385	.700	-.299	.201	.885	1.130
a. Dependent variable: BMI-for-age children Z-score										

RESULTS OF MULTIVARIATE ANALYSIS BY NUTRITIONAL STATUS OF STUDENTS, THIN-VERY THIN AND NORMAL-OVERWEIGHT-OBESE

The results of the multivariate analysis of the nutritional status of students, focusing on thin-very thin and normal-overweight-obese categories, show that the associated

factors are pocket money, use of social media, students' attitude, and parents' attitude.

VARIABLE	THIN-VERY THIN	NORMAL- OVERWEIGHT-OBESE	P-VALUE BIVARIATE	P-VALUE REGRESSION	ADJUSTED OR (CI 95%)
STUDENTS' CHARACTERISTICS					
Gender					
Male	56 (13.7)	352 (86.3)	0.104		
Female	39 (10.0)	351 (90.0)			
Pocket money per day					
Lower	51 (15.9)	269 (84.1)	0.014	0.045	1.8 (1.1-2.9)
Medium	16 (10.3)	139 (89.7)			1.6 (0.9-3.1)
Higher	28 (8.7)	295 (91.3)			Ref
Use of social media					
Don't have	65 (15.7)	349 (84.3)	0.001	0.001	2.1 (1.3-3.4)
Have minimum 1 account	30 (7.8)	354 (92.2)			Ref
Frequency of exercise					
Never	7 (9.6)	66 (90.4)	0.863		
<3 days a week	65 (12.7)	445 (87.3)			
3 to 6 days a week	17 (11.3)	133 (88.7)			
Every day	6 (9.4)	58 (90.6)			
HOUSEHOLD CHARACTERISTICS					
Age (years) of father					
< 40 years old	33 (12.4)	234 (87.6)	0.778		
> 40 years old	62 (11.7)	469 (88.3)			
Age (years) of mother					
< 40 years old	53 (11.6)	405 (88.4)	0.736		
> 40 years old	42 (12.4)	298 (87.6)			
Education of father					
Lower	27 (10.9)	221 (89.1)	0.915		
Medium	36 (12.0)	263 (88.0)			
High	23 (11.4)	178 (88.6)			
Education of mother					
Lower	25 (10.5)	213 (89.5)	0.398		
Medium	41 (13.4)	264 (86.6)			
High	22 (10.0)	198 (90.0)			
Occupation of father					
Not working	9 (8.7)	95 (91.3)	0.272		
Working	86 (12.4)	608 (87.6)			
Occupation of mother					
Not working	39 (12.1)	283 (87.9)	0.882		
Working	56 (11.8)	420 (88.2)			

VARIABLE	THIN-VERY THIN	NORMAL- OVERWEIGHT-OBESE	P-VALUE BIVARIATE	P-VALUE REGRESSION	ADJUSTED OR (CI 95%)
Number of HH member					
< 4	43 (11.1)	346 (88.9)	0.469		
> 4	52 (12.7)	357 (87.3)			
Highest tertile	32 (12.6)	222 (87.4)	0.495		
Medium tertile	28 (10.1)	250 (89.9)			
Lowest tertile	35 (13.2)	231 (86.8)			
HH food security status					
Food-secure	71 (11.5)	546 (88.5)	0.727		
Mildly food-insecure	13 (15.3)	72 (84.7)			
Moderately food-insecure	7 (13.0)	47 (87.0)			
Severely food-insecure	4 (9.5)	38 (90.5)			
District/city					
City	43 (10.8)	355 (89.2)	0.338		
District	52 (13.0)	348 (87.0)			
Students' knowledge					
Good > 80%	3 (10.0)	27 (90.0)	0.931		
Medium 60-79%	30 (11.7)	227 (88.3)			
Poor < 60%	62 (12.1)	449 (87.9)			
Students' attitude					
Good > 80%	30 (18.3)	134 (81.7)	0.018		
Medium 60-79%	37 (10.0)	332 (90.0)			
Poor < 60%	28 (10.6)	237 (89.4)			
Students' practice					
Good > 80%	1 (5.6)	17 (94.4)	0.135	0.014	0.5 (0.2-0.8)
Medium 60-79%	30 (14.6)	175 (85.4)			0.9 (0.5-1.6)
Poor < 60%	64 (11.1)	511 (88.9)			Ref
Parents' knowledge					
Good > 80%	18 (10.1)	160 (89.9)	0.078		
Medium 60-79%	37 (15.9)	195 (84.1)			
Poor < 60%	40 (10.3)	348 (89.7)			
Parents' attitude					
Good > 80%	13 (6.9)	176 (93.1)	0.030	0.025	Ref
Medium 60-79%	31 (11.9)	229 (88.1)			1.2 (0.7-2.1)
Poor < 60%	51 (14.6)	298 (85.4)			2.4 (1.2-4.6)
Parents' practice					
Good > 80%	54 (10.4)	464 (89.6)	0.203		
Medium 60-79%	37 (14.5)	219 (85.5)			
Poor < 60%	4 (16.7)	20 (83.3)			



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