PHASE I (B): SCHOOL EVALUATION BASED ON CENTRE FOR DISEASE CONTROL (CDC, USA) COORDINATED SCHOOL HEALTH APPROACH (CSHA)

Followed by the situational analysis of students, the 10 selected schools were evaluated based on the CDC guidelines of Coordinated School Health Approach (CSHA). The methodology used for school evaluation and results for phase 1b is discussed in this chapter.

METHODS AND MATERIALS

The methods and material for phase 1a are presented under following sub-sections:

- Rationale
- Objectives
- Study design
- CDC's Coordinated School Health Approach
- Components of Coordinated School Health Programme
- Component Score Scale (CSS)
- Tools and Techniques used under Critical Qualitative Research Concept
- Experimental design

RATIONALE

School is the primary institution influencing a child's healthy development. Coordinating many parts of school health into a systematic approach can enable schools to build "healthy school environment". For holistic growth of children (CDC, 2013); CDC has suggested on articulating various health components within a school system; however the paucity of such evaluation in private schools of Vadodara makes it important to conduct this phase of the study.

OBJECTIVES

1. To enlist and study the 8 components of Coordinated School Health Programme (CSHP) in the selected schools of urban Vadodara.
2. To identify 3 key elements from each component for assessing all the selected schools.
3. To develop a Component Score Scale (SCC) for evaluating the selected schools based on Coordinated School Health Programme (CSHP).
4. To rank the schools based on the scores computed using Component Score Scale (CSS).

STUDY DESIGN

The concept of Critical Qualitative Research (CQR) was used to implement CDC's CSHA (CDC, 2013). CQR encompasses many different forms of inquiry and methodological practices, which questions the conceptual base of knowledge and acknowledge the role of power and social position in health-related phenomena (Centre for Critical Qualitative Health Research, 2013).

CDC'S COORDINATED SCHOOL HEALTH APPROACH

CSHP aims to achieve four important and overlapping goals as mentioned below.

1. To increase health knowledge, attitudes, and skills.
2. To increase positive health behaviors and health outcomes.
3. To improve education outcomes.
4. To improve social outcomes.

These goals can be achieved by coordinating eight different components that are essential to establish a healthy school environment. The eight components covered by CDC are discussed below. For present study, from each of these eight components three subgroups were selected. Each of the sub-group was given criteria which carried either a positive or a negative score. Based on these scores a Component Score Scale (CSS) was developed as an evaluation tool for all ten schools.

COMPONENTS OF A COORDINATED SCHOOL HEALTH PROGRAMME

1. Health Education

Aim: To provide students with opportunities to acquire the knowledge, attitudes, and skills necessary for making health-promoting decisions, achieving health literacy, adopting health-enhancing behaviors.

Requirement: Courses of study (curricula) for students from junior K.G. to standard 12 should address a variety of topics on healthy eating/nutrition, mental and emotional health, personal health and wellness, physical activity, safety and injury prevention. The curricula should have the characteristics of an effective health education. Schools should have well qualified, trained

teachers to teach health education. The criteria enlisted and evaluated under this component are represented in table 4.1.

2. Physical Education

Aim: Physical education is a school-based instructional opportunity for students to gain the necessary skills and knowledge for lifelong participation in physical activity.

Requirement: Physical education is characterized by a planned, sequential curriculums that provides cognitive content and learning experiences in a variety of activity areas. Students should gain knowledge, skills, and confidence to enjoy a lifetime of healthful physical activity. Qualified, trained teachers to teach physical education should be available. The criteria enlisted and evaluated under this component are represented in table 4.2.

3. Health Services

Aim: To ensure access or referral to primary health care services, prevent and control communicable disease and other health problems, provide emergency care for illness or injury and provide educational and counseling opportunities for promoting and maintaining individual, family, and community health.

Requirement: Qualified professionals such as physicians, nurses, dentists, health educators, and other allied health personnel provide these services. The criteria enlisted and evaluated under this component are represented in table 4.3.

4. Nutrition Services

Aim: To provide access to a variety of nutritious and appealing meals and offer students a practical learning of classroom nutrition.

Requirement: School nutrition services and qualified child nutrition professionals. The criteria enlisted and evaluated under this component are represented in table 4.4.

5. Counseling, Psychological, and Social Services

Aim: To improve student's mental, emotional, and social health by undertaking individual and group assessments, interventions, and referrals.

Requirement: Qualified professionals such as certified school counselors, and psychologists. The criteria enlisted and evaluated under this component are represented in table 4.5.

6. Healthy and Safe School Environment

Aim: To improve the physical and aesthetic surroundings, psychosocial climate and culture of the school.

Requirement: Any biological or chemical agents that are detrimental to health and physical conditions such as temperature, noise, and lighting should not be found near the school building and surrounding areas. The criteria enlisted and evaluated under this component are represented in table 4.6.

7. Health Promotion for Staff

Aim: To provide an opportunity for school staff members to improve their health status.

Requirement: Regular health assessing activities and health education for staff members as an encouragement to the staff members to pursue a healthy lifestyle. The criteria enlisted and evaluated under this component are represented in table 4.7.

8. FAMILY/COMMUNITY INVOLVEMENT

Aim: To integrate school, parent, and community for enhancing the health and well-being of students.

Requirement: Availability of school health advisory councils and active parent teacher association for conducting community based activities. The criteria enlisted and evaluated under this component are represented in table 4.8.

Table 4.1: Sub-groups, criteria and score under component of health education

Sub-Groups and their criteria		Points
Topics on food, nutrition and health	> 5 topics covered	+10
	< 5 topics covered	-10
Nutrition expert	Available	+10
	Not Available	-10
Topics taught	Completely	+10
	Partially	-10

Table 4.2: Sub-groups, criteria and score under component of physical education

Sub-Groups and their criteria		Points
Variety of sports and physical activity	> 5 topics covered	+10
	< 5 topics covered	-10
Expert teacher	Available	+10
	Not Available	-10
Frequency of sports in school	≥3/week	+10
	≤3/week	-10

Table 4.3: Sub-groups, criteria and score under component of health services

Sub-Groups and their criteria		Points
Medical Kit	Well equipped	+10
	Insufficiently equipped	-10
Rest Room	Available	+10
	Not Available	-10
Person in charge	Nurse	+10
	Other	-10

Table 4.4: Sub-groups, criteria and score under component of nutrition services

Sub-Groups and their criteria		Points
Canteen Facility	Available	+10
	Not Available	-10
Type of food served	Freshly cooked	+10
	Ready to eat packed food	-10
Kind of service	Free	+10
	Paid	-10

Table 4.5: Sub-groups, criteria and score under component of counseling, psychological, and social services

Sub-Groups and their criteria		Points
Available in school	Yes	+10
	No	-10
Certified counselor	Available	+10
	Not available	-10
Kind of service	Free	+10
	Paid	-10

Table 4.6: Sub-groups, criteria and score under component of healthy and safe school environment

Sub-Groups and their criteria		Points
Space	Adequate	+10
	Inadequate	-10
Location	Suitable	+10
	Unsuitable	-10
Infrastructure	Desirable	+10
	Undesirable	-10

Table 4.7: Sub-groups, criteria and score under component of health promotion for staff

Sub-Groups and their criteria		Points
Health Camp	Arranged	+10
	Not Arranged	-10
Frequency of Camp	Yearly	+10
	Uncertain	-10
Type of Services	Free of cost	+10
	Paid	-10

Table 4.8: Sub-groups, criteria and score under component of family and community involvement

Sub-Groups and their criteria		Points
PTA	Available	+10
	Not Available	-10
Activities Undertaken	Yes	+10
	No	-10
Frequency of Meeting	4 Times a Year	+10
	< 4 Times a Year	-10

COMPONENT SCORE SCALE (SCC)

As enlisted in table 4.1 – 4.8, 3 important sub-groups were selected for each of the 8 components of CDC's CSHA. Thus total 24 sub-groups were selected. Each sub-group was assessed based on positive and negative criteria. The positive criteria carried +10 score while the negative criteria carried -10 score. Maximum positive points scored by a school could be +240, while maximum negative points scored would be -240. An aggregate of the scores of all 8 components was calculated to arrive at a single value; which determined the rank for all the schools CDC, 2013.

TOOLS AND TECHNIQUES USED UNDER CRITICAL QUALITATIVE RESEARCH CONCEPT

CQR concept is a defined guideline for a set of qualitative tools and techniques that elicit in depth information on a phenomena, situation and behaviour (Law et al., 1998). Selective qualitative tools and techniques such as secondary data, observations, canteen evaluations, meetings and interviews with key informants were used to evaluate the criteria under each component. Table 4.9 gives details on the use of respective techniques.

1. **SECONDARY DATA:** Data collected by someone other than the user is called as the secondary data; primarily gathered from institutional or organizational data (Wikipedia, 2007).

   Secondary data on topics of food, nutrition and health was collected from the school curriculum; while those on health promotional activities conducted in the schools was elicited from the school records.

2. **OBSERVATIONS:** Observations are used to document the non-verbal phenomenon. In specific, spot observation helps to reveal the important links of information which could not be gathered by other techniques such as interviews or discussions, yet are important for making the data complete.

   Using an observation checklist (Annexure 4), spot observations were made for all different activities performed by teachers, counselors, canteen in-charge, health service providers and others to complement the information collected through secondary data, meetings and key informants interviews. These observations were made during the school hours itself.

3. **MEETINGS:** Meetings are an important tool of qualitative research methodology. This technique helps to take simultaneous action for gathering information as well as making important decisions regarding the issue of concern.

   Meetings were conducted with the counselors, teachers and health care providers for assessing their views on various factors contributing towards the development of healthy school setting. The elicited data was consolidated in the form of minutes of all the meetings.

4. **INTERVIEW WITH KEY INFORMANTS:** The technique refers to the special nature of the interviewee who is purposely chosen by the interviewer because of an important and different point of view, status or knowledge issue being studied (Law et al., 1998).

   In the current study, school principals, class teachers, counselors and canteen in charge, were selected as key informants and interviewed using a pre-tested unstructured questionnaire (Annexure 5).

Key informant's interview was used to elicit in depth information on the following aspects:

a. Topics on sports, physical activity, health, food and nutrition and any other related content was part of the school curriculum and taught in the school
b. Kind of sports taught and encouraged in the schools
c. Professional services in the field of nutrition, psychology, physical fitness was accessible in the school premises
d. Facilities for undertaking health services, nutrition services and different sport activity was available

5. GROUP DISCUSSION: It is a formal way of interviewing a homogenous or heterogeneous group of people on a particular topic.

Group discussion was held with the parents of the enrolled students. Specific date, time and venue were pre-scheduled for parents of students of different standards (4^{th} – 9^{th}); accordingly the discussions were conducted within the school premises. Each session lasted for 30 – 40 minutes.

Questions regarding types and quality of services provided in schools, facilities available in the schools and parents' expectations from the school were formulated (Annexure 6).

Table 4.9: Consolidated description of school health component evaluation techniques and contact person

Components	Techniques of assessment	Contact person
Health Education	Secondary data	From school curriculum
	Meetings	With health service providers, science and PE teacher
Physical Education	Observations	During PE classes
	Interview	School Principal
Health Services	Meetings	With health service provider
	Observations	During school visits
	Interviews	School Principal
Nutrition Services	Interview	Canteen In-charge
	Observations (canteen survey)	During food preparation and during recesses time
Counseling, Psychological and Social Services	Interviews	With class-teachers and counselors
	Group discussion	Mothers
	Observations	During school visits
Healthy and Safe School Environment	Observations	During school visits and different school events
Health Promotion for Staff	Secondary data	School records
	Meeting	With school staff
	Observations	During health camps
Family/Community Involvement	Secondary data	School records
	Meeting	With school staff
	Observations	During various school events

6. CANTEEN EVALUATION: Evaluations were made on type of canteens operational in each school, available facilities and scope of improvement for providing nutritional menu during school hours using a semi-structured questionnaire (Annexure 7). The menus were evaluated using three different scales as described below.

Canteen Food Rating System (CFRS) Score: This score was developed on basis of the nutrient density of one meal of the day. The nutrient density was calculated based on the combination and serving quantity of food groups in a meal.

As per the recommendations of NIN, ICMR 1991 the serving size for each food group was adjusted according to the 1/3rd RDA for healthy school children. Accordingly maximum CFRS score of 60 calculated for 6 food groups was considered ideal for the selected students. Higher CFRS Score indicated better "nutrient density" with desired foods groups.

Scores were calculated for each of the menus in the manner shown below. Table 4.10 describes the scoring techniques used under the scale.

The CFRS score calculated for moong rice:

< 5 servings of grain: 5 points

½ serving of pulse: 8 points

2-3 servings of Fat: 10 points

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23 CFRS score

Table 4.10: Distribution of scores based on the serving size and food group

Food group	Servings	Points
Cereals	5-6	10
	4-4.9	8
	< 4	5
	0	0
Pulses	1	10
	½	8
	< ½	5
	0	0
Dairy products	½	10
	⅓	8
	< ⅓	5
	0	0
Vegetables	½-1	10
	⅓	8
	< ⅓	5
	0	0
Fruits	½-1	10
	⅓	8
	< ⅓	5
	0	0
Fat	2-3	10
	4-5	8
	>5	5
	0	0

0- No intake; 5- poor intake; 8- fair intake; 10- Good intake. Good score - 40-60; Needs improvement - 21-39 and Poor score - 1-20. *CFRS scores were developed according to ⅓ RDA of school children(7-12years) developed by NIN, ICMR 1991, and Nutri points (Roy E. Vartabedian and Matthews, published by Harper Collins Publishers, New York, 1990)

Colour Grading Scale: As shown in Table 4.11 the school menus were evaluated based macro and micro nutrient distribution.

Table 4.11: Colour grading scale

Color Grading Scale					
Colors	Grades	Calories (Kcal)	Protein (gm)	Fat (gm)	Micronutrients (no of servings of F & V)
	O = Out standing	500-600	15-20	10-15	1-2
	A = Good	300-499	10- 14	≤ 10	½
	B = Fair	< 300	< 10	≤ 10	< ½
	C = poor	300-500	10-14	> 15	< ½
	D = Very poor	300- 500	< 10	> 15	0
	E = Extremely poor	< 300	< 10	< 10	0
	F = Risky	< 300	< 10	> 15	0
* Colour Grading Scale is developed according to ⅓rd average RDA of school children (7-12yrs) developed by NIN, ICMR ,1991					

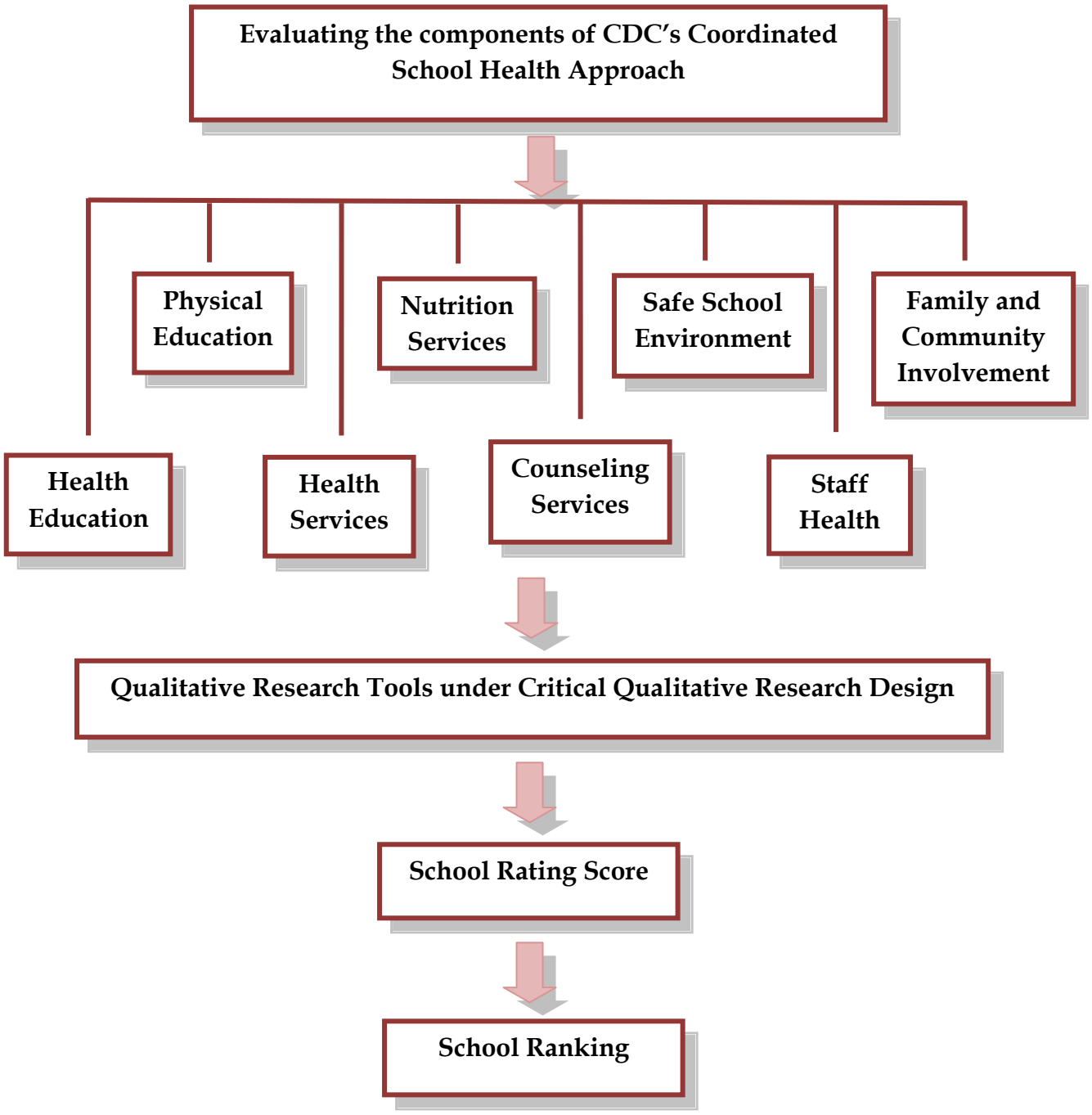
Unhealthy ingredients (AHA, 2009): This scale categorized the menus based on the combination of its ingredients. Table 4.12 gives the details.

Table 4.12: Ingredient based categorization of the menu

Ingredients	Category
Wheat flour refined + trans fat	Unhealthy
Wheat flour refined	Unhealthy
Trans fat	Unhealthy
Cereal- pulse/ cereal- pulse, veg. combination	Healthy

EXPERIMENTAL DESIGN

Figure 4.1: Experimental Design for Phase 1b



RESULTS AND DISCUSSIONS

Schools as an institution can address multifaceted health and lifestyle dimensions (Kanani and Agrawal, 1998; Gopalan, 1993). Various school based policies and programs have emerged for establishing a healthy school environment; but most of them are a patch work of programs prepared for different age groups, cultural setting, standards and requirements (CDC, 2013).

Schools having private management have an elaborate fee structure and charge handsome amount for various academic and co-curricular activities. The school curriculum claims to incorporate health and nutrition based topics and school management boosts on providing healthy meals in the school. These days' paramedical services such as counseling, health monitoring, clean and healthy school environment are also a part of school infrastructure. This phase of the study was conducted to evaluate all the selected schools as per the eight components of the CDC's standards of CSHA (Coordinated School Health Approach); and the results have been discussed in this phase.

- Quality of Education under Coordinated School Health
- Quality of Services under Coordinated School Health
- Quality of physical environment of a school under Coordinated School Health
- Extended canteen evaluation

QUALITY OF EDUCATION UNDER COORDINATED SCHOOL HEALTH

These components focused on the quality of education regarding health, nutrition, sports and physical activity. Health and nutrition education was evaluated by three indicators under component 1 (Table 4.13). Out of the 10 schools evaluated, the curriculum of 6 schools had more than 5 topics on health and nutrition and those topics were taught completely. Topics such as "Our Food", "Malnutrition", "Food groups and Nutrients", "Being Healthy", "Clean Eating Habits" etc. were part of the school curriculum. However in one of the school less than 5 topics were included in the curriculum; but all the topics were completely taught with due emphasis. Though health and nutrition was partly covered in the school curriculum, none of the schools had appointed a nutrition expert. Overall 3 schools secured minimum score of -30 and the maximum positive score obtained by 6 schools was +10. There is an immense need to incorporate and teach more topics on health, nutrition and lifestyle through a nutrition expert, preferably.

Component 2 evaluated the quality of physical education given in all 10 schools. Children were educated on topics such as "Physical fitness", "Types of outdoor sports", "Types of indoor sports" and were given a practical exposure by teaching sports such as football, basketball, volleyball, karate, yoga etc. Nine out of 10 schools covered more than 5 topics regarding physical education under the supervision and guidance of expert teachers. Only 4 schools provided more than 3 periods for sports and physical education, rest of the 6 schools had extremely insufficient time allocation for physical sports (Table 4.14). The total score revealed a better picture of "physical education" as 4 schools secured maximum score of +30 but the remaining 5 were on +10 only and one school had -30. Physical education requires greater emphasis and encouragement in terms of practical exposure and time allocation by both school as an institute and parents.

Table 4.13: School wise score given to health education (component 1)

School Code	Topics covered		Expert teachers		Topics taught		Total score
	> 5	< 5	Available	Not Available	Completely	Partially	
I	- - - -	-10	- - - -	-10	- - - -	-10	-30
II	+10	- - - -	- - - -	-10	+10	- - - -	+10
III	- - - -	-10	- - - -	-10	+10	- - - -	-10
IV	+10	- - - -	- - - -	-10	+10	- - - -	+10
V	+10	- - - -	- - - -	-10	+10	- - - -	+10
VI	- - - -	-10	- - - -	-10	- - - -	-10	-30
VII	+10	- - - -	- - - -	-10	+10	- - - -	+10
VIII	+10	- - - -	- - - -	-10	+10	- - - -	+10
IX	+10	- - - -	- - - -	-10	+10	- - - -	+10
X	- - - -	-10	- - - -	-10	- - - -	-10	-30

**Every positive parameter gets a score of +10 and negative parameter gets a score of -10*

Table 4.14: School wise score given to physical education (component 2)

School Code	Topics covered		Expert teacher		Frequency of sports in school		Total score
	>5	<5	Available	Not Available	≥ 3/week	≤ 3/week	
I	+10	- - - -	+10	- - - -	+10	- - - -	+30
II	+10	- - - -	+10	- - - -	- - - -	-10	+10
III	+10	- - - -	+10	- - - -	- - - -	-10	+10
IV	+10	- - - -	+10	- - - -	- - - -	-10	+10
V	+10	- - - -	+10	- - - -	+10	- - - -	+30
VI	- - - -	-10	- - - -	-10	- - - -	-10	-30
VII	+10	- - - -	+10	- - - -	+10	- - - -	+30
VIII	+10	- - - -	+10	- - - -	+10	- - - -	+30
IX	+10	- - - -	+10	- - - -	- - - -	-10	+10
X	+10	- - - -	+10	- - - -	- - - -	-10	+10

**Every positive parameter gets a score of +10 and negative parameter gets a score of -10*

QUALITY OF SERVICES UNDER COORDINATED SCHOOL HEALTH

Component 3, 4 and 5 evaluated health, nutrition and counseling services respectively. As shown in (Table 4.15), certain parameters assessed the health services for children. A School should be well equipped with primary health care and first aid facilities but 4 out of 10 schools had insufficient first aid facilities and five schools did not have a separate rest room to handle any emergency. Moreover, only four schools had appointed a well-qualified nurse to address primary health care emergencies and facilities. Just 3 out of 10 schools secured maximum score of +30 points, thus reflecting that rest of the schools needed great improvements with respect to the quality of health services.

Assessment of the nutrition services was based on the quality of canteen infrastructure and facilities (Table 4.16). Seven out of 10 schools had their own canteen in which they served freshly cooked meals and just 2 out of these 7 schools had paid food service. Rest of the schools had cafeteria or a food outlet where they sold ready to eat, packed foods in the school premises. The menus served in the schools were also evaluated for nutritional quality and quantity (the results have been presented and discussed in another section). Out of the 10 selected schools, 4 schools secured maximum score of +30 and the remaining schools had negative scores. The results called for immediate attention in enhancing the quality of food served in school.

The fourth component highlights the status of counseling services available in the selected schools (Table 4.17). Six schools had separate arrangement for counseling services within the school itself and were taken care by an expert counselor. However, only 4 out of 6 schools did not take any additional cost for these services. In all just 3 schools were providing optimum counseling services.

Table 4.15: School wise score given to health services (component 3)

School Code	Medical kit		Rest room		Person in charge		Total score
	Well equipped	Insufficiently equipped	Available	Not Available	Nurse	Other	
I	- - - -	-10	- - - -	-10	- - - -	-10	-30
II	+10	- - - -	- - - -	-10	- - - -	-10	-10
III	+10	- - - -	- - - -	-10	- - - -	-10	-10
IV	- - - -	-10	+10	- - - -	+10	- - - -	+10
V	+10	- - - -	+10	- - - -	+10	- - - -	+30
VI	- - - -	-10	- - - -	-10	- - - -	-10	-30
VII	+10	- - - -	+10	- - - -	- - - -	-10	+10
VIII	+10	- - - -	+10	- - - -	+10	- - - -	+30
IX	+10	- - - -	+10	- - - -	+10	- - - -	+30
X	- - - -	-10	- - - -	-10	- - - -	-10	-30

** Every positive parameter gets a score of +10 and negative parameter gets a score of -10*

Table 4.16: School wise score given to nutrition services (component 4)

School Code	Canteen facility		Type of food served		Kind of service		Total score
	Available	Not Available	Freshly cooked	Readymade snack	Free	Paid	
I	+10	- - - -	+10	- - - -	- - - -	-10	+10
II	+10	- - - -	+10	- - - -	+10	- - - -	+30
III	+10	- - - -	+10	- - - -	+10	- - - -	+30
IV	- - - -	-10	- - - -	-10	- - - -	-10	-30
V	+10	- - - -	+10	- - - -	- - - -	-10	+10
VI	- - - -	-10	- - - -	-10	- - - -	-10	-30
VII	+10	- - - -	+10	- - - -	+10	- - - -	+30
VIII	+10	- - - -	+10	- - - -	+10	- - - -	+30
IX	+10	- - - -	+10	- - - -	+10	- - - -	+30
X	- - - -	-10	- - - -	-10	- - - -	-10	-30

** Every positive parameter gets a score of +10 and negative parameter gets a score of -10*

Table 4.17: School wise score given to counseling, psychological and social services (component 5)

School Code	Available in school		Certified counselor		Kind of service		Total score
	Yes	No	Available	Not available	Free	Paid	
I	+10	- - - -	+10	- - - -	+10	- - - -	+30
II	- - - -	-10	- - - -	-10	- - - -	-10	-30
III	- - - -	-10	- - - -	-10	- - - -	-10	-30
IV	+10	- - - -	+10	- - - -	+10	- - - -	+30
V	+10	- - - -	+10	- - - -	- - - -	-10	+10
VI	- - - -	-10	- - - -	-10	- - - -	-10	-30
VII	+10	- - - -	- - - -	-10	+10	- - - -	+10
VIII	+10	- - - -	+10	- - - -	- - - -	-10	+10
IX	+10	- - - -	+10	- - - -	+10	- - - -	+30
X	- - - -	-10	- - - -	-10	- - - -	-10	-30

**Every positive parameter gets a score of +10 and negative parameter gets a score of -10*

QUALITY OF PHYSICAL ENVIRONMENT OF A SCHOOL UNDER COORDINATED SCHOOL HEALTH

Environment of the school, health facilities to the staff and involvement of family and community indirectly affects the safe and healthy physical environment of a school. Component 6 evaluates whether the selected schools had safe and healthy environment (Table 4.18). Seven schools had adequate space in and around the building; 6 schools were constructed in a suitable location and 9 schools had desirable infrastructure with respect to the classrooms, playing area, ventilation, illumination, sanitation and hygiene. Maximum score of +30 was secured by 4 schools, other 4 schools secured +10 score and the remaining 2 schools were rated as -10.

Table 4.19 describes the result on component 7, health promotion of staff. Health camps were arranged every year in just 4 schools during which children and staff underwent a health check up free of cost. Rest of the schools did not provided with any such facility, at least not regularly. Three out of 10

schools secured +30 points and rest had minimum of -30 score, describing how the "health" aspect of both students and staff members was neglected by the schools.

The 8th component assesses the involvement of family and community with schools for holistic development of children (Table 4.20). Out of the 10 evaluated schools, 8 schools had formulated parent's teachers association and 7 out of these 8 schools performed some or the other activities but the frequency of meetings was less than 4 times a year. The total score for all the schools was extremely poor. The integration of family and community with schools needs to be strengthened for all round development of the school children.

Table 4.18: School wise score given to healthy and safe school environment (component 6)

School Code	Space		Location		Infrastructure		Total score
	Adequate	Inadequate	Suitable	Unsuitable	Desirable	Undesirable	
I	- - - -	-10	- - - -	-10	- - - -	-10	-10
II	- - - -	-10	+10	- - - -	+10	- - - -	-10
III	+10	- - - -	- - - -	-10	+10	- - - -	+10
IV	+10	- - - -	- - - -	-10	+10	- - - -	+10
V	+10	- - - -	- - - -	-10	+10	- - - -	+10
VI	- - - -	-10	+10	- - - -	+10	- - - -	+10
VII	+10	- - - -	+10	- - - -	+10	- - - -	+30
VIII	+10	- - - -	+10	- - - -	+10	- - - -	+30
IX	+10	- - - -	+10	- - - -	+10	- - - -	+30
X	+10	- - - -	+10	- - - -	+10	- - - -	+30

**Every positive parameter gets a score of +10 and negative parameter gets a score of -10*

Table 4.19: School wise score given to health promotion of staff (Component 7)

School Code	Health camp		Frequency of arranging the health camp		Type of service		Total score
	Arranged	Not arranged	Yearly	Uncertain	Free	Paid	
I	- - - -	-10	- - - -	-10	- - -	-10	-30
II	- - - -	-10	- - - -	-10	- - -	-10	-30
III	- - - -	-10	- - - -	-10	- - -	-10	-30
IV	- - - -	-10	- - - -	-10	- - -	-10	-30
V	+10	- - - -	+10	- - - -	+10	- - - -	+30
VI	- - - -	-10	- - - -	-10	- - -	-10	-30
VII	+10	- - - -	+10	- - - -	+10	- - - -	+30
VIII	+10	- - - -	- - - -	-10	+10	- - - -	+30
IX	+10	- - - -	+10	- - - -	+10	- - - -	+30
X	- - - -	-10	- - - -	-10	- - -	-10	-30

**Every positive parameter gets a score of +10 and negative parameter gets a score of -10*

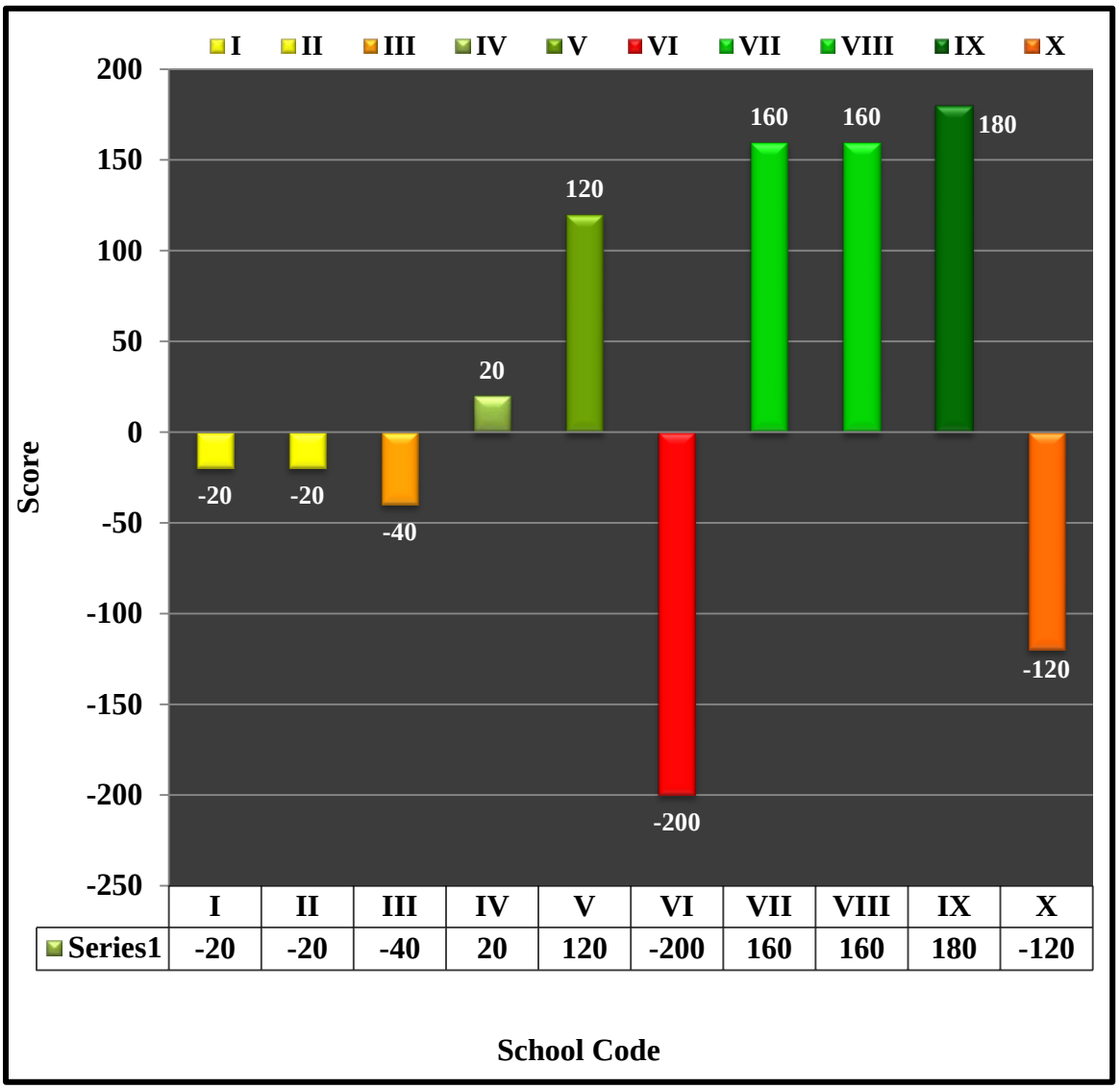
Table 4.20: School wise score given to family and community involvement (component 8)

School Code	PTA		Activities undertaken		Frequency of meeting		Total score
	Available	Not available	Yes	No	4/yr.	<4/yr.	
I	+10	- - - -	+10	- - - -	- - - -	-10	+10
II	+10	- - - -	+10	- - - -	- - - -	-10	+10
III	+10	- - - -	- - - -	-10	- - - -	-10	-10
IV	+10	- - - -	+10	- - - -	- - - -	-10	+10
V	+10	- - - -	- - - -	-10	- - - -	-10	-10
VI	- - - -	-10	- - - -	-10	- - - -	-10	-30
VII	+10	- - - -	+10	- - - -	- - - -	-10	+10
VIII	+10	- - - -	+10	- - - -	- - - -	-10	+10
IX	+10	- - - -	+10	- - - -	- - - -	-10	+10
X	- - - -	-10	+10	- - - -	- - - -	-10	-10

**Every positive parameter gets a score of +10 and negative parameter gets a score of -10*

Figure 4.2 reveals that 5 of the 10 schools scored positive score of which 1 school scored the maximum points of 180, followed by 2 other schools that scored 160, 120 and 20. The remaining schools scored negative points, where maximum negative point was 200 followed by 120, 40 and 20. Though 5 of the 10 selected schools have scored positively, the score is not completely up to 240 which reflect that the schools still have to go a long way to adhere to the CDC CSHP guidelines.

Figure 4.2: Ranking of all schools based on the total scores



EXTENDED CANTEEN EVALUATION

Of all the school canteens evaluated, 40% had cafeteria arrangement and 30% were of vending type and waiter type service (Figure 4.3). The CFRS scale, colour-grading scale and ingredient scale assessed the menus prepared and provided in each school.

Using the CFRS scale, 87 different types of menus from all 10 schools were (Table 4.21), evaluated and given a score. The same score evaluated the canteen facility of each school (Table 4.22 and 4.23). Just one school was rated as good, two schools were rated as poor and rest needed improvement.

As per the colour grading scale, 35% of the menus served in the school were risky and unhealthy choice and only 27% menus were healthy (Figure 4.4). Whereas based on the ingredients, Figure 4.5 and Table 4.25 reveals 2 out of 10 schools provided only unhealthy food having combination of transfat and refined wheat flour. The other two schools did not provide this unhealthy combination at all. Healthy food was provided in 4 schools in the rage of 57 – 60%.

Figure 4.3: Type of services available in the school canteens

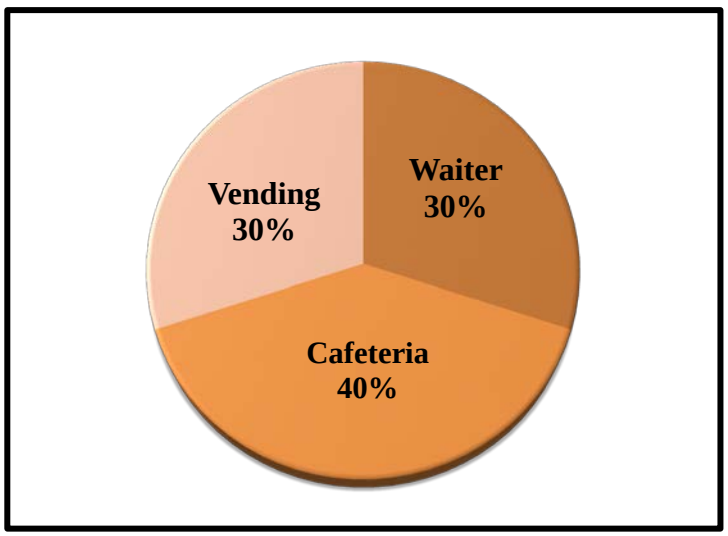


Table 4.21: CFRS Scores given to 87 different canteen menus

Menu	Score	Menu	Score	Menu	Score
Noodles	26	Samosa	18	Khichdi Kadhi, Salad	41
Bhel	32	Fried Rice	23	Idli, Medu Vada, Sambhar	31
Vadapav	20	Sev Sal, Pav	23	Roti, Lobia, Chhas	33
Puff	18	Mix Veg, Puri	23	Noodles, Manchurian, Banana	34
Bunsamosa	18	Dabeli	18	Dudhi Palak Dhebra, Curd, Fruit	33
Friedrice	23	Pasta	28	Sev Usal, Bread	23
Sev Khamni, Fruit	35	Mecroni	28	Roti, Mix Veg, Raita	35
Moong/Rajma Rice	23	Bread pakoda	23	Bhel, Shira, Bhajiya	33
Roti Subji	30	Chinese Bhel	21	Rice, Rajma, Corn	38
Idli Sambhar	33	Vada Sambhar	31	Roti, Mix Dal, Veg	35
Chana Chat	20	Dal Vada	18	Pavbhaji,Fruit Custard	48
Pav Bhaji	32	Veg Sandwich	28	Masala Bhat, Kadhi	31
Bataka Poha, Sev, Fruit	38	Idda	20	Burger, Friedrice	31
Daliya Khichdi Kadhi	31	Khichdi	20	Roti, Subji, Chhas, Fruit	45
Puna Misal	43	Khaman	20	Rice, Moong, Salad, Sev	33
Masala Puri, Pickle	13	Mix Veg Pakoda	23	Soup, Sandwich, Fruitchat, Cutlet	38
Kachori	26	Khasta Kachori	18	Roti, Subji, Fruit	35
Samosa Chat	23	Bataka Poha	23	Roti, Chana Gravy	35
Dhokla,Ketch	28	Sev Roll	18	Puri,Chole,Chhas	48

Up					
Thepla, Pickle	26	Dahi Vada	30	Bhel, Sheera, Fruit	34
Maggie	8	Bread roll, Chips	15	Pavbhaji, Rice Kheer, Fruit	53
Khichdi Kadhi	31	Rice, Roti, Kadhi, Subji, Lobiya	40	Daldhokli, Jeera Rice, Salad	36
Chhole Puri	38	Rice, Sambhar, Puri, Subji	40	Puri, Matar paneer, Jalebi	30
Bhel, Fruit	42	Raita, Biriyani, Chole Puri, Salad	48	Chole Puri, Banana	48
Upma	28	Jeera Rice, Punjabi Dal, Roti,S ubji, Butter milk	50	Sev Usal, Bun, Fruit	33
Idada, Chutney	28	Khichdi Kadhi, Subji, Puri, Pickle	40	Veg. Burger	23
Papdi Chat	33	Rice Dal, Roti Subji, Curd	45	Idli Chutney	18
Veg. Sandwiches	28	Ragda Petis	31	Cutlets	21

CFRS Scores	*Details*	*CFRS Scores*	*Details*
0	*No intake of particular food group*	*1-20*	*Poor*
5	*Poor intake of particular food group*	*21-39*	*Needs improvement*
8	*Fair intake of particular food group*	*40-60*	*Good*
10	*Good intake of particular food group*		

****Good score - 40-60, Needs improvement - 21-39 and Poor score - 1-20CFRS scores were developed according to 1/3rd RDA of school children (7-12years) developed by NIN, ICMR 1991, and Nutri points (Roy E. Vartabedian and Matthews, published by Harper Collins Publishers, New York, 1990)***

Table 4.22: Mean CFRS score given to canteen foods served in all ten schools

School code	Type of food service	Mean ± SD for CFRS scores	Quality of canteen Food
I	Vending	22.83 ± 5.4	Need improvement
II	Vending	28.25 ± 8.58	Need improvement
III	Vending	28.25 ± 8.58	Need improvement
IV	Cafeteria	22.00 ± 6.8	Need improvement
V	Cafeteria	23.75 ± 5.33	Need improvement
VI	Cafeteria	17.00 ± 1.73	Poor
VII	Waiter	43.83 ± 4.5	Good
VIII	Waiter	35.79 ± 6.18	Need improvement
IX	Waiter	39.00 ± 9.25	Need improvement
X	Cafeteria	16.50 ± 2.12	Poor

**Good= 40-60 scores, Need improvement= 21-39 scores, Poor= 1-20 scores*

Table 4.23: Details of the Colour Grading Scale

Color Grading Scale					
Colors	Grades	Calories (Kcal)	Protein (gm)	Fat (gm)	Micronutrients (no of servings of F & V)
	O = Out standing	500-600	15-20	10-15	1-2
	A = Good	300-499	10- 14	≤ 10	½
	B = Fair	< 300	< 10	≤ 10	< ½
	C = poor	300-500	10-14	> 15	< ½
	D = Very poor	300- 500	< 10	> 15	0
	E = Extremely poor	< 300	< 10	< 10	0
	F = Risky	< 300	< 10	> 15	0

* Colour Grading Scale is developed according to ⅓rd average RDA of school children (7-12yrs) developed by NIN, ICMR ,1991

Figure 4.4: Foods categorized based on the colour grading scale

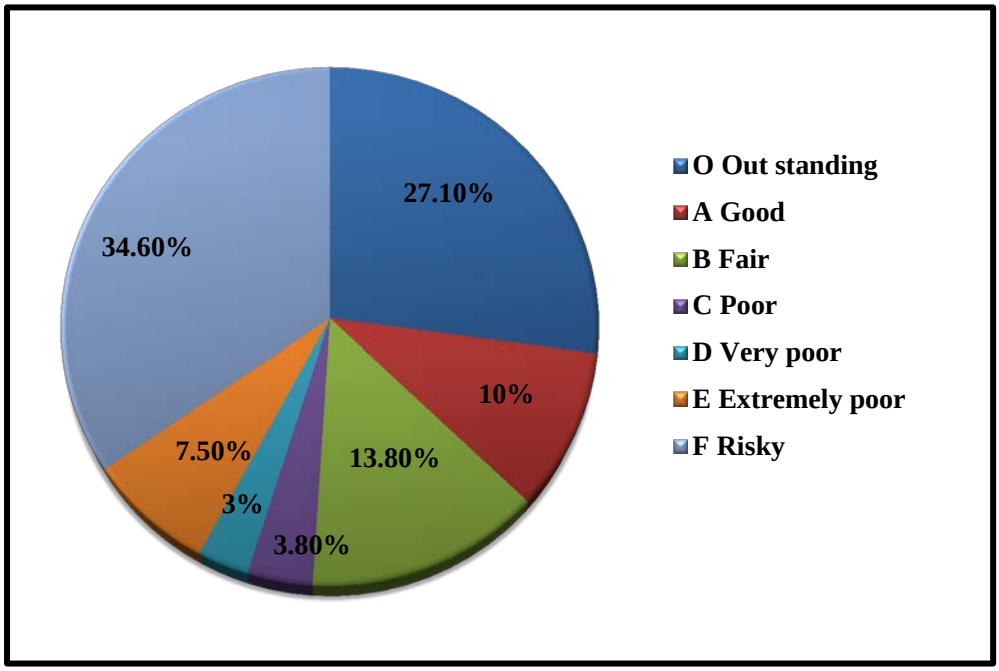
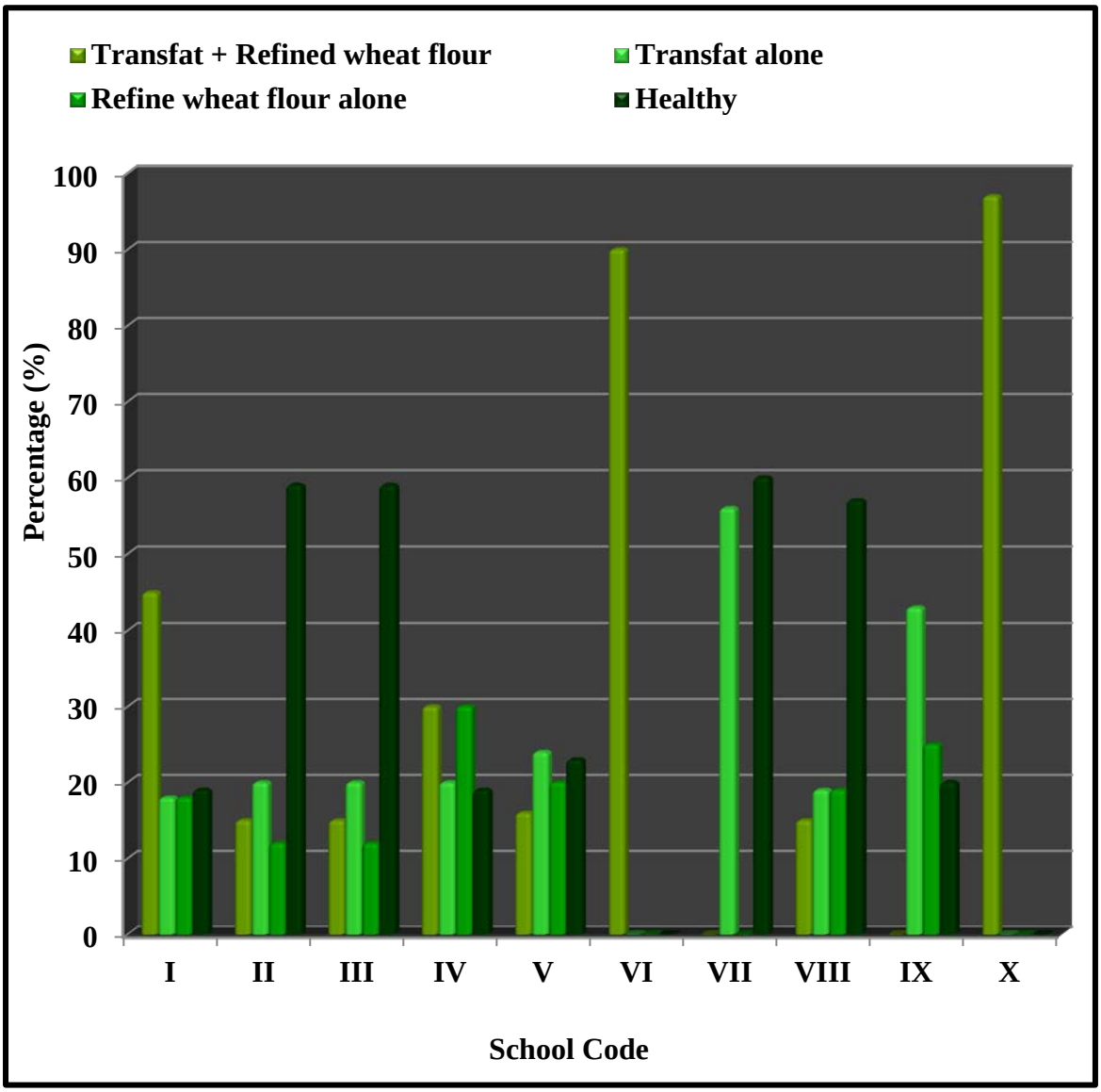


Table 4.24: Combination of the ingredients used and categories of the foods

Ingredients	Category
Wheat flour refined + trans fat	Unhealthy
Wheat flour refined	Unhealthy
Trans fat	Unhealthy
Cereal- pulse/ cereal- pulse, veg. combination	Healthy

Figure 4.5: Menus categorized as healthy and unhealthy based on the ingredients



TO SUM UP

The education cost is rising tremendously in Vadodara under the impression of "quality education", "quality services" and "assurance of a healthy school environment". This phase of the study evaluated all 10 schools based on the CDC's guidelines of a CSHA.

Critical quality research techniques were applied to evaluate the schools for 8 components namely nutrition education, physical education, health services, nutrition services, counseling services, school environment, health services for the school staff and family-community involvement. The important findings and respective recommendations have been summarized in the table 4.26 given below.

Table 4.25: Summary, limitation and recommendations of phase 1b

Components	Positive Findings	Limitations	Way Forward
Health education	60% schools covered >5 topics on nutrition	Not taught in depths Absence of a nutrition expert	Incorporate active learning Provide health and nutrition training to the teachers Collaborate with nutrition expert
Physical education	≤ 50% schools taught physical education completely	Inadequate time devoted to physical education Physical sports is given extremely poor attention by both schools and parents Increased academic pressure Non-supportive parents Unavailability of adequate place, time and resources to indulge in sports activities	Policy changes for making physical education compulsory Developing school based "Sports Club" for offering variety of sports and promotion of PA Special efforts should be made to increase the activity levels among girls
Health services	40% schools had a separate nurse and rest room	Dire need of a complete first aid kit and specialized nurse Health checkups were not a part of the school routine	Developing infrastructural support Nutritional status monitoring as part of health check up Involvement of parents in monitoring health

			status of children Appointing a specialized nurse
Nutrition services	70% schools had food service centers of their own Children were not allowed to bring junk food in the tiffins	Well equipped and spacious canteen was not present in all the schools Parents were not involved Kitchen was managed by private contractor Nutrition was a missing component 90% schools had fast food outlet near the vicinity Unavailability of healthy food options Absence of a nutrition expert	Involve and sensitize the parents towards healthy nutritional practices Develop a weekly menu by involving students and parents Policy implications for not having fast food outlet near school premises Dietary counseling services for students and parents
Counseling, psychological and social services	30% schools had specialized counselor who provided free of cost services within the school hours	Need of a psychological counselor was not felt by all the schools Seeking counseling was considered as a taboo by the parents Many of the school management found it costly to appoint a counselor	Effective collaborations with experts/organizations/institutes can be done by the schools A team of visiting specialist for paramedical services can be appointed by the school Parents need to be sensitized towards psychosocial requirements of the children

Safe school environment	90% schools had good infrastructure, adequate space and safe surroundings	Maintenance of the infrastructure depended on the type of school management	The empty place around the school can be effectively developed into sports club, school kitchen garden and much more interesting infrastructure that can contribute in a child's development Physical activity promoting strategies should be adopted by the schools
Health promotion for staff	40% schools conducted annual health check up for students and staff free of cost	The health check up does not include nutritional status assessment	BMI, Nutritional deficiencies, blood pressure should be included in the health check-ups and referrals should be made by involving the parents
Family and community involvement	Parent Teachers Association (PTA) was formed in 70% schools	Frequency and intensity of parents – school – community contact was very less	Active contact with parents and community Health based awareness camps, training sessions, and activities should be conducted with parents and communities

DISCUSSION

The selected schools were a balanced combination of both state and central board of education and the findings on the school curriculum were not distinctly different. Health and nutrition topics covered in the curriculum, the depths in which they were taught and the expertise of teachers in the respective field needs a lot of revision.

A "health building school" is more of a basic need for human growth and development than just education (Mwiria, 2004). Therefore the content of school education should be designed holistically, supported by novel teaching approaches (Florentino, 2002). Classroom curriculum focusing on dietary behaviour, physical activity and healthy lifestyle has shown to significantly reduce the total energy intake; (Caballero et al., 2003); is effective in weight reduction and behaivour change (Rieder et al., 2013). Moreover NHE delivered through a trained teacher helps in healthy decision as well as reduces screen time (Briss et al., 2000; Katz et al., 2005).

Lack of activity is a result of the lack of emphasis on physical education in schools and at home (Anrig, 2003). The curricula of physical education should therefore be planned to provide cognitive and learning experience in variety of activity areas such that a child may develop the confidence to enjoy a lifetime of healthful physical activity; preferably by a qualified and trained teachers (Kumar et al., 2007; CDC, 2013) by involving parents for providing a "after school" support environment.

The schools under study congregate wholesome amount of fees; still however the variety and quality of services provided in these schools was not in line with the guidelines and calls for much more rework. The study findings show that 70% evaluated schools had catering services but it was not monitored by a nutrition expert.

Nutrition policies and interventions remain incomplete without involving a nutrition expert (Februhartanty, 2005). Wisely governed school canteen provides a healthy school food environment, which shapes the balance of food intake (Griffin, 2006). Nutrition health education can be better enforced by providing healthy menus at the school canteen, practical learning experience by developing school kitchen gardens (Eschmeyer and Upton, 2013; Gibbons, 2002).

The results of kitchen and nutritional evaluation in the present study revealed that majority of the schools had good kitchen infrastructure, but the menus provided used ready to eat food and junk food at least twice a week; the combination of ingredients used in menus were rich in trans fat, sugar and refined cereals. Studies have documented that the school canteens can easily make healthy food available, attractive and popular among the children to convince them to change their behaviour (Schwarz, 2013; Wansink, 2013; Katz, 2008). Practical application within the schools and reinforcement by family's positive behaivour change (Shah et al., 2010) makes classroom awareness sustainable.

Among the well to do schools in the present study, psychosocial counseling of students and parents was not much widely practiced element. The school based health checkups' failed to monitor the healthy growth among children. Katz (2006) reports that frequent psychosocial assessments, counseling, regular BMI screening, parent reporting and target specific interventions have shown significant impact in reducing childhood health issues both mentally and physically (Soto and White, 2010); therefore it should be made an integral part of the school health services. Moreover, such services also help to monitor the impact of health programme or intervention on a longitudinal basis (Kafatos et al., 2005).

School infrastructure, facilities available, surrounding area, involvement of families and communities constitute the physical environment of a school.

The 10 schools evaluated under the study had adequate space, well-constructed infrastructure but it was underutilized, and its maintenance was a matter of concern. Moreover, parent school contact and involvement of the community was insufficient. Effective communication by the schools and involvement of parents especially in health check-ups, nutrition services and physical activity fosters strong and conducive school environment for the optimum behaviour change among children (NIHCM, 2007; Katz et al., 2005). Novel strategy such as "Wellness Council" that provides mid-day breaks for fitness and sports activities during the school hours can greatly improve the health scale of children by altering the school environment (Schwarz, 2013; Chen et al, 2014).

Increasing the frequency of meetings can strengthen parent and community involvement. Studies have shown that extent of time spent by parents, decisions made, practices adapted and lifestyle behaviour directly influences the dietary practices of children and their involvement in PA (Paxson et al., 2006). Some of the family and community based programmes such as KidShape, SHAPEDAOWN, HealthWorks, SlimKids, 10,000 Steps Program and Colorado on the move, have shown impressive positive results in weight management through dietary and lifestyle behaviour changes (NIHCM, 2003).

Healthy school initiative programme in India is yet to find its way in all public and private schools. Opportunities observed in Vadodara show promising results for developing schools as a "health promoting and fostering institute" which can effectively tackle the growing dual burden of malnutrition. The evaluation results gives a modest rational to pilot test a behaivoural model in one of the selected schools.