

SITUATIONAL ANALYSIS: IMPLEMENTATION OF THE NATIONAL SCHOOL NUTRITION PROGRAMME IN LOW SOCIO-ECONOMIC PRIMARY SCHOOLS IN NELSON MANDELA BAY

Annelie Gresse*, Anele Nomvete & Cheryl Walter

ABSTRACT

The general wellbeing of primary school children is affected by various factors, of which the lack of foods of high nutritional value – from the National School Nutrition Programme (NSNP) or from lunch boxes, tuck shops and vendors – is one factor. This article reports on sections of the baseline phase of a longitudinal cohort study, as part of an integrated study. The baseline exploratory survey in 2015 conducted structured interviews and observation in eight quintile 3 public primary schools from areas in Nelson Mandela Bay (Eastern Cape).

A total of 8 587 children received food from the Department of Basic Education's NSNP. The average expenditure of R2.51 per child per day, including costs for gas and food, makes providing a meal that meets 30% of the nutrient requirements difficult. Only one school had a vegetable garden providing for meals. Four of the eight schools had an acceptable kitchen, but none met all the necessary requirements regarding space and plumbing for the number of children catered for. None of the food providers was trained in basic hygiene and food safety. This was identified as a serious problem, as 60% of the children in the study had one or more types of parasitic infection.

Food items from tuck shops and vendors were generally low cost items with little nutritional value. Lunch boxes contained energy food – often refined, processed items low in fibre. The food providers, tuck shop operators, vendors and teachers require nutrition, health and safety education, as well as food garden training.

— Prof A Gresse*

Department of Dietetics
Nelson Mandela University
Port Elizabeth
South Africa
Tel: +27 (0)41 504 2048
Fax: +27(0)86 670 6680
Email: annelie.gresse@mandela.ac.za

*Corresponding author

— Mrs A Nomvete

Department of Dietetics
Nelson Mandela University
Port Elizabeth
South Africa
Tel: +27 (0)41 504 2048
Fax: +27(0)86 670 6680
Email: aynomvete@gmail.ac.za

— Prof C Walter

Department of Human Movement Science
Nelson Mandela University
Port Elizabeth
South Africa
Tel: +27 (0)41 504 2628
Fax: +27(0)86 670 6680
Email: cheryl.walter@mandela.ac.za

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BACKGROUND

Factors affecting the general wellbeing of primary school children have received insufficient attention in research (Richter et al. 2007). Under-nutrition, often due to a lack of resources to provide proper nutrition, is one such factor (Maunder et al., 2015). The National School Nutrition Programme (NSNP) was developed to assist in providing proper nutrition and improving the children's wellbeing (DoBE, 2014a). School lunch boxes lack foods of high nutritional value (Shisana, et al., 2013). Tuck shops and vendors often sell food that is affordable but has little nutritional value (Kroone & Alant, 2012).

This article describes sections of the baseline phase of a longitudinal cohort study, as part of an integrated investigation of nutrition and

learner well-being and the implementation of the NSNP in some schools in low socio-economic areas in Nelson Mandela Bay (Eastern Cape).

LITERATURE REVIEW

Under-nutrition in young children is most serious in rural areas and in children whose parents have low educational status, low or no income, or live under poor environmental conditions (Iversen et al., 2011). In South Africa, one in every ten children is underweight, one in every five children is stunted, and deficiencies in micro-nutrients, such as vitamin A, iron and zinc, are common (Maunder et al., 2015). Most food-insecure households lack variety in their diet (Naicker, et al., 2015) tending to spend on staple, affordable foods such as bread, maize (especially samp), tea and sugar, while foods from groups such as fruit and vegetables are considered too expensive. These choices increase the risk of micro-nutrient deficiencies (Mpontshane et al., 2008). Nutritional support from the NSNP could be valuable in increasing dietary diversity, general nutritional status and encouraging more balanced diets later in life.

Concurrent with under-nutrition, the South African National Health and Nutrition Examination Survey (SANHANES-1) reported that childhood obesity and overweight are escalating in South Africa, especially in formal and informal urban areas (Shisana et al., 2013). The SANHANES-1 reported a combined overweight and obesity prevalence of 13.5 percent for South African children aged six to 14 years. This is higher than the global prevalence of ten percent in school children, but lower than current levels of 32.6 percent for combined overweight and obesity in children aged six to 11 years in the United States of America (USA) (Mchiza & Maunder, 2013).

Overweight children have increased risks of adult overweight and obesity, associated with increased risks of hypertension, coronary heart disease, diabetes, stroke and some forms of cancer (Steyn & Temple, 2008). Thus, a focus on child health may have positive effects on societal progress, lessen the prevalence of the global burden of disease, and prevent some childhood deaths.

Many factors influence lunch box practices, including peer pressure, children's perception of 'what is better food', food availability, support at home and the time required to pack lunch boxes (St. Onge, et al., 2003; Shishana, et al., 2013).

The SANHANES-1 study demonstrated that school children who did not bring lunch boxes also often skipped breakfast, and that the majority relied on food availability at school from tuck shops, vendors and the NSNP (Shisana et al., 2013).

Pocket money influences dietary intake. However, many children prefer foods high in fat, salt and sugar available at tuck shops and vendors outside schools, and not healthy alternatives (Feeley, 2011 as reported in DoBE, 2014b; Kruger & De Villiers, 2011; Shisana et al., 2013). Soft drinks, affordable and acceptable, are similarly available from tuck shops and vendors. There has been a 56% increase in the consumption of soft drinks per person in South Africa from 2002 to 2012 (Tugendhaft et al., 2015).

The principles of the NSNP programme are grounded in Section 18 of the Constitution as part of the declaration of the provision of basic education as a right for all (Buhl, 2010). The National and Provincial Departments of Education are accountable for the management and utilisation of programme funds, as guided by national policies and legislation, as well as for monitoring the implementation of the programme at schools.

A national and provincial monitoring and evaluation process determines which schools receive grant money. Not all schools participate: the DoBE targets schools in low-income (Quintile 1 – 3 schools) and rural areas, focussing on those most in need. It is estimated that 9.1 million public school children in the 2013/2014 school year benefitted from school feeding, with more than 1.6 million of these being children in the Eastern Cape, in 3 968 schools (DoBE, 2014a).

The NSNP aims to improve the quality of education by enhancing children's learning capacity, encouraging regular attendance and punctuality, decreasing gender disparity, addressing micronutrient deficiencies, and alleviating short-term hunger by providing food that will supply 30% of the daily energy requirements of the child (Van Stuijvenberg, 2005; Buhl, 2010). The NSNP promotes school gardening to stimulate local farm production and a healthy lifestyle (DoBE, 2014a). Menus are based on the Food Based Dietary Guidelines and should include fresh fruit and vegetables (Vorster, et al., 2013).

The DoBE, with the Department of Health (DoH), provides menu options for schools which offer meals to meet at least 30% of the daily requirements for energy, protein, calcium, iron, zinc and vitamin A. Meals should offer a protein, a starch, and at least one green and one yellow, red or orange vegetable. Fats and oils, and iodized salt, should be used in moderation. Common ingredients in South African school meals include: samp, beans, rice, canned fish, soya, fortified maize meal, fortified bread, fruits and vegetables (Department of Education, 2009; Buhl, 2010).

The programme relies on regional structures that can result in uneven implementation (Buhl, 2010), and there are challenges with food distribution. Adequate stock to provide food according to the prescribed menus is usually available at urban schools but not always at rural schools.

Other challenges for the NSNP include:

- School children may receive less food at home as some parents argue that the children now obtain food at school; parents need education on the programme objectives (Buhl, 2010);
- Where cooking facilities are not available schools may choose “cold” menus (brown bread, margarine, peanut butter or jam) without that fruit and vegetables that ensure adequate micro-nutrient consumption (Buhl, 2010);
- The programme encourages the use of local resources, gardens and food products, but this is not a written policy (DoBE, 2014a);
- The creation of employment for local women volunteers to assist with food production is encouraged: however, these women may lack the knowledge and skills to provide nutritious meals (DoBE, 2014a);
- Water is often lacking in food preparation areas despite most menus requiring water (Faber, et al., 2013);
- The basic equipment and utensils for preparing and serving meals are often lacking (Buhl, 2010);
- There are no official food suppliers, leading to variation in quality and quantity of food served (DoBe, 2014a);
- Theft and corruption may result from poor

control (Buhl, 2010);

- Poor food safety may result from a lack of hygiene (Buhl, 2010);
- In the 2013/2014 financial year, only nine schools in the Eastern Cape could be physically visited to monitor the programme (DoBE, 2014a).

AIM AND OBJECTIVES

As there are continuing problems with nutritionally adequate school meals (Shisana et al., 2013; DoBE, 2014a), it is important to understand how the NSNP operates at primary school level. To this end, the study reported here investigated the efficacy and compliance of food provision by the NSNP at eight lower socio-economic primary schools.

The objectives were to determine:

- The efficacy and compliance of the programme compared with the nutritional requirements for children;
- The efficacy and compliance of the facilities and equipment compared with the prescriptions of the DoBE;
- Alternative sources of food;
- Whether basic hygiene and safety requirements are met.

METHODOLOGY

Study area

The study was conducted in historically black and coloured public primary schools from Nelson Mandela Bay (Eastern Cape, South Africa). Eight quintile three schools were purposively selected.¹ There were no quintile 1 or 2 schools in the longitudinal study areas.

Study design

The longitudinal cohort study, called the DASH study (Disease, Activity and School Children's Health), consists of three cross-sectional surveys (baseline, midpoint and final follow-up) from February 2015 to March 2017.

This article describes the baseline qualitative exploratory survey in order to identify factors influencing food provision according to the NSNP guidelines which directly and indirectly

¹ Quintile 3 schools: The quintile system allocates all government schools into one of five categories, quintile 1 schools being the poorest. The quintile to which a school is assigned is based on the rates of income, unemployment and illiteracy within the school's catchment area. Schools in quintiles 1 to 3 have been declared no-fee schools and are on the NSNP.

influence the nutritional well-being of the children. The data were collected by means of a structured interview and observation.

Sample size

The number of schools chosen for the study was based on achieving sufficient precision in estimating the prevalence of soil-transmitted helminth infections in the children, a factor identified as critical to the well-being of the children and one of the main areas of investigation in the overall study. For the cross-sectional baseline study, the sample size was calculated based on the prevalence of soil-transmitted helminth infections (p , of approximately 3 %), the average number of children per school (B , of 150 in Grade 4 that was the focus group for treatment), and an intra-class correlation coefficient for the clustering of outcomes within schools (ICC , of 0.15). This resulted in eight clusters (schools) identified in the township areas of Nelson Mandela Bay (Yap, et al., 2015).

Study participants

This part of the baseline survey describes the responses of the volunteers who produce the food, teachers involved in the management and co-ordination of the NSNP and tuck shops, and vendors outside the school grounds. Structured interviews were conducted with personnel who manage the tuck shop and NSNP and who cook and buy the food, as well as with vendors. Twelve interviews were held in each of the eight schools.

Data collection and management

The questionnaire for the structured interview was developed to determine the facilities available and procedures followed regarding food production. It was piloted at two schools. After minor adjustments, data were gathered from all eight schools in March 2015.

In addition, the questionnaire used by the DoH to assess hygiene in food production (including personal hygiene, food hygiene and hygiene of the premises) was adjusted and piloted along with the situational analysis questionnaire to determine the level of food hygiene during food production in the schools (National Department of Health, 2015). The questionnaire included sections on: who provided and prepared the food; the equipment and hygiene of the food preparation process and premises; funding; the

menu; what was prepared; portion sizes; information on the tuck shop and items sold;

information regarding vendors who sold food to the children; the items that they sold; and the contents of the children's lunch boxes.

The total amount of each food item produced was weighed and divided by the number of children who received food on that day at a specific school in order to determine the average portion sizes of the various food items given to children. As a follow-up to responses in the structured interviews, practices and problems were identified through observations by a trained dietitian.

Data were entered on a Microsoft Excel (2013) spread sheet and averages and ranges were determined where applicable.

Additional data were collected in the larger study but are not reported on here. These data included the parasitic infection rate and stunting. A single stool and a single urine sample were collected to determine parasitological infestation, specifically helminth and intestinal protozoa infections. Light microscopy was used for identification. Anthropometric indicators (i.e. height and weight) and calculated z-scores were used to determine stunting.

Ethical considerations

Ethical clearance for the study was obtained from the Ethics Committee Northwest and Central Switzerland (EKNZ) in Basel, Switzerland, as well as the appropriate ethics committees of the Nelson Mandela Metropolitan University (NMMU), the Eastern Cape Department of Education and the Eastern Cape Department of Health.

Written informed consent was obtained from the school principals and staff involved in food provision for this reported section of the study. Confidentiality and anonymity were ensured by not including any names of participants. Participation was voluntary, and participants could withdraw from the study at any time without consequences and further obligation.

RESULTS AND DISCUSSION

The survey and observation results will be discussed as follows: provision of food; adequacy of facilities and equipment; hygiene and safety during production; and food sources

TABLE 1: NSNP GRANTS PER SCHOOL

School	Number of children (n)	R/learner/day
1	830	2.50
2	1272	2.25
3	1332	2.33
4	1401	3.17
5	890	2.35
6	1155	2.50
7	937	2.62
8	770	2.42
Average	1073	2.51

TABLE 2: WEIGHTED FOOD GROUPS

Food group	Average cooked portion	Range
Protein	31 g	29 – 40 g
Starch	55 g	30 – 60 g
Vegetables & Fruit	48 g	10 – 120 g

TABLE 3: NUTRIENTS OF A TYPICAL SCHOOL MEAL AS PROVIDED BY THE SCHOOLS, COMPARED TO DIETARY REFERENCE INTAKE

Requirements	Recommended	Recommended 30% re-requirements	Average provision by schools
Average energy	8 000 kJ	2 400 kJ	655.9 kJ
Range of energy	6 900 - 9 570 kJ		
Average protein	35 g	10.5 g	10.2 g
Range of protein	19 – 52 g		
Average Vitamin A	360µg RE	108 µg RE	386.12 µg RE
Range of Vitamin A	275 – 445 µg RE		
Average Iron	4.82 mg	1.45 mg	0.65 mg
Range of Iron	4.1 - 5.9 mg		

(DRI, 2005)

other than the NSNP.

Food provision

In total, 8 587 children (approximately 95% of all children in these schools) received an early lunch between 10 am and 11 am as part of the NSNP at the eight schools. See Table 1. The food providers and teachers reported that some children (especially older children) did not participate because of peer pressure, with the NSNP seen as “not cool”.

All the schools kept to the prescription (DoBE, 2014a) of one food server (a volunteer who earns a stipend of R840 per month) for every 200 children. The funds received from the DoBE varied, depending on the administration and the total number of children that were reported to the Department. The DoBE

calculated the cost of an average meal as R2.58 in the 2014/2015 financial year in the Eastern Cape (DoBE, 2014a). The grant is also used for the gas used in cooking, and payment of the volunteers (DoBE, 2014a). It is difficult to provide a meal that meets 30% of the daily nutritional requirements of the children with these funds. Only one school had a vegetable garden contributing to food for meals.

All schools sought to keep to the prescribed menu but with some variations to ensure better acceptability of the meals, or due to the unavailability of certain ingredients. As the food was not always tasty, much food waste was observed which, however, was not measured in this study.

Portion sizes varied greatly between the various schools in the study; the weights of the portions

TABLE 4: MEAN ANTHROPOMETRIC MEASUREMENTS, HAEMOGLOBIN VALUES AND PARASITE INFECTION RATES OF GRADE 4 CHILDREN (N = 934)

	ASL infection ^a	TT infection ^b	Not infected with ASL or TT	HP infection ^c
Infection rate n (%)	248 (26.6)	207 (22.2)	635 (68.0)	434 (46.5)
Mean weight (kg) n (range)	28.4 (27.7 - 29.1)	27.8 (27.0 - 28.5)	31.6 (31.0 - 32.2) p = 0.011	
Mean height (cm) n (range)	131.8 (130.9 - 132.6)	131.1 (130.1 - 132.1)	133.9 (133.3 - 134.5) p = 0.009	
Mean BMI (kg/m ²) n (range)	16.2 (16.0 - 16.5)		17.5 (17.2 - 17.7) p = 0.024	
Wasted ^d n (%)	17 (6.9)	16 (7.7)	15 (2.4) p = 0.418	
Stunted ^e n(%)	47 (19.0)	47 (22.7)	37 (5.8) p 0.006	
Mean haemoglobin (g/l) n (range)	120.4 (119.2 - 121.6)	119.5 (118.3 - 120.6)	123.1 (122.3 - 123.8) p = 0.009	

^a Prevalence of *Ascaris lumbricoides* infection, irrespective of co-infections

^b Prevalence of *Trichuris trichiura* infection, irrespective of co-infections

^c Prevalence of *Helicobacter pylori* infection, irrespective of co-infections

^d Wasting: ≤ -2 BMI z score

^e Stunting: ≤ -2 HA (Height for age) z score

p-values calculated for difference between children infected with ASL and TT and those not infected.

(Müller, et al., 2016)

of individual food groups are reported in Table 2.

In Table 3, an average meal, based on the average portion size for the eight schools, of chicken (31g), carrots (48g) and rice (55g) (the most favoured meal in the schools surveyed) is compared with the Dietary Reference Intake (DRI) for children from six to 14 years of age (DRI, 2005).

Compared with the average recommended energy requirements of children, it is clear that the energy provided by the meal did not meet the required 30%. It was not possible to examine the range of energy provided as no specific school provided the smallest or biggest portions for all the food groups. Although the other nutrients were not as deficient in energy as this specific meal, the required 30% of the nutritional requirements that should be met by the school meal will usually not be met. Children at these lower socio-economic schools are often older than the national age norm for their grades, and this suggests a more serious impact. If, in addition, it is taken into account that parents may provide less food to children

because of the meal served at school (Buhl, 2010), the lack of a nutrient-dense lunch may cause an increase in malnutrition in the area.

Mean anthropometric measurements, haemoglobin values and parasite infection rates of grade four learners (the intervention group) in the eight schools are given in Table 4. Stunting was observed in 10% of the children, while wasting was recorded in 4%. On the other hand, 5% of the children were found to be overweight or obese (Müller, et al., 2016). Chronic under-nutrition in the children is reflected by the prevalence of stunting and the results indicate that the prevalence increased as primary school children became older. This reflects chronic under-nutrition and inadequate access to protein as part of the daily diet of these children, as also found by Nhlapo et al. (2015).

Investigation is needed as to the prevalence of stunting in relation to the smaller portion sizes and the fact that children, especially older children, did not always eat the NSNP meal provided. Furthermore, the increase in obesity in school children needs attention (Mchiza &

TABLE 5: FOOD SOURCES, OTHER THAN THE NSNP AVAILABLE AT SCHOOLS

School	Tuck shop available	Vendors available	Children that bring lunch boxes to school (%)	
			Grade 0-4 n = 5635	Grade 5 – 7 n = 2952
1	No	Yes	80	50
2	Yes	Yes	100	40
3	No	Yes	90	20
4	No	Yes	80	40
5	No	Yes	55	0
6	Yes	Yes	80	20
7	Yes	No	70	20
8	Yes	No	20	20
Average			72.0	26.2

Maunder, 2013). Another area for investigation would be the reasons why children do not bring lunch boxes to school, including the influences of peer pressure or preference.

Facilities and equipment

Four of the eight schools had an acceptable kitchen for food provision. However, none met all the necessary requirements regarding space, plumbing and electricity for the number of children catered for. None of the schools had the minimum required amount of equipment and utensils prescribed by the DoBE. There were no measuring cups and spoons, and a limited number of cutting boards, if any. Funds for the necessary large equipment were not available. Only four of the schools had adequate storage facilities.

Hygiene and safety during food production

No food provider had been trained in basic hygiene and food safety. This was identified as a serious problem, as 60% of the children in the study had one or more types of parasitic infection (see Table 4).

All food providers wore uniforms and caps. All knew that they should wash their hands often, but none did so between tasks, often due to a lack of water and insufficient equipment and utensils. Only one food production area had a hand washing basin and soap, but with cold water only, and no towels. Two schools did not wash fresh fruit and vegetables before preparation.

Only one school used different chopping boards for raw and cooked foods. In the other schools the few chopping boards available were used for

all food groups, with no distinction between raw and cooked foods, protein and other foods. Chopping boards were also not washed properly between the preparation of different items.

None of the food handlers used disposable gloves when serving food. Serving spoons were used, but were insufficient in all schools (as were spoons with the correct measurements).

Although no school had an official cleaning programme for food production, the floors in all but one school were clean during preparation, and were cleaned daily. Despite the lack of water in some production areas, the utensils and equipment used were clean and were also cleaned after use.

None of the food production areas had fire extinguishers. Gas was used for cooking and the lack of fire extinguishers poses a serious threat.

Other sources of food

Table 5 provides information on other sources of food.

Four of the schools had tuck shops selling snacks such as sweets, crisps and both carbonated and non-carbonated cold drinks. Prices were fair (cost price plus less than 10%) so that children could afford them. The percentage of children who brought money to buy snacks and/or lunch at the tuck shops or vendors ranged from 10% to 60% across the eight schools, with an average of approximately 45%.

It was found that school tuck shops often sell products high in sugar and fat. These encourage

an unhealthy lifestyle that could later lead to non-communicable diseases (Wiles, et al., 2011). A number of South African policies and guidelines provide ideas for healthy items to be sold at tuck shops (DoBE, 2014b), but there is no specific solution (Kruger and De Villiers, 2011). However, the tuck shop is often where children buy lunch and it is important to investigate the provision of low fat, low salt, nutrient dense food options at affordable prices.

At all the schools, except for two that had tuck shops, vendors had spaces on the pavement outside the school premises to sell cheap items such as sweets, cold drinks, ice pops, popcorn, vetkoek and cooked chicken feet. Prices were fair so that children could afford them, and varied from 20 cents for single sweets to 50 cents for a small amount of crisps, popcorn, a lollipop or a non-carbonated cold drink. Chicken feet sold for 70 cents per item and chicken heads at 50 cents per item.

Vendors were active outside the schools from early in the school day and 30 - 60 % of children regularly bought from them. Training for these vendors to include less high fat, high salt foods and more nutrient dense options, as in the case of the tuck shops, can contribute to improved health. However, this is a greater challenge than the training of tuck shop managers as they are not part of the school system and are not accountable to the same structures.

Children from all the schools brought lunch boxes. These were counted by teachers on the day that the specific schools were visited. More children in lower grades brought lunch boxes (72.0%) than those in higher grades (26.2%): see Table 5.

Children had a variety of food items in their lunch boxes, according to what was available at home, but white bread (with polony, cheese, peanut butter or jam) was the staple lunch item. The lunch boxes mostly contained a large starch portion with a high glycaemic index and some protein (often higher in fat and salt) but no fruit and vegetables. As it is not easy to inform parents regarding healthy options for lunch boxes, education will have to be aimed at the children. Healthy eating is part of the curriculum in various grades in the primary school syllabus, but the researchers found in an unpublished study that teachers do not always give attention to this (Gresse, et al. unpublished). The limited variety of foods available at the homes in the research areas must also be taken into

consideration.

CONCLUSIONS AND RECOMMENDATIONS

In a baseline exploratory study of eight schools, the data are of limited value. However, the trends are clear and are confirmed by the annual reports of the Department of Basic Education (DoBE, 2014a) and other research (Richter, et al., 2007; Buhl, 2010; Kruger and De Villiers, 2011; Wiles et al., 2011). The next phase of the project will examine the planning, execution and evaluation of remedial plans.

Schools follow the guidelines for the NSNP as far as possible, but there is a need for more training in hygiene and safety, improvement in the taste of food, more variation in recipes, and better portioning.

Due to the high level of parasitic infection, special attention should be given to hand washing, use of separate cutting boards (especially for cooked and raw foods), washing of utensils before use for a different dish (especially after raw food was prepared with the utensils), washing of raw vegetables and fruit before preparation, and the separation of cooked and raw foods.

Equipment such as hand washbasins, soap and hand towels, and running hot water in the food preparation area, together with utensils such as portioning scoops, are necessary for proper implementation of hygiene and portioning. Advice to schools on fundraising for such items can be beneficial.

From Table 3 it seems that the food provided in the NSNP at these schools does not provide at least a third of the daily nutritional requirements of the children, especially in the energy and iron requirements, and there is much waste as children do not always find the meals tasty. This was confirmed by Nhlapo et al. (2015) in other schools. If the results regarding parasitic infection, wasting and stunting, as presented in Table 5, are considered, better adherence to the NSNP and an increase in the provision of food for the children are essential, in addition to an effective deworming programme (not discussed in this study).

The DoBE recipe book with low cost basic recipes to add taste and variety (DoBE, 2013) can be used in training. The meals prescribed by the DoBE have been analysed for nutritional content and, with correct portion sizes, will

provide the necessary nutrients for an average of 30% of the nutritional needs of children (DoBE, 2009). The small size and variety of fruit and vegetable portions are of special concern. Buyers can be trained to look for products in season and vegetable gardens can be started at schools.

Training and discussions on healthy, affordable, non-perishable items with tuck shop managers and vendors will be an important aspect of the next phase of the study. Various studies (Wiles, et al., 2011; Kroone & Alant, 2012) have discussed the barriers to selling healthy items to children at tuck shops, with some foods not seen as "cool". In addition, the advertising power of packaging often attracts children to high fat, salt and sugar items. Training should focus both on what should be sold and the quality of these items, and on advertising and promotion strategies for items. Clear guidelines are provided for the operation of tuck shops by the DoBE (DoBE, 2014b), including guidelines on the selection of healthy food items. While these guidelines can be used in the training of vendors, they are not controlled by the DoBE. The value and benefits of training will have to be clearly communicated for their acceptance.

The children themselves need training regarding healthy, low cost lunch boxes. The benefits of a healthy diet should be emphasized, and ways to improve the "image" of the lunch box need to be found. Co-operation of other health workers – dietitians and nursing staff of clinics in the community, as well as teachers – should be sought. Effective image-rich pamphlets can be used to communicate with parents, as well as parent-teacher evenings.

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