

HealthKick: a school-based nutrition & physical activity intervention in disadvantaged school settings in the Western Cape, South Africa

Anniza de Villiers

Chronic Diseases of Lifestyle Unit

Medical Research Council of South Africa



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Funders and principal investigators

■ Funders: World Diabetes Foundation & Medical Research Council



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■ Scientific support and advice:

- Prof Vicki Lambert of UCT/MRC Research Unit for Exercise Science and Sports Medicine at the Sports Science Institute
 - Dr Nelia Steyn: Previously Interim Director Chronic Diseases of Lifestyle Unit of the MRC now Chief Specialist Scientist at the Human Research Council
- The funding agreement moved to the HSRC in 2010 but the project remained based at the MRC

Collaborators

- Western Cape Education Department
- Western Cape Department of Health
- University of Cape Town: Dept of Human Biology
 - *Research Unit for Exercise Science and Sports Medicine*
 - *Division of Human Nutrition & Dietetics*
- University of the Western Cape
 - *School of Public Health*
- Heart and Stroke Foundation of SA

Overall Aim and objectives

To develop, implement and assess the effectiveness of a school-based intervention program aimed at promoting the uptake and adoption of healthy lifestyle behaviours (healthy eating and optimal physical activity) for the prevention of risk factors for the development of diabetes in children, their parents and their educators in disadvantaged communities.

Pre-formative work: Background to the funding proposal to the WDF

SA Prevalence of NCDs

Risk factor status of SA children - Healthy Kids report Card

Review of the literature of what work in physical activity and nutrition interventions

2005

**Phase 1:
2007 - 2008**

Funding acquired from the WDF for a Primary School-based diabetes prevention project

**Phase 2:
2009 - 2011**

**Phase 3:
2009 - 2012**

Formative and baseline data

100 School Survey

Parent interviews (26 schools)

Parent and learner interviews (4 schools)

Learner survey (16 schools)

Implementation of the HealthKick Programme (16 schools)

Evaluation of the programme

NCDs: Prevalence in South Africa

NCD accounts for 28% of the total burden of disease in South Africa, mainly caused by heart disease, diabetes, respiratory disease and cancer (WHO 2008).

The high prevalence of HIV/AIDs in South Africa is associated with increase in the number of people on antiretroviral medication. Long-term use of the treatment may cause insulin resistance, dyslipidemia and lipodystrophy increasing risk for NCD (Ntsekhe et al 2009)

Prevalence of intermediate risk factors (Source: SA Demographic Health Survey (SADHS), 2003; DOH 2007.)

	Male	Female
Raised blood pressure (Hypertension)	8.8	18.8
Abnormal blood lipids	2	2.1
Overweight	29	59
Obese	8	23

Non communicable diseases



Cardio-vascular Disease

Diabetes

Cancers

Chronic Respiratory disease

Unhealthy diets
X

Physical inactivity
X

Harmful use of alcohol

Tobacco use

Shared modifiable risk factors

Risk factors status of South African children

**Healthy Active Kids
South Africa
Report Card on the
Physical Activity,
Nutrition and
Tobacco use for
South African
Children and Youth**

2010



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Report card Scores

Physical Activity

- Physical activity, physical education and organised sport at school – **Grade D**
- Screen time – **Grade F**
- Physical fitness levels – **Grade C**

Nutrition

- Overweight/obesity – **Grade C-**
- Stunting: **Grade D-**
- Fruit and vegetable intake – **Grade D**
- Fast food intake: **Grade F**
- School tuck shop, snacking and beverage intake: **Grade D**

“WHO What works...”

Best-practice interventions for promoting healthy diets and increased physical activity

Systematic review by the MRC and UCT/MRC ESSM unit ((Steyn et al., 2009).

Parental
component

Nutrition-
based
curriculum
component

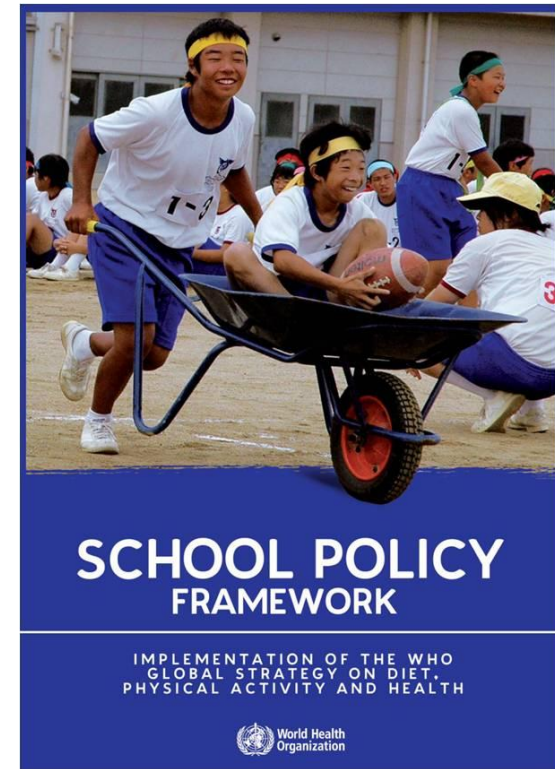
Food
Service
component

Physical
activity
programme

- School interventions were more likely to be successful if they were offered at primary schools and implemented by qualified educators to children in grades 4-7
- All best practice studies were based on a firm theory of behaviour, such as cognitive, social or stages of change theories.
- Multi-component school-based programmes seem to encompass all of the aforementioned elements.

WHO School guidelines

In response to the growing burden of NCDs and in order to reduce the impact of major risk factors such as unhealthy diet and physical inactivity, the World Health Assembly adopted the "Global Strategy on Diet, Physical Activity and Health" (DPAS) in May 2004. As one measure, DPAS calls upon Member States to develop and implement school policies and programmes that promote healthy diets and increase levels of physical activity.



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Phase 1: Formative assessment 100 Schools' Survey

A situational analysis of the policy environment and physical activity and nutrition environment at 100 randomly selected Q1 – Q3 primary schools from 2 Educational districts

- Urban Metropole North
- Rural Breede River/Overberg (*now Winelands and Overberg*)

- An interview with the Principal
- An observation schedule



Findings: 100 Schools' Survey

Tuckshop

**Health
priorities**

**Physical
environment**

**Sweets and crisps
were the main items
sold at all the
schools with tuck
shops**

**50% of principals
identified unhealthy
diets as the top
health priority for
learners**

**50% had signs
sponsored by
Coca-Cola**

**Unhealthy
diets**



Findings: 100 Schools' Survey

Policy Environment

The Education department has a national policy that are supposed to be implemented in all schools

Adherence to policies

85% in school buildings and vehicles
72% outside school buildings
69% at school events not at school

Learner behaviour

86% of principals indicated that very few or no learners smoke
(For parents smoking was rated as the second most important health priority by principals)

Tobacco use



Findings: 100 Schools' Survey



Findings: 100 Schools' Survey

**Learner
Behaviour**

**Role model
Behaviour**

**Physical
environment**

35% of principals identified physical inactivity as the top or 2nd most nb health priority for learners

Physical inactivity was the top health priority for educators identified by principals (n=23)

Only 19% of principals indicated that their sport facilities were adequate

**Physical
inactivity**



Phase 1: Formative assessment Parent survey

(small group parent interviews – 22 schools)

The family and community nutrition and physical activity environments in the Western Cape are highly complex.

Parents reported major safety concerns and lack of resources for physical activity.

Lack of organized markets or other sources of healthy foods in rural and township areas



Phase 1: Formative assessment: Educators survey (2007-2008)

A total of 517 grade 4-6 educators in 82 of the 100 primary schools participating in the study were screened

Data collection

- Anthropometry (height, weight and waist circumference)
- Blood pressure measurements
- Blood glucose measurements
- Blood cholesterol measurements and
- Completion of a questionnaire on nutrition and physical activity levels.



HEALTH RISK SURVEY RESULTS

Educators

Category	Percentage (%) males	Percentage (%) females
Overweight (according to BMI)	37	27
Obese (according to BMI)	35	55
Hypertension	62	50
Waist circumference	38	67

Formative evaluation: Learners (2008)

- Grade 4 learners (n=887)
 - Questionnaire on their nutrition and physical activity knowledge, attitudes and behaviour
 - Dietary intake assessment
 - Anthropometric measures
 - Fitness testing
- Questionnaire developed by research team and informed by questionnaires from local and international studies; translated into 2 languages
- Group administered in classroom setting, with teacher present



Formative findings: Dietary intake



Variety

Generated
Dietary
Diversity
Score – 9
groups

58% of
learners ate
4-5 food
groups, 19%
ate fewer
than 4 and
23% ate
more than 5
food groups

Only 15%
knew that
starchy
foods should
form the
basis of
most meals

Only 29%
knew that
fruit and
vegetables
contain fibre

Phase 1: Analysis of the problem

- **Team members involved in the different aspects embarked on a series of brainstorming sessions to -**
 - **determine the behaviours and environmental factors or conditions related to the problem**
 - **determine the key determinants/correlates of the behavioural and environmental factors**

What we used:

- **Evidence collected during the formative assessment,**
- **Theory**
- **Other research findings**
- **And the collective experiences of the team members**

Intervention Behaviour Objectives

- Eat a variety of foods every day
- Eat more different kinds of fruit and vegetables every day
- Eat less fat and oily food
- Eat less sugar and sweet foods, such as cakes, doughnuts, sweets, etc.
- Eat a regular healthy breakfast daily
- Bring healthy lunchboxes to school as a daily routine
- Increase physical activity of learners during school time
- Increase physical activity of learners after school hours



Structure of intervention

ED- Metropole North:

Intervention
(Co-implementation)

Control
(Self-implementation)

↓
4 schools

↓
4 schools

ED – Winelands / Overberg

Intervention
(Co-implementation)

Control
(Self-implementation)

↓
4 schools

↓
4 schools

Study populations:

2009: Grade 4 learners (n=800) - baseline survey

2010: Grade 5 learners (n=800) – 18 month survey

2011: Grade 6 learners (n=800) – 3 year survey

Parents (n = 346): surveyed 2010

Educators (n = 100): surveyed 2008 and 2011

Phase 2: Developing and implementing the intervention

The 8 co-implementation schools were taken through an **action planning process** that targets healthy nutrition and the physical activity environment at the schools.

A toolkit with resources was supplied to support the actions

The control or self-implementation schools only received a document that contains tips for creating a healthy school environment as well as the printed resource guide. They had to decide on their own whether they want to make use of resources listed in the guide

Background to Action Planning

- Aimed to guide co-implementation schools to assess areas for action related to nutrition and physical activity, identify priorities and set feasible goals
- Drew on –
 - ✓ Action Schools! BC Planning Guide for Schools and Teachers
 - ✓ CDC School Health Index: a self-assessment and planning guide
- Originally designed to cover 6 'zones'



Challenges and experiences with Action Planning

- From 6 Zones to 4 Action Areas
- From open to more focused
- Time

HealthKick Toolkit

- Educators' manual
 - 5 action planning booklets
 - Food based dietary guidelines
 - HealthKick goals
 - CD with resources
- Resource file
- Bin with physical activity equipment
- Curriculum document

HealthKick toolkit

1. The educators' manual

1.1 Action planning booklets



2. Physical activity bin



A guide to healthy eating

This information pamphlet is one of a series giving advice to South Africans over the age of 7 years about healthy food choices for healthy living. Following the advice in these pamphlets will help us to make wise food choices for ourselves and our families' health.

Many South Africans are not as healthy as they could be. Some South Africans, especially children, are underweight, do not grow properly and get sick easily. This is because they eat too little food or do not eat enough variety of foods to give them all the nutrients their bodies need. Others are overweight, which can lead to serious illnesses such as diabetes mellitus, heart disease, hypertension and stroke. This is because these people eat too much food, especially those too high in fat, salt and/or sugar; and also because they do not do enough physical activity.

What should I eat to be healthy?

South African nutrition experts have developed guidelines to provide us and our families with advice on how to eat healthy.

When choosing foods and planning meals for ourselves and our families it is important to apply these guidelines.

Enjoy a variety of foods

It is important to eat different types of food, because one type of food does not contain all the nutrients we need. To eat wisely means to eat different types of food that contain all the nutrients our bodies need.

The best way to ensure that we obtain all of the nutrients we need is to eat three meals a day and to eat a variety of foods at these meals. Young children should have extra food between meals because their stomachs are smaller.

When planning good mixed meals, these are the guidelines we should use:

Make starchy foods the basis of most meals

Choose a starchy food such as maize meal, bread, rice, potatoes or any other starchy foods that are available and affordable. Starchy foods are rich sources of carbohydrates which supply the body with energy. Starchy foods should make up the main part of the meal, and other food should be served with them to provide extra nutrients. We should also ensure that we make fortified maize meal and/or fortified bread part of our family's daily meals.

Add other foods to the starchy food. Examples of these are found in the following three guidelines.

Chicken, fish, meat, milk or eggs could be eaten daily

These foods are good sources of many nutrients. These include protein and minerals to build our muscles, our bones, our teeth and our blood. We can eat small portions of these foods daily.

1.2 Food Based Dietary Guidelines



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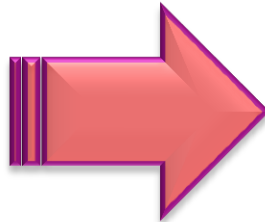
HealthKick toolkit :

Applied Curriculum document - example

Curriculum
expert



HealthKick
behaviour
outcomes



GRADE 4

Learning Outcome 1 – Health Promotion

The learner will be able to make informed decisions regarding personal, community and environmental health.

4.1.1 Investigates menus from various cultures and suggests plans for healthy meals

Knowledge

- Meaning of menu; meal plan.
- Importance of planning and eating a balanced/healthy meal.
- Choices of food for healthy meals using: Food-based dietary guidelines - South African Food Based Dietary Guidelines (these replace the food pyramid, a copy can be found in the Resource box as well as in the Educator's Manual).
- Menus from various cultures: African; Moslem; Hindu; Chinese; Jewish; White - English/Afrikaans.

Skills

- Investigate menus/types of food of various cultures.
- Compare them to the SA Food Based Dietary Guidelines.
- Plan healthy meals for own and/or other cultures within cultural and economic boundaries.

Values

- Respect for own and other cultures
- Own health and the foods that help maintain this

Assessment

The learner is able to:

- Explore menus from various cultures to note health value of the foods.
- Suggest plans for healthy meals in own culture.
- Make a poster emphasising value of one or more healthy foods.



Applied curriculum document: example

Activities

1. Collect menus from restaurants, neighbours, books, etc. to note the of foods different cultures eat.
2. Use the SA Food Based Dietary Guidelines to assess the value of in the different menus.
3. Record meals of previous day and them according to the SA Food Dietary Guidelines - using the *lots of; quite a lot of; a fair amount little of.*
4. Plan a one-day meal plan (including box) for own family or another culture using the SA Food Based Dietary Guidelines and emphasising the HealthKick goals.

Aspects that can be considered in the various suggested activities

- *Note the variety of foods in a meal e.g. different meats, fish, different kinds of vegetables, fruits*
- *Learners' attitudes to: eating fruits & vegetables; fats & oils; junk foods & takeaways; sugar, sweets & sweet foods*
- *Discussion on value of healthy breakfast and lunchbox. Plan menu with the SA Food Based Dietary Guidelines and use HealthKick goals as indicators, including lunchbox as a 'meal'*

types

foods

assess
Based
words:
of; a

lunch

Useful Resources in the Resource Box

- SA Food Based Dietary Guidelines
- Nutrition Articles
- Heart & Stroke Foundation SA - Children's Programme Notes
- The Valley Trust - Introduction to the School Nutrition education Programme

Applied curriculum document: example

Definitions

Foods are combined to make a meal; and the different dishes you would have in a meal, is called a **menu**.

A **meal plan** indicates what will be eaten for all meals in a day or a week.

Cultural groups are bound together by common practices such as the food they eat.

Assessment possibilities

1. Explore menus from different cultures – working in groups to collect menus and write up food values according to SA Food Based Dietary Guidelines for different food items.
2. Plans for healthy meals – set out possibilities according to own family circumstances and culture, taking knowledge of SA Food Based Dietary Guidelines into account - can include recipe/s.
3. The following activity from LO1 could include this poster display: *Plan a one-day meal plan for own family or another culture using the South African Healthy Eating Guidelines*

POSTER – 1 DAY MEAL PLAN

1. Record the previous day's meals using the headings below:
 - Breakfast
 - Snack at first break
 - Snack at second break
 - Lunch/snack after school
 - Late afternoon snack
 - Supper
2. Assess the meal plan according to the SA Food Based Dietary Guidelines
3. Using the same headings as before, replace the less healthy foods eaten with healthier options



Phase 3: Evaluating the intervention



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Learners: Baseline and outcome survey

Fitness Tests

Long jump
Shuttle run
Sit-ups
Sit-and-reach

Food eaten the previous day

1. Breakfast
2. On the way to school
3. First break
4. Second break
5. On the way home
6. Lunch
7. Afternoon snack
8. supper
9. Evening snack

Anthropometry

- Weight
- Height








Knowledge, Attitude and Behaviour questionnaire

Socio-demographic information
Food groups
Fruit and vegetables
Fat
Breakfast
Lunchbox
Physical activity

Learner KAB questionnaire: Nutrition knowledge

All about food

1. Look at the following pictures and fill in the LETTER (A, B, C, D, E, F or G) of the food group you think best fits the answer to the questions below (You can choose a group more than once)

Meat, Chicken, Fish, Eggs	Brown Bread, Rice, Samp, Mealie meal	Vegetables	Fruit	Sugar, Sweets	Fats, oils	Milk, Maas, Yoghurt, Cheese
<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
						

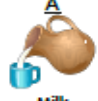













- 1.1. Choose the food group that you should eat the **MOST** of every day
- 1.2. Choose the food group that you should eat the **LEAST** of every day
- 1.3. Choose a food group that contains foods with **LOTS OF FIBRE (roughage)**
- 1.4. Choose the food group that best provides the body with **ENERGY**
- 1.5. Choose the food group that best **BUILDS THE BODY'S MUSCLES**
- 1.6. Choose the food group that best **PROTECTS THE BODY AGAINST ILLNESSES**

<input type="text"/>
<input type="text"/>
<input type="text"/>
<input type="text"/>
<input type="text"/>
<input type="text"/>

Learner KAB questionnaire: Nutrition knowledge & attitudes





KAB instrument items
for nutrition knowledge
and attitudes

2. In this question we are showing you two sets of pictures. Write the letter (A or B in the FIRST box) of the food item you LIKE BEST and the letter (A or B in the SECOND box) of the food item that is the HEALTHIEST (the best for you) [Box 1↓] [Box 2 ↓]

2.1	<p>A</p>  <p>Milk</p>	or	<p>B</p>  <p>Coffee creamer</p>	LIKE BEST	HEALTHIEST
				<input type="checkbox"/>	<input type="checkbox"/>
2.2	<p>A</p>  <p>Plain popcorn</p>	or	<p>B</p>  <p>Packet of chips</p>	LIKE BEST	HEALTHIEST
				<input type="checkbox"/>	<input type="checkbox"/>
2.3	<p>A</p>  <p>Brown bread with a boiled egg</p>	or	<p>B</p>  <p>Brown bread with a fried egg</p>	LIKE BEST	HEALTHIEST
				<input type="checkbox"/>	<input type="checkbox"/>
2.4	<p>A</p>  <p>Cool drink</p>	or	<p>B</p>  <p>Water</p>	LIKE BEST	HEALTHIEST
				<input type="checkbox"/>	<input type="checkbox"/>
2.5	<p>A</p>  <p>Sweets</p>	or	<p>B</p>  <p>Peanuts & raisins</p>	LIKE BEST	HEALTHIEST
				<input type="checkbox"/>	<input type="checkbox"/>
2.6	<p>A</p>  <p>Banana</p>	or	<p>B</p>  <p>Cookies / Biscuits</p>	LIKE BEST	HEALTHIEST
				<input type="checkbox"/>	<input type="checkbox"/>
2.7	<p>A</p>  <p>Bread & Jam</p>	or	<p>B</p>  <p>Bread & Peanut butter</p>	LIKE BEST	HEALTHIEST
				<input type="checkbox"/>	<input type="checkbox"/>

Learner KAB questionnaire: Exercise knowledge, attitudes & social support

32. Look at the pictures provided below, and fill in the LETTER (A, B, C or D) of the activities which BEST answers each question

TV watching, reading and computers	Eating with family and friends	Doing things outside e.g. playing games, gardening	Organised/team sports
<p style="text-align: center;">A</p> 	<p style="text-align: center;">B</p> 	<p style="text-align: center;">C</p> 	<p style="text-align: center;">D</p> 

32.1 Choose the activities that **YOU** like the most

32.2 Choose the activities that your **FRIENDS** like the most

32.3 Choose the activities that your Dad / Oupa /Uncle / Stepdad does **MOST** in his free time

32.4 Choose the activities that your Mom / Ouma, / Auntie / Stepmom does **MOST** in her free time

32.5 Choose the activities that are **BEST** for your health

Outcome evaluation

- Educators – repeat health risk assessment at the end of the study
- Parents – repeat health risk assessment at the end of the study
- Situational analysis – repeated annually (instrument refined)
- Evaluation of strategies – generic evaluation form, 2nd half of 2010 in 2011



Process evaluation

- Co-implementation schools –
 - ✓ Feasibility and acceptability of action planning process
 - ✓ Extent of use of the toolkit (educators manual, physical activity bin and curriculum document)
- Self-implementation schools –
 - ✓ Extent of use of resource guide and 'HealthKick tips for healthy schools'
- Qualitative methods – interviews and focus groups with champions, educators and principals

Publications and dissemination to date

- Abrahams Z., De Villiers, A, Steyn N.P., Fourie J., Dalais L., Hill J., Draper C.E. & Lambert E.V. (2011) What's in the lunchbox?: dietary behaviour of learners from disadvantaged schools in the Western Cape, South Africa. *Public Health Nutrition*
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- Evans W. Douglas; Blitstein Jonathan; Lynch Christina; de Villiers Anniza; Draper Catherine; Steyn, Nelia; Lambert Estelle (2009): Childhood Obesity Prevention in South Africa: Media, Social Influences, and Social Marketing Opportunities. *Social Marketing Quarterly*, Volume 15, Number 1, March 2009 , pp. 22-48(27)
- Steyn NP; Lambert EV, Parker W, Mchiza Z, & De Villiers A (2009) a review of school nutrition interventions globally as an evidence base for the development of the HealthKick Programme in the Western Cape, South Africa. *South African Journal of Clinical Nutrition*, 22(3):145-152

Where to from here:

2012

- Complete qualitative process evaluation
 - *Are schools viable settings for NCD risk factor prevention?*
- Complete the data analysis
- Report, disseminate and publish the findings
- Implement in two new schools

Thank you



Contact details:
Anniza.de.Villiers@mrc.ac.za