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

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Medical Research Council of South Africa
Funders and principal investigators

- **Funders:** World Diabetes Foundation & Medical Research Council

- **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

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)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raised blood pressure (Hypertension)</td>
<td>8.8</td>
<td>18.8</td>
</tr>
<tr>
<td>Abnormal blood lipids</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td>Overweight</td>
<td>29</td>
<td>59</td>
</tr>
<tr>
<td>Obese</td>
<td>8</td>
<td>23</td>
</tr>
</tbody>
</table>
Non communicable diseases

Cardio-vascular Disease
Diabetes
Cancers
Chronic Respiratory disease

Unhealthy diets
Physical inactivity
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
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
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).

<table>
<thead>
<tr>
<th>Parental component</th>
<th>Nutrition-based curriculum component</th>
<th>Food Service component</th>
<th>Physical activity programme</th>
</tr>
</thead>
</table>

- 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.
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

Health Kick
Findings: 100 Schools’ Survey

Health Programmes

- 28 schools had FASFACTS (foetal alcohol syndrome prevention program)

Parent behaviour

- 66% of principals rated substance abuse the top health priority for parents (19% the 2nd most important priority)

Learner behaviour

- No questions were posed relating to the learners

Harmful use of alcohol
Findings: 100 Schools’ Survey

Learner Behaviour

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

Role model Behaviour

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

Physical environment

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.

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
- Completion of a questionnaire on nutrition and physical activity levels.
# HEALTH RISK SURVEY RESULTS

## Educators

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage (%) males</th>
<th>Percentage (%) females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight (according to BMI)</td>
<td>37</td>
<td>27</td>
</tr>
<tr>
<td>Obese (according to BMI)</td>
<td>35</td>
<td>55</td>
</tr>
<tr>
<td>Hypertension</td>
<td>62</td>
<td>50</td>
</tr>
<tr>
<td>Waist circumference</td>
<td>38</td>
<td>67</td>
</tr>
</tbody>
</table>
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
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
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
1. The educators’ manual
   1.1 Action planning booklets
   1.2 Food Based Dietary Guidelines

2. Physical activity bin
**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**

<table>
<thead>
<tr>
<th>Knowledge</th>
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</thead>
<tbody>
<tr>
<td>• Meaning of menu; meal plan.</td>
</tr>
<tr>
<td>• Importance of planning and eating a balanced/healthy meal.</td>
</tr>
<tr>
<td>• 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).</td>
</tr>
<tr>
<td>• Menus from various cultures: African; Moslem; Hindu; Chinese; Jewish; White – English/Afrikaans.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment</th>
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</thead>
<tbody>
<tr>
<td>The learner is able to:</td>
</tr>
<tr>
<td>• Explore menus from various cultures to note health value of the foods.</td>
</tr>
<tr>
<td>• Suggest plans for healthy meals in own culture.</td>
</tr>
<tr>
<td>• Make a poster emphasising value of one or more healthy foods.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
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<tbody>
<tr>
<td>• Investigate menus/types of food of various cultures.</td>
</tr>
<tr>
<td>• Compare them to the SA Food Based Dietary Guidelines.</td>
</tr>
<tr>
<td>• Plan healthy meals for own and/or other cultures within cultural and economic boundaries.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Values</th>
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</thead>
<tbody>
<tr>
<td>• Respect for own and other cultures</td>
</tr>
<tr>
<td>• Own health and the foods that help maintain this</td>
</tr>
</tbody>
</table>
Applied curriculum document: example

**Activities**

1. Collect menus from restaurants, neighbours, books, etc. to note the types of foods different cultures eat.

2. Use the SA Food Based Dietary Guidelines to assess the value of foods 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 lunchbox) 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’

**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
Learners: Baseline and outcome survey

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

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

Anthropometry
- Weight
- Height

Knowledge, Attitude and Behaviour questionnaire
- Socio-demographic information
- Food groups
- Fruit and vegetables
- Fat
- Breakfast
- Lunchbox
- Physical activity

Food groups

Food eaten the previous day

Socio-demographic information
### 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).

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

1. Choose the food group that you should eat the MOST of every day
2. Choose the food group that you should eat the LEAST of every day
3. Choose a food group that contains foods with LOTS OF FIBRE (roughage)
4. Choose the food group that best provides the body with ENERGY
5. Choose the food group that best BUILDS THE BODY’S MUSCLES
6. Choose the food group that best PROTECTS THE BODY AGAINST ILLNESSES
Learner KAB questionnaire: Nutrition knowledge & attitudes

- **KAB instrument items for nutrition knowledge and attitudes**

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Food Item 1</th>
<th>Food Item 2</th>
<th>Like Best</th>
<th>Healthiest</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Milk</td>
<td>Coffee creamer</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2.2</td>
<td>Plan popcorn</td>
<td>Packet of chips</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2.3</td>
<td>Brown bread with a boiled egg</td>
<td>Brown bread with a fried egg</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2.4</td>
<td>Cool drink</td>
<td>Water</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2.5</td>
<td>Sweets</td>
<td>Peanuts &amp; raisins</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2.6</td>
<td>Banana</td>
<td>Cookies / Biscuits</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2.7</td>
<td>Bread &amp; Jam</td>
<td>Bread &amp; Peanut butter</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>
Learner KAB questionnaire:
Exercise knowledge, attitudes & social support

<table>
<thead>
<tr>
<th>TV watching, reading and computers</th>
<th>Eating with family and friends</th>
<th>Doing things outside e.g. playing games, gardening</th>
<th>Organised/team sports</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="A" alt="Image" /></td>
<td><img src="B" alt="Image" /></td>
<td><img src="C" alt="Image" /></td>
<td><img src="D" alt="Image" /></td>
</tr>
</tbody>
</table>

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 into 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


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

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