

FIFA 11 for Health programme: Implementation in five countries in Sub-Saharan Africa

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Abstract

Objective: To assess the effectiveness of the FIFA 11 for Health programme in increasing children's knowledge about communicable and non-communicable diseases in five countries of Sub-Saharan Africa.

Method: A prospective five-cohort study was implemented in schools in Ghana (17), Malawi (12), Namibia (11), Tanzania (18) and Zambia (11). The programme consisted of eleven 90-minute sessions consisting of two 45-minute halves of Play Football (football skills) and Play Fair (health issues). Participants were boys and girls aged 10–14 years: Ghana (906), Malawi (1098), Namibia (439), Tanzania (720), Zambia (651). The main outcome measures recorded were children's attendances at each session, their health knowledge (30-item questionnaire) before and after the interventions and the children's evaluation of the programme itself by means of a six-item questionnaire.

Results: Mean attendance by children during the programme ranged from 88% (Malawi) to 99% (Tanzania) of participants. Increases in the children's overall level of health knowledge were recorded in all countries: range: 11% (Malawi) to 25% (Namibia). Children's overall evaluation-rating of the programme was very positive in all countries, ranging from 93% (Zambia) to 98% (Namibia, Tanzania).

Conclusions: The FIFA 11 for Health programme produced significant increases in children's health knowledge and their awareness of disease prevention using an in-school, football-based health education programme. This success was most likely linked to the very high satisfaction rating given to the programme by the children involved. The success of the interventions also demonstrated the benefit of collaborating with the Ministries of Education in each country.

Keywords

FIFA 11 for Health, communicable diseases, non-communicable diseases, health knowledge, school

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Introduction

World mortality statistics (WHO, 2012) show that there are large regional differences in performance indicators such as life expectancy at birth and under-five year old mortality rate. These differences are particularly apparent in Africa, where life expectancy is 10 to 20 years lower and the under-five mortality rate two to 20 times higher than in other regions of the world. In 2008, nearly nine million children worldwide died before their fifth birthday, with 49% of these deaths occurring in Sub-Saharan Africa (Habimana et al., 2010). This situation is particularly disappointing as global aid allocated to address health inequalities, which increased from US\$7bn in 2000 to US\$17bn in 2006, resulted in significant improvements in under-five year old mortality rates in all areas of the world except Sub-Saharan Africa (WHO, 2008).

A World Health Organization (WHO) Report prepared for the Third High Level Forum on Aid Effectiveness (WHO, 2008) identified the major reasons for this disappointing situation to be: (i) aid was often fragmented with too many small inter-country projects; (ii) inter-country projects often did not focus on the specific health issues found in the individual countries; (iii) the level of aid received per capita varied between countries by more than an order of magnitude; (iv) aid was often disproportionately focused on a single issue to the detriment of other health issues; and v) 'technical cooperation' accounted for over 40% of all financial aid provided. The report illustrated these points using facts related to HIV/AIDS projects, such as: (i) 32% of all health aid in the period 2002 to 2006 was directed towards HIV/AIDS; (ii) 'technical cooperation' accounted for 53% of the aid provided for these projects; and (iii) countries with a low prevalence of HIV/AIDS, but high levels of morbidity/mortality from other health issues, received less aid (WHO, 2008).

Despite large differences in mortality statistics, underlying risk factors for premature death are the same in all regions of the world; namely, cardiovascular, lung, sexually transmitted and diarrhoeal-related diseases, cancers, substance abuse and nutritional deficiencies (WHO, 2012). WHO claimed that if just six risky behaviours related to (i) tobacco, alcohol and substance use, (ii) diet, (iii) hygiene, (iv) exercise, (v) violence and (vi) sexual activity could be changed, there would be a significant reduction in the overall incidence of premature death (WHO, 2013). Literature reviews concluded that health status correlates with health literacy although further research is required to translate this information into effective health improvement interventions (DeWalt and Hink, 2009; Yin et al., 2007).

The inter-relationship between health-knowledge and life-style attitudes and behaviours is an important factor in developing effective health promotion programmes. For example, DeWalt and Hink (2009: S272) have claimed: 'Health behaviour experts assert that all health behaviour theories assume adequate knowledge'. School-based education programmes designed to increase children's health knowledge and to change their attitudes and behaviours towards health issues have been identified as cost-effective and efficient intervention strategies (WHO, 1999). The potential of school-based health promotion strategies is encapsulated in a statement by the WHO Expert Committee on Comprehensive School Education and Promotion (WHO, 1999: 15): 'School health programmes can simultaneously reduce common health problems, increase the efficiency of the education system and advance public health, education and social and economic development in each WHO Member State'. The Committee identified five frequent failings in school-based health programmes. These failings were related to: vision and strategic planning; understanding and acceptance of school health programmes; collaboration and co-ordination among responsible parties; ownership, responsibility and accountability for actions; and provision of resources. Despite these failings, school-based health education programmes involving collaborations with national education bodies have been highlighted as being particularly beneficial as they provide direct

access to a large proportion of the target population (USAID, 2011). These views are supported by Bundy (2013: 13), who stated:

‘achieving education for all requires that all children, especially poor children and girls, are healthy enough both to attend school and to learn while there...in low-income countries, the health sector alone cannot respond effectively to these needs, and the education system itself has an important and often remarkably cost-effective role to play’.

While obesity is recognised as a major cause of cardiovascular, diabetes and other diseases in developed countries, it is becoming an equally important health risk factor in developing countries (WHO, 2003a). A study of physical activity in African countries concluded that ‘Unless action is taken in these settings, the low level of physical activity is likely to contribute to the rise in NCDs in the region’ (Guthold et al., 2011: 59). WHO (2003a) identified regular physical activity and sport as cost-effective ways of preventing non-communicable diseases for males and females of all ages. For children, physical activity provides many physical, mental and social health benefits. Although there remains much debate about how much and in what format the physical activity is best delivered, the general recommendation of 30–60 minutes of moderate physical activity every day remains a widely accepted guideline (WHO, 2003a). The United Nations Office on Sport for Development and Peace (UNOSDP) was established by the United Nations (UN) in 2001 with the belief that sport provided a means to promote education, health and achieve social change: the UN commitment (United Nations, 2013) to the positive contribution of sport in health and education was confirmed in Resolution 67/17 in 2012. The strong link between low levels of physical activity and poor health has been established (Blair and Morris, 2009; Hills et al., 2011); in addition, it has been suggested that there should be a focus on interventions to attain and maintain appropriate weight during childhood to reduce health problems later in life (Baker et al., 2007).

Gostin et al. (2010) claimed that the health of a country was both a national and an international responsibility. However, apart from the obvious responsibilities held by each country’s Ministry of Health and by organisations such as WHO, where do these responsibilities reside? The United Nations Office on Sport for Development and Peace (United Nations, 2013) encourages international and national sports federations to recognise the responsibility they have for improving the health of nations. Practical examples of initiatives of this type include the International Rugby Board’s partnership with the World Food Programme in the Tackle Hunger programme (World Food Programme, no date), the Scottish Premier League’s partnership in the Football Fans in Training (Gray et al., 2013) healthy living programme and the English Premier League’s health evaluation programme (White et al., 2012). Batt and Tanji (2011: 5) also suggested that sports and exercise physicians had a responsibility ‘to be advocates for physical activity and exercise for better health’.

In 2007, the Fédération Internationale de Football Association’s (FIFA) Medical Assessment and Research Centre (F-MARC) recognised the important contribution that football could make to health in the community and began developing a football-based health education programme for the children of Africa, entitled FIFA 11 for Health. The programme was intended to be a medical legacy for Africa following the 2010 FIFA World Cup South Africa™. The programme was designed to address risk factors associated with the most common non-communicable diseases, such as cardiovascular disease, hypertension and diabetes, and communicable diseases, such as HIV, malaria and diarrhoeal diseases, encountered in Sub-Saharan Africa. The rationale behind the development, content, implementation and evaluation of the FIFA 11 for Health programme has been described in detail previously (Dvorak et al., 2012; Fuller et al., 2010, 2011). The programme was developed following input from 14 experts working in areas of health, education and physical

activity: the contributing experts came from 10 countries on three continents but all had intimate knowledge and experience of the specific problems and issues related to developing and delivering health-related programmes in Africa (Fuller et al., 2010).

The FIFA programme was first implemented and evaluated in a township in South Africa in an out-of-school project involving children with a mean age of 13.3 years (Fuller et al., 2010); later it was evaluated in Zimbabwe in an out-of-school project involving children with a mean age of 11.5 years and in Mauritius in an in-school project, in collaboration with the Mauritius Ministries of Health, Education and Sport and the Mauritius Football Association, involving children with a mean age of 13.0 years (Fuller et al., 2011). All three projects resulted in significant increases in the children's health knowledge but it was concluded that the programme would be more likely to achieve nationwide acceptance and sustainability if it were delivered within the school curriculum in collaboration with the country's Ministry of Education and Football Federation (Dvorak et al., 2012). Langton et al. (2010) evaluated the FIFA 11 for Health programme, as a vehicle for bringing health education to a mass audience, using Kotter's (1995) eight principles for achieving change and concluded that the programme could provide a model for other international sports organisations.

The main objective of this study was to assess the effectiveness of the FIFA 11 for Health programme in increasing children's knowledge about communicable and non-communicable diseases in five countries of Sub-Saharan Africa (Ghana, Malawi, Namibia, Tanzania, Zambia) using a tripartite implementation strategy involving FIFA, national Football Federations and Ministries of Education, Health and Sport. In addition, the ways in which the FIFA 11 for Health programme addresses the concerns expressed by the WHO in the Report prepared for the Third High Level Forum on Aid Effectiveness (WHO, 2008) and on the need to increase levels of physical activity (WHO, 2003a) are discussed.

Method

The FIFA 11 for Health programme (Table 1) consists of eleven, interactive, 90-minute sessions: each session provides a 45-minute period of training in a football skill (Play Football) and a 45-minute period of health education (Play Fair). Play Fair sessions 1 to 10 address health topics while session 11 provides a summary of the key health messages presented in the previous 10 sessions. The structure and implementation strategy of the 11 sessions included inter-active educational exercises, role-playing, group discussions and a close relationship with the children's social environment (Fuller et al., 2010), as all activities were related to the children's normal day-to-day living conditions. The mode of delivery and the pre- and post-intervention questionnaires used to assess changes in children's health knowledge, which have been described previously (Fuller et al., 2010, 2011), were the same in all countries. Interventions were conducted in each country's main commercial and financial city: Ghana (Accra), Malawi (Blantyre), Namibia (Windhoek), Tanzania (Dar es Salaam), Zambia (Lusaka). The schools taking part in the project were selected by the Ministries of Education to be representative of the country's schools and the range of educational standards in the intervention cities; all children in each nominated school class, irrespective of the number, were included in the intervention, in order to avoid any possibility of influencing the results through the imposition of selection criteria.

Preliminary face-to-face meetings were held in each country between representatives of F-MARC, the Football Federation and the country's Ministries of Education, Health and Sport. At this time, the aims, objectives and content of the programme were presented and discussed: the Ministry of Education in each country subsequently approved delivery of the FIFA 11 for Health programme as part of the school curriculum in each of the intervention schools. A National Project

Table 1. FIFA 11 for Health programme content and health issues addressed by each session in the programme.

Session	Football skill	Health topic	Health issues addressed
1	Warming up	Play football (exercise)	Cardiovascular disease, stroke, diabetes, overweight, obesity
2	Passing	Respect girls and women	Gender violence, rape, mental abuse, HIV, STIs
3	Heading	Protect yourself from HIV and STDs	HIV, syphilis, chlamydia, gonorrhoea
4	Dribbling	Avoid drugs, alcohol and tobacco	Lung disease, kidney disease, gender violence, mental health
5	Shielding	Use a treated bed net	Malaria, dengue
6	Defending	Wash your hands	Diarrhoea, cholera, dysentery, typhoid
7	Trapping	Drink clean water	Diarrhoea, cholera, dysentery, typhoid, helminths
8	Building fitness	Eat a balanced diet	Under-weight, over-weight, obesity, diabetes, cardiovascular disease
9	Shooting	Get vaccinated	Influenza, polio, smallpox, meningitis, tuberculosis, tetanus
10	Goalkeeping	Take your prescribed medication	Cardiovascular disease, hypertension, diabetes, HIV
11	Teamwork	Fair play	Review of all health issues discussed in Sessions 1 to 10

STI: sexually transmitted infection; STD; sexually transmitted disease

Leader was recruited from within each country to work with the F-MARC Project Leader. National Project Leaders were senior members of the Football Federation (Ghana and Zambia: team physician; Malawi and Tanzania: team coach; Namibia: youth development officer) who had the knowledge, experience and status to represent F-MARC and the Football Federation in discussions with their country's Ministry of Education and the principals at each school. Detailed implementation timetables were developed for each country, taking into account the country's school year and holiday periods, curricula, examination periods and special events and the availability of F-MARC master instructors to deliver the teacher training courses. The overall timetable for each project, which typically extended over a period of 6–8 months, provided sufficient time for planning, preparation and implementation of the 11-week programme (Ghana: October 2012–February 2013; Malawi: August–December 2011; Namibia: May–September 2011; Tanzania: April–December 2012; Zambia: June–October 2012). Based on class sizes of 30 to 90 children and with two teachers or one teacher and one football coach per class delivering the course, every school received the following resources (dependent on class size): equipment bag (one); footballs (10–15); football carrying net (1–2); football pump/needle (one); bibs (25–50); cones (30); stopwatches (two); activity cards (two sets); course manuals (two); whistles (two); malaria bed nets (4–5).

In each country, two F-MARC master instructors (one male, one female) presented a five-day training course prior to the start of the intervention. This course was attended by one or two physical education teachers (male and female) from each of the participating schools and between two and 10 coaches from the Football Federation. The teachers received instruction on the philosophy, structure, content and delivery mode of the FIFA 11 for Health programme and on the implementation of the data collection instruments. At each school, teachers recorded the overall number of

children taking part in the programme and the numbers attending each session and the children completed the questionnaires, which included: demographic data (five questions related to gender, age, preferred sport, school attended, home accommodation) and a 30-item pre- and post-intervention health knowledge questionnaire using positively and negatively worded statements that anticipated a mixture of positive and negative responses using a three-point scale of true, false, don't know. There were three questions related to each of the health topics covered in sessions 1 to 10, which were used to calculate a mean knowledge score for each health topic. Where appropriate, responses to questions were reversed for data analysis purposes so that the three responses could be combined to produce a unidirectional overall knowledge assessment. As part of the post-intervention evaluation, the children completed a six-item questionnaire using five-point Likert scales (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree) to provide a programme evaluation: the questions addressed issues such as the children's learning experience, change in attitudes towards health, course satisfaction and willingness to recommend the programme to their friends. All questionnaires were administered in English, which was the standard language used in schools in each country. The National Project Leaders provided the F-MARC project leader with on-going feedback during the implementations.

Life expectancy and under-five mortality rates are key indicators of national health performance reported by WHO and therefore these parameters were assessed in the five countries to see whether they correlated with national GDP per capita and health expenditure per capita values using linear regression analyses (StatPlus:mac®); R^2 and p values are reported. The percentage change in health session knowledge was calculated as the mean value of the (post-intervention value – pre-intervention value) for the three questions related to the health topic. Differences in the pre- and post-intervention health knowledge values (proportion of correct responses) for each question were compared in each country using Z -tests for proportions; p values for significant differences are reported at levels of $p \leq 0.05$, $p \leq 0.01$, $p \leq 0.005$, $p \leq 0.001$.

Results

Published values for population (World Bank, no date^a), life expectancy at birth (WHO, 2012) (years), under-five mortality rate (WHO, 2012) (deaths per 1000 live births), GDP per capita (World Bank, no date^a) (US\$), health expenditure per capita (World Bank, no date^b) (US\$) and the 10 highest ranked, health-related causes of premature death in each country are presented in Table 2. Life expectancy and under-five mortality rate did not correlate significantly with GDP per capita (life expectancy: $R^2=0.197$, $p=0.453$; under-five mortality rate: $R^2=0.594$, $p=0.127$) or health expenditure per capita (life expectancy: $R^2=0.147$, $p=0.523$; under-five mortality rate: $R^2=0.560$, $p=0.146$) in the five countries. A summary of published data about self-reported, health-related behaviours of school children aged 13–15 years in each of the five countries is presented in Table 3.

The sample population taking part and the proportions of children attending each of the FIFA 11 for Health sessions and responding to the pre- and post-intervention questionnaires in each country are presented in Tables 4 and 5, respectively. The proportions of children responding correctly to each question in the pre- and post-intervention health-knowledge questionnaires are presented in Table 6. The percentage changes (absolute) in mean knowledge value for each health topic and each country are shown in Figure 1. The children's evaluation of the FIFA 11 for Health programme at the end of the intervention period provided positive responses (agree and strongly agree) ranging from 88.3 to 98.4% across the six questions.

Pre-intervention questionnaire responses in the five countries showed that the mean level of children's health knowledge fell into two distinct groups, namely, a higher-knowledge group

Table 2. Leading health-related causes of death, population, life expectancy, under-five mortality rate and GDP per capita.

Rank	Cause of death ^a	Ghana	Malawi	Namibia	Tanzania	Zambia
	World					
1	Coronary heart disease	Diarrhoeal diseases	HIV/AIDS	HIV/AIDS	HIV/AIDS	HIV/AIDS
2	Stroke	HIV/AIDS	Flu/pneumonia	Stroke	Flu/pneumonia	Flu/pneumonia
3	Flu/pneumonia	Stroke	Diarrhoeal diseases	Coronary heart disease	Malaria	Diarrhoeal diseases
4	Lung disease	Flu/pneumonia	Malaria	Flu/pneumonia	Diarrhoeal diseases	Malaria
5	Diarrhoeal diseases	Coronary heart disease	Stroke	Road traffic accidents	Stroke	Stroke
6	HIV/AIDS	Tuberculosis	Coronary heart disease	Diabetes	Coronary heart disease	Coronary heart disease
7	Lung cancers	Malaria	Low birth weight	Malaria	Low birth weight	Low birth weight
8	Tuberculosis	Low birth weight	Violence	Violence	Birth trauma	Birth trauma
9	Diabetes	Birth trauma	Meningitis	Tuberculosis	Violence	Violence
10	Hypertension	Road traffic accidents	Birth trauma	Diarrhoeal diseases	Meningitis	Road traffic accidents
	Population^b (millions)	24.97	15.38	2.32	46.2	13.47
	Life expectancy at birth^c (years)	60	47	57	55	48
	Under-5 mortality rate^c (deaths/1000 live births)	74	92	40	76	111
	GDP/capita^b (US\$/person)	1570	365	5293	532	1425
	Health expenditure/capita^d (US\$/person)	75	31	283	37	87

^aLeDuc Media, no date.^bWorld Bank, no date^a.^cWHO, 2012.^dWorld Bank, no date².

Table 3. Self-reported health-related behaviours, protective factors and violence of school children aged 13 to 15 years.

Health-related behaviour	Proportion of boys/girls, %				
	Ghana ^a	Malawi ^b	Namibia ^c	Tanzania ^d	Zambia ^e
Consumed alcohol at least once during the preceding 30 days	26.4/29.3	5.3/2.5	35.0/30.9	6.7/4.6	38.7/45.1
Smoked cigarettes at least once during the preceding 30 days	N/A	5.9/3.8	18.2/14.2	5.3/2.0	N/A
Used drugs at any time	24.6/24.8	N/A	31.3/26.6	6.8/4.8	36.7/39.3
Never or rarely washed hands before eating	7.8/9.4	N/A	7.1/6.2	5.8/6.1	15.2/10.1
Never or rarely washed hands after using the toilet	12.1/11.5	6.3/4.2	N/A	11.9/10.1	16.8/14.4
Physically active	13.8/12.6	N/A	10.2/9.7	30.6/20.0	9.7/10.2
Had sexual intercourse	25.0/24.9	28.1/16.5	37.9/18.8	14.9/3.8	45.2/29.1
Had been physically attacked/been in a fight in previous 12 months	57.5/61.2	23.7/20.8	57.7/44.5	58.5/52.0	50.3/55.9
Felt their peers were never/rarely kind/helpful	27.8/26.7	N/A	46.3/39.8	60.9/58.2	N/A
Missed at least one day of school per month	44.5/45.6	N/A	41.6/38.7	34.2/31.9	59.3/58.1

^aWHO, 2007b.^bWHO, 2009.^cWHO, 2004a.^dWHO, 2006.^eWHO, 2004b.**Table 4.** Number of schools and children taking part, mean number of children (standard deviation) per school, age and gender of children.

Parameter (values at start of intervention)	Country				
	Ghana	Malawi	Namibia	Tanzania	Zambia
No. of schools	17	12	11	18	11
No. of children	906	1098	439	720	651
No. of children/school, mean (SD)	54.5 (17.9)	91.5 (65.4)	39.9 (0.7)	40 (0.0)	59.2 (22.7)
Age of children, mean years (SD)	13.5 (1.5)	13.1 (1.3)	11.4 (1.0)	11.3 (0.7)	11.7 (1.2)
Gender, % boys/% girls	48.2/51.8	46.3/53.7	51.7/48.3	50.7/49.3	51.3/48.7

consisting of Malawi (74.7%) and Tanzania (71.3%) and a lower-knowledge group consisting of Ghana (61.3%), Namibia (57.9%) and Zambia (57.5%). The health topics showing the biggest differences in knowledge between the high- and low-knowledge groups related to HIV/AIDS, malaria, hygiene and vaccination. Post-intervention, the level of health knowledge increased significantly ($p \leq 0.001$) in all countries for a large number of the 30 health-related questions (Ghana: 29; Malawi: 20; Namibia: 29; Tanzania: 24; Zambia: 25). However, the bigger increases observed in

Table 5. Mean percentage of children attending each activity in each country.

Country	Activity, attendance, %											Mean attendance at all sessions, %		
	Pre-Q	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10		S-11	Post-Q
Ghana	98.2	96.3	94.5	94.0	91.2	88.9	93.4	94.0	91.1	94.9	93.5	94.5	94.7	93.3
Malawi	89.1	94.5	91.9	92.7	91.2	84.9	87.8	86.3	83.7	82.3	84.6	92.2	73.7	88.4
Namibia	96.6	97.5	97.5	96.6	96.4	95.7	96.8	96.1	96.4	95.9	96.8	96.6	96.6	96.6
Tanzania	100.0	99.4	98.3	97.9	96.5	98.5	99.2	99.2	99.3	99.3	99.6	99.7	99.6	98.8
Zambia	94.3	91.1	91.8	91.9	86.2	89.7	89.1	88.0	85.4	90.0	89.4	96.5	99.1	89.9

Q: questionnaire; S: session

Table 6. Pre- and post-intervention health knowledge, as a function of country.

Session number and health statement	Country and stage of intervention (% correct responses)									
	Ghana		Malawi		Namibia		Tanzania		Zambia	
	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
S-1 Football injuries can be prevented by warming up correctly Regular exercise helps to prevent being overweight Minimum daily amount of exercise required to stay healthy	64.9	91.0*	64.7	80.9*	50.0	86.7*	69.3	91.4*	71.6	78.3**
	75.8	92.4*	80.7	91.2*	63.6	84.9*	84.5	93.1*	62.5	79.9*
	53.2	93.1*	81.4	87.6*	49.6	93.6*	47.8	76.0*	58.9	69.3*
S-2 Important for boys to listen to girls Boys should help to protect girls from harm	52.8	90.8*	64.6	78.8*	63.6	91.5*	73.3	93.6*	69.0	84.5*
	79.6	95.4*	71.7	86.1*	83.0	95.5*	78.3	90.4*	79.8	86.1***
S-3 Football is just for boys You can get HIV by touching someone with HIV/AIDS Not having sex is an effective way to avoid getting HIV/AIDS You can tell whether people have HIV by the way they look	85.1	96.3*	96.6	96.7	82.6	96.2*	95.3	97.9	67.0	83.6*
	83.6	96.4*	98.2	99.0	79.7	97.9*	95.3	92.4	61.4	80.0*
	65.9	80.8*	83.5	88.6*	53.6	76.2*	76.6	85.8*	62.7	71.5*
S-4 It is possible to become addicted by starting to smoke cigarettes People who smoke cigarettes have more health problems It is my choice whether or not I take drugs	39.5	81.3*	87.2	94.2*	68.9	91.7*	76.4	88.7*	54.7	71.7*
	67.9	91.5*	72.2	79.2*	63.3	85.5*	71.8	84.9*	70.6	73.3
	77.6	88.3*	88.3	93.0*	59.0	84.6*	86.9	94.0*	71.0	79.2*
S-5 Rats spread malaria Using a bed net at night helps to prevent getting malaria There is no cure for malaria	39.8	36.3	41.6	27.8	46.2	51.2	32.5	35.8	48.3	29.4
	79.5	94.6*	97.2	95.3	76.4	88.7*	95.1	97.5***	67.6	80.1*
	76.4	91.9*	97.2	98.6	70.3	88.2*	88.9	94.8*	75.2	81.7***
S-6 After washing, it is OK to dry my hands on my shirt You can see germs on your hands How long should I wash my hands to remove germs?	73.8	89.1*	95.9	94.4	58.5	77.1*	89.0	94.8*	60.0	74.9*
	74.5	94.0*	77.9	92.1*	63.7	94.0*	84.2	93.1*	53.9	77.2*
	71.4	93.3*	92.8	96.1***	59.1	91.7*	87.4	96.4*	67.9	84.1*
S-7 You can tell if water is safe to drink by its appearance	32.3	86.5*	36.5	73.2*	31.9	88.8*	24.4	81.3*	23.7	80.7*
	28.0	74.5*	73.6	88.2*	41.5	86.0*	67.0	92.2*	46.9	70.7*

Table 6. (Continued)

Session number and health statement	Country and stage of intervention (% correct responses)									
	Ghana		Malawi		Namibia		Tanzania		Zambia	
	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
Storing river water for three days makes it safe to drink	59.9	85.4*	92.5	93.6	59.6	87.5*	77.8	91.3*	66.6	77.6*
Length of time water should be boiled to make it safe to drink	18.5	86.7*	30.9	73.8*	29.4	87.1*	21.6	80.8*	10.5	67.9*
S-8 A balanced diet contains food of many colours	52.9	93.9*	46.3	81.8*	42.4	88.1*	30.0	78.9*	58.8	80.9*
Eating a lot of fruit makes you obese	63.7	82.4*	63.4	78.8*	54.4	75.1*	67.5	82.6*	45.1	66.7*
It is healthy to eat lots of fried food	75.3	91.0*	64.5	80.0*	68.5	91.0*	70.9	84.0*	58.0	79.2*
S-9 Vaccinations are dangerous	41.2	80.6*	76.9	89.2*	44.1	80.8*	83.4	89.5*	42.5	70.3*
All vaccinations last your lifetime	38.3	69.6*	69.6	68.8	44.3	69.3*	51.4	55.5	45.3	58.5*
All vaccinations are received as injections	32.4	65.0*	33.9	68.0*	25.9	71.5*	61.6	82.3*	38.8	64.0*
S-10 I can stop taking medication as soon as I feel better	74.8	93.6*	84.7	91.5*	67.8	92.2*	86.2	96.6*	54.6	83.1*
People with diabetes can die if untreated	79.8	92.7*	81.5	89.0*	66.7	76.9*	82.5	86.7***	66.1	77.6*
The right medication can help people with HIV to live longer	81.4	92.9*	94.2	93.5	69.5	89.6*	80.6	89.7*	64.6	78.3*
Mean value	61.3	86.4	74.7	85.0	57.9	85.3	71.3	86.4	57.5	74.7

Statistical tests refer to comparisons between the post- and pre-intervention values for the same country: * $p \leq 0.001$; ** $p \leq 0.01$; *** $p \leq 0.005$; **** $p \leq 0.05$

Namibia (27.4%) and Ghana (25.1%) were such that the mean post-intervention levels of health knowledge in Namibia (85.3%) and Ghana (86.4%) were very similar to those recorded in Malawi (85.0%) and Tanzania (86.4%).

Discussion

The differences in knowledge between the higher- and lower-knowledge groups cannot be explained by simple differences in social conditions within the five sample populations, as the schools included in all countries were located in similar social environments within major commercial cities. The differences also cannot be explained by an age-related effect because the mean age of the children in Tanzania (higher-knowledge group) was 11.3 years and the mean age of the children in Ghana (lower-knowledge group) was 13.3 years. The causes for these baseline

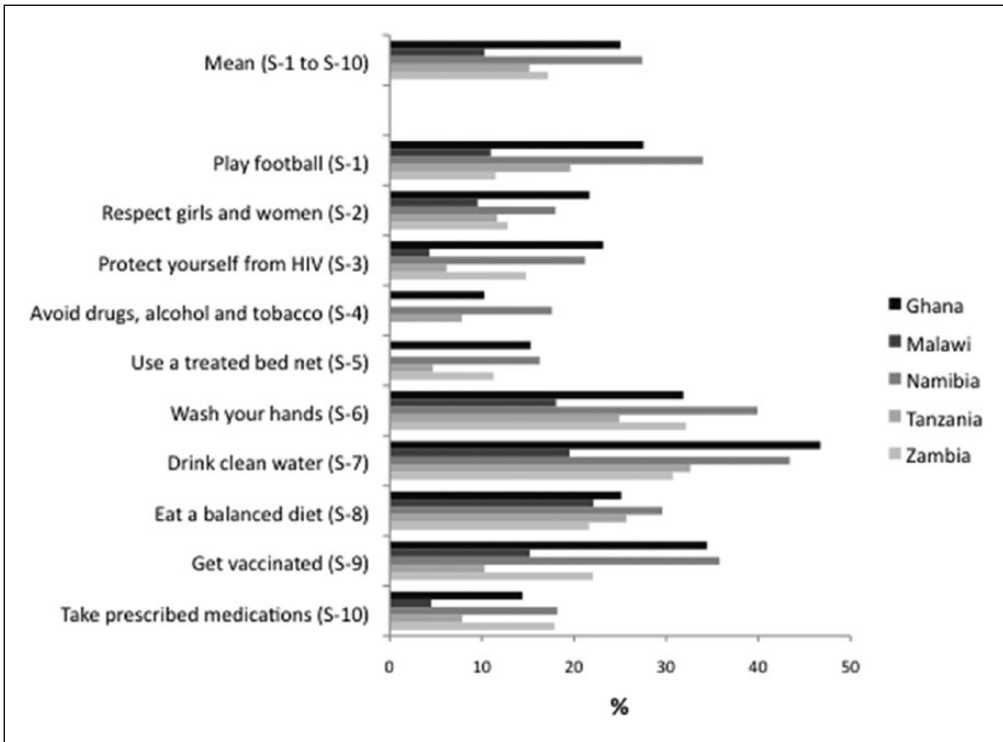


Figure 1. Change in health topic knowledge (% absolute change from baseline value).

differences are therefore most likely linked to more complex social, cultural and environmental factors that would require a separate investigation to define; however, the factors affecting the children's baseline health knowledge did not appear to limit the post-intervention health knowledge values. The differences observed in the baseline health knowledge of the 11–13 year old children in this study may help to explain the differences in the self-reported health-related behaviours of children aged 13–15 years reported by WHO in the same countries (Table 3). For example, children in Malawi and Tanzania (higher-knowledge group) were less likely to have consumed alcohol, smoked tobacco or used drugs, and were more likely to wash their hands before eating and after using the toilet than children in Ghana, Namibia and Zambia (lower-knowledge group). Children in Malawi and Tanzania were also less likely to have had sexual intercourse than children in Namibia and Zambia.

While mean increases in knowledge were observed for all health topics in Zambia, it was not established why the post-intervention values achieved for the 10 health topics were consistently lower than those in the other four countries. One aspect of the education programme (personal empowerment to avoid taking drugs) failed to show an increase in children's knowledge in any of the five countries. At this time, it is not known whether this was caused by deficiencies in the teaching of this aspect of the programme or by a misunderstanding of the question posed to the children; this issue will be investigated in future implementations.

In summary, the FIFA 11 for Health programme resulted in significantly higher post-intervention levels of health knowledge for all health topics in all five countries, which is a similar result to that observed for three countries (South Africa, Mauritius, Zimbabwe) included in two previous studies

(Fuller et al., 2010, 2011). The ability for the programme to achieve the observed increases in health knowledge may be linked to the high attendance levels achieved during the interventions (Table 5) and the high positive ratings given to the programme by the children.

Considering the results obtained in the five countries, it is valuable to assess the strengths and weaknesses of the programme and intervention strategy against the recommendations made by WHO for school-based health education programmes (WHO, 1999).

Programme content

WHO has criticised health-education programmes focusing on a single health issue without taking into account all the major diseases prevailing in the recipient countries (WHO, 2008). This issue was addressed in two ways during the design of the FIFA 11 for Health programme. First, the most common communicable and non-communicable diseases encountered in Sub-Saharan Africa were included in the programme and, second, the six key risky behaviours identified by WHO (2013) as affecting health were also covered in the programme. The programme therefore provided children with a holistic understanding of the health issues that they were most likely to encounter and provided information on safe behaviours.

Programme design

The key design principle under-pinning the programme incorporated the views of Blair (2009) that physical inactivity poses the biggest health problem of the 21st century and of the WHO (WHO, 2003a, 2007a) that physical activity provides an effective approach for the prevention of non-communicable diseases. Each 90-minute session of the FIFA 11 for Health programme allocated a 35-minute period in the Play Football section to a football activity and a 20-minute period in the Play Fair section to a football-based activity related to the health issue. As recommended by WHO (2003b), both the Play Football and the Play Fair components of the programme included a variety of teaching approaches, such as observation, practice, role-playing and discussions. Another important aspect of the programme design was the strong link between the Play Football and Play Fair components of each session, which embedded a strong learning feature within the programme (WHO, 2003b) and also linked the programme strongly to a range of world footballers who act as role models and ambassadors for the health messages (Fédération Internationale de Football Association, no date).

Programme implementation

WHO recognises that school-based programmes enable countries to provide health and education benefits to whole communities within a single setting, as schools present a route within which children and their families and associates can all be accessed (WHO, 1999). USAID also claimed that schools provide an efficient and cost-effective implementation strategy (USAID, 2011), as they utilise and build on a country's existing educational infrastructure. The most important aspect of the FIFA 11 for Health implementation strategy was, however, the formal strategic link between F-MARC and the Ministry of Education in each country, which created an effective partnership at an early stage and importantly established a commitment to a follow-up nationwide implementation of the programme involving a much larger number of schools (Dvorak et al., 2012). The WHO (1999: 15) claimed that many school programmes lacked vision and strategic planning, which are required 'to develop and implement solutions and to start a difficult process and see it through to the end'. The current project, however, had a clear short-term plan (Dvorak et al., 2012), which

resulted in the FIFA 11 for Health programme being implemented in eight countries in Sub-Saharan Africa over the period 2009 to 2013. The programme is also currently being implemented in three countries in Latin America, two countries in Asia and two countries in Oceania: in all cases the programmes are implemented in collaboration with the countries' Ministries of Health and Ministries of Education. However, more importantly, the project has a long-term vision as a health initiative because in 2013, Member Associations of FIFA voted unanimously at the annual FIFA Congress (Fédération Internationale de Football Association, 2013) to further expand the FIFA 11 for Health project in order to cover more countries worldwide in the period 2014 to 2019.

Resource allocation

WHO has been critical of the different levels of financial support provided to countries for health initiatives (WHO, 2008); the F-MARC approach provided an equivalent level of support to all countries in terms of expertise, training, resources and finance. In financial terms, the major part of the support provided covered the provision of equipment and other materials required to deliver the programme. However, involving local personnel in the planning and implementation of the programme ensured that expertise was developed and capacity was built within the country for future implementations. A major benefit of adopting this approach was the creation of a pool of trained teachers who acted as course instructors for follow-up, larger, nationwide implementations (Dvorak et al., 2012) currently underway in each of the five countries (Ghana: 2013–2014; Malawi: 2012–2013, 2013–2014; Namibia: 2012–2013, 2013–2014; Tanzania: 2013–2014; Zambia: 2013–2014).

A healthy population is a valuable resource for any country but how much of a country's national budget should be spent on health is a difficult question to answer. Savedoff (2003: 3) has argued that the real question to address here is:

'How much should my country spend on health, given our current epidemiological profile relative to our desired level of health status, considering the effectiveness of health inputs that would be purchased at existing prices, and taking account of the relative value and cost of other demands on social resources?'

To answer this complex question, Savedoff (2003) identified five sub-questions that needed to be addressed in each country, namely, what is the disease epidemiology, what are the health aspirations, how effective are current health services, what is the price of the health service provided and what are the cost–benefits associated with the money allocated to health? The causes of early mortality and poor health in the five countries studied were similar but the magnitude of the health problems varied significantly. For example, six health conditions (communicable diseases: HIV, flu/pneumonia, diarrhoeal diseases, malaria; non-communicable diseases: stroke, coronary disease) appeared among the top-10 causes of early mortality in all five countries and one health condition (low birth-weight) appeared in the top-10 lists of four of the five countries. However, life expectancy at birth (range: 47–60 years) and under-five mortality rates (range: 40–111 deaths/1000 live births) varied considerably across the countries and the values of these measures correlated poorly with national GDP per capita and health expenditure per capita in the five countries. This would indicate therefore that health aspirations, effectiveness of service provision or the cost of health services provided varied across the five countries or that the money available for government spending in each country is allocated using different criteria. These are important issues of national health provision that must be addressed alongside the issue of health education.

Conclusions

This study demonstrated that the FIFA 11 for Health programme offers an effective way of engaging with children in order to increase levels of physical activity and to enhance health knowledge, improve understanding of health risk factors and provide guidance on prevention strategies for the major diseases in Sub-Saharan Africa. When delivered through national education systems, the programme has the potential to reach a very high proportion of the target population. The results obtained are most likely linked to the very high satisfaction rating given to the programme by the children involved, which was reflected in the high attendance levels achieved during each session. The results obtained also demonstrate the contribution that international sports governing bodies can make in health education and helping to reduce the prevalence of communicable and non-communicable diseases in Sub-Saharan Africa.

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