

Primary School Nutrition and Tuck Shops in Hhoho, Swaziland

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Please note that this study was published before the SY2014-15 implementation of the Smart Snacks Nutrition Standards for Competitive Food in Schools, as required by the Healthy, Hunger-Free Kids Acts of 2010. As such, certain research relating to food in schools may not be relevant today.

ABSTRACT

Background

Obesity and associated chronic diseases are increasing in frequency in African populations that also have a high burden of disease from infectious diseases such as HIV/AIDS and tuberculosis. Obesity and diabetes mellitus are common in Swaziland, Southern Africa, where >10% of children under the age of five are already obese.

Methods

To examine the school food environment in primary schools in Hhoho, Swaziland, the menus at two tuck shops (in-school convenience shops) were evaluated and macronutrients were obtained for various items.

Results

Both tuck shops sold a high number of sugar-sweetened beverages and other nutrient-poor, high caloric foods. Correspondingly, neither tuck shop sold low fat or skim milk or fruits or vegetables. The tuck shops were open all day and available to students as young as those in the preschool grades.

Conclusion

To curb obesity and associated conditions in Swaziland, school officials and health policy advocates need to focus on the school nutrition environment

Keywords: Africa; school nutrition; school health; sugar sweetened beverages; soda

BACKGROUND

Obesity and Undernutrition

In the United States and other industrialized countries, there is much focus on childhood overweight and obesity because of the high prevalence of these problems in all population groups (Ogden, Carroll, Bit, & Flegal, 2012; National Center for Health Statistics, 2012). Meanwhile, there is less attention paid to these issues in the developing world, particularly in sub-Saharan Africa, where there is a much greater focus on problems of undernutrition and malnutrition which are common features of HIV/AIDS and tuberculosis infections and other infectious disease processes. However, in 2011, an estimated 43 million children younger than 5 years (7%) were overweight worldwide, which was a 54% increase from an estimated 28 million in 1990. Most overweight children under 5 years of age live in low and middle income countries. In sub-Saharan Africa the prevalence of overweight children increased from 4% in 1990 to 7% in 2011, and it is anticipated it will reach 11% in 2025 (Black et al., 2013). While prevalence is increasing in all income groups in developing countries, the overall prevalence is higher in the richest quartiles than the poorest and in urban versus rural areas based on WHO data (Black et al., 2013). Obesity in children is associated with future risk for obesity in adulthood and co-morbidities including diabetes mellitus, hypertension and dyslipidemia and other alterations in lipid metabolism (Black et al., 2013).

Southern Africa

Southern Africa includes the countries of South Africa, Lesotho, Swaziland, Mozambique, Namibia, and Zimbabwe. Swaziland, a small country of approximately 1 million people in Southern Africa, has both undernutrition and overnutrition in children. Approximately 29% of children under five have problems of stunted growth, an indicative measure of chronic malnutrition, and 10.3% are considered severely stunted (have a height-for-age ≤ 3 SD below the mean) (Central Statistical Office [CSO] Swaziland & Macro International, 2008). Meanwhile, for the same age group, 10.8% are obese and 13.9% in the highest income wealth quintile. The prevalence of obesity is exceedingly high in adults, particularly women, with 62.9% of Swazi women overweight and 32.4% obese (CSO Swaziland & Macro International, 2008). Physical inactivity is part of the problem with 66.5% of men and women in Swaziland being physically inactive (CSO Swaziland & Macro International, 2008). Additionally there is a high per capita consumption of soft drinks in Southern Africa, with per capita consumption of Coca-Cola products at 249 servings of 8 fluid ounces per year in 2009 for all South Africans (higher than in the United Kingdom or Canada for the same year) (Coca-Cola Company, 2010).

Tuck Shops in Southern Africa

Tuck shops, or small food vendors typically located within school grounds, are a common feature of many schools across Southern Africa, such as those in Swaziland, akin to the beanery, kiosk, or convenience store in the North American school. Most tuck shops are operated by parents with a few run by unrelated third parties, and there are limited or no nutritional standards set for the types of foods and beverages sold (Wiles, Green, & Feldman, 2011). A study of tuck shops in Cape Town, South Africa found that nearly 70% of children purchased food at school, with the majority of purchases being low quality, energy-dense foods and drinks with low nutrient values including candies, chocolates and soft drinks (usually high content of sugar), French fries, and potato chips (Temple, Steyn, Myburgh, & Nel, 2006). Further, among students who purchased food at school, 70% purchased no healthy items and 73% purchased two or more unhealthy items (Temple et al., 2006). Another study of 11 tuck shops in Pietermaritzburg found that only 18% of the tuck shops sold milk products including yogurt and low fat milk (Wiles et al., 2011). This same study found that the most commonly sold items in the tuck shop included high fat and salt corn crisps and savory pies and the most popular beverage was Coca-Cola. Another study, also from Pietermaritzburg, South Africa, with 4th grade pupils, found that those students who purchased items from the tuck shops had significantly higher body mass index (BMI) compared with those who did not (Wiles et al., 2013). Similarly, a study from the Western Cape in South Africa, found that those students who took a lunchbox to school had a lower BMI in contrast with those who bought from the school tuck shop (Abrahams et al., 2011).

Recently, programs aimed at improving child nutrition have begun promoting healthy eating practices in tuck shops across Southern Africa, although it is not clear the extent to which these programs have been implemented by schools in the region. For example, Woolworths, a popular South African supermarket chain with shops throughout Southern Africa, publishes a *Healthy Tuck Shop Guide* to assist schools in providing children with more opportunities to make healthy eating choices (Woolworths Holdings Ltd, 2014). This guide provides tips on implementing changes to tuck shop menus in ways that will be well accepted by the community and gives schools ideas for healthy tuck shop lunches and nutritious snacks, including a specific "healthy tuck shop policy." Similarly, the Heart and Stroke Foundation of South Africa has a Tuckshop programme, which is a service provided to school tuck shops to assist in the process of changing foods offered to learners so as to provide with a healthier option (Heart and Stroke Foundation of Africa, 2013). While the outlines and resources for healthy eating in the schools are available, they have yet to be implemented and systematically reviewed in Southern Africa.

Soda, sugar-sweetened beverages, and junk food bans have already been adopted by many local and regional governments across Europe and North America (Bertin, Lafay, Calamassi-tran, Volatier, & Dubuisson, 2012; Heart and Stroke Foundation of Africa, 2013; The National Archives, United Kingdom, 2011; Wojcicki & Heyman, 2006). For example, sodas and other sugar-sweetened beverages have been banned from public primary schools since 2003 and public high schools since 2005 in California (CA SB965, CA SB12) (California Project LEAN, 2014). Additionally, new nutrition

standards have been proposed by the U.S. Department of Agriculture (USDA) that will cover all foods and beverages sold in U.S. schools starting in July 2014 (USDA, 2014) as part of the Healthy Hunger Free Kids Act of 2010. These standards limit calories, sodium, fat and sugar in any food sold in schools (USDA Smart Snacks in School, 2014). Similarly, in 2006, the province of British Columbia, Canada, launched an initiative requiring all foods sold in vending machines in provincially owned public buildings to meet provincial nutritional guidelines. Countries in Southern Africa have yet to have national tuck shop policies although the South African Department of Health is drafting guidelines (Vitality Healthstyle Ltd, 2010). Meanwhile, even with guidelines present, it is not clear if schools will implement them if they fear any loss of financial resources. To help stimulate change and direct attention towards the issues of school food in Swaziland, we surveyed the school food offerings at two schools in one province in Swaziland.

METHODOLOGY

Two English medium primary schools for preschool to grade 7 (one private and one public/government) in the Hhohho district of Swaziland) were surveyed to determine the types of foods that were being offered to school children. The authors visited the tuck shops and spoke with the women who were selling snacks to children in 2013 to compile a list of items that were sold. Specifics concerning the total caloric information in the product and grams of fat and sugar were subsequently compiled from the nutrition label, if available, or from the manufacturer using on-line resources. The information brochure from the private school was also examined to find detailed information on bake sales and tuck shop hours. The authors had no conflicts of interest in the conduct of the study. The study was exempt from institutional review board review (IRB) as there was no human subject research participation.

RESULTS

Both tuck shops were located within the school grounds, and students were allowed to visit the tuck shops during break times and after school. Schools also allowed for the provision of birthday treats at both schools without any specific guidelines for what types of treats would be appropriate or not. One school used cake sales in each grade to raise funds for the purchase of educational resources and to undertake trips.

Both schools offered many calorically dense nutrient poor snacks such as candies and chocolate, potato chips/crisps, and ice creams (Tables 1 and 2). The public/government school sold 8 different types of sweet snacks and 5 different savory snacks/chips (Table 2). Additionally, neither school sold fruits or vegetables in the tuck shops. The public/government school did not allow for the sale of Coca-Cola and Pepsi brand sodas, but 11 different fruit juices/fruit drinks and 3 different types of South African made sodas (Bashews brand) were sold. Meanwhile, the private school sold 16 other types of fruit drinks including sodas and 100% fruit juice beverages. The private school also sold bottled water.

Both schools sold a wide range of ice cream bars and popsicles. Both schools sold 9 different types including the calorically dense Magnum classic ice cream bar (made by Ola), with 240 kcal per serving and 16g of fat and 21g of sugar. Other calorically dense products that the school offered including a large Kit Kat bar (233 kcal, 12g of fat, and 20g of sugar) and the PS Bar (235 kcal, 13g of fat, and 23 of sugar) (Tables 1 and 2).

Table 1: Private School Tuck Shop Food and Beverage Items in Swaziland			
	Kcal	Total Fat (g)	Sugar (g)
Beverages			

Appletiser (juice drink) 330 ml	144.0	0.0	33.0
Cabana juice (big) 1 liter	449.3	0.0	90.0
Cabana juice (small) 350 ml	157.3	0.0	31.5
Ceres fruit punch (100% fruit juice) 250 ml	130.0	0.0	31.0
Ceres mango juice (100% fruit juice) 250 ml	130.0	0.0	27.0
Coca Cola (soda) 330 ml	139.0	0.0	35.0
Energade (sports drink) 550 ml	154.0	0.1	28.0
Fanta orange (soda) 330 ml	92.0	0.0	22.8
Flavored water 500 ml	0.0	0.0	0.0
Grapetiser (juice drink) 330 ml	179.0	0.0	41.3
LiquiFruit cans (100 fruit juice) 330 ml	166.0	0.0	42.0
LiquiFruit clear apple juice (100% fruit juice) 250 ml	133.4	0.0	32.0
LiquiFruit clear breakfast punch (100% fruit juice) 250 ml	123.8	0.0	29.5
LiquiFruit mango orange juice (100% fruit juice) 250 ml	121.9	0.0	29.3
Minute Maid (100% fruit juice) 330 ml	134.0	0.0	31.2
Powerade (sports drink) 550 ml	80.0	0.0	19.5
Still mineral water 500 ml	0.0	0.0	0.0
Chips and Savory Snacks			
Lays potato chips 36 g	193.0	13.0	0.3
Mini cheddar 25 g	131.0	7.5	1.2
Popcorn (locally produced, size unspecified)*			
Simba peanuts 50 g	306.0	25.0	6.0
Ice Creams			
Conetto (ice cream cone)	190.0	10.0	14.0
Crystale Red popsicle*			
Fruttare (fruit popsicle 60 ml)	145.0	<0.1	13.0

Ola Choc Pie (frozen vanilla ice cream with chocolate) 70 ml	180.0	11.0	0.0
Ola Magnum Classic (ice cream)	240.0	16.0	21.0
Paddle Pop Chocolate (frozen popsicle with milk) 60 ml	63.0	2.1	9.1
Paddle Pop Orange (frozen popsicle with milk) 60 ml	40.5	0.0	9.6
Paddle Pop Strawberry Buzz	60.0	0.0	10.0
Tornado ice cream	90.0	0.0	20.0
Sweet Snacks			
Jungle Energy Bar 48 g	241.0	14.0	16.0
Kit Kat (chocolate bar with wafers) large	230.0	13.0	20.0
Lunch Bar (chocolate, caramel, nuts, and rice)	229.0	12.0	24.0
PS (chocolate and caramel bar)	240.0	14.0	24.0
Homemade Products (without nutritional information)			
Biltong (South African beef jerky)*			
Brownies*			
Hot dogs*			
Mini sausage roll*			
Mini doughnuts*			
Muffins*			
Pizza*			
Potato chips or French fries*			
Rice Krispies squares*			
Samosas*			
*Nutritional information is not known			

The private school stated in its information brochure that it offered a healthy option at the tuck shop; meanwhile the school had the following menu advertised during the week that we visited: 1) Monday – Cheese Dog and Popcorn, 2) Tuesday - Large Samosas, Brownies, Chips and Popcorn, 3) Wednesday - Mini Sausage Rolls and Rice Krispie Squares 4) Thursday – Pizza, Mini Doughnuts and Popcorn and 5) Friday – Cheese Dogs and Potato Chips. Although the school advertised a healthy

meal option, none of the menu items included vegetables or fruits when we surveyed the school. The private school did not have any restrictions on the amount of money or number of items purchased by students, and it was not clear if there were any restrictions at the public school.

Table 2. Public/Government School Tuck Shop Food and Beverage Items in Swaziland			
	Kcal	Total Fat (g)	Sugar (g)
Beverages			
Chocolate flavored milk, First choice brand 250 ml	176.0	3.8	25.5
Cocopine Bashews (soda) 300 ml*			
Eco water, various flavors*			
Energade	154.0	0.1	28.0
Gingerbeer Bashews (soda) 300 ml*			
Lipton iced green tea 500 ml	95.0	0.0	23.0
Lipton raspberry iced tea 500 ml	95.0	0.0	24.0
LiquiFruit Berry Blast (100% fruit juice) 250 ml	125.8	0.0	31.8
LiquiFruit clear apple juice (100% fruit juice) 250 ml	133.4	0.0	32.0
LiquiFruit clear breakfast punch (100% fruit juice) 250 ml	123.8	0.0	29.5
LiquiFruit mango orange juice (100% fruit juice) 250 ml	121.0	0.0	29.3
Maize drink (Mahewu), Mandla brand*			
Minute Maid apple juice (100% fruit juice) 330 ml	120.0	0.0	27.0
Minute Maid mango juice (100% fruit juice) 330 ml	120.0	0.0	31.0
Minute Maid orange juice (100% fruit juice) 330 ml	120.0	0.0	25.0
Raspberry Bashews (soda) 300 ml*			
Strawberry flavored milk, First choice brand, 250 ml	163.0	3.8	26.5
Chips and Savory Snacks			
Doritos Nacho Cheese Chips 28 g		8.0	1.0
Lays potato chips 36 g	193.0	13.0	0.3

Nik Naks 55 g	307.0	19.7	0.7
Simba potato chips 36 g	190.0	12.6	1.0
Ice Creams			
Fruitare mango (fruit popsicle) 60 ml	145.0	<0.1	13.0
Fruitare passion fruit (fruit popsicle) 60 ml	145.0	<0.1	13.0
Ice pop (locally produced)*			
Ola Carmel Crunch ice cream bar*			
Ola Magnum Classic (ice cream bar)	240.0	16.0	21.0
Paddle Pop Strawberry (fruit popsicle with milk)	60.0	0.0	10.0
Paddle Pop Chocolate (popsicle with milk) 60 ml	63.0	2.1	9.1
Paddle Pop Rainbow (fruit popsicle with milk)	107.0	3.0	14.0
Tornado ice cream bar	90.0	0.0	20.0
Snacks/Sweets			
Bar One (chocolate and caramel bar)	228.0	11.0	27.0
Cadbury Astros 40 g	192.0	8.6	26.0
Cadbury Nutty Tumbles 40 g	223.0	15.0	73.0
Cadbury Snackers (chocolate bar)	196.0	8.0	15.0
Kit Kat (chocolate and biscuit bar) large	233.0	12.0	20.0
Lunch Bar (chocolate bar with nuts, caramel, and rice)	229.0	12.0	20.0
PS Bar (caramel and chocolate bar)	235.0	13.0	23.0
Tex Mini Bar (chocolate and biscuit bar)	183.0	11.0	16.0
Homemade Products (without nutritional information)			
Cupcakes*			
Pizza roll*			
French fries*			

Spaghetti*
Popcorn*
*Nutritional information is not known.

At the schools, the only products offered for sale which were not calorically dense and nutrient poor included popcorn, bottled water, and salted peanuts (the latter two offered at the private school only). The government/public school sold two different types of 2% low fat milk products; however, both were flavored (strawberry and chocolate) and also included 26.5 and 25.5 grams of sugar respectively as well. Neither school sold low fat or skim milk.

DISCUSSION

Previous studies have found that consumption of sugar-sweetened beverages is associated with increased BMI in preschool and school-aged children (DeBoer, Scharf, & Demmer, 2013; Grimes, Riddell, Campbell, & Nowson, 2011). The two schools surveyed in Swaziland served a wide range of sugar-sweetened beverages, creating an environment conducive to weight gain and obesity. In the last 10-15 years, school districts in the United States have attempted to change school meal policies to reduce availability of sugar-sweetened beverages and increase access to low fat and whole grain items to address the pediatric obesity epidemic (Hood, Colabianchi, Terry-McElrath, O'Malley, & Johnston, 2013).

In contrast with the studies from South Africa, both tuck shops in the Hhoho region of Swaziland, offered only sweets and savory snacks and no healthy options, specifically no fruits or vegetables (Temple et al., 2006; Wiles et al., 2013). Both schools offered many ice cream choices including the high caloric ones such as the Magnum classic. In contrast, the primary school in Pietermaritzburg (South Africa) detailed by Wiles, Green, and Weldman (2013) offered more healthy options including fruit salads, yogurts, bananas and salads that were not offered by the schools in Hhoho province. The school in Pietermaritzburg or those surveyed in Cape Town (Temple et al., 2006) actually did not sell any ice creams, only the frozen popsicles (Wiles et al., 2013), and additionally, the survey of 11 primary schools in Pietermaritzburg also did not indicate that any ice cream was sold at the tuck shops there (Wiles et al., 2011). The private school surveyed stated that the tuck shop offers a healthy food option; however, on the day surveyed, the tuck shop provided only fast food options. With the exception of the flavored milks high in sugar content sold at the public/government schools (van Loan, 2009), neither school offered low fat milk options or other foods rich in calcium, such as cheeses and yogurts, necessary for primary school students and shown to be associated with reduced risk for obesity. The schools in Pietermaritzburg also did not sell plain low fat milk, but only flavored milks, akin to the Swazi government school; yogurt was sold at these schools, but it was not stated whether these were low fat yogurts and the sugar contents of the yogurts (Wiles et al., 2011). The schools in Cape Town only offered whole milk options (Temple et al., 2007).

Although school administrators may worry about the financial implications of removing unhealthy food and beverage items from the tuck shops, previous studies have found that changing to a healthy menu may not have negative financial implications on the school (Kim et al., 2012; Wojcicki & Heyman, 2006), and students may actually report higher satisfaction with healthier options (Kim et al., 2012). Additionally, previous studies have shown a positive association between improving the nutritional content of school foods and enhanced student learning and test scores (Edwards, Mauch, & Winkelman, 2011). The studies from South Africa indicate that the primary reason that the tuck shops sell only unhealthy items is that they fear losing profits, and those that already have limitations complain about the loss of revenue from nutritional regulations (Wiles et al., 2011).

Our study showed that other areas in Southern Africa outside of South Africa such as Swaziland, may have even more detrimental school nutrition than those previously described in South African school nutrition studies (Wiles et al., 2011; Wiles et al., 2013). Forty-five percent of individuals in

Swaziland live in extreme poverty (living on less than \$1/day) with only 21% of the population having food security. South African supermarket chains (Spar, Shoprite, Pick n Pay) are an important source of food for urban Swazis, including those living in poverty, with over 90% of the population stating that they get foods from supermarket chains at least once a month, and they are the leading food source for 79% of Swazis in the lowest income tercile (Tevera, Simelane, Peter, & Salam, 2012). South Africa faces an important obesity and diabetes mellitus epidemic with some studies showing up to 28.2% of South Africans with diabetes mellitus (Erasmus et al., 2012) and 45.7% of adults and adolescents who are 15 years and older obese (Malaza, Mosssong, Barnighausen, & Newell, 2012). Many of the processed foods that are available to South Africans are similarly available to Swazis. Specifically, Swaziland has a high adult and pediatric obesity prevalence and associated co-morbidities including diabetes mellitus with 29% of all deaths attributed to non-communicable diseases (Rabkin et al., 2012).

CONCLUSIONS

Recent studies have focused on the emerging problem of obesity and diabetes mellitus in sub-Saharan Africa (Kegne, Echouffo-Tcheugul, Sobngwi, & Mbanya, 2013); however, with the exception of a few studies coming from South Africa, few studies have evaluated the role of the African school food environment in contributing to problems of obesity. Our study is the first to show that in urban Swaziland, the school food environment is without regulation and may contribute adversely to ongoing problems with chronic disease among Swazi youth including diabetes mellitus, obesity and metabolic syndrome. Following the experience of school food movements in the United States and other industrialized areas of the world, parents, school officials and other members of the community in Swaziland and the larger Southern Africa must voice their concerns regarding the provision of unhealthy foods so as to instigate the development of guidelines and regulations for school food (USDA, 2005; Wojcicki & Heyman, 2006).

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BIOGRAPHY

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