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The impact of dietary habits and practices during adolescence on the risk of obesity: the birth to twenty cohort

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Exploratory survey of informal vendor-sold fast food in rural South Africa

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Abstract

Background: South Africa is experiencing a dramatic increase in obesity in both urban and rural areas. It is important to understand access to food better and how this influences food choice in rural environments. This study aimed to explore the nature and availability of fast foods in rural South Africa.

Method: Convenience sampling was used to procure fast food samples. The study was conducted in rural northeast South Africa in four villages, part of the South African Medical Research Council and University of the Witwatersrand-Agincourt Health and Socio-Demographic Surveillance System (HSDSS). The outcome measures were assessment of the availability of fast foods and their macronutrient composition.

Results: This study highlights the availability of fast foods through informal community vendors. Of note is the limited variety of foods sold by informal vendors, of which a striking two thirds were either vetkoek or fried chips, which on average yielded 943–5 552 kJ and 11–64 g fat. Additionally, we found that rural vendors sold a local fast food item, the kota.

Conclusion: Given that rural South Africa is undergoing rapid health, social, and nutrition transitions, this study signals the need for more comprehensive research to improve our understanding of the contributory role of fast food and its connection with both livelihoods and the burgeoning obesity epidemic in poorer rural areas. It is through better research and greater understanding that we can work with communities and local government to improve access to more nutrient-rich foods that are less energy dense.

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Introduction

Obesity, a marker of nutrition transition, is high in urban South Africa. Evidence suggests that rural areas are also undergoing a nutrition transition, with increasing obesity prevalence mimicking that in urban areas. Among 17-year-old girls in Soweto, the prevalence of combined overweight and obesity was recently 27.2%,[1] while in a rural site in Mpumalanga province, the prevalence was 20%.[2] Understanding food availability within urban and rural contexts is important; of particular importance is the extent to which the environment may promote or prevent an individual's health-promoting lifestyle choices.[3,4]

We have found that fast food (defined as convenience foods obtained from take-away vendors, and usually characterised as energy dense, low in micronutrients and fibre and high in simple sugars and salt) consumption is high among teenagers in Soweto. An average of seven or more fast foods per week is consumed, and the most popular items include hamburgers, kotas [quarter-loaf of white bread, chips, processed cheese and any number of processed meats and sauces, and yields more than 50% of the daily energy requirement of an average 17-year-old (5970 kJ)], fried chips and vetkoek.[1] This finding may be, in part, because of the ease of accessing vendors (a non-commercial outlet selling food, in some cases a converted garage or a home, or a purpose-built building) in the community.

The aim of this study was to explore the availability of fast food in a rural South African setting.

Method

Study setting and protocol

The study was conducted in Mpumalanga province, in the rural north-east of South Africa. A convenient sample of four villages was selected. All the villages are part of the South African Medical Research Council and University of the Witwatersrand-Agincourt Health and Socio-Demographic Surveillance System (HSDSS). The HSDSS monitors 84 000 inhabitants in 14 000 households across 25 villages, where the annual income of 73% of households falls below ZAR9 600.[5] The villages were selected based on HSDSS data to ensure variation in socio-economic status: village A was the most economically developed (with a trading centre), followed by villages CB, C, and then KB. A marginal number of the total available vendors was accessed in this study. The study protocol entailed driving through each village and stopping at vendors that sold fast food.

Informed consent was obtained from the vendors, and the following two study components were completed:

- An interview was carried out with the vendor to ascertain what fast food items were available, and which item was the most popular among adolescents, and its cost.
- An estimation of the energy and macronutrient content of the most popular fast food item was determined.

Each food sample was inventoried and weighed to the nearest gram using household weighing scales. Nutrient composition (energy, total fat, carbohydrate and protein) was estimated using FoodFinder3, nutrient analysis software based on the South African Medical Research Council food composition tables.[6] The mean nutrient breakdown of the samples was used for comparative purposes.

Ethics clearance was obtained from the University of the Witwatersrand Committee for Research on Human Subjects (M080320).

Results

All vendors had electricity, but none had running water. Vendors either sold foods from their converted garages or from purpose-built concrete buildings of basic construction. Only 15 food samples were collected from 18 vendors identified in the villages selling fast food (five vendors in village A, five in village CB, two in village C, and three in village KB), as three vendors were sold out of food. An inventory of the samples is presented in Table I. The most common items available for purchase were fried chips and vetkoek, followed by kotas. Other foods included bread, polony, atchar (a pickle made with unripe green mangoes and chillies, prepared in oil), chakalaka (a relish made with carrots, tomatoes, chillies and onions, prepared in oil), boiled eggs and fried fish.

The macronutrient breakdown of the fast food items is presented in Table II. The reasons that vendors gave for the limited range of Fast food items were restricted resources, customer preferences and difficulty in keeping food fresh (no refrigeration available). One vendor noted that "since the introduction of the National School Nutrition Programme teenagers no longer want kotas, they just buy chips to supplement their food from school." Grocery items that were sold by vendors but not assessed included tinned goods, packet soups, oil, soft drinks and packets of crisps.

Discussion

South Africa is experiencing a dramatic increase in obesity in both urban and rural areas. It is important to understand access to food and how this influences food choice in rural environments. The results of this study highlight the availability of fast food from village vendors. Of note is the limited variety of foods sold by vendors. A striking two-thirds were either vetkoek or fried chips, which, on average, yielded 943–5 552 kJ and 11–64 g fat. We found that rural vendors also sold the local fast food item, the kota. When compared to the Sowetan samples, the rural kotas contained more energy and fat (6 300 kJ, 60 g fat vs. 5 369 kJ, 51.5 g fat),[1] which may be attributed to the higher amount of fried chips contained within the samples. Fried foods such as these are micronutrient and fibre poor, energy dense and have high amounts of fats. Using a 17-year-old as a reference (daily energy requirements are around 10 000 kJ,[7] of which less than 30% of energy should be derived from fat (approximately 92 g fat per day), these fast food items may contribute significantly to energy intake. One vetkoek would contribute 12% of daily fat, and a portion of fried chips and a kota could contribute up to 70% of the total daily fat requirement.

Table I: Villages from which fast food items were obtained, description of the immediate environment, type of outlet visited, specific sample purchased and its cost

Village	Description of surrounding environment	Type of outlet	Sample purchased	Cost (ZAR)
A	At an intersection of a busy through road	Fast food only	Kota	9.00
A	At an intersection of a busy through road, next to a grocery shop	Fast food only	Vetkoek	0.50
A	On a main road, some distance from dwellings/other buildings	Fast food and groceries	Vetkoek	0.50
A	On a main road, some distance from dwellings/other buildings	Fast food only	Kota	10.00
A	A high school	Fast food and groceries	Brown bread, chakalaka, soup	8.00
KB	Very rural, no other vendors nearby	Fast food and groceries	Chips	10.00
KB	Next to a shebeen	Fast food only	Vetkoek	0.50
KB	A high school	Fast food and groceries	White bread, atchar, polony	5.00
CB	Next to a grocery shop	Fast food and groceries	Vetkoek	1.00
CB	Adjoining another fast food outlet	Fast food only	Chips	12.00
CB	100 m from a high school	Fast food and groceries	Chips	7.00
CB	Less than 100 m from a high school	Fast food and groceries	Vetkoek	1.00
CB	Around 500 m from a high school	Fast food and groceries	Chips and boiled eggs	12.50
C	Adjoining a shebeen and grocery shop	Fast food only	Chips	10.00
C	A high school	Fast food and snacks[a]	Fried fish, battered	2.00

a = Crisps, fruit, single-item sweets

Table II: Energy and macronutrient breakdown of fast food samples

	Mean weight (g) range	Mean energy (kJ) range	Mean protein (g) range	Mean [a]CHO (g) range	Mean fat (g) range
Kotas (n = 2)	530 (485–575)	6300 (5711–6 889)	14 (12–15)	158 (128–187)	60 (48–73)
Fried chips (n = 4)	469 (401–506)	5987 (5120–6 461)	20.2 (17–22)	164.4 (141–178)	69 (59–75)
Vetkoek (n = 5)	62 (48–96)	943 (731–1 463)	4.3 (4–7)	26 (20–41)	11 (9–17)
Fried chips, boiled egg (n = 1)	354	4157	20	106	44
White bread, atchar, polony (n = 1)	174	2 036	11	67	17
Brown bread, chakalaka, soup (n = 1)	300	1 468	15	55	3
Fried fish, battered (n = 1)	63	538	12	4	7

a = carbohydrate

As this was an exploratory study, the results are limited, but the study does provide an opportunity for hypothesis generation. Our hypothesis is that these fast food items may become a regular part of the local diet because healthier options are less accessible. For households, this easy access to fast food may influence cooking practices: home cooking may become less frequent, with increasing dependence on fast food, especially in cases where there are long distances and high transport costs to larger villages with formal vendors or trading centres. However, from a community perspective, food vendors are an important aspect of local communities and a livelihood strategy.

Conclusion

Given that rural South Africa is undergoing rapid health, social, and nutrition transitions,[8] this study signals the need for more comprehensive research to improve our understanding of the contributory role of fast food and its connection with both the livelihoods of and the burgeoning obesity epidemic in the poorer rural areas. It is only through better research and greater understanding that we can work with communities and local governments to improve access to more nutrient-rich foods that are less energy dense. Partnership programmes that draw on the natural environment to benefit local dwellers (e.g. food garden projects) need to be evaluated as possible ways of improving access to healthier food. However, we cannot discount the local fast food vendor, and therefore we need a better understanding of the parameters that influence vendors' choice of foods to sell and how receptive they would be to selling healthier alternatives.

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