



The Nutrition Transition: Changes in Patterns of Food Consumption in Southeastern Botswana

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Introduction

Non-communicable diseases such as cardiovascular disease, cancer, and diabetes are the leading causes of death worldwide (Bloom 2011). Poor nutrition is a major risk factor for non-communicable diseases (NCDs) and is of particular importance in rapidly urbanizing Botswana. As people move away from villages where traditional food is dominant and into urban areas like Gaborone, convenience food which is typically less healthy is readily available.

A comparative study of patterns of food consumption was conducted in Mochudi, a peri-urban area of Botswana, and on the campus of University of Botswana, in the capital city Gaborone, to investigate how diets vary in rural and urban areas. Participants were asked qualitative and quantitative questions about what food they eat, how much they eat, their sources of food in Mochudi and Gaborone, their perception of healthy food, and risk factors for non-communicable diseases other than nutrition. Results suggest that a nutrition transition truly is occurring.

Methods

Participants

- Convenience sample of N=20, with residents of Mochudi (n=10) and students from University of Botswana (n=10)
- Participants from Mochudi ranged in age from 12 to 50 years ($\mu=33.6$), and there were 6 females and 4 males interviewed
- Participants from UB-Gaborone ranged in age from 18 to 29 ($\mu=21$), and there were 5 females and 5 males

Measures

- Oral interview with 31 questions, both qualitative and quantitative
- Question themes: unhealthy food consumption, home cooked meals, grocery stores, concept of healthy food, and risk factors for NCDs
- Questions for residents of Mochudi investigated the aforementioned themes in Mochudi as well as during visits to Gaborone
- Questions for UB students investigated the aforementioned themes at UB in Gaborone as well as in students' home villages

Data Analysis

- Single factor ANOVA, frequency distribution, ranges, and means in JMP 10.0.0 and Excel 12.2.6

Results

Unhealthy food consumption: *Magwinya* or "fat cakes," which are a traditional food made of fried dough, were consumed the most frequently by UB students in Gaborone ($\mu=24.9$ /month), followed by residents of Mochudi ($\mu=21.5$) and finally in UB students' home villages ($\mu=15.5$). Fresh chips were consumed the most frequently by UB students in Gaborone ($\mu=12.2$ /month), followed by residents of Mochudi ($\mu=2.75$) and finally in UB students' home villages ($\mu=2.4$). Fizzy drinks were also consumed most frequently by UB students in Gaborone ($\mu=22.2$ /month), followed by UB students' home villages ($\mu=13.1$) and finally by residents of Mochudi ($\mu=12.05$). Consumption of fresh chips differs significantly by location ($F=2.85$, $P=0.07$). Consumption of *magwinya* and fizzy drinks were not statistically significant [$(F=0.2043$, $p=0.82$), ($F=1.12$, $p=0.34$), respectively].

Home cooked meals: Consumption of home cooked meals differed significantly amongst residents of Mochudi, UB students in Gaborone, and UB students in their home villages ($F=12.62$, $p>0.0001$). Residents of Mochudi consumed the highest amount of home-cooked meals ($\mu=2.6$ /day), followed by UB students in their home villages ($\mu=2.2$) and finally by UB students in Gaborone ($\mu=0.9$).

Grocery stores: Choppies was visited the most frequently by 42% of the respondents ($n=21$). This was followed by 18% of respondents visiting Spar ($n=9$) and 14% of respondents visiting Shoppers ($n=7$). These were followed by Shop Rite ($n=4$) and Pick N Pay ($n=4$). When asked what they would like to change about these grocery stores, 27% desired change in the price of food ($n=7$). 19% desired improvement in service ($n=5$). 15% of respondents desired change in quality of food ($n=4$), 11% of respondents desired a change in the types of food sold ($n=3$), 8% desired better availability of non-food items ($n=2$), and 8% desired no change ($n=2$).

Urban-rural linkages: All 10 research participants from Mochudi stated that they travel to Gaborone for various reasons. 9 respondents go to Gaborone once or twice a month, and 1 participant worked in Gaborone 5 days/week. When asked what food and drink they consumed when in Gaborone, 60% of respondents mentioned meat ($n=6$), 40% mentioned fizzy drinks ($n=4$), 30% mentioned fresh chips ($n=3$), 30% mentioned rice ($n=3$), 20% mentioned fruit ($n=2$), and 20% mentioned sweets ($n=2$).

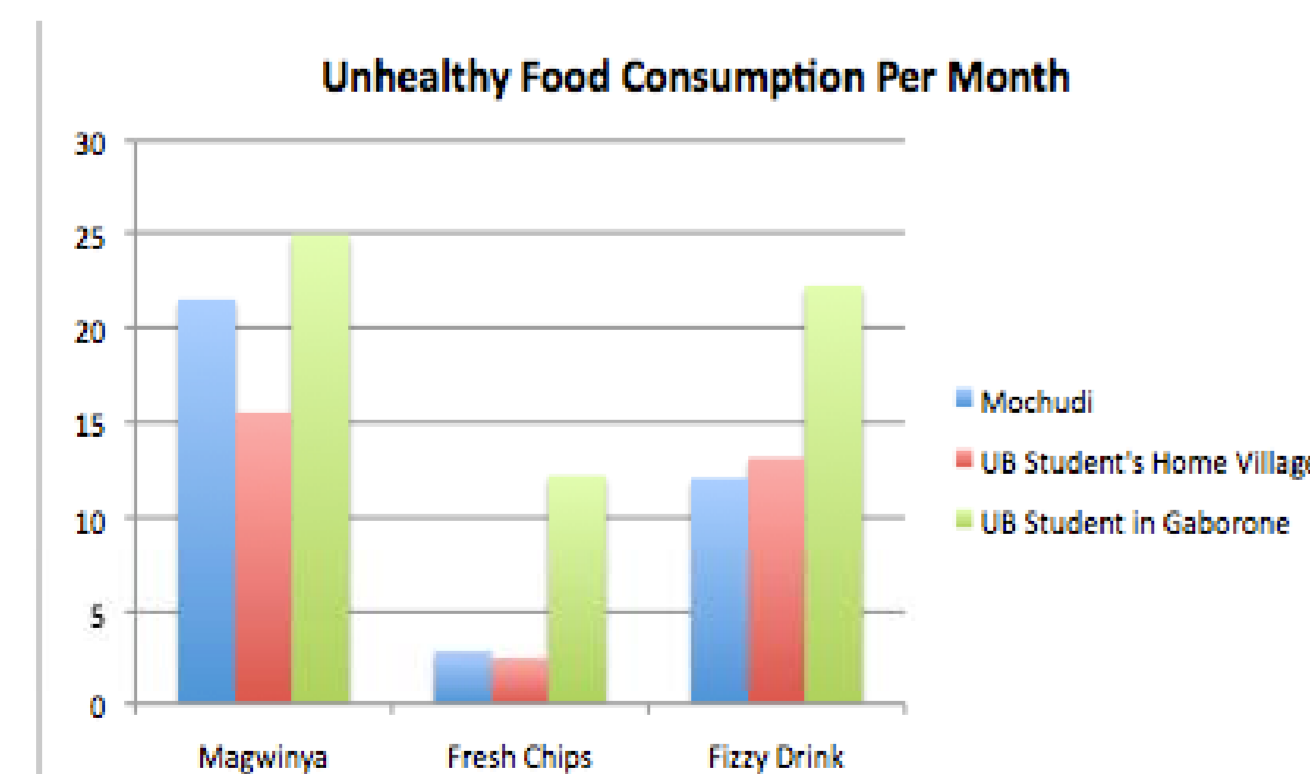


Figure 1: Consumption of magwinya, fresh chips, and fizzy drinks per month

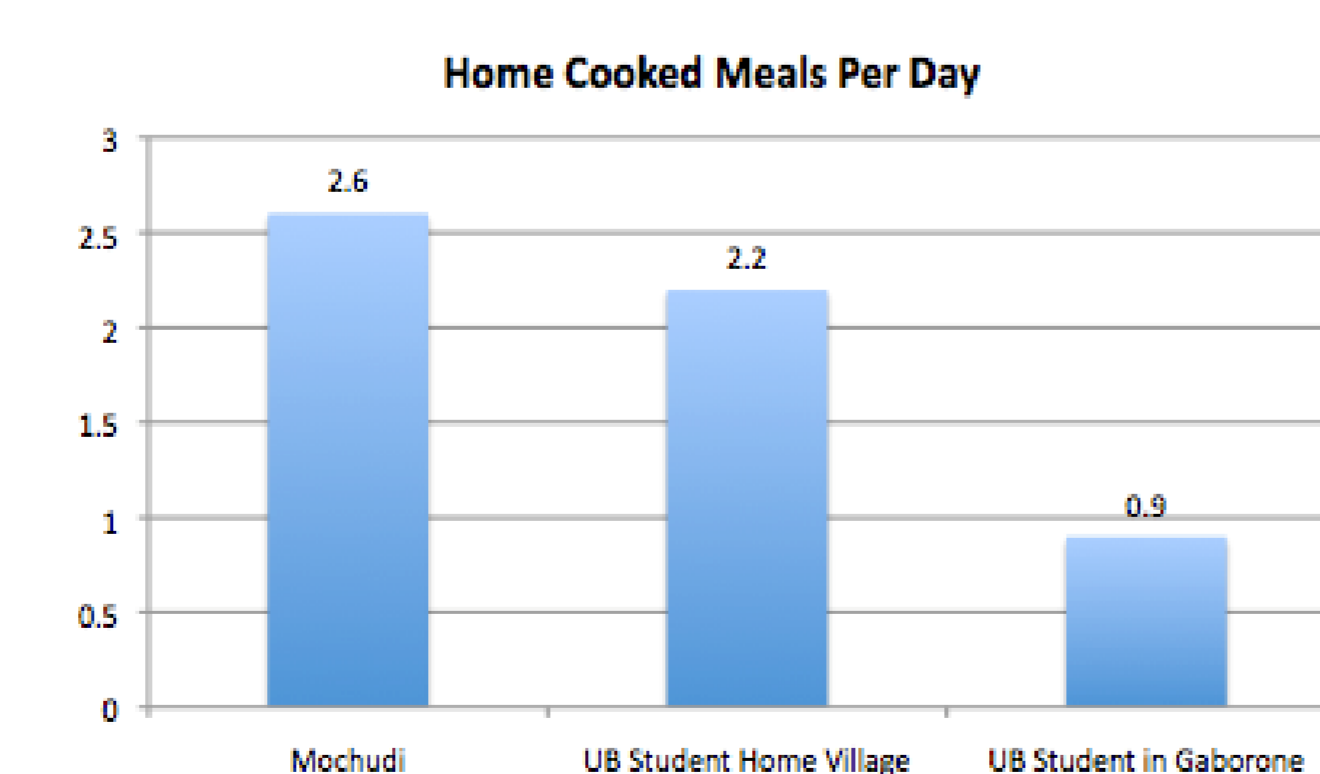


Figure 2: Home-cooked meals per day in Mochudi, Gaborone, and UB students' home villages

Concept of healthy food: When asked what came to mind with the words "healthy" food, 15% of people mentioned vegetables ($n=9$); 12% mentioned "no fat," "less fat," or "reduced fat" ($n=7$); 8% mentioned "fruit" ($n=5$); 7% mentioned "balanced diet" ($n=4$); 5% mentioned "milk" ($n=3$); and 5% mentioned "vitamins" ($n=3$). When grouped together, 20% of people ($n=12$) mentioned some sort of nutrient: vitamins ($n=3$), carbohydrates or energy ($n=3$), proteins ($n=2$), nutrients ($n=2$), minerals ($n=1$), and fiber ($n=1$). When asked what types of healthy food they ate, out of the 60 responses, 20 vegetables were mentioned with *merogo* being the most common ($n=4$). 16 fruits were mentioned with apples being the most common ($n=6$). 8 dairy foods were mentioned with milk being the most common ($n=4$). 6 proteins were mentioned with meat being the most common ($n=3$) along with beans ($n=3$). 6 carbohydrates were mentioned with bread or dumplings being the most common ($n=3$).

Risk factors for NCDs: Only 1 participant smoked cigarettes, and he smoked an average of 4 per day. 30% of respondents drank alcohol ($n=6$). 5 of those 6 respondents had 1-4 drinks per week. Out of the three risk factors for NCDs investigated between people in Mochudi and at UB, patterns of exercise were the most similar ($\mu=4.6$, $\mu=4.9$, respectively). The largest contrast was regarding alcohol consumption with residents of Mochudi consuming far less alcohol than UB students ($\mu=0.2$, $\mu=3.0$, respectively).

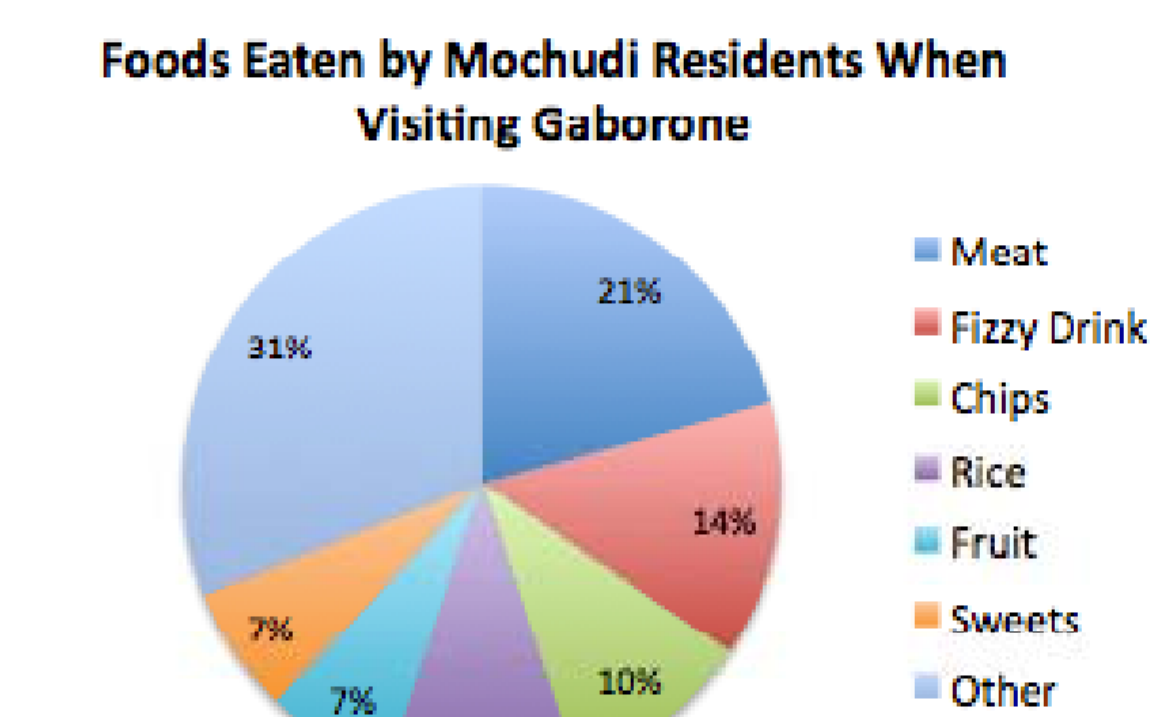


Figure 3: Food eaten by residents of Mochudi in Gabs

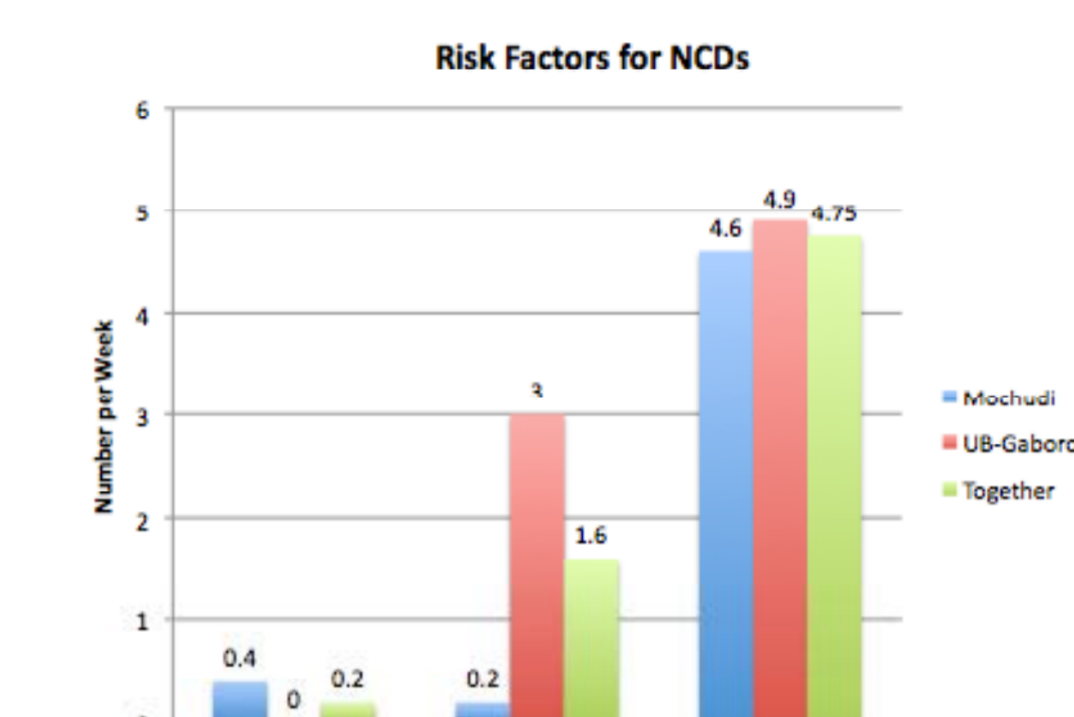


Figure 4: Risk factors for NCDs in Mochudi and Gabs

Discussion

Conclusions

Foods such as *magwinya*, fresh chips, and fizzy drinks are very prevalent in Gaborone and are consumed more often by UB students in Gaborone than by UB students in their home villages or residents of Mochudi. These foods are rich in fat, calories, and sugar. UB students eat significantly fewer home cooked meals per day when in Gaborone than residents of Mochudi or when in their home villages. Most people shop at Choppies, Spar, and Shoppers, and the most common things they wanted changed were prices, service, and quality of the food.

Residents of Mochudi maintained close ties with Gaborone, visiting on average 3.3 times per month. During these visits, meat, fizzy drinks, and chips were consumed the most frequently, suggesting the increased consumption of unhealthy food due to urbanization. In this sample, smoking was nearly non-existent, but alcohol was 15 times more common in UB than in Mochudi. Exercise was very similar between rural and urban populations. Overall, risk factors for non-communicable diseases, especially lack of proper nutrition, were prevalent.

Policy Recommendations

- Encourage culturally relevant, healthier, traditional diet patterns (Maruapula et al. 2011)
- Support education campaigns and consumer awareness on grocery shopping, food preparation, and intake
- Issue a clear document from the Ministry of Health about NCDs and nutrition with standard dietary recommendations
- Support initiatives that address other related issues such as poverty, inequality, and unemployment

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