

Food Behavior of Pupils in the City of Bobo-Dioulasso (Burkina Faso)

Téné Marceline Yaméogo^{1,2*}, Bazoumana Coulibali¹, Aimée Senkaye-Lagom Kissou^{1,2}, Issiaka Sombié¹, Carole Gilberte Kyelem^{1,2}, Mireille Marie D. Tapsoba¹, Alassane Ilboudo², Omar Guira³, Djingri Lankoandé², Abraham Bagbila², Marina Birba², Macaire Sampawindé Ouédraogo^{1,2}, Youssouf Joseph Drabo³

¹INSSA, University Nazi Boni, Bobo-Dioulasso, Burkina Faso

²CHU Sourou Sanon, Bobo-Dioulasso, Burkina Faso

³UFR-SDS, University Joseph Ki Zerbo, Ouagadougou, Burkina Faso

Email: *teneline@gmail.com

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Abstract

Introduction: Diet is a determinant of chronic non transmissible diseases. The aim of this study was to describe pupils' diet in the city of Bobo-Dioulasso (Burkina Faso). **Methods:** This was a descriptive cross-sectional study that took place from March to April 2016, among 1st, 4th and 7th form pupils of public and private schools in the city of Bobo-Dioulasso. Diet survey methods were a reminder of the last 24 hours and the questionnaire of consumption frequency. **Results:** A total of 1993 pupils were surveyed. The mean age was 17.5 ± 3.6 years and the sex ratio 0.7. The majority of pupils (90.5%) reported eating at least 3 meals a day. Dietary recommendations were different according to food groups. For example, vegetables (90.0%), fruits (75.4%) and dairy products (79.3%) were the least well consumed foods compared to recommendations. Protein and starch intake were inadequate among these pupils with 39.7% and 58.2% respectively. Almost 1/4 had a regular weekly alcohol consumption (23.4%) while an excessive consumption of sweet drinks and fried foods was noted in 12.7% and 28.2% of them, respectively. **Conclusion:** This study has revealed a general insufficiency in the recommended dietary intakes of fruit, vegetables, proteins, starchy foods and dairy products among pupils, and on the other hand, a regular consumption of fatty, sugary and alcoholic foods for about a fifth of them. An intervention program such as "Communication for Continuous Behavior Change" would help improve these habits.

Keywords

Food Behavior, Pupils, Burkina Faso

1. Introduction

Apart from hypertension, obesity, hyperglycemia, dyslipidemia, sedentary lifestyle and smoking, food behaviors such as the low consumption of fruits and vegetables, the excessive consumption of alcoholic beverages are currently recognized as cardiovascular risk factors through nontransmissible diseases (NTDs) [1].

According to WHO, by eliminating modifiable risk factors including harmful eating habits, we would prevent 80% of premature heart disease, 80% of premature brain strokes, 80% of type 2 diabetes, and 40% of cancers. Children are not exempt from this problem. Overweight, obesity and type 2 diabetes are becoming more common among children and adolescents [2].

The determinants of food behavior are known and are of two kinds: individual determinants (age, sex, food preferences, and knowledge) and collective determinants (economic, social and physical environments) [3].

In the United States, studies have shown a deterioration in the quality of the diet and a decline in the frequency of lunch with age, as well as an increase in snacks among pupils; while children who have lunch regularly tend to have a better diet than those who do not [4] [5].

In order to reduce the effects of major risk factors such as unhealthy diet and lack of physical exercise, the World Health Assembly adopted in May 2004 the “Global Strategy for Food, Physical Exercise and Health” (DPAS).

Among other measures, the DPAS calls on Member States to develop and implement school policies and programs to promote healthy diet and increase the practice of physical exercise [2].

The general characteristics of secondary school pupils’ food habits are more or less known in Burkina Faso, and particularly in Bobo-Dioulasso region. In Ouagadougou, Daboné in 2011, in a study including 799 middle class schoolchildren (mean age: 11.7 ± 1.4 years) reported that during the week preceding the study, 25% of children had not eaten fruit, 20% no meat, 20% no vegetables while 18.3% consumed ice cream every day [6].

Our study aims to lay the basis for a reflection on the appropriate cardiovascular prevention measures for this category of our population, the adolescents.

2. Methods

This was a cross-sectional study that took place from March to April 2016, among 1st, 4th and 7th form pupils of public and private schools in the city of Bobo-Dioulasso. The calculation parameters of the sample were as follows: prevalence 8% (prevalence of overweight/obesity at school in Burkina [7], accuracy 3%, alpha error 5% (95% CI), $N = 65765$ pupils, a cluster effect 2. The calculated sample was 1890 pupils, distributed to 630 pupils per class group of 1st, 4th and 7th form in order to detect a possible gradient according to the level of studies.

Food survey methods consisted in a reminder of the last 24 hours associated with consumption frequency questionnaire. The questionnaire was self-administered,

under the supervision of intern medical students.

In order to better profile possible future prevention actions, we have highlighted in the results, the behaviors that deviate from the usual dietary recommendations. Thus, we have defined as non-recommended diet, the consumption of:

- more than 3 sweet drinks (soda) or sweetened juice per day (33 cl × 3);
- less than 1 serving of vegetables per day;
- less than 1 fruit per day;
- less than 1 dairy product per day;
- less than one serving of protein per day;
- less than 3 rations of starchy foods per day;
- more than one ration of food fried/cooked in oil per day;
- more than 1 alcoholic beverage per week.

The overall project of this study was approved by the Burkina Faso National Ethics Committee. Authorizations from the Regional Director of Secondary Education and Secondary Schools Administration were obtained for the survey. An informed consent form attached to an information leaflet was sent to parents before the survey. Only pupils whose parents gave their consent by signing the consent form were interviewed. The data was also processed respecting the anonymity of respondents.

3. Results

A total of 1993 pupils, distributed as follows, were interviewed: 649 in 1st form, 673 in 4th form and 671 in 7th form.

3.1. General Characteristics of Pupils

The mean age of the pupils was 17.5 ± 3.6 . The mean age per class group was 13.6 ± 1.5 years in the 1st form, 17.5 ± 1.8 years in the 4th form, and 21.3 ± 2.0 years in the 7th form.

Female pupils accounted for 56.6% ($n = 1128$), that is a sex ratio of 0.8.

The majority of students were single: 99.1% ($n = 1976$). The remaining 0.9% ($n = 19$) were married or cohabiting. Two-thirds of them lived with their two parents (67.6%), 15.3% with only one parent and 17.0% with another member of the family.

The occupations of fathers/guardians were mainly: farmers 25.4% of the cases, traders 23.4% and civil servants 21.4%. The occupations of mothers/tutors were: housewives 48.8% and traders 27.9%.

The body mass index was found to be overweight for 7.3% ($n = 146$) of pupils with 1.4% of obese subjects and leanness for 16.8% ($n = 366$).

3.2. Diet

3.2.1. Number of Daily Meals

The majority (90.5%) had 3 meals or more per day (**Figure 1**).

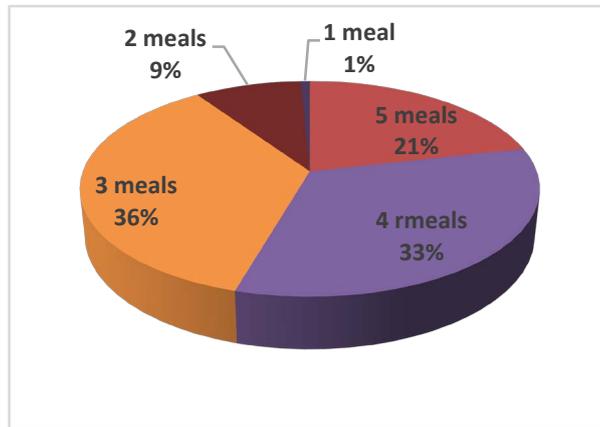


Figure 1. Number of pupils' daily meals in Bobo-Dioulasso (Burkina Faso), 2016.

One-fifth of the pupils, 21.5% ($n = 428$), had 5 meals/day (a breakfast, a lunch, a snack at 10 am and 4 pm and a dinner). It was mostly:

- girls: 23.1% against 19.3% of boys ($p = 0.03$);
- 1st form and 4th form pupils: 29.6% and 23.0% against 12.0% for 7th form pupils ($p < 0.001$);
- under 15 years: 32.0% against 18.1% for those aged 15 years and over ($p < 0.001$).

The participation of pupils in the different meals of the day was greater at lunch and dinner, respectively 96.3% and 92.8%. It should be noted that 63.3% had breakfast (**Figure 2**).

3.2.2. Frequency of Consumption of Different Food Groups

The food consumption of pupils was generally far from the recommendations (**Figure 3**). It was noted that: 7 to 8 pupils out of 10 had less than 1 serving of vegetables, fruit and dairy per day; 4 out of 10 did not have a daily ration of protein; nearly 1/4 of pupils had regular weekly alcohol consumption.

4. Discussion

The purpose of this study was to highlight the individual behaviors of pupils in order to draw lessons for cardiovascular prevention. Collective determinants of food behavior (environmental, social, economic), not addressed in this study, should however be analyzed in a comprehensive prevention program.

The majority of pupils (90.5%) had at least 3 meals per day. Escalon in France reported among the 12 - 30 years old, 3 meals a day for 78.8% of the respondents and 2 meals a day for 19.4% of them [8].

Taking breakfast would be associated with a lower risk of overweight among children and adolescents [9]. In our study, when reminding the last 24 hours, 63.3% of pupils reported having breakfast. Doku in Ghana reported that 31% of pupils had breakfast less than 4 days/week [10]. In the HBSC survey in France, more than half of college pupils (58.3%) said they had breakfast every day [11].

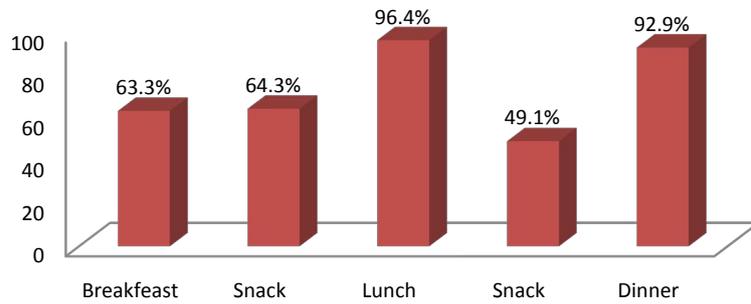


Figure 2. Participation of pupils in the different meals of the day, Bo-bo-Dioulasso (Burkina Faso), 2016.

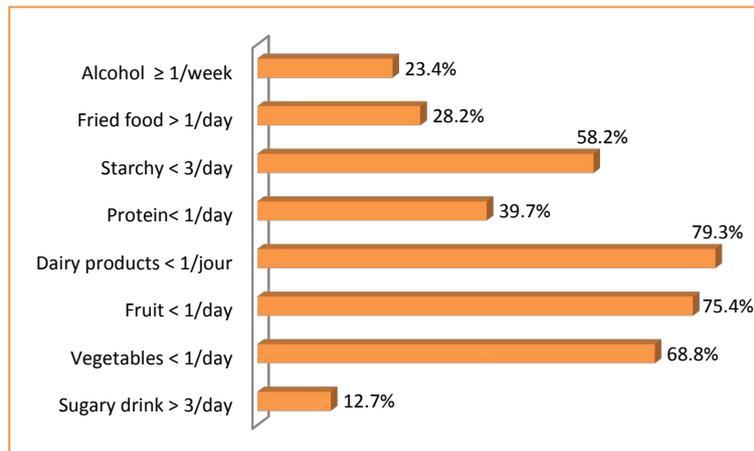


Figure 3. Frequency of pupils' consumption of different food groups, Bo-bo-Dioulasso (Burkina Faso), 2016.

The general consumption characteristics of the different food groups show in our study a deficiency at all the levels compared to other studies, except for the consumption of sugary drinks, which is higher among French and Algerian pupils [11] [12] (Table 1).

The consumption of dairy products was insufficient in the majority of cases (79.28%). Yet, dairy products provide the calcium necessary for the growth of children and the strength of their bones [13]. It was the same for proteins (4 pupils out of 10), and starchy foods (6 pupils out of 10). It is not surprising in these conditions to record up to 17% of lean pupils in our schools. This poor consumption of structural foods is a reflection of the socio-economic level of our country, where 1/3 of the population lives below poverty line according to the INSD [14]. In France, for example, insufficient consumption of dairy products concerned only 19% of the pupils surveyed [11]. In addition, awareness-raising interventions of the National Nutrition Health Program in schools in France could also explain our differences. We do not have for the time being a program of this type in our secondary schools and colleges.

The prevalence of alcohol consumption was 23.4%. This result is higher than that of the HBSC survey in France which was 7% [11]. WHO recommends not

Table 1. Consumption of different food groups.

Consumption	Our study (%)	Doku Ghana [10] (%)	Allam Algérie [12] (%)	HBSC France [11] (%)
Excessive consumption of sugary drinks	12.7		60	27.3
Insufficient vegetables	90.0	48	50	61.2
Insufficient fruit	75.4	56	50	58.9
Insufficient dairy products	79.3		50	19.8
Insufficient protein	39.7			
Insufficient starches	58.2			
Excessive consumption of fried foods	28.2		15	
Regular weekly alcohol consumption	23.4			7

consuming alcohol during adolescence. The actions recommended to reduce this alcohol consumption of pupils are among others, the prohibition of consumption, the increase of prices, the prohibition of sale inside and around secondary colleges [13] [15].

5. Conclusions

This study has revealed a general insufficiency in the recommended dietary intake of fruit, vegetables, proteins, starchy foods and dairy products among pupils; and a consumption of fatty, sugary and alcoholic foods for 1/10 to 1/4 of them.

The analysis of parents and guardians' food behavior, as well as the collective determinants of food behavior, would help to develop a cardiovascular prevention program adapted for this segment of the population.

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