

Prevalence of Foodborne Infections among Students in Dangbo Commune (Benin Republic) In 2018

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ABSTRACT

Introduction: Common foodborne illness and foodborne diseases are responsible for many deaths, especially among children who, compared to adults, observe much less hygiene. This study aims to determine the most common foodborne infections among middle school students in Dangbo commune in Benin. **Methods:** To this end, the study involved 318 adolescent students, including 161 boys from the 6th, 5th and 4th grades, selected according to the non-random method and the reasoned choice technique. The collection tools used were collection tools used was a questionnaire and an interview guide that took into account students' health data. **Results:** Out of all students surveyed, 76.7% acknowledged the occurrence of foodborne infections on an irregular basis. These infections occurred regularly in 9.7% of respondents. Diarrhoea and stomach aches following the consumption of meals at school are the main foodborne infections cited by 61.6% and 13.8% of students respectively. **Conclusion:** The high frequency of diarrhoea requires action on behaviour and the environment to reduce it in students.

Key words: Rural community, Adolescents, Common foodborne diseases, Foodborne diseases, Benin.

Key Message: In the commune of Dangbo, in the Republic of Benin, food infections, of which diarrhoea is the main manifestation, are common among students, with diarrhoea as the main manifestation.

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INTRODUCTION

Children are more vulnerable to collective foodborne infections and foodborne illness because of their lack of knowledge and non-compliance with basic hygiene practices.^{1,2} In sub-Saharan Africa and Benin in particular, the situation of these conditions is worrying in schools, where children spend the day with teachers who are not always able to ensure that hygiene is observed during their breaks.^{3,4} The objective of the study is to determine the most frequent foodborne illness and collective foodborne infections among students in Dangbo commune.

METHODOLOGY

This is a descriptive, quantitative, cross-sectional study carried out in January 2018 in two Colleges of General Education (CEG) in the municipality of Dangbo. Of all the colleges in the municipality, only these two CEG gave their approval for the implementation of the survey. In the CEG in Benin like those in Dangbo, there are seven levels of study organized in two cycles. The first cycle takes into account the classes from sixth to third grade. The second cycle concerns the classes from second to Terminale. The minimum study sample size, calculated using Schwartz's (1988) formula, was 267 students, with a margin of error of

6%. Since the estimated proportion of the population with the characteristic studied is unknown, i.e. the presence of the foodborne disease or infection, the 50% rate was set to apply the formula.

The target group consisted of students selected from CEG 1 in Dangbo and CEG Késsounou in Dangbo commune. Since the survey period coincides with the start of the end-of-year holidays for pupils, only the 6th, 5th and 4th year classes were still present in these colleges. The study sample consisted of 318 students from the intermediate classes of the first cycle (6th, 5th and 4th) selected according to the non-random method with the accidental choice technique. These students were present in the targeted classes to participate in the study on the day of the survey and had previously given their free, informed and written consent.

Students were asked to complete a 21-item grouped questionnaire on respondent identification and data related to access to health care, illnesses observed following food consumption at the college, the frequency of onset of these illnesses and the conduct of parents in the event of foodborne illness and collective foodborne infections.

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The questionnaire was pre-tested with 30 students who resided in an area other than the survey area and who attended Akpro-Misséré's CEG 2. An interview guide, which strengthened the quantitative data, was sent to nurses from the colleges and/or heads of health centres in Dangbo commune in order to collect information on socio-cultural and health aspects. The interview focused on: a) their assessment of the level of use of health services by the population; b) the reasons for consulting students in the health centre/nursery concerned; c) the most frequent illnesses observed among these students; d) suspicion as a cause of illness; e) consumption of food in the canteen or from school caterers; f) the level of disease progression before the consultation; g) access to effective health care and parents' ability to pay health care costs.

RESULTS

Data from the questionnaire survey

All the students interviewed said they had discomfort after eating at school. Among these diseases (Table 1), they were affected by diarrhoea (61.6%), stomach aches (13.8%), malaria (11.3%), typhoid (11.1%), cholera (1.9%) and migraine (0.3%). Based on the statements of the students interviewed, diarrhoea and stomach aches are the main foodborne illness and collective foodborne infections observed in these students after eating food at school. According to the same respondents (Table 2), these diseases occurred on an irregular basis in 244 (76.7%) and on a regular basis in 31 (9.7%).

Data from the interview

With regard to the frequency of diseases observed among students, on of heads of health centres in Dangbo said that *"during the flood period, there are some cases of diarrhoea"*. In relation to the beliefs of the inhabitants of the commune of Dangbo on Foodborne Diseases and Collective Foodborne Infections, Doctor A stated that *"the population thinks that for them they are not worrying infections in rural areas"*. The head of the Kessounou dispensary reinforced the doctor's comments with the following words: *"it is witchcraft, everything is linked to witchcraft"*.

With regard to the occurrence of infections, all the doctors surveyed considered that the consumption of food by the college's saleswomen can be considered as a source of foodborne infection. This was confirmed by Doctor B when he stated that *"when people contract foodborne diseases, or first before they even get there, it is after eating a particular meal or drinking non-potable water"*. The doctors surveyed cited diarrhoea, fever and vomiting as reasons for consulting students in their health centres. Doctor A confirmed the occurrence of these symptoms by reminding that these clinical signs are the most frequent reasons for consultations in children; because *"they often come in relation to fever, diarrhoea or fever-vomiting"*.

DISCUSSION

This study is based on the assumption that diarrhoeal diseases are the main foodborne infections observed among students in Dangbo high schools. A mixed approach that combines quantitative and qualitative data collection was used to conduct the study. This prospective study was conducted in both quantitative and qualitative forms. Non-random sampling using the accidental choice technique made it possible to select the sample of students according to the inclusion criteria set. To carry out the investigation, authorization was obtained from the school principals and the Dangbo CEG Parent Association. All the students surveyed and their heads of household gave their informed and written consent.

This study showed that the most frequent food-borne infections among the students surveyed in Dangbo commune are diarrhoea and stomach aches. The results of the survey showed that the occurrence of diarrhoea

in Dangbo is becoming more and more frequent. Indeed, health authorities underestimate these diseases because populations do not always use health services.⁵

The question of geographical accessibility is an acute one, since everyone living in a community must benefit from the provision of health care services at a reasonable distance; this is not the case for the majority of populations.⁶ These various diseases are considered either as minor diseases or as cases of witchcraft in this environment strongly influenced by considerations.

In fact, in Africa and more particularly in Benin where health conditions are precarious,^{7,8} populations tend to think that foodborne infections are of supernatural origin. Foodborne Diseases and Collective Foodborne Infections are also considered to be associated with poisoning.⁵ In fact, several factors facilitate the occurrence of these diseases. For example, during the rainy season, scouring water contaminated with wastewater from various household tasks is used by a large proportion of the population⁹ either to wash dishes or for consumption. Children, who usually eat by hand, as is customary in Africa,¹⁰ do not observe basic hygiene rules by washing their hands properly before each meal.¹¹ Contaminated wastewater also flows into the fields and contaminates food that is brought to markets and consumed by the population.⁹

In schools, gastrointestinal disorders are very common and most often manifest as vomiting and diarrhoea.³ The problem is really getting worse at school, because the origin of the meals sold there is generally not known. The meals sold are not always covered, exposing the food to dust and flies. The drinking water used to make food, sold and consumed by students, is often not guaranteed.^{12,3} All these factors increase the risk of children's exposure to foodborne infections in schools, whereas this institution must receive children in the best conditions of safety, hygiene and well-being.¹⁰

In this regard, a study conducted in Ghana showed that 90% of students suffered from diarrhoea during the 2007 academic year, following the ingestion of contaminated food at school.¹³ These diseases can manifest themselves as diarrhoea in 70% of cases.¹⁴ Foodborne diseases and common foodborne illness are therefore today real public health

Table 1: Diseases observed among students after eating at their colleges in Dangbo in 2018 (n = 318).

Diseases	Numbers	Percentages
- None of them	00	0.0
- Diarrhoea	196	61.6
- Cholera	06	1.9
- Malaria	36	11.3
- Typhoid	35	11.1
- Stomaches	44	13.8
- Migraine	01	0.3

Table 2: Frequency of occurrence of Foodborne Illnesses and Collective Foodborne Illnesses among Dangbo students in 2018 (n = 318).

Terms and conditions	Numbers	Percentages
- Never	43	13.5
- An irregular basis	244	76.7
- A regular basis	31	9.7
Total	318	100.0

problems¹⁵ with potentially serious consequences, especially for children.¹⁶ Therefore, the consequence that any foodborne infections may have in them may have adverse health consequences or simply lead to death.¹⁷

Clearly, diarrhoea can have lethal consequences for children. It is considered to be one of the leading causes of infant mortality.¹⁸ It has become a major public health problem, accounting for 4.3% of all deaths worldwide.¹⁹ According to the World Health Organization (WHO), more than 1.8 million people died in 2005 from diarrhoea as a result of eating infected food and water.²⁰ Diarrhoea is thus the main public health problem in the countries of the South¹⁸ and one of the leading causes of morbidity and mortality among children in these countries.²¹

In addition, the most common symptoms in cases of foodborne infections are diarrhoea, vomiting and fever.³ Despite the cases of consultations related to Foodborne Diseases and Collective Foodborne Infections, populations who feel they know how to treat these diseases prefer self-medication²² to medical follow-up. Diarrhoea is usually caused by foodborne pathogens,²³ which can lead to intestinal diseases or extra-intestinal infections.²⁴ Although the frequency and mortality rate of these diseases is high, diarrhoeal diseases and the deaths they cause are preventable.²⁵

Innovations and applications

This research identified diarrhoea as the most frequent foodborne infection in rural Benin, more specifically in Dangbo, as the most common foodborne infection in schools. It appears necessary to promote good food hygiene practices among at-risk populations and more particularly among students²⁶ in order to limit the risks related to the occurrence of this disease. Health education actions will promote good behaviours among these students in order to reduce the level of risk of exposure to food-borne infections. Future work in this direction should highlight the behavioural and environmental factors related to the occurrence of diarrhoea. Ultimately, this work will be a basis for developing an effective communication strategy that can improve the levels of knowledge, attitude, perception, beliefs and practices in food hygiene among these students so that they can have a positive impact on their communities.

CONCLUSION

This study aims to determine the most common foodborne infections among middle school students in Dangbo commune in Benin. The results showed that these food infections occurred on an irregular basis in 244 (76.7%) and 31 (9.7%) of the students surveyed and are mainly manifested as diarrhoea, thus confirming the initial hypothesis. It is therefore important to diagnose the environmental and behavioural factors associated with diarrhoea. Strengthening good food hygiene practices should be considered to reduce the occurrence of diarrhoeal diseases in this student population.

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CONFLICT OF INTEREST

None.

ABBREVIATIONS

CEG: Colleges of General Education; WHO: World Health Organization.

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