

Hygiene Education and Success for Resident Students in Cabins on the Natitingou University Campus in the Republic of Benin

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Abstract: *Hygiene education plays an essential role in ensuring a healthy university environment conducive to academic success. This study examines the impact of hygiene conditions on the academic performance of students living in cubicles on the campus of the University of Natitingou in Benin. A mixed-methods approach was used, involving surveys, interviews and observations. The results reveal significant health problems, including a high prevalence of diseases such as malaria and respiratory infections, which adversely affect students' academic performance. The study highlights the need for strong hygiene education and improved campus sanitation to improve student performance.*

Keywords: hygiene education, student health, academic performance, university sanitation, Natitingou campus

1. Introduction

Higher education remains a stimulating place to learn, and an environment conducive to changing attitudes. For this reason, hygiene in the university environment is a decisive factor contributing to the health of all its users and, above all, to the academic success of students. It serves as an essential motivator for students, encouraging them to persevere and succeed despite challenges. In other words, it enables students to fully enjoy their right to education by preventing the onset of certain illnesses that could prevent them from following their training normally.

The hygiene of a residence requires particular attention to the indicators on which its ownership, sanitation and environmental quality depend. But these are often given little attention. In university halls of residence, hygiene sometimes leaves much to be desired, while the poor quality of hygiene has a detrimental effect on student health and success (Institut national de santé publique, 2002). In fact, most student residences in our universities have no hygiene and sanitation services at all. The provision of these adapted services prevents students from infections linked to lack of hygiene, and helps them to achieve their ambitions.

Hygiene covers many social, mental, emotional aspects linked to the way we live, environmental pollution, lack of cleanliness especially in the university environment, leading to many diseases that remain a concern in society. Poor hygiene leads to illness and sometimes death, for many learners and people advanced in age (WHO/UNICEF, 2012). For this reason, hygiene education requires the intention to change behavior, since there is only a transition from intention to action when people have the appropriate hygiene facilities and equipment.

Unfortunately, the implementation of hygiene education on university campuses is open to question. The campuses have no operating component to represent activities aimed at improving conditions at the university. These conditions do not encourage university staff and students to adopt behaviors

that help prevent diseases linked to lack of hygiene. Yet the lack of hygiene in university residences undermines students' right to a quality education. Students are unable to achieve their full learning potential because the hygienic conditions are not in place for training to take place in a healthy environment (Bocovo et al., 2023). After the family, the university is the most important place for students (UNICEF, 1998). But the sanitary facilities available at university are hardly conducive to good learning conditions. These places often lack the hygiene services and sanitary facilities that would enable students to regain their independence and enjoyment of learning.

The problems encountered by students in university residences give rise to the following research question: how can hygiene problems hinder the success of resident students in university cabins on the Natitingou campus in the Republic of Benin?

In response to this concern, the aim of this study is to help improve the academic performance of resident students by eliminating the hygiene-related risk factors that prevent them from fully enjoying their right to education.

Specifically, this study aims to:

- Identify the hygiene-related risk factors that prevent students from enjoying their right to education;
- Evaluate the effects of poor hygiene on students' academic performance;
- Propose strategies to reduce the occurrence of hygiene-related risks that prevent students from enjoying their right to education.
- To achieve our objectives, the following questions, guided us throughout this study. They are:
- what are the risk factors, linked to poor hygiene, that prevent students from fully enjoying their right to education?
- what are the effects of poor hygiene management on students' academic performance?
- what strategies can be used to limit the occurrence of hygiene-related risks that prevent students from enjoying their right to education?

To this end, our hypotheses are:

Volume 14 Issue 1, January 2025

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

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- Disease, malnutrition and poor housing conditions are hygiene-related factors that prevent students from properly enjoying their right to education;
- Poor hygiene at university has a negative impact on students' academic performance;
- Hygiene education helps to reduce the occurrence of certain hygiene-related risks that prevent students from enjoying their right to education.
- To achieve this, the following phase describes the methodology adopted to carry out the research work.

2. Methodological Approach

This research was carried out on the Natitingou university campus, home to the Ecole Normale Supérieure (ENS) and the Faculté des Sciences et Techniques (FAST). The Natitingou university campus is under the supervision of the National University of Science, Technology, Engineering and Mathematics (UNSTIM) in Abomey. It is located in the Atacora department in the northwest of the Republic of Benin (INSAE, 2013). In 2022, the campus welcomed 1,526 students, including 1,146 from FAST and 380 from ENS (Scolarité FAST et ENS de Natitingou, 2024). The target population for this research is all students on the Natitingou university campus. These are mainly resident students and, secondarily, university staff, including campus infirmary staff.

This research is part of a mixed (quantitative and qualitative) approach to analyze the link between hygiene and the success of resident students in cabins on the Natitingou Campus. This research combines investigative tools such as documentary research, observation, questionnaire administration and individual semi-structured interviews.

For data collection, in addition to documentary research, we observed student accommodation (cabins), their surroundings and common areas, to see if hygienic conditions were met.

We also administered a semi-open questionnaire, via whatsapp forums, to 90 student volunteers, around half of whom live in cabins, to find out about their accommodation conditions and prospects for improving their living and studying conditions. The size of the sample of learners to be surveyed on this campus is calculated using Javeau's 20% formula, which states that "the sample may present 20% or more of the parent population, i.e. one fifth" (Javeau, 1982, p.46). Applying this formula, we used more than 20% for the selection of students in general (90 students for 1526 enrolees) and boarding students in particular (45 students for the 200 residents).

To complete our data, we carried out individual face-to-face interviews with 05 people, including 02 teachers in charge of school services and 03 staff from the university campus infirmary and social services. The purpose of these interviews was to gather information on student enrolment, cabin management, infirmary attendance rates and recurrent illnesses faced by students.

The data collected was manually processed and analyzed. Qualitative data and observations were transcribed and analyzed (content analysis).

3. Presentation and Analysis of Results

In this section, we present and analyze the results obtained on the basis of the data collected in the field.

3.1 Data from staff interviews

Data relating to enrolment figures, cabin management, infirmary attendance rates and recurrent illnesses faced by students.

Table 1: Statistics on student use of the Natitingou campus infirmary

Year	Statistics on students treated in the infirmary				Total workforce
	Internal		External		
	Workforce	Rates	Workforce	Rates	
2020	81	47,71%	08	52,29%	589
2021	227	34%	440	66%	667
2022	149	34%	289	66%	438
Total	657	38,78%	1037	61,22%	1694

Source: Natitingou university infirmary, 2024

The data compiled in Table 01 show that 38.78% of all students attending the infirmary on the Natitingou campus are internal students, compared with 61.22% external students.

Table 2: Number of students on the Natitingou university campus

Year	Number of students at the Natitingou university campus		
	FAST	ENS	Total
2020	1277	431	1708
2021	1172	349	1521
2022	1146	380	1526
Total	3595	1160	4755

Source: FAST and ENS Natitingou, 2024

The data compiled in table 02 show that in 2022, 1,526 students were enrolled in establishments on the Natitingou university campus, including 1,146 at FAST and 380 at ENS. If 438 students visited the infirmary in 2022 (cf. table 01), this implies that 28.70% of students were ill during the year, i.e. more than 1/4 of the total number of registered students. For a university striving for excellence, the number of students who fell ill during the year seems high, and is not without consequences for their academic performance.

Of the 438 students who visited the infirmary in 2022, 149 were boarders. The capacity of the cubicles is 200, which means that 74.50% of students are interns, compared with 15.76% externs [209/(1526-200)]. We can deduce that the proportion of resident students (interns) who fell ill during the reference year is very high compared with the proportion of external students (74.50% vs. 15.76%).

Table 3: Statistics on illnesses recorded at the Natitingou campus infirmary

Pathologies	Statistics on illnesses recorded at the Natitingou campus infirmary						Total	
	2020		2021		2022		Workforce	Taux (%)
	Workforce	Rates (%)	Workforce	Rates (%)	Workforce	Rates (%)		
Malaria	249	42,27	206	30,88	137	31,93	592	34,95
Intestinal parasitosis	86	14,60	126	19,89	99	23,07	311	18,35
Respiratory infections	131	22,24	191	28,63	89	20,74	411	24,26
STI	69	11,74	76	11,39	46	10,72	191	11,27
Dermatitis	7	1,74	10	1,49	08	1,86	25	1,46
Conjunctivitis	5	0,84	5	0,74	7	1,63	17	1
Trauma	5	0,84	7	1,04	3	0,69	15	0,89
Hepatitis	3	0,50	4	0,59	1	0,23	09	0,53
Other	34	57,72	42	6,65	48	10,95	123	7,26
Total	589	100	667	38,78	438	61,22	1694	100

Source: Natitingou university campus infirmary, 2024

The data compiled in Table 03 show that students visit the infirmary because of several illnesses, the most recurrent being malaria (34.95%), followed by respiratory infections (24.26%), intestinal parasitosis (18.35%) and STIs (11.27%). These various recurring illnesses are not conducive to quality training for students, and hinder their success. They are a source of inappetence to learning, dropping out, failure, absenteeism, etc. among students. The impact of the health factor on the quality of training and student success is well established. In fact, the lack of maintenance of sanitary facilities, cabins and common areas is one of the consequences of students' state of health.

3.2 Data from student questionnaires

The results obtained show that the people surveyed have a divergent perception of hygiene in the residences on the Natitingou university campus, as shown in the graph below:

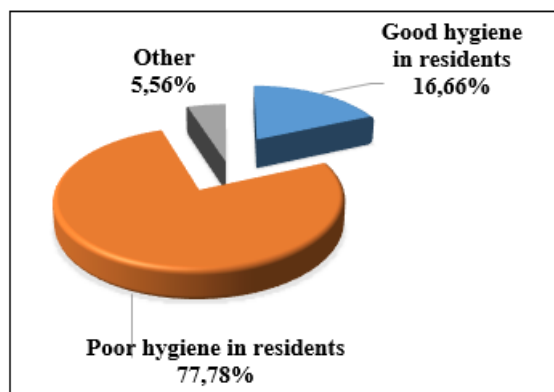


Figure 1: Respondents' perception of cabin cleanliness

The data in this graph show that the majority of respondents (77.78%) felt that the residences were subject to poor hygiene. Only 16.66% of those surveyed felt that good hygiene prevailed in the halls of residence, and 5.56% were indifferent or felt that hygiene conditions were more or less good in the halls of residence.

In response to the question “What are the causes of the lack of hygiene?”, 97.78% of those surveyed said that the absence of a hygiene and sanitation service in the halls of residence was the cause of the lack of hygiene, the consequences of which are the various illnesses suffered by students living in the halls of residence. Added to this are hygiene problems

linked to the quality of catering. Indeed, while 48% of the students surveyed (just under half) acknowledged that the meals served in the university dining halls were of good quality, 52% of those surveyed felt that the meals were not always of good quality, or were poorly cooked. This can lead to indigestion or stomach upsets.

Data from the student questionnaire also showed that all respondents had been ill at least once during their university career: 77.78% were sometimes ill and 22.22% often ill. Similarly, all respondents acknowledged having suffered from malaria and 16.67% from respiratory infections.

As for the influence of illness on learners' academic progress, 66.67% of respondents said that illness often (16.67%) or sometimes (50%) disrupted their exams or course attendance. Also, 47.76% of respondents (i.e. less than half) said they always slept under mosquito nets, compared with 52.24% who never (35.57%) or not often (16.67%) slept under mosquito nets. The fact that more than half of those surveyed do not sleep under a mosquito net is a factor that justifies malaria being at the top of the list of the most recurrent illnesses for which students go to the infirmary for consultations.

We can deduce from all the above that poor living and accommodation conditions for resident students are the main causes of illnesses from which they suffer and which prevent them from enjoying their right to education.

3.3 Observation data

Field observation shows that the sanitary blocks and equipment, as well as the common areas and surroundings of the residences, are poorly maintained. In addition, access to the campuses by local residents and animals has not been completed.

3.3.1. Poor maintenance of blocks and sanitary facilities

Observation data show that sanitary facilities are dysfunctional and poorly maintained (see Plate 1).



Plate 1: Sanitary facilities in poor working order or poorly maintained

Source: Photographs taken on the eve of toilet maintenance by the university administration, S. N. HOUEHA, 2024

The photos compiled on Plate 1 show that the floors of toilets, hand-washing facilities, urinals and showers are very poorly maintained, if at all. Some urinals are out of order (photo 6), and some hand-washing facilities are inoperative or malfunctioning (photos 1 and 5). This makes it difficult to wash hands systematically. In some toilets (e.g. in residence A), the flush mechanism doesn't work at all, and the mechanism sometimes ends up outside the fixture or on the floor (photo 2). This means that buckets of water are needed to flush out faecal matter after each use of the toilet. Students often neglect to do this, or do it carelessly. What's more, toilet bowls or pots are often not well maintained. All this leaves a crust of faecal matter in these toilet bowls (3), with the release of unpleasant odours.

3.3.2. Poor maintenance of communal areas and surroundings

Observation data show that the surroundings of the residences are poorly maintained, with piles of garbage and water flasks close to the dwellings (see Plate 2).



Plate 2: Common areas and surroundings of unfit residences
Source: Photo shoot, S. N. HOUEHA, 2024

The photos on Plate 2 show the existence of uncontrolled rubbish dumps in the vicinity of buildings housing resident students (photos 1 and 2). Although some garbage comes from the wind and run-off water, the origin of these dumps is the work of students who dump garbage near university residences. Photos 4, 5 and 6 on Plate 2 show that it's in this unsanitary environment that resident students set up their households to do the washing, the dishes and the cooking.

In addition to the piles of garbage, pockets of stagnant water can be seen between dormitories A and B, concealed by a few bricks or pebbles (photo 3). Due to a faulty water tap, these flasks of stagnant water are favourable sites for the production of mosquito larvae, which later give rise to the mosquitoes responsible for malaria.

3.3.3. Access to campuses by local residents and animals due to unfinished fencing

The Natitingou university campus is not fully fenced. As a result, the campus courtyard is frequently crossed by local residents to access their homes, and animals, either alone or in herds, wander through (Plate 3).



Plate 3: Animals roaming the campus
Source: Photo shoot, S. N. HOUEHA, 2024

The photos on Plate 3 show the presence of animals, particularly goats, roaming around the university campus residences. In addition to being a nuisance, these animals often graze on the university campus, whose fencing has not yet been fully completed, further polluting the site by leaving behind faecal matter. What's more, the lack of fencing means that the wind and run-off water carry plastic bags and paper, further soiling the grounds of the university center, particularly around the halls of residence (photo 2). However, this form of pollution is also caused by students returning from the city with their shopping packed in plastic bags, which they throw away near their residences after using up the contents. It should also be pointed out that the lack of fencing makes it easier for local residents to access and cross the campus. The latter access the campus for a variety of reasons, including the search for running water or shortcuts to reach their homes as quickly as possible.

4. Discussion

Analysis of the survey data showed that on the Natitingou university campus, students live in accommodation where the communal areas and surroundings, as well as the sanitary blocks and facilities, are poorly maintained, with water flasks and garbage in the vicinity of the residences; toilets, urinals and hand-washing facilities are sometimes defective or even unsanitary. This lack of hygiene in the residences is a breeding ground for disease, and therefore has consequences for the health of the resident students. J. A. Listorti and F. M. Doumani (2001), point out that poor environmental hygiene contributes to health problems, in particular diarrheal diseases

and vector transmission such as malaria, schistosomiasis and dengue fever. Also, S. Wahba (2018), reminds us that poor waste management spreads diseases, increases respiratory problems due to open burning of garbage, kills animals and affects economic development.

We can therefore affirm that the lack of hygiene in university residences is a cause of the various illnesses suffered by resident students, with malaria (34.95%), respiratory infections (24.26%), intestinal parasitosis (18.35%) and STIs (11.27%) being the most recurrent. In addition, 52.24% (over half) of resident students do not sleep under a mosquito net. This exposes them more to the bites of mosquitoes responsible for malaria, and explains, on the one hand, why malaria comes top of the list of the most recurrent illnesses for which these students go for consultations at the university campus infirmary, and on the other, the fact that they have each been affected at least once by malaria during their stay in a university residence.

Based on these results, we can also say that the most recurrent illnesses for resident students, of which malaria is the most common, have non-cognitive consequences on education, such as school absenteeism (Brooker et al., 2000; Leighton & Foster, 1993). Above all, however, they have cognitive consequences in terms of limiting learners' academic performance. Indeed, Holding P. A. and Snow R. W. (2001) demonstrate that malaria has a negative impact on learner performance and learning, mainly through neurological disorders due to cerebral malaria. Fernando D. et al (2003 and 2006), estimate that repeated malaria infections and attacks have a significant negative effect on school performance. Thus, a child who has had more than 5 malaria attacks performs 15% less well in examinations than a child who has had less than 3 malaria attacks. The cognitive performance of children in endemic areas also declines as the number of malaria infections increases.

Analysis of the survey data also revealed that resident students prepare their food in an unhealthy environment, and 52% of those surveyed reported that some of the meals served to them in the university canteen are not always of good quality, or are not often properly cooked. For students, this is a source of illness, manifesting itself in the form of indigestion or gastric disorders. In fact, according to a study by the Centre intégré universitaire de santé et de services sociaux de la Mauricie-et-du-Centre-du-Québec, "a person may have become ill when hygiene measures are not respected (e.g., a sick person handling food), when food is poorly washed, cooked, preserved or stored, or when there is cross-contamination (e.g., using the same utensil to handle raw meat, once the meat is cooked)" [3].

In short, we can say that students living on the Natitingou university campus are housed and live in conditions marked by a lack of hygiene, which leads to the outbreak of a number of diseases, including malaria, respiratory infections, intestinal parasitosis and STIs. In addition, the occurrence of diseases linked to poor hygiene adversely affects the academic performance of resident students.

5. Suggestions

These suggestions are aimed at improving hygiene on the Natitingou university campus, in particular the living and accommodation conditions of resident students, and are addressed to the students themselves, as well as to the institutions in charge of education and university works.

5.1. For students

To prevent the outbreak of diseases linked to poor hygiene on campus, particularly in university residences, it would be worthwhile to include a hygiene education module in the student training program. It would also be interesting to organize Behavior Change Campaigns (BCC) on hygiene education for students in general, and resident students in particular. Teachers could play an important role in this hygiene education campaign by addressing this notion during their teaching. In this way, students will have sufficient information to protect themselves against the harmful consequences of poor hygiene on their health, with a view to optimizing their academic performance. Information to be disseminated as part of hygiene education could cover

- Personal hygiene (personal hygiene and cleanliness, clothing hygiene, food hygiene, rest and sleep);
- Vector and nuisance control;
- Setting up hygiene clubs.

5.2. For institutions in charge of education and university works

In order to ensure the hygiene of the campus, in particular university residences and their surroundings, it would be worthwhile taking measures to regulate the application of the hygiene law in universities. To this end, the institutions in charge of education, and in particular the Centre des Œuvres Universitaires et Sociales (COUS), must invest more in:

- The hygiene of the university campus and its environment (hygiene of classrooms, hygiene of dormitories, hygiene of sanitary facilities);
- Drinking water supply;
- Excreta and wastewater disposal;
- Solid waste disposal;
- Food hygiene, in particular, improving the quality of catering;
- Vector and nuisance control, by repairing water leaks and ensuring that resident students sleep under mosquito nets;
- Hygiene training or refresher courses for teachers;
- Complete the fencing of the campus to prevent access by local residents and animals;
- The creation of a hygiene and sanitation department;
- Support for the hygiene club.

6. Conclusion

Students, particularly those living in cabins on the Natitingou university campus, do not fully enjoy their right to education because of certain risk factors, including the occurrence of diseases such as malaria (34.95%), respiratory infections (24.26%), intestinal parasites (18.35%) and STIs (11.27%). The study showed that these illnesses are due to the poor accommodation and living conditions of resident students, and adversely affect their academic performance.

The study recommends the provision of hygiene education modules for students, and urges institutions in charge of education to take risk factors into account to enable students to fully enjoy their right to education.

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