

## Hand Hygiene Promotion and Education: Handwashing Practices with Soap and Water at the Félix Houphouët-Boigny University in the District of Abidjan (Ivory Coast)

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### Abstract

A study on the state of knowledge of handwashing with soap and water at Félix HOUPHOUËT-BOIGNY University, followed by awareness-raising on good practices was undertaken between 14 and 26 October 2019 to help guide the development of a programme to promote good hygiene practices. A survey form that included columns of variables such as name, age, gender, and function was used in conjunction with handwashing practice. A total of 2024 individuals, 478 (23.62%) of whom were female and 1546 (76.38%) male, participated in the survey. The study found that 5.04% of people (female and male) have good handwashing practices. The good practice of handwashing at the Félix HOUPHOUËT-BOIGNY University is less well known. However, the science faculties had good handwashing practice compared to students in other faculties. It would be advisable to increase awareness of good hygiene practices, particularly handwashing, in order to prevent infections.

**Keywords:** Promotion, Evaluation, Hygiene, Hand, University, Ivory Coast.

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### INTRODUCTION

Hygiene is defined as the set of individual or collective principles and practices aimed at preserving health [1]. It has played an important role, particularly in the prevention of infectious diseases for centuries, mainly in developed countries [2, 3]. However, the advent of vaccines and antibiotics may have led to a relaxation of individual attention to hygiene, especially hand hygiene [4, 5]. Nevertheless, the link between hand hygiene and the spread of disease has been established. Indeed, hands are real highways for microbes [6, 7]. They carry faecal germs from toilets or defecation sites to utensils, water and food [8]. Hands are man's grasping tool and are used to interact with his environment. This

external environment is populated by a diverse flora, but also by dirt and toxic elements. When they come into contact and are colonized by germs, the hands participate in carrying these germs, which are the basis of hand-borne pathologies.

In developing countries these diseases represent a huge burden [9]. They affect people who do not have access to basic sanitation and hygiene services [10, 11]. Indeed, a precarious environment is one of the causes of the spread of diseases [11]. These pathologies are often the cause of a high rate of absenteeism of pupils and students. This often leads to a drop in their academic performance [12].

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Hand hygiene remains the cornerstone to prevent these pathologies. It is the most effective general precaution in the prevention of infections [6, 13].

In Côte d'Ivoire, following the example of other developing countries, the rate of compliance with good hand hygiene practices is low in most cases [14] with very little data available on experiences [15].

At the University Félix HOUPHOUËT-BOIGNY, according to the activity report of the community-based health centre (Centre régional des oeuvres universitaire Abidjan 1), the presence of hand-borne diseases such as ascariasis, giardiasis, hookworm, typhoid fever are rampant [16]. In addition, several recent studies have shown the inadequacy of good hygiene practices, especially hand hygiene [17-19]. It is in a context of improvement of the inadequacies observed during these various studies that an information and awareness campaign was initiated in the context of Global Handwashing Day on 15 October 2019. This campaign falls within the framework of university health. It fills the gap on good hand hygiene practices in the university environment. Thus, the general objective of this study is to promote good hand hygiene practices in the university environment in order to contribute to the reduction of hand borne pathologies. To achieve this general objective 03 specific objectives are listed:

- Assess the level of knowledge of handwashing in the university environment;
- To determine the proportion of individuals who practice handwashing with soap and water correctly;
- Ensure the monitoring-evaluation of the hand hygiene practices of this population.

## METHODS

### Study Areas

The study was carried out at the University Félix HOUPHOUËT-BOIGNY. It is located between 5°20 and 5°38 North Latitude, 3°58 and 3°59 West Longitude (Fig-1). It represents the main university of Côte d'Ivoire. It has about 60,000 students [20]. Three sentinel sites were selected for mass sensitization (Fig-1). These sites concerned the main entrance of the university at the University Hospital Centre (CHU) of Cocody (S1), the main entrance of the university at the Police Academy (S2) and the esplanade of the Félix HOUPHOUËT-BOIGNY University (S3).

These choices were made with a view to raising mass awareness on a large scale throughout the entire study area, with priority being given to areas with a high concentration of individuals.

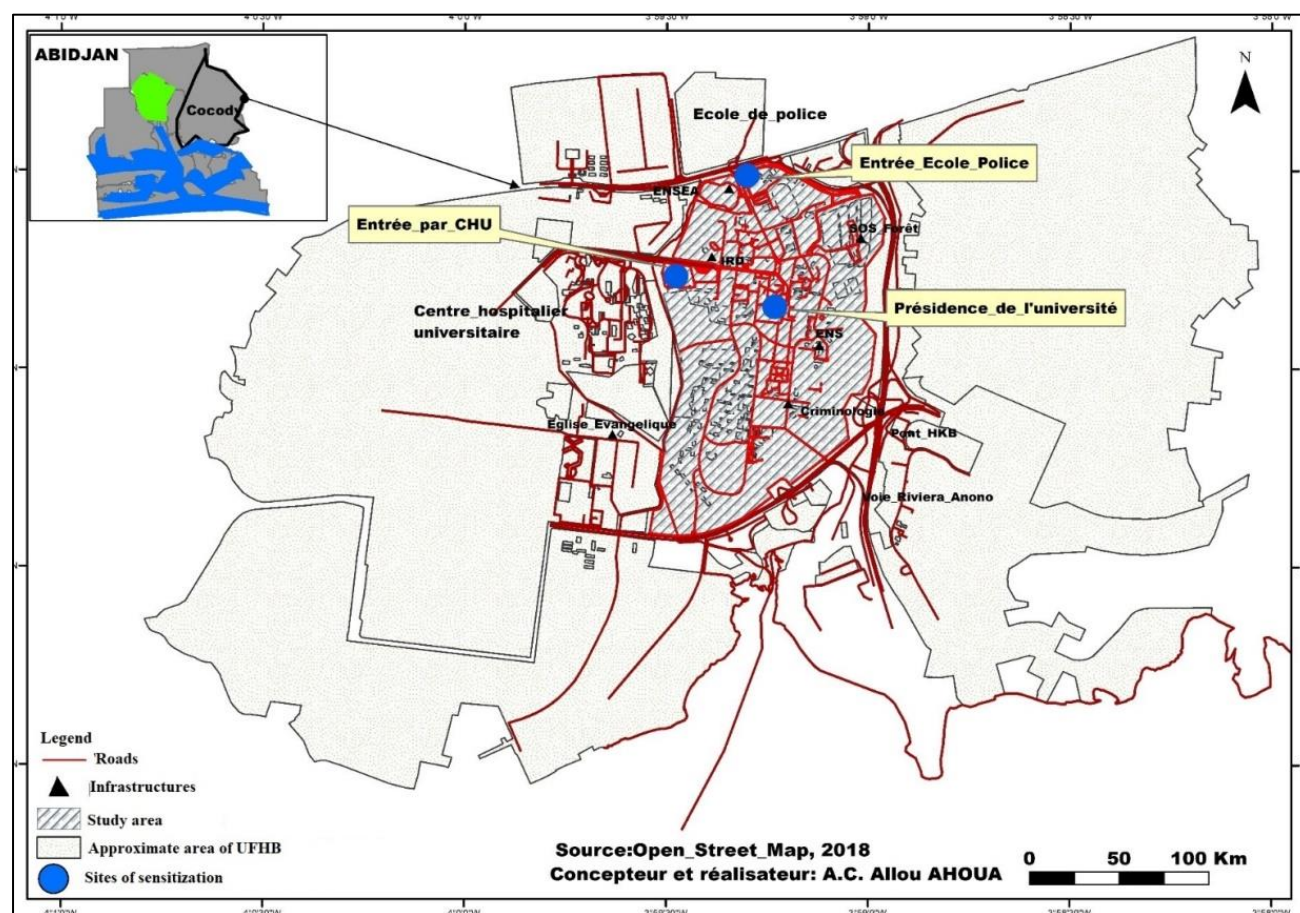


Fig-1: Location of Study Sites

## METHODOLOGY

For the implementation of this study, volunteers were trained on handwashing techniques with soap and water accompanied by an awareness message. The awareness-raising message was as follows: "As part of Global Handwashing Day (GHD), which takes place every 15 October, we invite you to wash your hands

regularly. Handwashing is a simple, life-saving gesture that can help prevent hand diseases such as Ascariidiosis, influenza and respiratory illnesses". At each site, two handwashing devices were displayed, individuals were approached and then invited to wash their hands with the awareness message. The approach initiated is spread out according to the methodology shown in Figure-2.

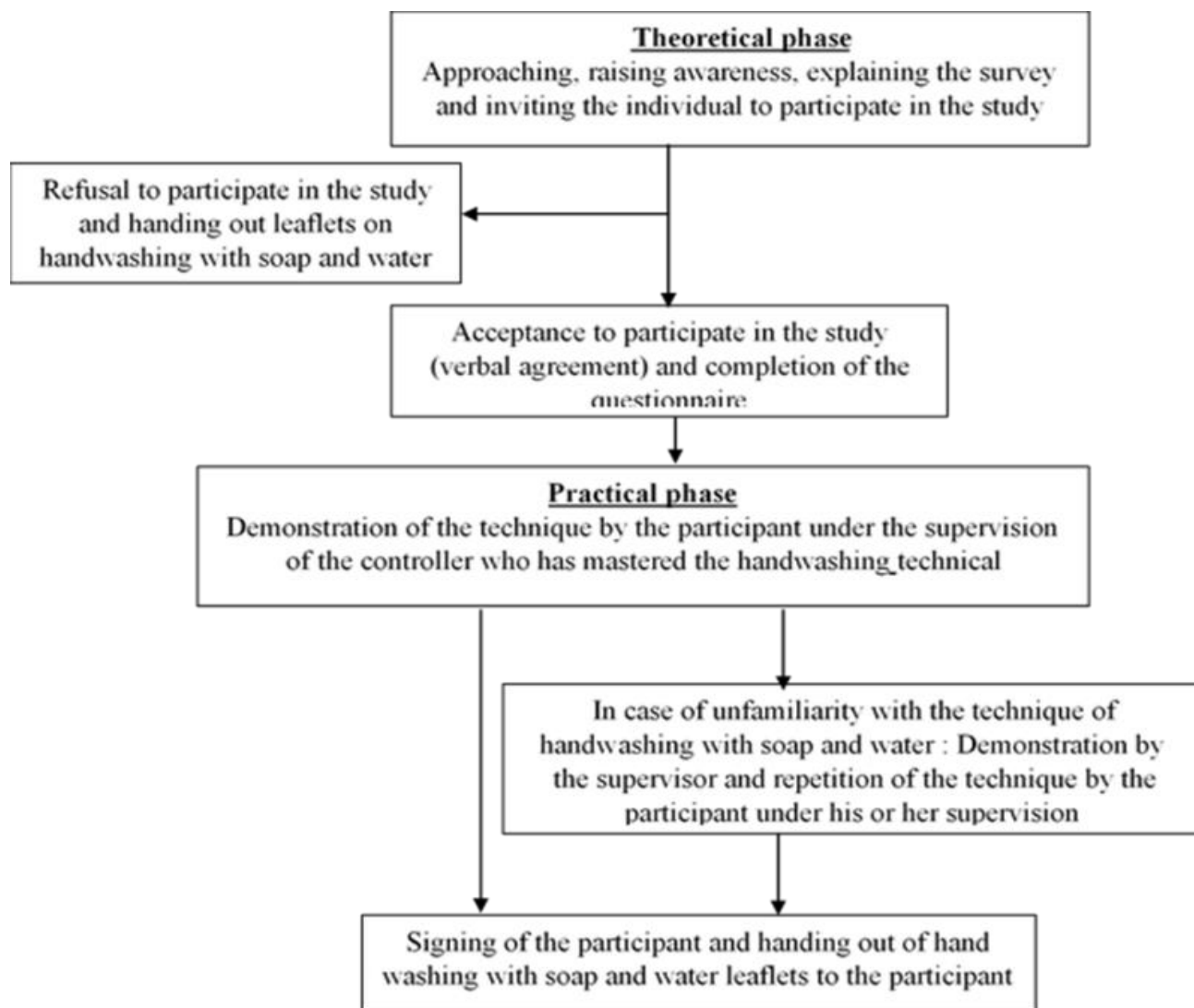


Fig-2: Awareness Methodology Flowchart

### Use of Data

Data entry was carried out using Excel software. A series of statistical analyses were applied to the data to assist in the interpretation of the results. This type of analysis was performed with R software version 3.3.3. The Chi-square test was used to compare the observed differences to measure the degree of significance of the frequency differences. P-value less than or equal to 0.05 was considered statistically significant. The map was produced with the ArGis 3.2 mapping software.

## RESULTS

### Characteristics of the survey population

At the site level, 6325 individuals were approached for outreach (Fig-3). Of these, 2024 participants were obtained, distributed as follows: 1780 students, 150 university staff, 82 users and 12 teacher-researchers. The majority of the participants were male (1546) and the age group from 21 to 30 was in the majority (Table-1).

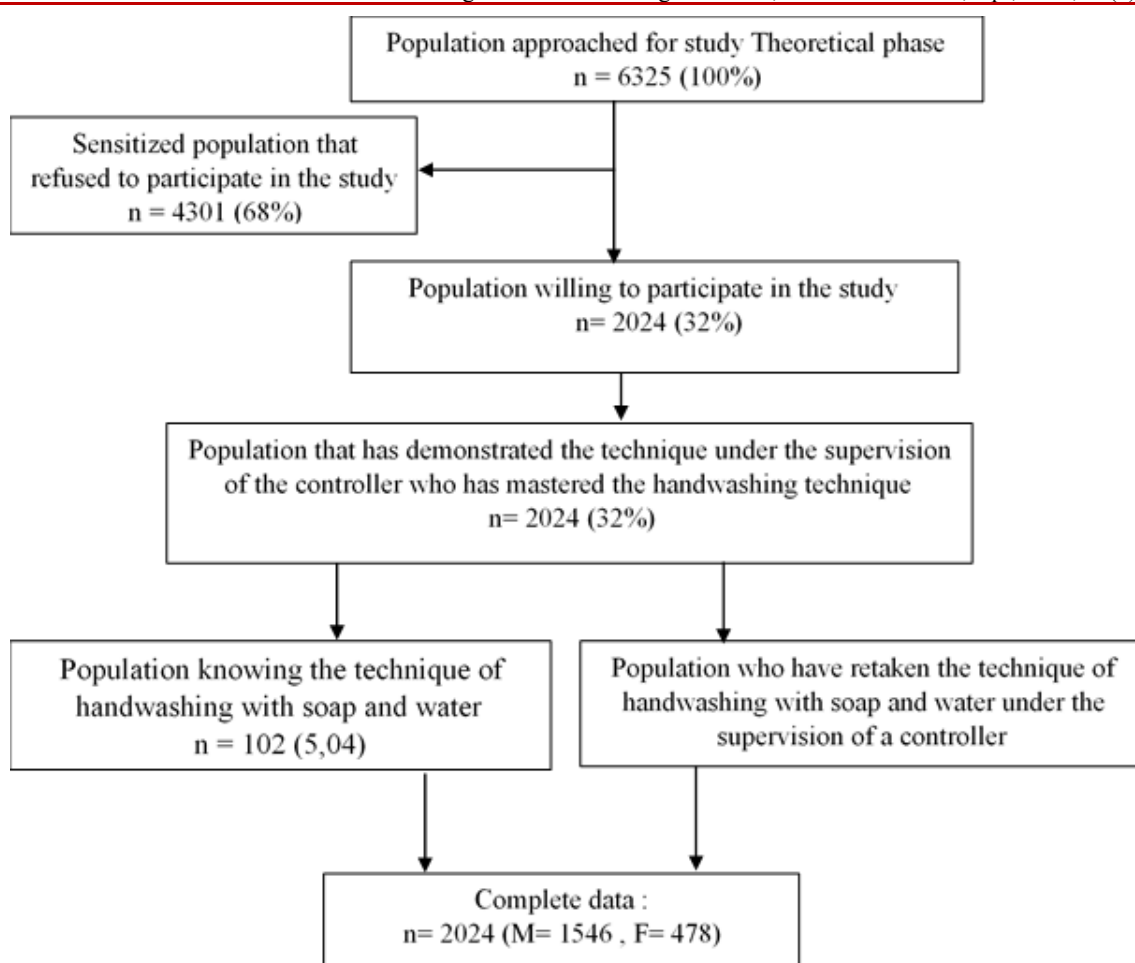


Fig-3: Distribution of the population involved in the study

Table-1: Characteristics of the study population

| Variables                     |   | Staff       | %            |
|-------------------------------|---|-------------|--------------|
| Sex                           | Female                                      | 478         | 23.62        |
|                               | Male  | 1546        | 76.38        |
| <b>Total</b>                  |   | <b>2024</b> | <b>100 %</b> |
| Unit of Training and Research | Languages Literature and Civilizations      | 567         | 28,01        |
|                               | Biosciences                                 | 328         | 16.20        |
|                               | Human and Social Sciences                   | 251         | 12.40        |
|                               | Computer Mathematics                        | 125         | 06.17        |
|                               | Administrative and Political Legal Sciences | 103         | 5.08         |
|                               | Economics and Management Sciences           | 81          | 4            |
|                               | Earth Sciences and Mining Research          | 79          | 3.90         |
|                               | Criminology                                 | 58          | 2.86         |
|                               | Structural Sciences and Technology          | 58          | 2.86         |
|                               | Institute of Art and Communication          | 28          | 1.38         |
|                               | Pharmaceutical and Biological Sciences      | 27          | 1.33         |
|                               | Odontostomatology                           | 17          | 0.83         |
|                               | Medical Sciences                            | 16          | 0.80         |
|                               | Musicology                                  | 01          | 0.05         |
|                               | Others                                      | 104         | 5.14         |
|                               | Not defined                                 | 181         | 8.94         |
| <b>Total</b>                  |   | <b>2024</b> | <b>100</b>   |
| Age group                     | 16 – 20                                     | 422         | 20.84        |
|                               | 21 – 30                                     | 1228        | 60.67        |
|                               | 31 – 40                                     | 160         | 7.90         |
|                               | 41 – 50                                     | 36          | 1.77         |

| Variables    |            | Staff       | %          |
|--------------|------------|-------------|------------|
| Occupation   | 50 et plus | 23          | 1.13       |
|              | Non défini | 155         | 7.65       |
|              | Students   | 1780        | 87.94      |
|              | Teachers   | 12          | 0.60       |
|              | Personal   | 150         | 07.41      |
|              | Others     | 82          | 4.05       |
| <b>Total</b> |            | <b>2024</b> | <b>100</b> |

**Knowledge of handwashing technique with soap and water**

Among 2024 individuals who agreed to the study, 1922 (94.96%) were not familiar with handwashing techniques. This knowledge of handwashing technique was assessed according to variables such as sex, age, training and research unit, and occupation.

**By Gender**

The handwashing with soap and water knowledge assessment survey was evaluated according to the gender of the individuals surveyed. No statistically significant difference was obtained between gender and handwashing knowledge ( $X^2 = 0.20902$ ,  $df = 1$ ,  $p\text{-value} = 0.647$ ) (Table-2).

**Table-2: Knowledge of handwashing technique according to gender**

| Variables    | N <sub>0</sub> | N <sub>1</sub> | Frequency (%) | P-value |       |
|--------------|----------------|----------------|---------------|---------|-------|
| Sex          | Female         | 478            | 26            | 23.62   | 0.647 |
|              | Male           | 1546           | 76            | 76.38   |       |
| <b>Total</b> | <b>2024</b>    |                | <b>100 %</b>  |         |       |

N<sub>0</sub>: Number of individuals surveyed

N<sub>1</sub>: Number of individuals knowing the handwashing technique

**According to age**

No significant difference ( $X^2 = 5.155$ ,  $df = 5$ ,  $p\text{-value} = 0.397$ ) was observed among individuals with

knowledge of handwashing with soap and water according to age group (Table-3).

**Table 3: Knowledge of handwashing with soap and water according to age**

| Variables    | N <sub>0</sub> | N <sub>1</sub> | Frequency (%) | P-value |       |
|--------------|----------------|----------------|---------------|---------|-------|
| Age group    | 16 – 20        | 422            | 16            | 03.79   | 0.397 |
|              | 21 – 30        | 1228           | 62            | 05.047  |       |
|              | 31 – 40        | 160            | 13            | 08.12   |       |
|              | 41 – 50        | 36             | 01            | 2.77    |       |
|              | 50 and more    | 23             | 01            | 4.34    |       |
|              | No defined     | 155            | 09            | 5.80    |       |
| <b>Total</b> | <b>2024</b>    | <b>102</b>     | <b>5.04</b>   |         |       |

N<sub>0</sub>: Number of individuals surveyed

N<sub>1</sub>: Number of individuals knowing the handwashing technique

**Depending on the Training and Research Units**

Awareness of handwashing was assessed in relation to training and research units and showed that

there was a statistically significant difference between handwashing awareness and training and research units ( $X^2 = 1233.8$ ,  $df = 17$ ,  $p\text{-value} = 0.00001$ ).

**Table-4: Knowledge of handwashing technique with soap and water in use training and research units**

| Variables                   | N <sub>0</sub> | N <sub>1</sub> | Frequency (%) | P-value |         |
|-----------------------------|----------------|----------------|---------------|---------|---------|
| Training and research units | LLC            | 567            | 01            | 00      | 0.00001 |
|                             | Biosciences    | 328            | 01            | 00      |         |
|                             | SHS            | 251            | 00            | 00      |         |
|                             | MI             | 125            | 00            | 00      |         |
|                             | SJAP           | 103            | 00            | 00      |         |
|                             | SEG            | 81             | 01            | 00      |         |
|                             | STRM           | 79             | 00            | 00      |         |
|                             | Criminologie   | 58             | 00            | 00      |         |
|                             | SSMT           | 58             | 00            | 00      |         |
|                             | ICA            | 28             | 00            | 00      |         |

| Variables         | N <sub>0</sub> | N <sub>1</sub> | Frequency (%) | P-value     |
|-------------------|----------------|----------------|---------------|-------------|
| SPB               | 27             | 27             | 1.3           |             |
| Odontostomatology | 17             | 17             | 0.8           |             |
| Medical Sciences  | 16             | 15             | 0.7           |             |
| Musicology        | 01             | 00             | 00            |             |
| Others            | 104            | 09             | 0.4           |             |
| Not defined       | 181            | 31             | 1.5           |             |
| <b>Total</b>      | <b>Total</b>   | <b>2024</b>    | <b>102</b>    | <b>5.04</b> |

N<sub>0</sub>: Number of individuals surveyed

N<sub>1</sub>: Number of individuals knowing the handwashing technique

SPB: Pharmaceutical and Biological Sciences, LLC: Languages, Literatures and Civilizations, SHS: Human and Social Sciences, MI: Computer Mathematics, SJAP: Administrative and Political Legal Sciences, SEG: Economics and Management Sciences.

### Depending on the Profession

The evaluation of handwashing technique according to occupation was assessed among the surveyed individuals and showed that there was a

statistically significant difference between occupation and handwashing knowledge ( $X^2 = 402.34$ ,  $df = 3$ ,  $p\text{-value} = 2.2e-16$ ) (Table-5).

**Table-5: Knowledge of Handwashing with Soap and Water and Occupation**

| Variables    | N <sub>2</sub> | N <sub>1</sub> | %  | P-value |                      |
|--------------|----------------|----------------|----|---------|----------------------|
| Occupation   | Students       | 1780           | 53 | 2.6     | 2.2 <sup>c</sup> -16 |
|              | Teachers       | 12             | 00 | 00      |                      |
|              | Personal       | 150            | 7  | 0.3     |                      |
|              | Others         | 82             | 42 | 2.1     |                      |
| <b>Total</b> | <b>2024</b>    | <b>102</b>     |    |         |                      |

N<sub>0</sub>: Number of individuals surveyed

N<sub>1</sub>: Number of individuals knowing the handwashing technique

## DISCUSSION

According to the World Health Organization [21, 22], hand hygiene is the cornerstone in the prevention of many infections, especially hand infections. This study is a pioneering study that has made it possible to take stock of good practices in handwashing with soap and water in universities. The survey on good handwashing practices showed firstly a low participation rate of 32%. Second, it showed that only 5.02% of individuals have a good knowledge of hand hygiene practice. Then; it was revealed that the practice was not gender related. Hand washing with soap and water has been considered a personal hygiene measure for centuries [21]. It helps to prevent infections, especially hand-to-mouth infections. Handwashing is the most effective way to prevent the transmission of infections. This conclusion has also been reached in studies conducted in daycare centres and schools, where people are in close contact and where objects are shared. Handwashing, done in the right way at the right time, contributes to a decrease in the transmission of infections [23]. WASH programmes have been successful in improving sanitation in learning institutions, handwashing facilities and hygiene behaviours of individuals. The community-wide WASH programme has demonstrated its performance in reducing open defecation practices and reducing handborne diseases such as parasitosis [24, 25]. The poor handwashing practice observed in the survey could be a cause of disease spread because according to WHO, it is one of

the main causes of transmission of these mostly hand-borne diseases [26]. The 32% participation rate observed for all study procedures (filling out questionnaires and demonstrating handwashing technique) could be explained by the lack of trained volunteers included in the study.

## LIMITATIONS OF THE STUDY

The study had limitations in that the number of trained individuals included was insufficient. This did not allow for enough individuals to be approached. The number of hygiene devices was insufficient compared to the university population and a water supply problem was reported.

## CONCLUSION

The study found that most of the individuals surveyed were not familiar with handwashing techniques. It showed that 5.04% of the individuals surveyed are aware of the handwashing technique. These results of the evaluation activities are of concern regarding the ignorance of hand hygiene practice at the Félix HOUPOUET-BOIGNY University on the part of students and university staff. This awareness campaign has helped to sensitize more than sixty thousand people on hand hygiene and to strengthen the capacities of 1922 people. It would therefore be interesting to perpetuate this awareness in the long term in order to inculcate good hand hygiene practices to this student population.

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