



(RESEARCH ARTICLE)



Assessment of stress levels among students in the biosciences department at Felix houpouet-boigny university in Abidjan (Côte d'Ivoire)

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Abstract

Stress poses a real threat to human health and well-being. In academia, in particular, it manifests itself in different ways through the reactions and actions of those involved in the field, namely students and their performance. Our study is therefore aims to assess the prevalence of stress and these factors among bioscience students. Stress levels are measured and monitored according to several evolutionary axes. In terms of socio-demographic characteristics, the majority of students are aged between 18 and 24. There is an almost equal distribution between the sexes, and most of students live outside the university campus. The fairly average prevalence of stress indicates that most of students experience a moderate stress level, with a slightly higher rates among women and those living off campus. Stress levels appear to be relatively similar across different fields of study, although first-year undergraduate and first-year Master's students are slightly more represented in the medium stress categories. Regarding stress factor, the results show that the level of stress related to academic training is significantly higher among first-year undergraduates and that those living outside the university campus also experience increased stress. When it comes to perceptions of career prospects, a majority of students report high levels of stress, particularly among women. These findings enable the implementation of an anti-stress approach both on and off campus, contributing to individual fulfilment and improved performane in studies.

Keywords: Stress; Student; Career opportunities; Academy; Evolution

1. Introduction

In Côte d'Ivoire, the recent increase in the number of students has presented a number of challenges. These challenges are primarily related to accommodation, education and career prospects. With regards to accommodation, it should be noted that students admitted to Félix University come from all over the country, and that the state is unable to meet all their requests for places in university halls of residence. Consequently, most of students end up staying with host families or tutors, where the conditions often make studying difficult. Indeed, it is not easy to find the necessary time or peace and quiet to study when living with a family. Added to this are the long hours spent waiting at bus stops to travel to and from lectures. Regarding education, the undergraduate curriculum is designed to provide students, on the one hand, with an initial overview of the various approaches within their discipline, and, on the other hand, with a broad-based education in fields related to their discipline. Before specialising in their chosen subdiscipline, students must therefore necessarily take and pass so-called « general' subjects » [1]. As a result, biosciences students generally have a very busy timetable. As exams approach, many students sleep in lecture theatres or certain practical classrooms in order

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to have the necessary time to revise and to stay calm. The issue of career prospects, this stems from the fact that most courses do not lead directly to a professional qualification. Consequently, after defending their research master's thesis, many students are not accepted onto a PhD programme. Left to their own devices after several years of study, when they are left to their own devices and facing pressure from increasingly impatient parents who are want to see a return on their investment, the period following the master's degree can be difficult. Given the difficulties that biosciences students during their studies and after graduation, it is reasonable to expect them to experience stress. This study was undertaken to test this hypothesis; according to Selye [2], stress is a non-specific response of the body to any demand placed upon it. This concept is commonly used in various fields, including social, academic and professional contexts [3]. Lazarus and Folkman define it as 'the imbalance between the demands placed on an individual and the resources available to them to cope with them'. It is therefore considered one of the most significant problems of our time, as it has serious repercussions on both individuals' mental health and the national economy [4]. The aim of this study is to assess stress levels among students in the Biosciences Department. This will be achieved by identifying their socio-demographic characteristics, evaluating their stress levels based on questionnaire scores, and determining the predominant stress factors.

2. Material and methods

2.1. Material

Our study focuses on students enrolled at the Faculty of Biosciences at Félix Houphouët-Boigny University. This is a higher education institution specialising in the life sciences. Founded in 1958, it offers high-level courses in subjects such as biology, biochemistry, genetics and microbiology. The students who were approached at random at the UFR Biosciences were there for lectures, exams, administrative procedures, revision, etc., and had voluntarily agreed to complete the questionnaire. The research tool used was a 24-question questionnaire relating to the selected stress factors. This questionnaire was therefore used to determine the students' stress levels and the stress factor with the highest score based on the results obtained from their answers. The questionnaire thus comprises two dimensions:

Firstly, the total stress score to assess stress levels for each year group:

- If the score is between 0 and 20: stress levels are low;
- If the score is between 21 and 39: stress levels are moderate;
- If the score is above 40: stress levels are high.

Secondly, the stress factors.

- To determine the highest stress factor in each course, we compared the scores for the three potential stress factors:

Score P: by adding up the marks obtained for the eight questions (1, 2, 3, 4, 5, 6, 7, 8).

- This score corresponds to factors related to academic training.

C score: by adding up the marks obtained for the eight questions (9, 10, 11, 12, 13, 14, 15, 16).

- This score corresponds to factors related to the perception of career prospects after the course.

-Score F: by adding up the marks obtained for the eight questions (17, 18, 19, 20, 21, 22, 23, 24). This score corresponds to factors related to the academic environment

2.2. Methods

The data presented in these documents were collected from students in the first, second and third years of their bachelor's degree, as well as those in the first and second years of their master's degree, at the Faculty of Biosciences. After explaining the purpose of the study, a questionnaire in French was distributed. Only those who were present on campus and available to complete the questionnaires were selected. The methodology used in this field survey is based on Karasek's method [5], and the study took place from 10 July to 10 August 2024. Students under the age of 18, students not enrolled in the Biosciences Department, and students who, although enrolled in Biosciences, did not fall into the categories described above were not included. The information previously collected on the survey forms was entered

and processed using XLSTAT 2021 software. Variables are expressed as percentages. Pearson's chi-square test was used to evaluate the variables against the theoretical figures. A p-value < 0.05 was considered statistically significant.

3. Results

3.1. Sociodemographic characteristics

The socio-demographic characteristics of our sample (Table 1) showed that the majority of respondents (86.88%) are aged between 18 and 24, suggesting that the sample consists mainly of young adults, likely students at the start of their university studies. Only 12.5% of individuals are aged between 25 and 34, whilst a very small proportion (0.63%) are over 35. In terms of gender, the distribution is almost balanced, with 49.69% women and 50.31% men. A large majority of participants (88.13%) live outside the university halls of residence, whilst only 11.88% reside in halls of residence. The distribution of study levels shows that 33.44% of participants are in their first year of a Bachelor's degree and represent the largest group. Students in the first year of a Master's degree (26.88%) and in the second year of a Bachelor's degree (17.50%) follow, whilst students in the third year of a Bachelor's degree (5.31%) and in the second year of a Master's degree (16.88%) are fewer in number.

Table 1 Sociodemographic characteristics

Socio-demographic characteristics	n	%
Age group		
<i>Aged 18 to 24</i>	278	86.88
<i>Aged 25 to 34</i>	40	12.50
<i>Aged 35 and over</i>	2	0.63
Sex		
<i>Woman</i>	159	49.69
<i>Man</i>	161	50.31
Place of residence		
<i>On campus</i>	38	11.88
<i>Outside the university campus</i>	282	88.13
Level of study		
<i>Licence 1</i>	107	33.44
<i>Licence 2</i>	56	17.50
<i>Licence 3</i>	17	5.31
<i>Master 1</i>	86	26.88
<i>Master 2</i>	54	16.88
Total	320	100

3.2. Assessment of stress levels

The overall assessment of students' stress levels revealed that 83.75% of students experience moderate stress and 9.69% experience high stress. The analysis of stress levels based on socio-demographic data showed that women had a moderate stress level of 42.81%, compared with 40.94% among men. As regards high stress levels, the rate was higher among men (5.63%) than among women (4.06%). The p-value associated with this comparison is 0.507; therefore, there is no statistically significant difference between the stress levels of men and women. As for students living outside the university campus, they exhibit a higher average stress level (74.06%) than those living on campus (9.69%). Our results also indicate that, amongst certain students, high stress levels are more prevalent amongst those living outside the university halls of residence (8.75% versus 0.94%). The p-value is 0.522, indicating that there is no significant difference in stress levels based on place of residence. Finally, regarding year of study, first-year undergraduates have

the highest percentage of average stress levels (27.50%). The p-value is 0.340, indicating that there is no significant difference in stress levels based on year of study (Table 2).

Table 2 Overall stress levels by sociodemographic characteristics

Sociodemographic characteristics	Overall stress level						
	Low		Medium		High		Chi ² / Fisher exact
	n	%	n	%	n	%	p_value
Sex							
Woman	9	2.81	137	42.81	13	4.06	0.507
Man	12	3.75	131	40.94	18	5.63	
Place of residence							
University campus	4	1.25	31	9.69	3	0.94	0.522
Outside the university campus	17	5.31	237	74.06	28	8.75	
Level of study							
Licence 1	9	2.81	88	27.50	10	3.13	0.340
Licence 2	2	0.63	50	15.63	4	1.25	
Licence 3	1	0.31	14	4.38	2	0.63	
Master 1	2	0.63	73	22.81	11	3.44	
Master 2	7	2.19	43	13.44	4	1.25	
Total	21	6.56	268	83.75	31	9.69	

3.3. Determining the dominant stress factor

Analysis of our results revealed that the search for job opportunities is the dominant stress factor, with a score of 69.4. This is followed by environmental factors and training, with scores of 50.98 and 37.66 respectively (Table 3).

Table 3 Average scores for the various stress factors

Level of study	Stress factors		
	Training	Career opportunities	The environment
Licence 1	11.58	17.28	14.44
Licence 2	07.80	15.03	12.71
Licence 3	03.82	11	04.47
Master 1	08.24	12.22	10.64
Master 2	06.22	13.87	11.72
Total	37.66	69.4	50.98

3.4. Determining students' stress levels based on stress factors

With regard to academic stress, first-year undergraduate students are the most stressed, with an average stress level of 24.38% and a high stress level of 1.88%, with significant p-values (p = 0.006*), indicating that year of study could be an important factor in academic stress (Table 4).

In terms of perceptions of career prospects, first-year undergraduate and first-year Master's students recorded high stress rates of 17.19% and 17.5% respectively, with significant p-values ($p = 0.013$). This suggests that level of study may influence perceptions of career prospects (Table 5).

Regarding stress related to the students' physical environment, first-year Master's students exhibit the highest stress level (5.94%). However, first-year undergraduate students recorded an average stress level of 24.06%, with a significant p-value ($p = 0.016^*$). This indicates that level of study is an important factor in stress related to the academic environment (Table 6).

Table 4 Students' stress levels in relation to their academic studies

Level of study	Level of stress related to academic studies						
	Low		Medium		High		Khi ² / Fisher exact
	n	%	n	%	n	%	p-value
Licence 1	23	7.19	78	24.38	6	1.88	0.006*
Licence 2	21	6.56	31	9.69	4	1.25	
Licence 3	6	1.88	11	3.44		0.00	
Master 1	39	12.19	45	14.06	2	0.63	
Master 2	26	8.13	28	8.75		0.00	
Total	115	35.94	193	60.31	12	3.75	

Table 5 Students' stress levels according to their perception of career prospects

Level of study	Level of stress related to perceptions of career prospects after graduation						
	Low		Medium		High		Khi ² / Fisher exact
	n	%	n	%	N	%	p-value
Licence 1	8	2.50	44	13.75	55	17.19	0.013*
Licence 2	2	0.63	25	7.81	29	9.06	
Licence 3	2	0.63	5	1.56	10	3.13	
Master 1		0.00	30	9.38	56	17.50	
Master 2	2	0.63	25	7.81	27	8.44	
Total	14	4.38	129	40.31	177	55.31	

Table 6 Students' stress levels by academic environment

Level of study	Level of stress related to the academic environment						
	Low		Medium		High		Khi ² / Fisher exact
	n	%	n	%	n	%	p-value
Licence 1	14	4.38	77	24.06	16	5.00	0,016*
Licence 2	4	1.25	34	10.63	18	5.63	
Licence 3	2	0.63	11	3.44	4	1.25	
Master 1	10	3.13	57	17.81	19	5.94	
Master 2	11	3.44	41	12.81	2	0.63	
Total	41	12.81	220	68.75	59	18.44	

4. Discussion

Our study, entitled 'Assessment of stress levels among students in the Faculty of Biosciences at Félix Houphouët-Boigny University in Abidjan', aimed to determine the stress levels of biosciences students in relation to stressors such as accommodation, their studies and the university environment. The participants in this study were students from the first year of the Bachelor's degree to the second year of the Master's degree,

The sociodemographic data, which included participants' age, gender, place of residence and level of education, revealed that, in terms of age, the student population was predominantly young (86,88%), aged between 18 and 24. This trend is corroborated by several studies which highlight that the majority of university students fall within this age group, a fact often linked to the direct transition from secondary school to university [6]. With regard to gender distribution, the results indicate near-equality between men (50,31%) and women (49,69%). This parity is consistent with the observations of several researchers who note that student numbers in higher education tend to be approaching gender parity, although disparities remain in certain disciplines [7]. As for where they live, our study reveals that 88,13% of students live off-campus. This situation may have implications for their well-being and academic performance. According to a study by [8], students living outside university halls of residence may experience higher levels of stress due to the need to manage commuting and additional responsibilities, such as part-time work. With regard to year of study, the majority of participating students are in their first year of undergraduate study (33,44%). This distribution is representative of trends observed in higher education, where a large number of students begin their academic journey in their first year [9]. However, it is also important to note that only 5,31% of students are in the third year of their Bachelor's degree, which could indicate a dropout or repetition rate in previous years, a phenomenon often discussed in the academic literature [10],

The overall assessment of students' stress levels revealed that 83,75% experienced moderate stress while 9,69% experienced high stress. A similar study among medical students in Fez found that 11,3% of them experienced severe stress and 51,5% moderate stress; 11,4% of students reported that they were completely unable to concentrate, and 25,7% reported that they were dissatisfied with their general state of health; 58,3% of students had significant sleep difficulties, whilst 13,6% reported suffering from physical pain preventing them from carrying out the required tasks [11]. Our study population, which exhibits high levels of stress, may also experience disturbances in attention, sleep and general health,

The distribution of stress levels according to socio-demographic parameters showed that, in terms of gender, 42,81% of women and 40,94% of men had a moderate level of stress, whilst 4,06% of women and 5,63% of men had a high level of stress. These statistically similar results are consistent with the work of Misra and McKean [12], who found that gender differences in stress levels in an academic context are not always significant. However, other studies, such as that by [13], suggest that women may be more likely to report higher stress levels due to social and psychological factors. As for the analysis of stress levels by place of residence, 74,06% of students living off-campus reported an average stress level, compared with only 9,69% of students living on campus. Although this difference is not statistically significant, it could be linked to generally difficult family living conditions that do not allow for more time to be devoted to studies, and the daily difficulties of urban transport when travelling to and from lectures. Baker and Siryk [14], echoing this view, noted that students living outside the university halls of residence may experience social isolation, which can contribute to higher levels of stress. Similarly, Tinto [15] emphasised that social integration is crucial for academic success, and a lack of social support can exacerbate stress. Regarding the link between stress and level of study, first-year undergraduate and first-year postgraduate students have the highest rates of moderate and high stress levels. These are two levels, one at the start of the undergraduate cycle and the other at the start of the postgraduate cycle. The stress observed could be linked to motivation and/or fear of failure. These findings are consistent with those of Kuh *et al.*, [16], who showed that students at higher levels of study may feel increased pressure to succeed, which can lead to higher levels of stress. Perry *et al.*, [17] also noted that Master's students may experience concerns about their professional future, which can contribute to increased stress,

In response to the predominant level of stress, our study revealed that the search for career opportunities is the dominant stressor, with an average score of 69,4. Previous research has shown that uncertainty about one's professional future can be a major source of stress for students [18]. The analysis of stress according to stress factors showed, in terms of academic level, that first-year undergraduate students appear to experience higher levels of stress compared to students at other levels. This observation is supported by previous studies suggesting that first-year students often face adjustment challenges, which can increase their stress levels [19]. Regarding perceptions of career prospects, first-year undergraduate and first-year Master's students exhibit significantly high levels of stress. This finding confirms and identifies the primary cause of the stress experienced by first-year undergraduate and first-year Master's students when we explored the link between stress and level of study. This thus confirms the arguments of [16] Kul *et al.*, (2008) and

those of [17] Perry et al., (2001), With regard to the relationship between student stress and the environment, the results indicate that first-year Master's students, followed by first-year Bachelor's students, experience higher levels of moderate and high stress, In Biosciences, first-year Master's students specialise by joining the various laboratories within the Faculty, We also note the presence, within the student body, of students from different universities across the country, We therefore see a reshuffling of the student body in the first year of the Master's programme, All these factors could explain a sensitivity to the university environment similar to that of first-year Bachelor's students,

5. Conclusion

This study was undertaken to determine the level of stress experienced by biosciences students and the predominant stressors, The key finding is that 83,75% of students experience moderate stress while 9,69% experience high stress, This level of stress among students could lead to impaired concentration, sleep disturbances and a decline in the general health, The search for career opportunities remains the dominant stress factor, This is explained by uncertainty regarding these students' professional future, The year groups most affected by stress factors are first-year undergraduates and first-year postgraduates, As they are at the start of their degree programmes, they exhibit a greater fear of failure, A This fear that will certainly fade gradually,

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflict of interest,

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