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Influences of examination periods on the state of alertness of students at the Biosciences UFR of the Felix HOUPHOUET-BOIGNY University in Abidjan (Côte d'Ivoire)

Paterson Valery DISSEKA [1, 3, *], Emmanuel DIBOH [2], Kakou Luc GBALOU [3], Akissi Ruth KOFFI [3], N' dah Augustin KANGAH [3] and Léon GLIN [3]

[1] *Laboratory of Human Movement Sciences, Development and Well-Being, National Institute of Youth and Sports (INJS), Abidjan, Côte d'Ivoire.*
[2] *Animal Physiology Unit, UFR Environment, Jean Lorougnon Guédé University, Daloa, Côte d'Ivoire.*
[3] *UPR Neurosciences, Laboratory of Biology and Health, UFR Biosciences, Félix HOUPHOUET-BOIGNY University, Abidjan, Côte d'Ivoire.*

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Abstract

Introduction: University exam periods are marked by increased workload and pressure to perform, leading to changes in lifestyle habits. These changes can strongly affect the physiological and psychological state of students. Objective: This study examines the influence of exam periods on the state of vigilance of students at the UFR Biosciences of the Félix HOUPHOUËT-BOIGNY University of Abidjan (Côte d'Ivoire).

Methodology: A questionnaire survey was conducted among 100 students, including 50 during exam periods and 50 outside exam periods.

Results: The results reveal a significant reduction in sleep duration during exams (5.54 ± 1.33 hours compared to 8.50 ± 1.64 hours during normal periods) and an increase in revision time (4.38 ± 1.85 hours versus 2 ± 0.88 hours). The alertness index decreased significantly during exams (0.95 ± 0.20 versus 1.67 ± 0.26). However, neither the number of examinations per day, nor the timing of revisions, nor their duration have a significant impact on vigilance. Thesis results suggest that exam periods negatively affect students ' alertness, mainly due to changes in sleep and study habits.

Conclusion: This study highlights the importance of a balance between revision and rest to maintain optimal alertness during exams.

Keywords: Vigilance; University Exams; Sleep; Academic Stress; Côte d'Ivoire.

1. Introduction

Vigilance, defined as a state of readiness to detect and respond to changes in the environment [1,2], plays a crucial role in students ' academic performance. In the university context, this vigilance is particularly in demand during exam periods, when students are subjected to high levels of stress and pressure [3,4]. Although numerous studies have examined the effects of academic stress on students ' mental health [5,6,7], little research has specifically examined the impact of examination periods on university students ' state of alertness, particularly in the African context. The aim of this study is to explore the influences of examination periods on the state of alertness of students in the Biosciences UFR at the Université Félix HOUPHOUËT-BOIGNY in Abidjan. By better understanding this relationship, it would be possible

* Corresponding author: Paterson Valery DISSEKA

to contribute to the development of more effective strategies to support students during thesis critical periods in their academic careers.

Vigilance is a complex physiological and psychological state involving several components of the central nervous system [8]. It is characterized by an optimal level of alertness, allowing sustained attention and effective reactivity to environmental stimuli. In the academic context, an adequate state of alertness is essential for learning, memorizing and exam performance [9,10].

Exam periods are particularly intense moments in the lives of university students. They are characterized by a significant increase in workload, increased pressure to perform and, often, changes in sleeping and eating habits [3]. Thesis factors can have a significant impact on the physiological and psychological state of students. Several studies have shown that exam stress can have a negative impact on students ' cognitive functions. For example, research by Vedhara et al [11] found that examination periods were associated with a 15.3% decrease in short- term memory performance in medical students. Similarly, Lund et al [12] found that the quality of sleep of university students deteriorated significantly, by 30.7%, during exam periods, which could have direct implications for their state of alertness.

However, it is important to note that the effects of exam periods on alertness can vary from one individual to another. Some students may experience hypervigilance due to exam anxiety [13], while others may suffer reduced alertness due to exhaustion and sleep deprivation [14].

In the African context, and more specifically in Côte d'Ivoire, few studies have specifically examined the impact of examination periods on the state of alertness of university students. Existing research has focused more on academic stress in general [6] or on the stress and disruption of academic examinations associated with student demonstrations, particularly those organized by the Fédération Estudiantine et Scolaire de Côte d'Ivoire (FESCI) [15,16]. This gap in the literature highlights the need to explore this issue in greater depth in the specific context of the Félix HOUPHOUËT-BOIGNY University in Abidjan.

Although existing research suggests a link between examination periods and various aspects of students ' cognitive and psychological functioning, there is still a lack of clear and specific understanding of the influence of examination periods on students ' state of alertness, particularly in the context of higher education in West Africa. This gap is all the most relevant to fill as alertness is a crucial factor in academic performance. Furthermore, studies conducted in other cultural and educational contexts cannot necessarily be generalized to the situation of students at the Biosciences UFR of the Université Félix HOUPHOUËT-BOIGNY in Abidjan. The specificities of the Ivorian education system, the particular conditions of study and the stress factors specific to this context could uniquely influences the state of vigilance of students during examination periods.

Thus, the central question of this research is the following: How do examination periods influence the state of alertness of students in the Biosciences UFR at the Université Félix HOUPHOUËT-BOIGNY in Abidjan?

The answer to this question would not only fill a major gap in the scientific literature, but would also provide valuable information for the development of support strategies tailored to the specific needs of these students. A better understanding of this relationship could lead to targeted interventions aimed at optimizing students ' state of alertness during exam periods, thus potentially helping to improve their academic performance and general well-being.

The main objective of this study is therefore to examine the influence of examination periods on the state of alertness of students at the Biosciences UFR of the Université Félix HOUPHOUËT-BOIGNY in Abidjan. Specifically, it aims to establish comparisons between students in composition periods and students in non-composition periods, through the analysis of sleep and revision time, and the state of alertness.

2. Materials and method

2.1. Materials

2.1.1. Subjects

The present study is based on a sample of 100 students (72 men and 28 women) enrolled in the first cycle (License) and second cycle (Master) of the Biosciences UFR at the Université Félix HOUPHOUET-BOIGNY in Abidjan-Cocody, Côte d'Ivoire. Thesis subjects were all at least 18 years old.

2.1.2. Technical equipment

For this study, the technical equipment consisted of a questionnaire for data collection and XLSTAT version 2021 software for statistics processing.

2.1.3. Data collection material: the questionnaire

The questionnaire used included four (04) parts. The first collects the socio-demographic characteristics of the subjects through five (05) variables: age, sex, place of residence and level of education. The second concerns the collection of information relating to the examination period through three (03) variables: the length of the examination period, the number of Elements Constituting Teaching Units (ECUE) scheduled for this period and the average number of ECUE scheduled per day. The third part looks at the amount of time spent sleeping and revising subjects. The fourth and final part of the questionnaire is a self -assessment test of vigilance (Thayer Vigilance Scale), designed by Thayer [17]. Thayer's activation theory is two-dimensional. The first dimension looks at the level of General Activation (GA) and the tendency to sleep (DS). The level of wakefulness is assessed through the GA/DS ratio. The second dimension relates to emotions associated with neurovegetative hyperactivation (HA) or hypoactivation (GD). The scale consists of a list of 20 adjectives for which the subject is asked to associate one of the following four (04) modalities: 'a lot', 'a little ', ' don't know' and 'not at all'.

2.1.4. Data processing equipment

The data were processed using the 2021 version of XLSTAT. This is a statistical analysis software package that can be integrated with Microsoft Excel in the form of a computer add-in. Within the framework of a statistic study, XLSTAT gives its users the advantage of carrying out all types of data processing (data entry, analyses, representations and statistical tests) using Microsoft Excel software, which is easy to access.

2.2. Method

The present work is a descriptive study which compares the state of alertness of subjects during the examination period with that of subjects (controls) who are not concerned by this period. The sample is essentially made up of 100 students enrolled in the Biosciences Department of the Université Félix HOUPHOUET-BOIGNY who gave their free and informed verbal consent to take part in the study.

2.2.1. Sample method

Subjects were recruited using a combination of two non- probabilistic sampling methods. The first method, that of convenience, was adopted because of the lack of access to the complete list of students enrolled at the Biosciences UFR. In order to ensure a more representative study population, the quota method was combined with the first method. Subjects were divided into two (02) categories depending on whether or not they were in exam period. The sample was then made up of 50 subjects in the examination period (35 men and 15 women) and 50 subjects not in the examination period (37 men and 13 women). With regard to their level of study, nine (09) subjects were enrolled in License 1, 39 in License 2, 13 in License 3, 34 in Master 1 and 5 in Master 2.

2.2.2. Data collection method

The data for this study were collected from students of the Biosciences UFR, met at the Université Félix HOUPHOUET-BOIGNY. For those who meets the participation criteria and whose consent to participate had been received, a copy of the questionnaire was given to them and collected a few hours later after completion. The investigators occasionally intervened, either directly or by telephone, to respond to certain concerns of the subjects. All the questionnaires distributed were filled in correctly and no major incident disrupted data collection.

2.2.3. Method of statistical data processing

The statistical processing of the data is carried out in two (02) stages. The first consists of describing the different analysis results through tables and histograms, and the second, of testing the significance of these results at the alpha threshold set at 0.05 ($\alpha = 0.05$). The significance of the differences between the proportions resulting from the intersection of the qualitative variable "subjects' situation" with each of the qualitative variables "bedtime" and "wake-up time" is analyzed through the Chi 2 proportion test. The significance of the results resulting from the intersection between the continuous variables (sleep duration, study duration and vigilance index) and the qualitative variables (subjects' situation, number of assessments/day and duration of revisions) is analyzed by the Student t test or its non-parametric equivalent, the Mann-Whitney test.

3. Results

Analysis of the examination period, the number of assessments scheduled during this period and revision times

Analysis of the examination period shows that it varies between seven (07) and 30 days, ie between one and four (04) weeks. The results then indicate that the majority of subjects in the exam period (n=17; 34%), write over 14 days. This was followed by a period of 10 days, which concerned 26% (n = 13) of subjects in examination periods. The 07-day period also accounted for a significant proportion, with 24%, ie 12 subjects (Table 1).

With regard to the number of ECUEs assessed per day, the results show that most subjects (n = 39; 78%) were subject to an average of two ECUEs per day. This proportion is significantly higher than the other categories, suggesting that most students have a relatively moderate examination timetable, focusing on two GCSEs per day. Secondly, 12% (n=6) of the subjects had only one ECUE per day. This configuration seems less frequent but is still remarkable. On the other hand, only 2 % of subjects (n=1) had three TUECs per day, while 8% (n=4) had four. It seems that the latter subjects have an extremely busy exam timetable (Table 2).

In terms of revision times, the results show that most subjects (n = 41; 82%) have a clear preference for night revision. This proportion is higher than that of subjects (n = 9; 18%) who opt for revision during the day (Table 3).

Table 1 Distribution of subjects according to examination period

Examination period (day)	Effective	Percentage
7	12	24%
9	5	10%
10	13	26%
14	17	34%
21	1	2%
30	2	4%
Total	50	100%

Table 2 Distribution of subjects according to the average number of examinations per day

Number of ECUE per day	Effective	Percentage
1	6	12%
2	39	78%
3	1	2%
4	4	8%
Total	50	100%

Table I Distribution of subjects according to the time of study

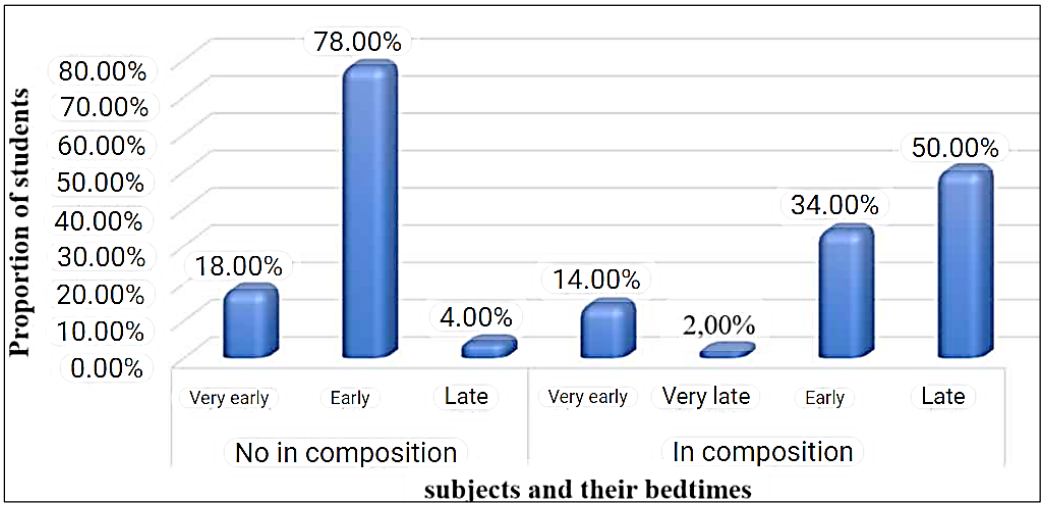
Study time during exam period	Effective	Percentage
Day	9	18%
Night	41	82%
Total	50	100%

3.1. Analysis of subjects' bedtimes and wake-up times

Bedtime analysis compares subjects between periods when they are not composing and those when they are composing.

Outside of the composition periods, the majority of subjects (78%) go to bed "Early" (between 22:00 and 00:00), which indicates a dominant tendency to sleep at reasonable hours when exams are not imminent. This tendency is significant according to the Chi-square proportion test applied to the results (p = 0.000). Then, a minority, representing 18% of the subjects, go to bed "Very Early" (at the latest at 22:00), thus suggesting a well-organized sleep routine or a preference for waking up early. Only 4% of the subjects go to bed "Late" (between 00:00 and 03:00) outside of the examination periods, and finally no one goes to bed "Very Late" (after 3:00).

When subjects are in the composition period, their sleeping behavior changes. Indeed, during the examination periods, the majority of subjects (50%) go to bed "Late", which suggests a significant tendency (Chi ^{2} : p = 0.000) to extend their study hours until late at night. The proportion of subjects who go to bed "Early" decreases to 34%, which remains a significant share but significantly lower than during the period without the composition. Subjects who go to bed "Very early" represent 14% of the sample during the composition period. The proportion of subjects who go to bed "Very late" during the examination periods is only 2% (Figure 1).

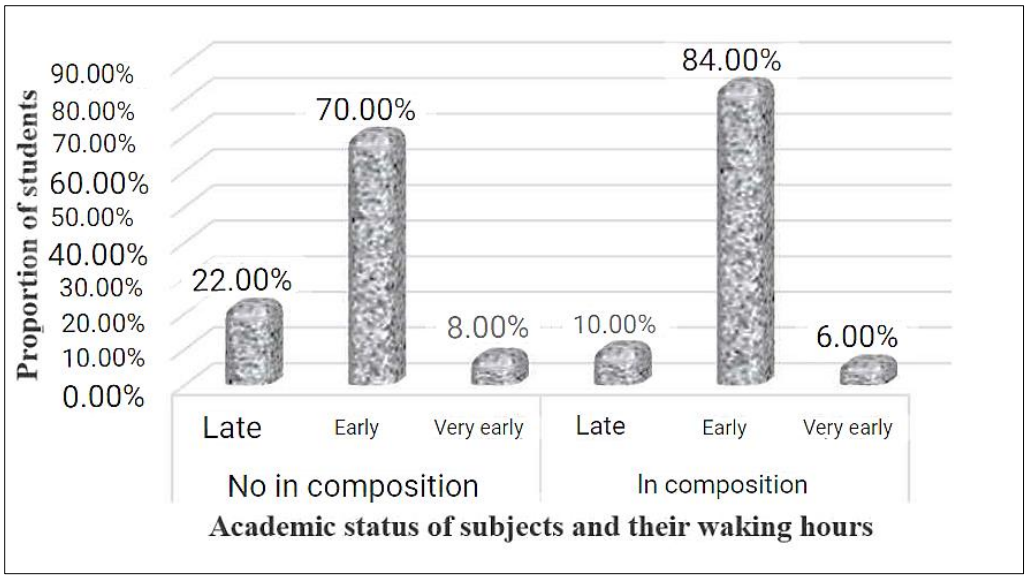


Very early: bedtime ≤ 22:00; Early: 22:00 < bedtime ≤ 00:00; Late: 00:00 < bedtime ≤ 3:00; Very late: bedtime >3:00; Chi ^{2} of proportion (Not in composition) : p = 0.000 < 0.05; the proportion of the "Early" modality of the "Not in composition" subvariable is significantly the highest; Chi ^{2} of proportion (In composition) : p = 0.000 < 0.05; the proportion of the "Late" modality of the "In composition" sub-variable is significantly the highest.

Figure 1 Distribution of subjects according to their academic situation and their bedtimes

Concerning waking hours, the results show that outside of composition periods, the majority of subjects (70%) wake up "Early" (between 04:00 and 08:00). This dominant tendency to wake up early, even in the absence of exam pressure, is significant with regard to the applied Chi-square test (p = 0.000). A notable proportion of 22% of subjects who wake up "Late" (after 08:00 but before 12:00) is also observed, which could be associated with later bedtimes or a longer rest period. Finally, 8% of subjects wake up "Very Early" (before 04:00), which is relatively uncommon, but may reflect particular sleep habits or personal needs.

During the composition periods, the proportion of subjects waking up "Early" increases to 84%, indicating a strong majority of subjects who opt for early waking, probably to maximize their revision time before exams. The proportion of subjects waking up "Late" decreases to 10%, suggesting a significant reduction in late waking during the exam periods. The proportion of subjects waking up "Very Early" remains relatively stable, decreasing from 8% in the non-composition period to 6% in the composition period, showing that this habit is not largely affected by the exam periods (Figure 2).



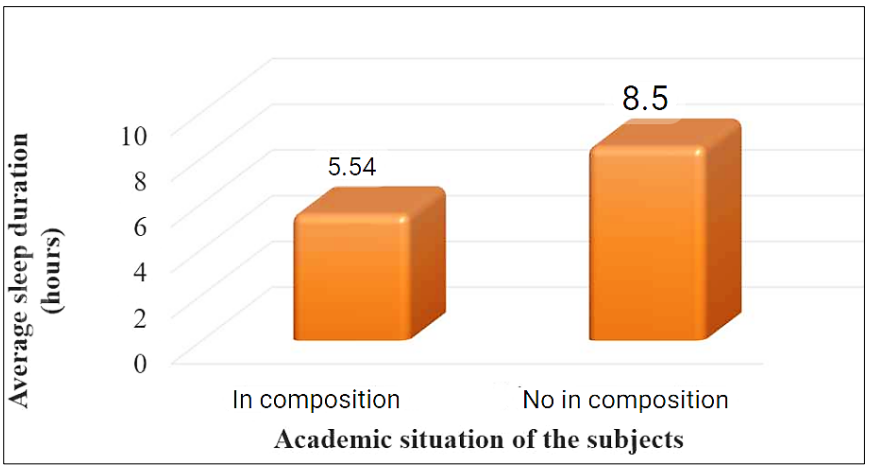
Very early: wake-up time ≤ 04:00; Early: 04:00 < wake-up time ≤ 08:00; Late: 08:00 < wake-up time ≤ 12:00; Very late: wake-up time >3:00; Chi ² of proportion (Not in composition): p = 0.000 < 0.05; the proportion of the "Early" modality of the "Not in composition" subvariable is significantly the highest; Chi ² of proportion (In composition): p = 0.000 < 0.05; the proportion of the "Early" modality of the "In composition" subvariable is significantly the highest.

Figure 2 Distribution of subjects according to their academic situation and their waking hours

3.2. Analysis of sleep duration and revisions depending on whether the subjects are in exam period or not.

The analysis of the duration of sleep and the revisions of the subjects is carried out according to their academic situation, comparing the periods when they are in composition with those when they are not. The results are expressed in hours, with an indication of the variability (standard deviation) around the mean.

According to these results, during exam periods, subjects sleep on average 5.54 ± 1.33 hours per day, while outside these periods, the sleep duration is on average 8.50 ± 1.64 hours per day. In addition, the Student t-test reveals that the difference in average sleep duration observed between the two academic situations is significant, with a p-value of 0.000, well below the threshold of 0.05. This decrease of almost 03 hours highlights the impact of exam periods on students' sleep habits, probably due to the need to extend revision periods to the detriment of rest (Figure 3).

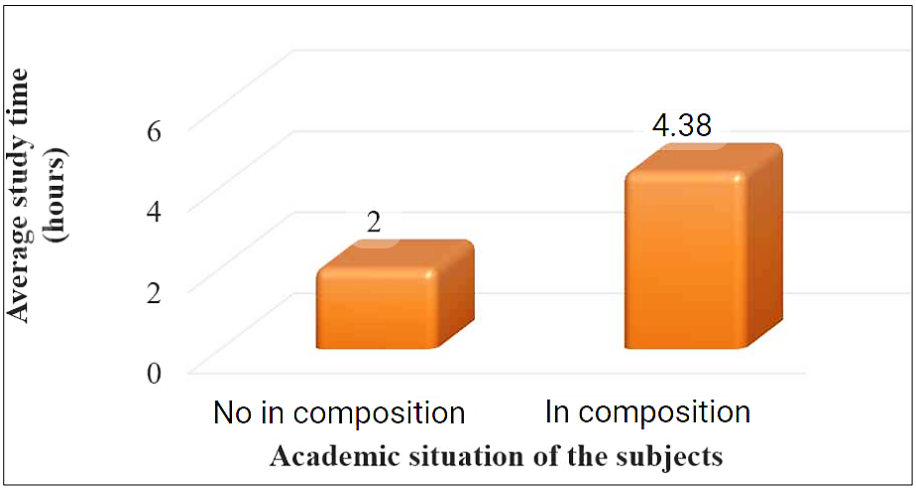


Student 's t-test : p = 0.000 < 0.05; the difference in mean sleep duration between the two groups of subjects (composition and non-composition) is significant.

Figure 3 Average sleep duration according to the academic situation of the subjects

Regarding the duration of revisions, the results reveal that when the subjects are in exam periods, they devote on average 4.38 ± 1.85 hours per day to studying, while outside these periods, the average study duration is reduced to 2 ± 0.88 hours per day. In other words, the average study duration doubles during exam periods. Furthermore, the Student

t-test indicates a statistically significant difference in the average study duration between the two academic situations, with a p-value of 0.000, much lower than the threshold of 0.05. This significant increase illustrates the additional effort that students are willing to make when preparing for academic exams (Figure 4).



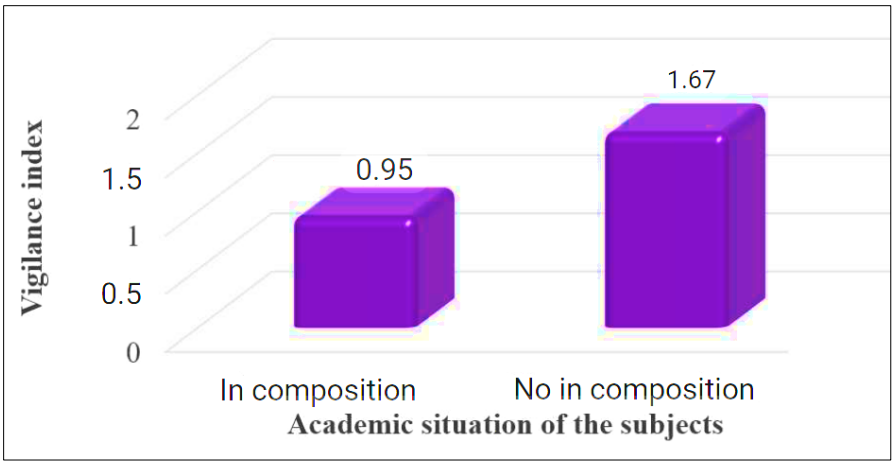
Student 's t-test : p = 0.000 < 0.05; the difference in mean study duration between the two groups of subjects (in composition and not in composition) is significant.

Figure 4 Average duration of study according to the academic situation of the subjects

3.3. Analysis of the subjects' state of alertness

The alertness index is a quantitative measure that indicates the state of alertness and the ability of the subjects to concentrate, with higher values indicating increased alertness. The analysis of this parameter is initially carried out according to the academic situation of the subjects (in composition period or not) and the number of ECUE scheduled per day during the examination period.

The results show that during the composition period, the average vigilance index is 0.95 ± 0.20, while outside these periods, this index appears slightly higher, with an average of 1.67 ± 0.26. Moreover, the Student t-test reveals that the difference in the average vigilance index between the two academic situations is statistically significant, with a p-value of 0.027, lower than the threshold of 0.05. This significant difference shows that the variation in vigilance between the composition and non-composition periods is a real phenomenon and not linked to chance (Figure 5).



Student 's t-test : p = 0.027 < 0.05; the difference in the mean vigilance index between the two groups of subjects (in composition and not in composition) is significant.

Figure 5 Vigilance index of subjects according to their situation

The results then show that during the composition period, subjects with a number of assessments less than or equal to 2 ECUE per day have an average vigilance index of 1.06 ± 0.21. As for subjects with a number of assessments greater than 2 ECUE per day, they have an average vigilance index of 1.02 ± 0.12. The Mann-Whitney test, used to compare the

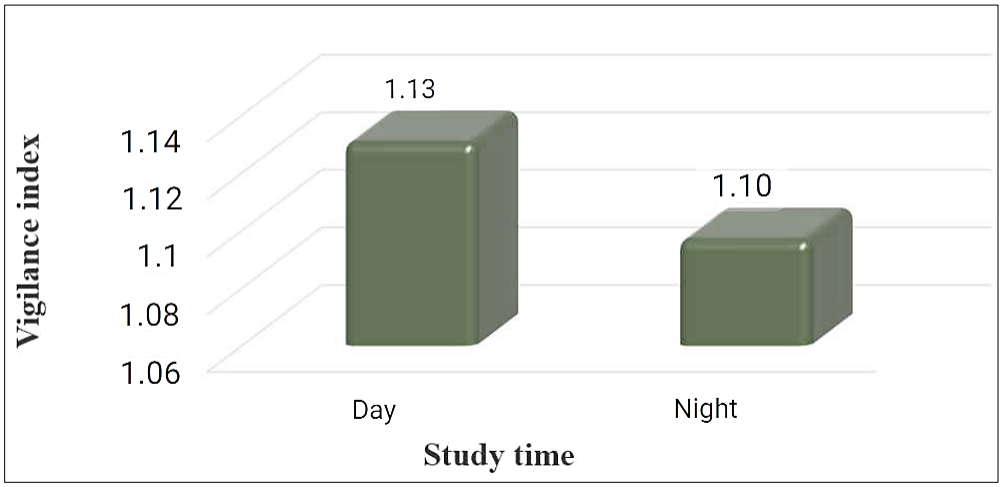
vigilance indices between the two groups, reveals a p-value of 0.981, greater than the threshold of 0.05. This indicates that the difference observed between the two groups is not statistically significant. In other words, the variation in the number of assessments per day has no significant impact on the students' vigilance index (Figure 6).

Mann-Whitney test: p = 0.981 > 0.05; the difference in the mean vigilance index between the two groups of subjects in composition (number of ECUE ≤ 2 and number of ECUE > 2) is not significant.

Figure 6 Student alertness index based on the number of assessments per day

In the second step, the vigilance index is analyzed according to the time of study and the daily duration devoted to revision by the subjects.

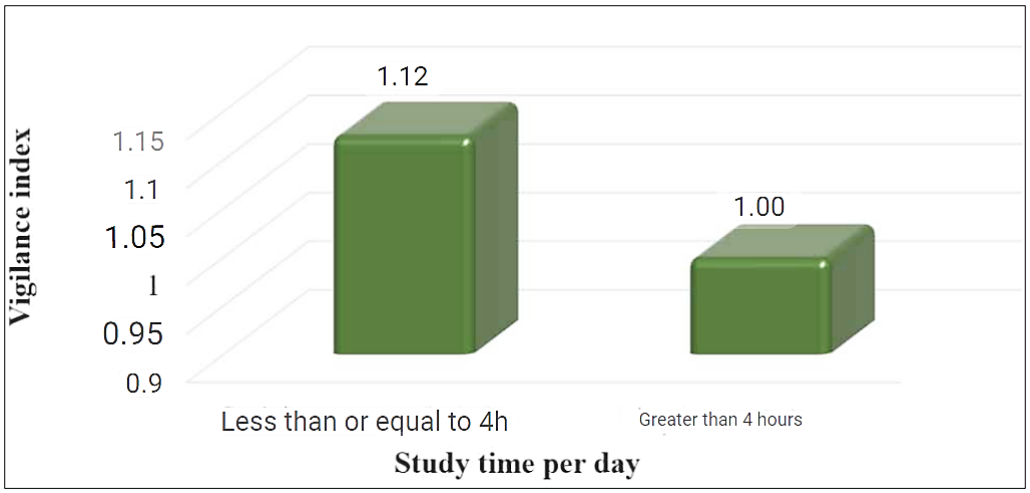
According to the results of the analyses, the subjects who revise mainly during the day, present an average vigilance index of 1.13 ± 0.22. For the subjects who usually revise at night, the average vigilance index is 1.10 ± 0.24. The Mann-Whitney test used to compare the vigilance indices between these two groups of subjects, shows a p-value of 0.421, higher than the threshold of 0.05. This indicates that the difference observed between the two groups of subjects is not statistically significant. In other words, the time of revision (day or night) does not significantly affect the vigilance index of the students (Figure 7).



Mann-Whitney test: p = 0.421 > 0.05; the difference in the mean vigilance index between the two groups of subjects (those studying during the day and those studying at night) is not significant.

Figure 7 Subjects' vigilance index according to their revision time

The results also show that subjects who revise for no more than 4 hours per day, display an average vigilance index of 1.12 ± 0.22. On the other hand, for subjects who study more than 4 hours per day, the average vigilance index is 1.00 ± 0.24. The Mann-Whitney test reveals that the difference in vigilance index between the two groups of subjects is not statistically significant, with a p-value of 0.069, higher than the threshold of 0.05. This indicates that the variation in the duration of revisions per day has no significant effect on the vigilance index of the subjects (Figure 8).



Mann-Whitney test: p = 0.069 > 0.05; the difference in the mean vigilance index between the two groups of subjects (those who study 4 hours maximum per day and those who study more than 4 hours per day) is not significant.

Figure 8 Subjects' alertness index according to their daily revision duration

4. Discussion

This study aims to examine the impact of exam periods on the state of alertness of students of the UFR Biosciences of the University Félix HOUPHOUËT-BOIGNY of Abidjan (Côte d'Ivoire). The discussion of the results obtained focuses on four main aspects addressed: the period of exams and revision habits, bedtime and wake-up times, the duration of sleep and revision, and the state of alertness of students.

4.1. Exam period, number of assessments and revision times

The results indicate that the majority of students (34%) have a 14-day examination period, followed by 26% with a 10-day period. In addition, 78% of students are subject to an average of two ECUEs per day. These data suggest a moderate workload but concentrated over a relatively short period.

This configuration may have significant implications on students' cognitive functioning. Indeed, the concentration of exams over a two-week period can induce a state of chronic stress, activating the hypothalamic - pituitary -adrenal axis in a prolonged manner. According to Joëls et *al.* [18], this prolonged activation may affect synaptic plasticity in the hippocampus, a region crucial for memory and learning. This could explain why 82% of students opt for nighttime revisions, potentially seeking to maximize their study time. These results are consistent with the study of Salgado-Delgado et *al.* [19], who showed that changes in circadian rhythms during periods of academic stress can affect memory consolidation. Their study found that 76% of university students significantly change their sleep patterns during exams, a proportion similar to that observed in the present study.

This pattern of exam periods and revision habits raises questions about the long-term impact on students' cognitive health and well-being. Hence the need to explore in more detail how these factors influence students' bedtimes and wake-up times.

4.2. Analysis of subjects' bedtimes and wake-up times

The results of this analysis show a significant change in students' sleep habits during exam periods. Outside of composition periods, 78% of students go to bed "Early" (between 22:00 and 00:00), while during exams, 50% go to bed "Late" (between 00:00 and 03:00). Similarly, 84% of students wake up "Early" (between 04:00 and 08:00) during exams, compared to 70% during normal periods.

This shift in sleep hours may have important consequences for cognitive functioning. Sleep plays a crucial role in memory consolidation, particularly slow-wave sleep and REM sleep. According to Rasch and Born [20], slow-wave sleep, predominant in the first part of the night, is particularly important for the consolidation of declarative memory, while REM sleep, more frequent towards the end of the night, promotes the consolidation of procedural and emotional memory. The fact that students go to bed later during exams could reduce the duration of slow-wave sleep, potentially to the detriment of the consolidation of declarative knowledge crucial for their exams [21]. Furthermore, early

awakening could interrupt REM sleep phases, potentially affecting emotional regulation and creativity, which are also important for academic performance [22,23]. These results are in line with the study by Hershner and Chervin [24], which showed that 70% of university students slept less than 8 hours per night during exam periods, with negative consequences on their cognitive performance. Similarly, a study by Okano *et al.* [25] found that students who maintained more regular sleep schedules performed better academically, highlighting the importance of sleep regularity.

These changes in sleep patterns during exam periods raise questions about the quality and quantity of sleep students get. Looking more closely at sleep and revision duration could provide a more comprehensive picture of the impact of exams on students' daily rhythms.

4.3. Analysis of sleep duration and revisions

The results of this analysis reveal a significant reduction in sleep duration during exam periods, from 8.50 ± 1.64 hours to 5.54 ± 1.33 hours per day. At the same time, the time spent revising doubles, from 2 ± 0.88 hours to 4.38 ± 1.85 hours per day.

This drastic reduction in sleep time can have significant consequences on students' cognitive functioning. Sleep plays a crucial role in memory consolidation and synaptic plasticity. According to Krause et *al.* [26], even moderate sleep deprivation can significantly affect executive functions, working memory, and sustained attention. These functions are essential for academic performance, especially during exams.

Furthermore, increased revision time, while understandable in the context of exams, may not be as beneficial as hoped if it comes at the expense of sleep. Smarr and Schirmer [27] showed that learning and memory consolidation are optimal when synchronized with the body's natural circadian rhythms. Disrupting these rhythms through prolonged nighttime revision could therefore paradoxically impair learning effectiveness.

These results are consistent with those of Curcio *et al.* [9], who found a negative correlation between sleep deprivation and academic performance in college students. Their study showed that students who slept on average less than 6 hours per night during exam periods had significantly lower test scores (about 15% lower) compared to those who slept 7 to 8 hours. Similarly, a longitudinal study by Phillips *et al.* [28] on 61 medical students reveals that those who maintain a constant sleep duration (7 to 9 hours) throughout the semester, including during exams, have an academic performance higher by 11% on average compared to those who significantly reduce their sleep time during exam periods.

These significant changes in sleep and study duration raise questions about students' alertness during exam periods. Therefore, examining in detail how these changes in sleep and study habits affect students' alertness is a crucial factor for their academic performance.

4.4. Analysis of the subjects' state of alertness

The results of this analysis show a significant decrease in the vigilance index during exam periods, from 1.67 ± 0.26 to 0.95 ± 0.20. However, it is interesting to note that neither the number of ECUEs per day, nor the time of revision (day or night), nor the daily duration of revisions shows a statistically significant impact on the vigilance index.

This general decrease in alertness during exams can be explained by several factors. First, sleep deprivation, as observed in the previous section, can have a direct impact on the activity of the prefrontal cortex, a region crucial for alertness and executive functions. According to Krause *et al.* [26], even moderate sleep deprivation can lead to decreased metabolic activity in the prefrontal cortex, resulting in decreased alertness and cognitive performance. In addition, chronic stress associated with exams can affect the hypothalamic - pituitary -adrenal axis, leading to prolonged release of cortisol. Although cortisol may initially enhance alertness, prolonged exposure can have the opposite effect, leading to cognitive fatigue and decreased alertness. McEwen et *al.* [29] showed that chronic stress can alter the structure and function of neurons in the hippocampus and prefrontal cortex, thereby affecting alertness and cognitive performance.

These results are corroborated by those of Lo et *al.* [30], who studied the impact of sleep deprivation on alertness and cognitive performance. They found a 29% decrease in alertness scores in participants deprived of sleep for 24 hours, which is comparable to the decrease observed in the present study. Similarly, a study by Pilcher and Walters [14] of 44 university students showed that those who were deprived of sleep for one night before an exam had 40% lower alertness scores than the control group, and their performance on a cognitive test was 50% lower.

Interestingly, the present study did not find a significant association between the timing of revisions (day or night) and alertness, contrary to some expectations. This could suggest that other factors, such as sleep quality or stress level, might have a greater impact on alertness than the specific timing of revisions.

These results highlight the importance of maintaining a balance between revision and rest during exam periods. They also suggest that interventions aimed at improving sleep quality and reducing stress could be beneficial for maintaining optimal alertness during exam periods.

5. Conclusion

This study aimed to examine the influence of exam periods on the state of alertness of students at the UFR Biosciences of the Félix HOUPHOUËT-BOIGNY University of Abidjan. The results obtained allow us to affirm that this objective has been achieved. Exam periods have a significant impact on the state of alertness among these students.

The results reveal a significant decrease in the vigilance index during exam periods. This decrease is associated with a significant reduction in the average duration of sleep, as well as a significant increase in the time spent revising. These results allow us to conclude that, for the sample studied, exam periods negatively influence the state of vigilance of students, mainly due to the change in sleep and study habits. The generalization of these results to the entire student population of the UFR Biosciences suggests that this phenomenon is probably widespread and deserves special attention.

However, the study does not highlight any significant impact of the number of ECUEs per day, the time of revision (day or night), or the daily duration of revisions on the alertness index. These unexpected results open new research perspectives to understand the factors that influence students' alertness during exam periods.

To further explore these findings, future research could focus on exploring the physiological and psychological mechanisms underlying the observed decline in alertness. It would also be relevant to study the long-term impact of these changes in sleep patterns on students' health and academic performance. Finally, the development and evaluation of interventions aimed at improving sleep and stress management during exam periods could be a promising avenue of research to improve the well-being and academic success of university students.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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