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INFLUENCE OF MORNINGNESS-EVENINGNESS PREFERENCE OF EDUARDO MONDLANE SECONDARY SCHOOL STUDENTS IN CHIMOIO ON SCHOOL PERFORMANCE

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Abstract: The current study aims to diagnose the influence of morningness-eveningness preference of Eduardo Mondlane Secondary School (EMSS) students in Chimoio on school performance. The research involved school students of the grade 10 (N= 88) from Chimoio in Manica which 51 were male and 37 female, with ages ranging from 14-22 years old. For data collection was used Horne and Osterberg questionnaire Portuguese version. This research seeks to answer the following questions i) what is the frequency distribution of early and late chronotypes in the population of the students? ii) is there any relation between the variation of chronotypes and school achievement? Our results show that 60% of students have morningness preference, 35% intermediate and only 5% have eveningness preference. The study reveals a certain correlation between morningness-eveningness preference and school performance on EMSS students in Chimoio thus 85% morningness preference that have morning schedule approved and only 15% reprovved. The night schedule students have 75% of approvals and 25% of disapproval. In conclusion, the morningness students attending the morning shift have better school performance in relation to the morning attending the night shift. The competent authorities, parents and guardians should identify the morningness-eveningness preferences on students as they influence positively or negatively on educational performance in our schools.

Keywords: Morningness-eveningness, schedule, school performance.

Introduction

This work is the result of a survey of the students of the 10th grade at the Eduardo Mondlane Secondary School (EMSS), in order to analyze the influence of biological rhythms in biology learning, focusing on the sleep/ wake cycle (SWC).

It should be noted that all living beings have "watches" biological internal controlling and set the time activity of their systems. The science that deals with the study of biological rhythms is called Chronobiology, the branch of science that studies the temporal organization of living organisms and the mechanisms that control the various vital systems and chemical and electrical activities of each body. It appears then, that the temporal organization of life has a huge effect on the structures and dynamics of living beings (LIMA, 2012).

According to MARQUES & MENNA cited by Barreto-Filho, *at all* (2013), these concepts began in the eighteenth century in the international community with issues involving the existence of variations or rhythms in plants, but had not yet occurred disclosure in the scientific community.

With regard to education, the study of Chronobiology seeks to understand and improve the study of the nature of man, can obtain knowledge about the disposition for learning. Educators need to think better about the distribution of the student's activity during the day, to know what the most appropriate time to perform certain activities, which of shifts (morning, afternoon, evening) could be more appropriate, in accordance with the biological rhythm of the student (Finimundi, 2012).

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There are people who sleep more and some who sleep less, people who like to sleep earlier and others later. Each individual has his/her preferences for hours of sleeping and waking. In this regard, humans have been classified as: morningness (those who wake up early and sleep early), there are also eveningness (those who wake up late in the morning and go to sleep late), and those who are intermediaries, who are neither morningness and eveningness or so (LOUZADA & MENNA-BARRETO cited FINIMUNDI, 2012).

The brightness is responsible for keeping our speeds by LOUZADA & MENNA-BARRETO cited BARIN (2011), it enters the body through the retina and goes to the hypothalamus, where the biological clocks are, it modifies the expression of biological rhythms through the increased secretion of a hormone called melatonin by the pineal gland at dusk, signaling the darkened body.

At dawn, the adrenal gland secrete a greater quantity of another hormone called cortisol, which prepares the body for alertness, and also is related to the secretion of gastric juice before feeding schedules, (Almondes cited BARIN, 2011) .For EXPOSITO cited BARIN (2011), the body temperature of the evening is higher than that of the morning when awake. And the temperature of the evening increases, reaching its maximum in the late afternoon, while the morning arrives at most a few hours earlier.

When the temperature of the body is at its maximum, human beings have optimum performance in activities and there is more willingness to them, (MORAES cited BARIN, 2011).By studying the rhythm of the students and to check the availability of students to study, highlighting the students of the morning and of the EMSS night in biology discipline, we have taken into account that circadian rhythms (which last 24 hours) can happen freely, even when students have knowledge of the time of the day. The school must take into account elements that go beyond the classroom, enhancing skills and competencies according to the biological time of each student. With the investigation, it was possible to identify whether the students classified with morning and evening have better or worse school performance, by studying the morning shift or night.

Description and placement of the problem

The student's time is critical to his learning, each having his biological time, his history and the period he remains at school. Barsan quoted by BARBIERI (2008) also points out that the student can suffer behavioral changes during the day and did not show the same performance at all times of the day, "it is known what to teach, how to teach, but one needs to know when teach. "The organic cost of a school task is not the same in different hours of the day. For example, one of the stages in adolescence is the delay characteristics of the biological clock, probably determined by the major hormonal changes. The result is that young people have a hard time to go to bed early and wake up early. It is a fact that has a negative impact on school performance when the round is too early or too late.

According to some studies, sleep deprivation or poor sleep may compromise the memorization process and logical reasoning, since information learned are more efficiently memorized after an appropriate period of sleep. Believe, is that part of memory consolidation which occurs during REM sleep stage (from the English (rapid eye movements), (ALMEIDA, 2013). Even with classes starting not very early (usually 7 o'clock), some students are not able to sleep early, especially if you have television, internet or friends nearby. When the awakening touches, your sleep is disrupted. Teenagers studying in the morning suffer a partial pressure of chronic sleep, and this can have consequences. The first consequence is the excessive daytime sleepiness. Drowsiness in the classroom decreases attention and interest, and may impair school performance, to address this problem rise the question:

How the biological rhythms of the students of the 10th grade at the EMSS interfere in the teaching and learning of biology?

Objective

To analyze the influence of the biological rhythms of the students of the 10th grade at the EMSS in Chimoio in the teaching and learning of Biology.

Question research

What is the frequency distribution of early and late chronotypes in the population of the students?
Is there any relation between the variation of chronotypes and school achievement?

Justification and relevance of the research

It is common to see in the school, the first hours of classes; students yawn, and become lazy and dose on their desks. Perhaps a father or mother would say that they watch television till late, and then complain to wake up early.

According to Mello (2014), it is known that adolescence is a stage of transition, marked by several conflicts and new challenges for the youth. It is also a phase in which the body undergoes a series of changes. This process of organic amendments is given the name of puberty and it seems that puberty modifies the biological rhythms. During puberty it is observed a delay in biological rhythms, the youth, later begins to feel sleep and wake up later also.

"The planning of school activities can and should be seen under a chronobiologic prism. It means organizing activities in order to behold moments of greater or lesser efficiency in school tasks, from the point of view of the students or the teachers "(GOMES, 2014).

For some reasons the teenagers are subjected to night shifts or shift contrary to their biological rhythm, which can compromise their performance. According FINIMUNDI (2013), with respect to these conditions with regard to human social organization, most labor and educational activities takes place between 8 am and 6 pm, in order to impose a certain temporality that favors the best performance of individuals who are synchronized to this time. However, part of the population is biologically synchronized at unusual times and lives in a desynchronized state of social schedules.

Regarding the age group, the most marked change in the SWC occurs in adolescence, probably secondary to hormonal changes caused by puberty. Most children aged up to 10 years presents a morning chronotype, while in puberty, becomes eveningness. Teenagers start to present a delay at bedtime and difficult to wake up early. Thus, when they are in term time, often complain about the daytime sleepiness and difficulty in sleeping early, resulting in a reduction in the number of sleeping hours, which are compensated on weekends, beside the changes in sleeping habits. In the adult stage, the morning period returns as favoring of the achievements of intellectual and sporting activities (Almeida, 2013).

Thus, it is assumed that there are times of day when every student is more willing to do certain tasks, such as schooling. It is necessary, then, after identifying this preference, to evaluate his performance in both periods of the day and know what the student is doing in the reverse shift of their classes, especially in the discipline of Biology. So you can analyze what is the best time for each group of students, whether morningness, intermediate and eveningness are more on the mood to the learning process.

The human biological rhythm, governed by the hypothalamus, is the key to health and the adaptation of man, so, the student to the environment. For all to go well and makes sense to the brain, is necessary to assimilate at the right time, factors such as sleep, words, movements, expressions, emotions, attitudes, interactions, etc. (LOUZADA & MENNA, quoted by BARBIERI 2008) .

It should be also referenced that there were not done studies in Mozambique of the influence of biological rhythms in learning, school performance of students in schools. Teachers need more specific knowledge of their students, as their biological rhythm, for more satisfactory results for the academic achievement.

According to ALMEIDA (2013), these works are very important and should be encouraged in order to draw new plans in education, to adequate teaching to the student's profile and not in contrary as we find today, where students are forced to follow a routine schedule, that for some, can be harmful in view of the different characteristics of chronotypes.

Methods

A sample of 88 secondary students, 51 male and 37 female, aged from 14 to 22 year old. All participants were tested in groups of 44 students. Sample was taken from a universe of 1057 students. Their participation was voluntary and they were not paid.

The Morningness-Eveningness questionnaire (MEQ), Portuguese version from Horne-Ostberg morningness-eveningness scale (Horne and Ostberg, 1976) were used us data collection instrument. The MEQ is the most frequently used self-evaluation instrument (scale). It has been translated into many local languages to make it easily understood by the subjects, all over the world (Achari & Pati, 2007). The basic scores of the questionnaire were used to identify the biological rhythms of the students of the 10th grade at the EMSS in Chimoio.

For relate the academic performance and the school shift to the biological rhythms of the pupils, Grade Point Average was used. It has been calculated in common subjects: Mathematic, Physic, Biology, Chemistry, Portuguese, English, History and Geography. Official grades ranged from 0 (worst) to 20 (best). Most of the other studies are also based on this method (e.g. Díaz-Morales, & Escribano, 2013, Besoluk, Onder & Devenci, 2011, Gray & Watson, 2002, Randler & Frech 2006, 2009).

Results and Findings

From the questionnaire of Horne and Osterberg applied to 88 students, we identified 53 students *morningness* oriented, 36 students attend school in the morning shift and 17 students attending school on the night shift. The *eveningness* students totaled were 4, all attend school in the morning. We found 31 students that were *intermediate* oriented.

Relating the biological rhythm and school shift, there is a greater number of the *morningness* in the morning shift with 36 students, 21 intermediate students and 4 eveningness students oriented.

On the night shift there are also a greater number (17) of morning-type students, 10 students were intermediate and no evening –type student were found.

The identification of students chronotypes it turns out that there are 60% of the morning-type students, 35% intermediate-type, and only 5% of students are evening-type. The morning-type are mostly male gender and women present a higher degree of eveningness, which leads to the conclusion that men tend to be more morningness regarding women. These results coincide with the study done by BARBIERI (2008), in the Farroupinha Municipality School in Brazil. It is also explained by ROENNBERG, at all, (2004) cited by BUENO & WEY, (2012), which says that the delay in adolescence, reaches a peak around the age of 16 for women and 21 years for men, this could set up a late adolescence marker.

The results of this study show that the morning-type students studying in the morning shift mostly have a higher academic performance with more than 3.0 values the most difference in average relative between other morning-type students studying on the night shift. FINIMUNDI, (2013), says that it may be related to their energy pike (biological rhythm), which is more active for the morning and therefore, are dedicated to schoolwork outside school.

Correlated to some studies done in the afternoon shift students and morning for (Barbieri et al, 2007; BARBIERI, 2008; BARIN 2011, quoted by FINIMUNDI, 2013), at different schools, concluded that the morning –type younger students had higher academic achievement in the morning shift and older have higher academic achievement in the afternoon.

The intermediates-type students have few significant differences with respect to the school day. It leads to the result that morning teenage students from the night shift, are studying in turn contrary to its biological rhythm.

The sample assessed shows significantly an increase in higher disapproval index on the night shift, especially among the morning-type students. The study indicates that if the morning-type students have a bad school performance when placed at evening classes because they have many failures and approvals averaging 10 points which is the minimum to pass. It leads to the point that the students are not on schedule conducive to their biological rhythm. REINBERG quoted by FINIMUNDI, at all (2013) introduces the term "school rhythms," which means that the uses of student time scale of days of the week and some quarters. It reports that there is an ideal time to learn and memorize. Intermediate-type students no significant difference presented in their school performance. The research leads to a result which indicates that individuals with the morningness profile have better test scores when do their activities in morning, but reduce the quality of their performance during the course of the day. The individuals with eveningness profile do the opposite way, presenting lower incomes in the morning and gradually improving over day (ALMEIDA, 2013). Similarly the morningness put on the night shift did not perform well as they are not willing to study as defined by their biological rhythm.

Conclusion

The morningness students attending the morning shift have better school performance in relation to the morning attending the night shift. The morningness students studying in the morning have good results and fewer failures, while the morning-type studying at night has many failures.

Recommendations

We recommend the Ministry of Education of Mozambique to include as regulation, the identification of students biological rhythm; the directors of the schools to check the turn in which the student is more willing to studies, seeking hence better learning; the parents to have attention on developing healthier sleep habits in their children's lives, starting with the identification of possible sleep deprivation signs, looking for a better school performance.

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