

Study of School Fatigue on a Group of Teenagers Studying at “Dimitrie Cantemir” Highschool, Iași

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ABSTRACT: Purpose. Fatigue is a physiological phenomenon which is permanently present at students because of the scholar demands. Excessive demands can cause pathological fatigue phenomenon, which should be avoided. **Subjects and method.** The study included a group of 203 students from Dimitrie Cantemir Highschool in Iași. The teenagers were questioned about the presence of the fatigue phenomenon. **Results.** Fatigue is rarely present at 62.6% of the questioned students. During the week, this phenomenon appears especially at the beginning (22.2%) or in the middle of the week (34.5%). In a few cases it appears at the end of the week, as it should. Night sleep is only of 6-7 hours (37.4%) or 7-8 hours (36.9%), which is not enough. The insufficient number of sleeping hours can be paid by day sleep, but most of the responses are “rarely” (50.7%). Active rest is represented by sport or other activities of choice. Sport is the only less attractive option - in most cases children allocate only 15-30 minutes a day for it (33.5%). They stay in front of the TV between 0.5 and 1 hour (42.9%) and of the computer between 2-3 hours (44.3%) daily. **Conclusions.** Children’s daily schedule isn’t balanced, so the risk of excessive fatigue really exists.

KEYWORDS: school fatigue, insufficient physical activities, computer

Introduction

Fatigue is a physiologic phenomenon that appears after doing an activity that requires concentration or physical effort. Interrupting this effort is accompanied by fatigue’s fading. On students, fatigue is part of one day or of the week school schedule [1, 2].

School medicine specialists are very concerned about the intensity of this phenomenon and the need of avoiding the appearance of pathologic fatigue. In this context, it is possible to reach a school failure connected to the need of postponing the studying year, which is not wanted [3, 4].

It is required a close team work between teachers and school doctors in order to track down in time any phenomenon of not adjusting to school requirements. Unfortunately, in most cases there is no such team work, which is associated with the lack of an objective appreciation of the requests imposed to children. Their body is very requested at school and physiological processes of growth and development, which create favorable conditions for the development of health issues [5, 6, 7].

Preventive programs targeting teenagers should also include these issues, because they are part of a teenager’s life.

Subjects and method

The study was run at Dimitrie Cantemir Highschool in Iași, by questioning 203 students in the 10th grade, aged between 16 and 17. The

students filled in a questionnaire with questions regarding the presence of the fatigue phenomenon, the moment when it appears, the type of extracurricular activities and the time spent doing these activities [8, 9]. The research was done in 2010 (89 students) and 2012 (114 students), aimed to notice differences or resemblances between the students’ responses; the results are presented in comparison. The answers were processed using the Pearson test.

Results

Firstly we were concerned about appreciating the presence of the school tiredness in the study group. When asked „Are you tired?”, only 6 students (2.9%) gave “never” answers. In most cases (62.6%), the students perceive this phenomenon as “rare” (Table 1).

Table 1. Statistical distribution of the students according to the frequency of the appearance of the tiredness

Year	Often	Rarely	Never
2010	40	48	1
2012	30	79	5
Total	70	127	6
%	34.5	62.6	2.9

In this context, we considered necessary to continue the study and to appreciate the moment of the week and of the day when the child accuses tiredness. The results are not encouraging because 45 students (22.2%)

mentioned the presence of the tiredness at the beginning of the week (not at its end). In other 70 questionnaires (34.5%) the presence of the fatigue is marked in the middle of the week,

which is not a positive element. In 88 cases (43.3%) students are tired at the end of the week (Fig.1).

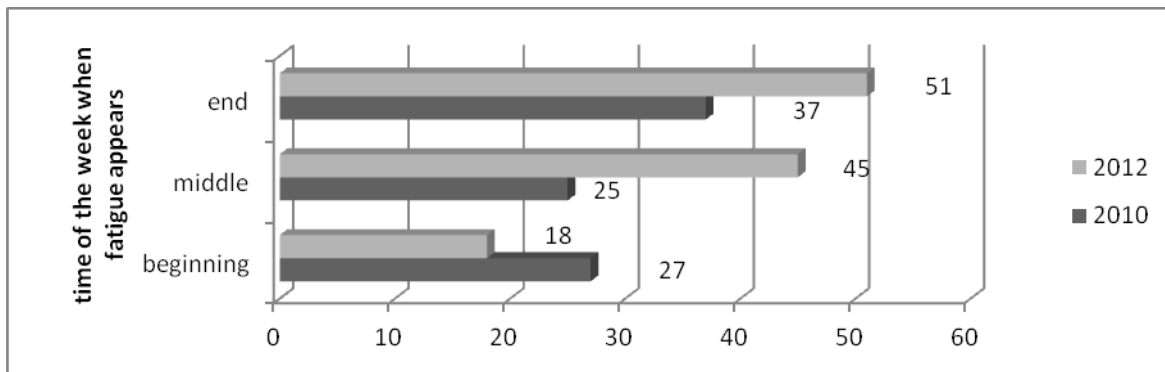


Fig.1. Statistical distribution of the students according to the moments of the week when fatigue is obvious

Secondly, we took into consideration the fact that tiredness normally disappears through passive rest, represented by sleep. In the study group most of the students reported 6-7 hours of sleep a night (N=76 - 37.4%), respectively 7-8 hours (N=75 - 36.9%) (Table 2).

Table 2. Statistical distribution of the students according to the number of sleeping hours per night

Year	6-7 hours	7-8 hours	8-9 hours	9-10 hours / > 10 hours
2010	34	29	24	2
2012	42	46	18	8
Total	76	75	42	10
%	37.4	36.9	20.7	4.9

Thirdly, we must pay attention to the active rest as well, this is why the questionnaire contained items referring to the type of extra-school activities and the time spent for them. Such an activity, with a positive effect on teenagers' health, is doing sport. Unfortunately, nowadays the time spent doing physical exercises is becoming shorter and shorter. In the study group the dominant answer refers at exercising 15-30 minutes daily (N=68 - 33.5%) which is absolutely not enough. We have to mention that 53 students (26.1%) draw attention to the physical activity, doing sport more than 60 minutes daily, while 31 of them (15.3%) exercise less than 15 minutes per day (Fig.2).

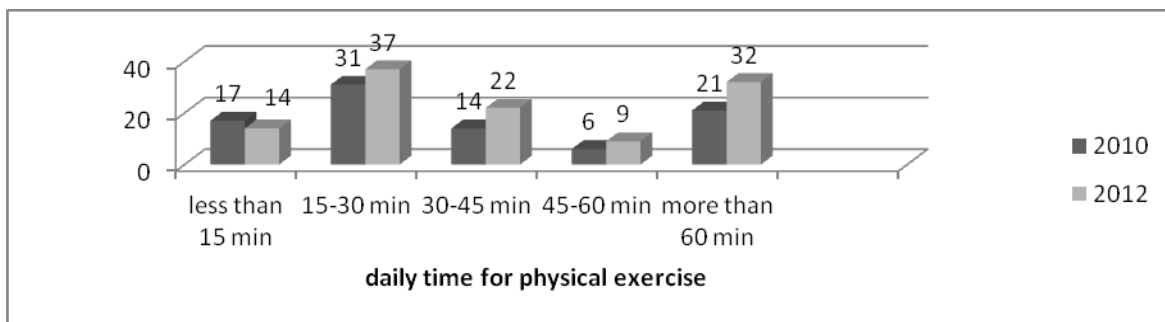


Fig.2. Statistical distribution of the students according to the time spent daily doing physical exercise

If the physical exercises hold a less important place in the students' schedule, we notice that watching TV and spending time at the computer gain more ground [10]. In fact, TV programs are daily watched by 87 students (42.9%) for about 0.5-1 hour and by 76 (37.4%).of them for 2-3 hours. It is important to mention that 11 teenagers (5.4%) spend daily 4-5 hours in front

of the TV, while 29 of them (14.3%) do not watch TV at all (Table 3).

We have to insist on the time students spend in front of the computer. They frequently do this for playing games or for socializing and rarely for preparing homework that needs to be done with the help of the computer [11].

In most cases (N=90 - 44.3%) the teenagers from the study group spend 2-3 hours daily in front of the computer; 8 students (3.9%) do not use computers at all, while 53 of them (26.1%) choose the "4-5 hours" answer (Fig.3).

The questions regarding the time spent with friends show that 83 students (40.9%) spend 2-3 nights a week with their friends, while 16 (7.9%) - a part of every night. We registered a number of 37 students (18.2%) who never meet their friends at night.

Table 3. Statistical distribution of the students according to the time spent watching TV

Year	None	0.5-1 hour	2-3 hours	4-5 hours
2010	7	39	38	5
2012	22	48	38	6
Total	29	87	76	11
%	14.3	42.9	37.4	5.4

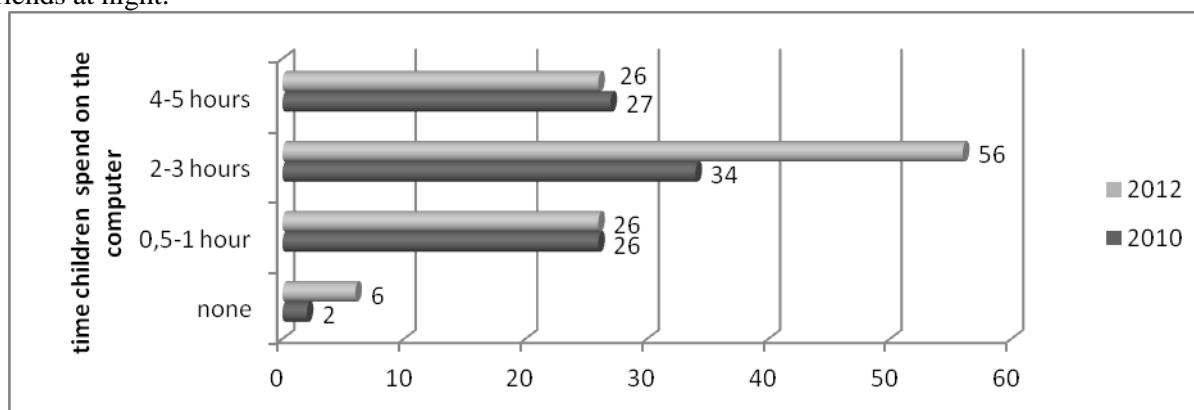


Fig.3. Statistical distribution of the students according to the time they spend on computer activities

Discussions

The study was run in two years; this situation allows obtaining comparative results. It is possible that a phenomenon that occurred in one year doesn't appear the following year, which guides to a temporary situation. If a phenomenon appears in more years, we can talk about a feature of students' activity that interferes positively or negatively in maintaining their health.

The dynamic analysis of the results regarding the presence of the school tiredness is interesting because there is a drop in the frequency of "often" answers. Thus, in 2010 this answer was present in 40 students (44.9%) but only in 30 (26.3%) in 2012. The differences are statistically significant for $p < 0.05$ ($df=2$, $\chi^2=8.63$). This is a result that should be carefully analyzed taking into account that the school demands do not reduce from one year to another; there might be a change in children's reaction to these requests, a better adapting to the school schedule which determines a decrease of the intensity of the subjective fatigue phenomenon.

When about the moment of the week and of the day when the child accuses tiredness, it is well-known that the normal situation for the fatigue to show up is at the end of the week, after a sustained school and extra-school activity

of five days. The present situation (the subjects mentioned the presence of the tiredness at the beginning of the week) could be explained by the fact that the week-end is loaded with other school and extra-school activities, so the teenager feels tired on Sundays evening (and, of course, on Mondays).

The Pearson test shows statistically significant differences between the two years of the study for $p < 0.05$ ($df=2$, $\chi^2=6.78$) which suggests the change of the moment of the week when the teenagers feel tired, with an increase of the "normal" situation. Unfortunately this is not an encouraging result because we observe only the decrease in the frequency of children who feel tired at the beginning of the week - from 30.3% (27 students) in 2010 to 15.8% (18 students) in 2012; this decrease is associated with the increase of the frequency of those who feel tired in the middle of the week - from 28.1% (25 students) in 2010 to 39.5% (45 students) in 2012.

During the day fatigue normally appears after 6-7 hours spent at school and other 2-3 hours of doing homework for the following day. In the study group the results are interesting because in 70 cases (34.5%) fatigue appears in the middle of the day and in other 65 cases (32.0%) - in the morning. Normal fatigue, at the end of a working day, is present only in 68 (33.5%) of the questioned teenagers.

The teenager needs about nine hours of sleep daily (comparing to the young adult who, physiologically, reaches a need of eight hours of sleep). These hours can be divided between night and day sleep; a teenager who sleeps 8-9 hours a night and even only 30 minutes during the day assures his sleeping need for 24 hours [12]. In the study group the busy school schedule forces an important decrease of the number of sleeping hours. This situation is seriously concerning because insufficient sleep represents a risk factor which can easily conduct to the appearance of the pathological fatigue phenomenon. In fact, more than 70% of the questioned students do not sleep enough at night. Only in 25.8% of the cases the number of sleeping hours is the one recommended by the effective rules. In the study group the situation does not change from one year to another, the differences being statistically insignificant. The results suggest that students pay a small importance to recover their ability to effort by passive rest. They consider "sleeping" as an act that distracts them from their favorite activities, such as spending time in front of the computer.

The issue of the short hours of night sleep could be solved by sleeping during the day. Unfortunately, only 16 students (7.9%) sleep "daily" at noon, while 56 of them (27.6%) – "often"; most of them (N=103 - 50.7%) "rarely" sleep at noon, which is not a positive situation. These results do not change from one year to another, the differences being statistically insignificant.

We found no statistically significant differences between the two years of the study from the point of view of spending the spare time; that shows a similar interest of the study group for television and computer activities, especially games and socializing programs. We have to mention that the time spent at the computer is longer than the one spent in front of the TV; the differences are statistically significant for $p < 0.001$ in 2010 ($df=3$, $\chi^2=19.56$) and for $p < 0.0009$ ($df=3$, $\chi^2=31.62$) in 2012. Anyway, spending 4-5 hours every day in front of the computer, after 6-7 hours spent at school and 2-3 hours doing homework is a challenge for these teenagers and also an obvious factor to trigger the fatigue phenomenon, even the pathological one

Free time must be spent with friends, too. Teenagers are interested in their friends' opinion and behaviour. Spending time with friends is a basic element of adolescence. The group of friends is essential, because the teenager grows

up within it. We consider "worrying" the number of 37 students who affirm not to meet their friends in the spare time; on the other hand, the answer of the 16 teenagers who spend a part of every night with their friends is worrying as well because they almost have no time for rest.

Conclusions

The study included a group of 203 teenagers, students in the 10th grade at Dimitrie Cantemir Highschool in Iași. Their questioning was done in two years – 89 teenagers in 2010 and 114 in 2012, which allows a comparative appreciation.

Fatigue is known by most students, being a physiological phenomenon after five days of activity. It frequently appears at the beginning or in the middle of the week - an usual situation. Its appearance at the beginning of the week suggests a very stressfull week-end. During the day, fatigue usually appears at night.

Fatigue is chased through pasive rest, represented by sleep. Even the recommended number of sleeping hours is nine for a teenager, the subjects of this study frequently sleep for only 6-7 hours a night. The issue could be solved by sleeping during the day, but this habit rarely appears in the study group.

Active rest through sports is weakly represented at the questioned students. In most cases, students spend only 15-30 minutes a day doing sports; there are teenagers who exercise less than 15 minutes daily, respectively more than 60 minutes.

Watching TV is more frequent than doing sports, in most cases students spending between 30 minutes and one hour in front of the TV. Using the computer "needs" also 2 - 3 hours daily.

This kind of studies seems to be very important because they allow the knowledge of some risk factors related to the school activity, which is a starting point in achieving a targeted intervention. Without field assessments, prevention programs would be less adapted to the real needs of adolescents.

References

1. Gavăt V, Albu A, Petrariu FD. Alimentația și mediul de viață în relație cu dezvoltarea copiilor și tinerilor. Ed. "Gr.T. Popa" Iași, 2006.
2. Alexander R. Children, their world, their education. Ed. Routledge, London and New York, 2010.
3. Kreipe R. Focusing on populations to improve the health of individual adolescents and young adults. Journal of Adolescent Health, 2011; 49(2); 111-112.
4. Bardov VG. Hygiene and ecology. Nova Kenya Publishers, Vinnysya, 2009.

5. Buzdugan T. Avertismentele adolescenței. Ed. Didactică și Pedagogică, București, 2009.
6. Eftodii I, Meșina V, Ferdohleb A. Modificările indicilor psihofiziologici ai oboselei la studenții USMF "Nicolae Testemițanu". Buletinul Academiei de Științe a Moldovei, 2013; 5(41); 36-40.
7. Papalia D, Olds S. A child's world. McGraw – Hill Publishing Company, New York, 1990.
8. Guilbert P, Gautier A, Baudier F, et al. Baromètre santé 2000 - Les comportements des 12-25 ans, Éditions INPES, Paris, 2004.
9. Rombaldi A, Clark V, Reichert F, et al. Incidence of school failure according to baseline leisure time physical activity practice. Prospective Study Journal of Adolescent Health, 2012; 51(6); S22-26
10. Maillet J. La psychiatrie de l'enfant et d'adolescent expliquée aux parents. Ed. Desclée de Brouwer, Paris, 1997.
11. Croitoru C, Ostrofeț G. Parametrii mediului de instruire la computer. Buletinul Academiei de Științe a Moldovei, 2013; 5(41); 56-59.
12. Vidalin H. Fatigue, stress, entrainement - comment s'évaluer. Cinésiologie, 1999;187:161-5.

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