

## The evaluation of the scholar fatigue phenomenon and some causative factors in a group of teenagers from Iasi

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### Suggested Citation:

Albu, A., Hodorca, R. M., Onose, I., Negrea, M. & Cracana I. (2016). The evaluation of the scholar fatigue phenomenon and some causative factors in a group of teenagers from Iasi. *Global Journal of Sociology: Current Issues*. 6(2), 44-49.

Received 22 June, 2016; revised 07 August, 2016; accepted 05 November, 2016.

Selection and peer review under responsibility of Prof. Dr. Mustafa Gunduz, Cukurova University, Adana, Turkey

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### Abstract

Scholar fatigue should be carefully evaluated in order to interfere when necessary. Goals: the evaluation of the differences/similarities regarding fatigue in pupils studying at different high schools. Material and methods: the study was conducted with a group of 237 teenagers studying at three different high schools in Iasi: the Sport High School (75 teenagers), the Music High School (73 students) and the Grammar School (89 students). The pupils completed a questionnaire regarding the emergence of fatigue. The results were analysed using the Pearson CHI Square test. Results and discussions: in 45.99% of cases students were often tired, the calculated differences being statistically significant for a  $p < 0.01$  ( $f=4$ ,  $\chi^2=15.500$ ); fatigue was often acknowledged by the grammar school teenagers. The phenomenon appeared in the middle of the week (48.10%  $p > 0.001$   $f=4$ ,  $\chi^2=20.862$ ) and at midday (43.03%,  $p < 0.01$ ,  $f=4$ ,  $\chi^2=11.738$ ). The statistically significant differences show a high frequency of positive answers for grammar school students. One of the factors favouring the appearance of fatigue was the low number of sleeping hours (6-7 hours in 75.94%). The calculated differences were statistically significant for a  $p < 0.001$  ( $f=4$ ,  $\chi^2=21.716$ ) and show a high frequency of grammar school teenagers who have little sleep. Conclusions: the appearance of fatigue is different for each high school, which demonstrates specific details of the various features of teenagers' loads.

Keywords: high school, scholar load, insufficient sleep

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## 1. Introduction

A pupil's development can be disrupted by the emergence of the scholar failure phenomenon, a situation which can be evaluated with the help of some markers represented by: unsatisfying school results of the teenager, the existence of a gap between his personal potential and his results, a lack of personal contentment and self-confidence, scholar absenteeism, early school abandonment, leaving school without obtaining a qualification, and failure at final exams (Cosmovici & Iacob, 2008).

One of the main causes of scholar failure, for a teenager with no family or health problems, is represented by the existence of too high a scholar demand associated with the appearance of intense fatigue or even the exhaustion phenomenon (Clerget, 2012; Papalia & Olds, 1990). The fatigue phenomenon has been studied intensely, but as yet the elements causing it and its place in the intellectual structure of a person are not known.

Fatigue is a complex state characterised by both objective and subjective symptoms. The objective symptoms are represented by visceral and endocrino-metabolic changes, which appear in people open to this phenomenon. These can be detected through special medical investigations. The subjective symptoms are easy to identify with the help of questionnaires, and can quickly be perceived by the person investigated (Gavat, Albu & Petrariu, 2006). The investigation of fatigue is important for students in order to evaluate how the scholar demands are adapted to the teenagers' potential, taking into account especially the age group.

Another aspect which needs to be carefully studied is that of how the teenagers spend their free time. Many teenagers spend hours every day in front of a computer (playing games or socialising with their group of friends) or a TV, which is a worsening factor for fatigue, and not a relaxation element.

The objectives of the study were: evaluating the presence of the fatigue phenomenon in a group of students; evaluating the differences/similarities that indicate the presence of scholar fatigue in students from different types of high schools; evaluating the time students spend in passive rest that allows alleviation of physiological fatigue; knowledge of fatigue generating factors, such as too much time spent in front of the TV or computer.

## 2. Methods

The study was undertaken on a group of 237 teenagers from the 9th and 10th grade (of ages between 14 and 16) from three different types of high schools: Sport High school (75 teenagers), Music High school (73 teenagers) and the G. Ibraileanu Grammar school (89 teenagers) in Iasi. These pupils completed a questionnaire with questions oriented in three directions: the presence of the subjective fatigue phenomenon (three questions regarding the presence of this phenomenon at the moment during the day or week when teenagers feel tired); the amount of time spent on day sleep and night sleep, allowing the body to regain its strength (two questions about the number of hours of night sleep and the presence of sleep during the day); the number of hours spent on free time activities that emphasize the student's fatigue (two questions about the daily time spent in front of the TV or computer) (Gavat, Albu & Petrariu, 2006). The results are presented in a comparison of the three scholar collectives, analysed with the Pearson CHI Square test.

## 3. Results

The interpretation of results begins with the three main directions approached: the presence of the fatigue phenomenon, time spent on passive rest and time spent on recreational activities.

The presence of fatigue was admitted by 45.99% teenagers, who responded to the question "do you feel tired?" with the answer "often". Attention is drawn to the 3.79% of teenagers who chose the "never" option. These students do not become fully involved in their scholar schedule, thus they do not feel tired (Table 1). The calculated differences in the scholar collectives are

statistically significant for a  $p < 0.01$  ( $f=4$ ,  $\chi^2=15.500$ ) and they highlight the existence of a high degree of fatigue in grammar school students. tired (Table 1). The calculated differences in the scholar collectives are statistically significant for a  $p < 0.01$  ( $f=4$ ,  $\chi^2=15.500$ ) and they highlight the existence of a high degree of fatigue in grammar school students.

Table 1. Presence of fatigue phenomenon in the questioned students

High school	Often	Rarely	Never	Total
Sport High school	21	49	5	75
G. Ibraileanu High school	50	37	2	89
Music High school	38	33	2	73
Total	109	119	9	237
%	45.99	50.21	3.79	

Physiological fatigue appears in the evening after a work day and at the end of the week (Bardov, 2009). For the students in the study group, the physiological fatigue after a work day was present in only 28.27% of cases, which is worrying. In most cases, (43.03%) this phenomenon appeared in the middle of the day, after finishing the scholar schedule (Table 2).

Table 2. Moment of day and week when fatigue appears

High school	Beginning	Middle	End	Total
Presence of fatigue throughout a work day				
Sport High school	27	23	25	75
G. Ibraileanu High school	18	48	23	89
Music High school	23	31	19	73
Total	68	102	67	237
%	28.69	43.03	28.27	
Presence of fatigue throughout a work week				
Sport High school	23	26	26	75
G. Ibraileanu High school	30	52	7	89
Music High school	25	36	12	73
Total	78	114	45	237
%	32.91	48.10	18.98	

The situation is worrying for 28.69% teenagers who feel tired in the morning, after a night's sleep, because it was insufficient. The calculated differences are statistically significant for a  $p < 0.01$  ( $f=4$ ,  $\chi^2=11.738$  and attention is drawn to the answers of the G. Ibraileanu High School students. Physiological fatigue that appeared after a week of scholar effort was admitted by only 18.98% of the questioned students. In most cases, (48.10%) fatigue appeared in the middle of the week, a time when their effort capacity is at its maximum. The answers of 32.91% teenagers are worrying as they feel tired at the beginning of the week, after a weekend full of activities and insufficient sleep. The calculated differences are statistically significant for a  $p < 0.001$  ( $Gf=4$ ,  $\chi^2=20.862$ ), drawing attention again to the answers of the G. Ibraileanu High School students.

The results obtained highlight the existence of a fatigue phenomenon marked especially in the students from G. Ibraileanu High School. Thus, it is important to evaluate the time spent on passive rest (night and day sleep). Normally, teenagers need nine hours of sleep a day. We consider eight hours of night sleep to be acceptable, associated with some sleep during the day.

In most cases (75.94%) pupils admitted to a night sleep of between six and seven hours, which is totally insufficient (Table 3).

Table 3. Numbers of hours of night sleep for the teenagers of the study group

High school	6-7 hours	8-9 hours	More than 9 hrs	Total
Sport High school	45	21	9	75
G. Ibraileanu High school	81	5	3	89
Music High school	54	14	5	73
Total	180	40	17	237
%	75.94	16.87	7.17	

The recommended number of night sleep hours is achieved by 16.87% of the questioned teenagers, but there are cases of teenagers who sleep more than nine hours a night (7.17%). The calculated differences are statistically significant for a  $p < 0.001$  ( $f=4$ ,  $\chi^2=21.716$ ), which shows an insufficient number of night sleep hours, especially for the grammar school pupils.

The insufficient hours of night sleep can be balanced with day sleep, in the afternoon. This sleeping time is permanently present in the schedule of 5.48% teenagers and often present in 13.92% of cases. Practically, the insufficient night sleep is balanced with the day sleep in only a few cases (Table 4).

Table 4. Presence of afternoon sleep in the pupils' schedule

High school	Every day	Often	Rarely	Never
Sport High school	8	14	30	23
G. Ibraileanu High school	4	16	42	27
Music High school	1	3	31	38
Total	13	33	103	88
%	5.48	13.92	43.45	37.13

In most cases (43.45%) pupils rarely sleep in the afternoon. Attention is drawn to the 37.13% of negative answers, which highlights the absence of the possibility to balance the insufficient number of night sleep hours. The calculated differences are statistically significant for a  $p < 0.01$  ( $f=6$ ,  $\chi^2=20.303$ ), which indicates the existence of a very small number of pupils from the Music High school who sleep every day or often in the afternoon.

The study continues by evaluating the daily time pupils spend watching TV or on computer activities (Table 5).

Table 5. Time teenagers spend watching TV or on the computer

High school	None	30 min. – 1 hour	2-3 hours	4-5 hours
How many hours a day do you watch TV?				
Sport High school	11	36	25	3
G. Ibraileanu High school	14	36	31	8
Music High school	29	26	14	4
Total	54	98	70	15
%	22.78	41.35	29.53	6.32
How many hours a day do you spend on the computer?				
Sport High school	11	20	26	18
G. Ibraileanu High school	7	24	36	22
Music High school	10	21	30	12
Total	28	65	92	52
%	11.81	27.42	38.81	21.94

In most cases (41.35%) pupils stay in front of the TV between 30 minutes and one hour, which is an adequate schedule. Attention is drawn to the 29.53% of teenagers who watch TV between two and three hours every day and another 6.32% who watch it for between four and five hours. In contrast, there are 22.78% of teenagers who do not watch TV shows. The calculated differences are statistically significant for a  $p < 0.01$  ( $f=6$ ,  $\chi^2=18.666$ ). Attention is drawn to the grammar school pupils, who spend a great amount of time in front of the TV, thus explaining the intensity of the fatigue phenomenon present in these teenagers.

The activity on the computer lasts in most cases between two and three hours a day (38.81%), which is a significant amount. Attention is drawn to the 21.94% of pupils who spend between four and five hours a day on the computer, but also the 11.81% of teenagers who do not use a computer every day. The calculated differences are statistically insignificant ( $p < 0.05$ ,  $f=6$ ,  $\chi^2=3.914$ ), which highlights that the study group pupils had similar interest in computer activity.

#### 4. Discussion

Pupils do not experience the scholar period with pleasure and ease, thus it is necessary to study scholar adaptation (Buzdugan, 2009; Godeau, Arnaud & Navarro, 2008). For better scholar adjustment, it is important to follow some rules: create a balanced life and study schedule; accomplish rest by keeping to normal sleeping hours; alternate scholar activities with fun; and achieve fulfilment in scholar results (Enachescu, 2004). For the study group pupils, scholar adaptation was difficult, thus they frequently had to deal with scholar fatigue. The occurrence of this phenomenon is logical for the Sport High school pupils, who, in addition to their normal scholarly activity, have daily practice and, at the end of the week, frequently have competitive sport events. Fatigue was also expected at the Music High school, where there are rehearsal classes within the timetable and many contests. However, the most problems appeared at the Grammar High school, thus demanding that special attention is given to these teenagers.

Fatigue disappears after a relaxing and sufficient sleep, but this is quite rarely presented in these teenagers. They have different interesting activities, thus the time spent sleeping is considered to be wasted. Teenagers often go to bed late and wake up early, so their physiological sleep time is not respected (Jayson, 2008). For the pupils questioned, the number of night sleep hours is totally insufficient, thus explaining the occurrence of fatigue during the day or week. The biggest problem appears to be with the Grammar High school pupils, thus there will need to be more focus on these teenagers.

One final aspect which needs to be carefully studied is related to how the teenagers spend their free time. The ways of enjoying leisure time which have become so popular in recent decades are the television and computer. Television has a good effect as it broadens the field of knowledge, but it also has negative effects because the pupils passively witness events on the screen (Maillet, 1997). Also, television frequently presents shows full of violence and aggression. There are no shows adapted for teenagers and this is a negative factor (Braconnier, 1999). The results obtained from the pupils of the study group are very similar to those obtained in France in the international investigation from 1998, 'Health Behaviour in School-Aged Children'. The results of this investigation were: absence of watching TV shows – 2.9% pupils, between 30 minutes and 1 hour – 49.9% teenagers, 2-4 hours daily – 39.9% and more than 4 hours – 7.4% (Godeau, Dressen & Navarro, 2000). The results obtained in this study point to the existence of a higher percentage of teenagers who do not watch TV shows. Grammar High school teenagers spend more time in front of the television, which explains their fatigue. The result obtained is quite discouraging because the pupils questioned have little idea about how they should spend their free time.

Free time is frequently spent on the computer. At first, the entry of computers into schools was seen as a positive element, opening new possibilities for teenagers to gain information and to communicate (Alexander, 2010). Nowadays, the internet network is developing, as are video games. Pupils do their homework on the computer and socialise on the computer, and so there

is a risk that it will be necessary to deal with computer addiction (Braconnier, 1999). For the pupils questioned, the calculated differences are statistically insignificant, so they all spend a similar amount of time on the computer. It does not matter if they have homework, a practice schedule or musical rehearsals, they still have time for computer games, even if that means insufficient sleep.

## 5. Conclusions

The study undertaken on this group of pupils highlights a series of discouraging results. Fatigue is associated with a reduced number of sleeping hours and an increased number of hours spent in front of the TV and, in particular, on the computer. The professionals, doctors, teachers and families should unite to ensure there are adequate scholar activities and a rest timetable for these pupils. Rest means other ways of spending free time, such as sport, cinema, reading, music, theatre, or going out with friends. If the situation is not addressed in time, there is a significant risk of oversteering or pathological fatigue phenomena to occur.

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