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Full Length Article

Mutual relations between sleep deprivation, sleep stealers and risk behaviours in adolescents



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ABSTRACT

Objectives: The aim is to evaluate the mutual influences between sleep duration/sleep deprivation (SD) and the sleep stealers/adolescent risk behaviours.

Methods: The national survey is a component of the Health Behaviour in School-Aged Children (HBSC) study, it is based on a school-based self-completed questionnaire; 3476 students were randomly selected from 139 randomly chosen Portuguese schools using as an unit the class, 53.8% were girls; 45.9% attended the 8th grade and 54.1% the 10th grade; the mean age was 14.9 years. The measured variables were: 1) gender and age; 2) sociodemographics; 3) sleep duration during the week and during weekends and computed SD; 4) screen time (computer use during the week and during the week end (PC use); watching TV and mobile phone use; 5) earlier sexual behaviour; 6) violent behaviours: fights, use of weapons; 7) use of tobacco, alcohol and drugs. The statistical analysis included Pearson chi-square tests and logistic regression.

Results: Excessive use of mobile phone, of computer use during weekdays, and internet facilities; substance use; violence and earlier sexual relations had significantly higher prevalence in sleep deprived adolescents. By logistic regression only using PC during weekdays, tobacco, drugs and weapons were associated to SD, while SD was associated to PC use during weekdays, tobacco use and drugs' use. Computer uses tend to be associated among themselves. Mobile phone is associated with computer practices and with alcohol and tobacco use. Tobacco is associated with most risk behaviours. Alcohol use is associated with other substance use, computer use and violent behaviours. Violence behaviours, earlier sex and drugs use tend to be associated among themselves.

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Conclusions: Sleep stealers use and risk behaviours are more prevalent in sleep deprived adolescents, but, in spite of significant individual associations, models of risk behaviours are still lacking.

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1. Introduction

Adolescents sleep shows marked variation in duration and variability [1] and persistent circadian misalignments [2]. Two types of behaviours have major impact upon sleep: those that reduce sleep duration (the Sleep stealers: high tech media and gadgets) and those associated with health and survival risks (the Health risk behaviours) [3]. The Sleep stealers, i.e., gadgets or behaviours that reduce sleep duration, include TV, mobile phones and derivatives, computers and internet facilities, play stations, games, etc. Multiscreen viewing is a current practice [4]. In the EU Health Behaviours in School-aged Children (HBSC) study, 62% of the girls and 64% of the boys watch television two or more hours on week days [5]. Screen time, is an overweight [6] and diabetes risk factor [7], with high levels of emotional eating [8] and unhealthy food preferences [9–13]. Lower economic status [14–16], lower parental regulation and increased parental TV viewing are associated with increased screen times [17].

Risk behaviours are important threats during adolescence due to possible lifetime negative consequences. Their prevalence is high in the USA: the percentage of those who ever smoke, drunk, use marijuana and cocaine was respectively 44.7, 70.6, 39.9 and 18.2% in a national survey; the percentages of those carrying weapons to school (5.4%), involved in fights (12.0%), being bullied (18.2%) or having had sexual intercourse (47.4%) are impressive [18]. In Europe, smoking is decreasing, but alcohol consumption is high (31% of the girls and 36% of the boys have been drunk at least twice); 15% of the girls and 20% of the boys have ever used cannabis [5]. Alcohol consumption among Thai adolescents affects 14.8% (21.2% males and 9.3% females) [19].

In the USA 47.4% of the teens had already sexual intercourse, and some with violence (9.4%) or forced sexual intercourse (8%) [20]. Lower self-control or neurobehavioral disinhibition are possible substrates for sexual and other risk behaviours [21, 22], as well as exposure to traumatic life events [23], lower social/familial protection [24–28], and alcohol [29] and drug consumption [30].

Violent behaviours have been associated with sleep disturbances, the observation of violence, use of alcohol, internalised anger [31], or with violent TV contents [32]. Many of these behaviours influence sleep and sleep duration, namely screen time [15,33,34] and risk taking behaviours [3,31,35]. Playing violent games had significant impact upon sleep [36,37].

Short sleep duration and irregular schedules were significantly associated with all risky behaviours, and long sleep duration was significantly associated with all risky behaviours except for suicidality [35], school violent behaviours

[38], bullying [39]; association between vexingness and aggression or antisocial behaviour was found [40].

This study aims the bidirectional influences between sleep deprivation, sleep stealers and risk behaviours in adolescents, while evaluating their predictive values.

2. Methods

2.1. Participants

This survey is a component of the Health Behaviours in School-Aged Children (HBSC) study [5,41]. The Portuguese HBSC survey included 3476 pupils, (53.8%, $n=1869$) were girls, in the 8th (45.9%) and 10th grades (54.1%) with a mean age being 14.9 years ($SD=1.26$, min 12.5, max 19.0) randomly chosen from 139 schools, in a national sample geographically stratified by Education Regional Divisions, using as a sampling unit the school and then the class. The school response rate was 89.9%. The overall procedure, concerning has been described elsewhere; briefly this study has the approval of a scientific committee of the involved institutions, an ethical national committee (Hospital S. João- Oporto-Portugal), the Ministry of Education (Directorate of Education) and the national commission for data protection and followed strictly all the guidelines for protection of human rights. Adolescents' participation in the survey and completion of the questionnaires was voluntary and anonymity was assured, all parents signed an informed consent.

2.2. Instrument

The questionnaire inquired about: 1) gender and age; 2) sociodemographics; 3) sleep duration during the week and weekends, sleep deprivation (SD) (difference in sleep duration equal/higher than 3 hours between weekdays and weekends) [42]; 4) screen time (computer use: standard; games, internet; social networks, emails,); 5) TV and mobile phone use; 6) earlier sexual behaviour; 7) violence: fights, use of weapons; 8) use of tobacco, alcohol and drugs. Answers were provided by Likert type scales inquiring if behaviours occurred and their frequency (e.g. how many hours a day do you sleep during the weekdays – or during the week end? how many times a month do you drink spirits? How many cigarettes do you smoke every month?), and for the purpose of the present study were dichotomised into a YES/NO behaviour occurrence basis.

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