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Educational and Psychological Implications of Sleep Habits and Technology Usage: Inattention and Controlled Behaviors

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Abstract

Assessment of education and learning in formal contexts often underestimated the effect of the sleep variable. The sleep behavior and the chronotype of adolescents are important to understand the causes of failure in specific academic tasks, but also affecting classroom behaviors. The chronotype characterizes individuals according to their sleep habits and their preference and willingness to perform their tasks at specific times of the day. Adolescents tend to be evening type contrary to the morningness profile. Evidence supports that evening adolescents will perform better in late schedules. Besides schedules and traditional educational methods, technology-based and digital education are important to comprehend how evening individuals could compensate their cognitive phase during early hours. Two Portuguese empirical studies were compared concerning the educational outputs and the use of technologies attending certain periods of the day. A theoretical framework will be presented grounded by results gathered from the two research studies. This theory evidence based will help to contribute to a better understanding sleep habits and exposure to screens in pubescent population.

Index Terms— Sleep, Psychology, Technology, Covid-19, Bullying.

1. Introduction

This paper presents a narrative about the state of sleep disturbances and the technology usage among adolescents. Both – sleep patterns and technology usage - affecting school achievement and well-being. The narrative is developed, in summary, based in empirical data from two previous studies with the main goal to examine how sleep disturbances were result from isolation contexts and extended technology usage enabled by the pandemic context; also, the implicit inattention and (non)controlled behaviors among young students, in adolescent phase. Quantitative data will be not addressed intentionally with the main goal to develop a tentative theory to understand the correlation between sleep patterns, technology habits and disrupted performance. This theoretical perspective is grounded in two quantitative and empirical studies. The new framework, mainly considering the post-pandemic period, will address concrete evidence only supported from both studies and not focusing, as priority, the previous literature. Applications and implications will be considered for scholars, educational practitioners and psychologists.

Firstly, exposure to screens will be addressed concerning how they impacted sleep regular habits of pubescents and, simultaneously, how that disruptive scenario was a result from COVID-19 isolation and online schooling. Chronotypes will be briefly addressed also attending to changes that the first empirical study observed: morningness changed as predictor of better attention and behaviors at classroom.

Secondly, the two perspectives of both researchers are approached in a revisited intention for the literature focused in this field.

2. Exposure to Screens, Isolation and Sleep

Considering the circadian reference for the human being and cognitive activity, there are two biological preferences not depending on the social schedules: morning and evening chronotypes. The first one refers to individuals with better performance in the early periods of the day, also with early schedules regarding bedtime and awake. Mostly the awakeness states during the 24 hours. The evening chronotype refers to the opposite: preference and advantage when executing in late periods and with late sleep schedules. The difference can be tracked by one or two hours comparing morning and evening types, but it is enough to observe significant behaviors that diverge among individuals.

The chronotype, however, changes during lifespan. In adolescents and pubescents, the chronotype occurs in a critical period because this age group are exposed to a phase delay (normally of one hour). This is a biological trait observed in every pubescent and affects, normally, the academic performance, motivation, initiative and humour regulation. Mostly considering the evening types. Since young ages, children exhibit the morningness or eveningness tendency. The earlier exposure (in young ages) to technology devices and long usage (considering mostly the evening hours before going to bed) is a problem that we need to examine considering mostly the variable of post-pandemic context.

The pandemic strike demanded isolation, total and partial attending to different waves occurred in 2020-2022. That isolation resulted in remote schooling through online and digital forms, as well remote work for families functioning at the same space during long periods. These conditions enable rapid changing of habits, specifically those related with sleep. With more 'availability' at home the technology usage was extended in terms of hours per day. In a negative way. We approach technology usage in two perspectives: functional, because computers and tablets (sometimes smartphones) were necessarily used for schooling activities; arbitrary, because the young students extended their access to devices after classes not only for home-work.

The arbitrary perspective comprehends the time spent with games, text messaging and social platforms. The devices actived until late hours affected directly the bedtime and the sleep onset. Those are different constructs (bedtime and sleep onset) measured by instruments designed for. Only with those sleep indicators, we can calculate the midsleep point and observe disturbances when they existent, considering cut-off scores. One individual can have a bedtime established but not corresponding to the sleep onset. The resting behavior was compromised mostly since the COVID-19 and the usage of devices with no parental supervision.

Sleep deprivation and inadequacy of work and school schedules were observed during COVID-19 outbreak. By inadequacy we mean the long hours and the negative exposure to screens for extended periods. The telework or online work, as well the online and remote classes, were simultaneously in diurnal timetables and at the same spaces. Families were working and living in a constrained space with the perfect conditions to affect sleep and negative well-being. Stress and anxiety causing and caused by sleep deprivation and postponed sleep agenda. The household turned workplace and school. Pubescents suffered more than children considering the critical period for the phase delay expected for sleep adjustment in this age.

More devices appeared during the period of 2020-2022 and locked the families in a negative dynamic where the online dominated the home context and parenting. For work, schooling and living out of work and school. The study conducted with adolescents and their living during lockdown revealed high levels of anxiety and mainly disruptive behaviors that are, now, transferred in classroom (in person). Since the end of 2022. The consequences from the pandemic and lockdown are more visible now and they need to be supported to eradicate psychomotor agitation at classroom, reeducation of technology usage and high supervision of sleep schedules at home. If sleep was less studied in young populations, now its supervision became a upmost concern for investigation, for educational/psychological practice and for personal/family orientation.

To add, in this first part of the theoretical framework, we registered an incongruence. Morningness appeared more associated, compared to eveningness, with inattention and indiscipline. As hypothesis for this evidence we address that this scenario changed caused by the COVID-19 constraints at home during the isolation periods. Moreover, the isolation was not linear: different waves provoked different period of isolation and disrupting classroom management. This affected students and families with consequences for inattention, psychomotor agitation and sleep disturbances.

Chronotypes should be revisited against their first theories that advocated the following: morning children and adolescents are more discrete and less disruptive at classroom; evening individuals are more prone to agitation, behavioral problems and sleep defiance. Here parental education was observed, in our study, as a covariate that moderates the effect of discipline, attention and related behaviors. Also, considering the supervision of children' sleep in post-pandemic period.

3. School Bullying, Sleep Quality and Use of Electronic Devices in Children

Bullying is a violent behavior, being the most prevalent form of violence in schools (Kubiszewski, Fontaine, Potard, & Gimenes, 2014) and involves negative actions with the intention to harm the other, which manifest systematic abuse of power repeatedly performed by one or more individuals. This behavior is more prevalent in primary and secondary education, and about one third of children at this level of education engage in bullying as bullies, victims or both (victim-harmful) (Kubiszewski et al., 2014).

Bullying behaviors in school settings integrate several participants such as the bully, victim and bystanders and can have negative consequences, both long- and short-term in children and adolescents (Bettencourt, Clary, Lalongo, & Musci, 2023).

It is estimated that about 20% to 30% of school-age children experience poor quality sleep and that approximately 40% of children experience a sleep problem at some point in their lives (Caliendo, Lanzara, Vetri, Roccella, M., Marotta, Carotenuto, Russo, Cerroni, & Precenzano, 2020). Disturbed sleep in children can range from difficulty falling asleep or staying asleep to sleep apnea, and as a consequence, they may wake up several times during the night, experience extreme restlessness, wake up too early or experience fatigue and excessive daytime sleepiness. These consequences may be temporary difficulties that disappear without any intervention or they may extend over long periods of time and have a negative impact on the child's physical and mental health, emotional and behavioral regulation and learning and memory (Caliendo et al. 2020).

Lack of self-regulation can lead children to become emotionally unstable and more reactive to their peers, thus creating more social difficulties and problematic interactions, such as bullying. Just as sleep influences aggressive behaviors, so bullying influences the various dimensions of sleep (Kubiszewski et al., 2014;). Children victimized by peers show more sleep-related problems than children who do not experience such victimization. Sleep functions are associated with the body's overall balance and it is understandable that a disturbed sleep causes imbalances at various levels. That said, it becomes essential to understand the factors that influence sleep and make children more susceptible to display aggressive behaviors and more vulnerable to peer aggression.

Recent studies confirm that children exposed to adverse experiences, such as school bullying can negatively influence sleep quality, enhancing emotional and behavioral problems (Qu, G., Liu, H., Han, T. et al. 2023).

The quality of children's sleep is also influenced by factors related to sleep hygiene, including the appropriate habits for a quality sleep. Bedtimes, the act of turning off the lights and sleeping without exposure to devices by children are extremely important factors for sleep quality (Excelmans & Van den Bulck, 2015). Exposure to light from screens that leads to the suppression of melatonin, the hormone that promotes sleep (Czeisler, 2013); and the use of mobile phones either due to exposure to the electromagnetic fields emitted that cause changes in brain activity and, consequently, sleep or by interrupting sleep through the reception of messages.

Bullying behavior, sleep and use of electronic devices before bedtime are related to each other and we considered it pertinent to explore these relationships in order to increase our knowledge about three modern problems, the prevalence of bullying behavior in schools, the influences of sleep disturbance and the increasing use of electronic devices before bedtime in a population vulnerable to its short and long term consequences.

A convenience sample of 860 children attending the first grade, aged between six and 12 years old was selected. The children were given a self-report instrument on the quality of peer interpersonal relationships and a sociodemographic questionnaire with questions on electronic devices. Parents were given a questionnaire about their children's sleep. Data analysis revealed a significant relationship between quality of sleep and bullying behavior, $\chi 2$ (3) = 27.795, p = ,001. A significant relationship was obtained between sleep quality and the use of electronic devices before bedtime, except for television which revealed no significant association. Although

causality relationships cannot be assured, these results point to an interaction between these three components and open new avenues for future research.

4. Conclusion

The results of our studies support an advance for a new theoretical framework where morningness chronotype can be more correlated to disruptive behaviors at classroom, contrary to the common expectancy related with the association between evening types and opposition behaviors. In children and pubescents. The pandemic strike and the current post-pandemic scenario are two important factors to revisit the sleep changes occurred since 2020. After the forced isolation, children and adults disrupted their vigil and sleep schedules with serious consequences for a new balance in the post-pandemic period. Parental investment should be included as a predictor in this theoretical approach concerning the sleep habits awareness and balance. Families were simultaneously affected in their sleep behavior.

Also the empirical data confirmed the negative influence of sleep quality on bullying behavior. Our analyses indicated that victim-bully bullies experienced the most sleep problems. In addition, we found that the use of electronic devices before bedtime had a negative impact on children's sleep, with the exception of television. The school should focused on maintaining a positive school environment that promotes the reduction and elimination of bullying behavior. Health professionals should reflect on the links between bullying, sleep and electronic devices. Parents should ensure good sleep hygiene and healthy habits of their children, as well as a monitored use of electronic devices thus promoting appropriate behavior and quality sleep.

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