

# Late Bedtime from the Perspective of Adolescents: A Qualitative Study

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**Purpose:** Later sleep timing is a key determinant of reduced sleep duration and quality in adolescents and is associated with negative mental and physical outcomes. However, little is known about adolescents' views on late bedtime. The study's purpose is to explore adolescents' perspectives on why they go to sleep late during school nights and what would help them to go to bed earlier.

**Patients and Methods:** We conducted online semi-structured interviews with 24 adolescents aged 14–17 years as a part of the international HBSC (Health Behaviour in School-aged Children) study. The data were collected via individual and group interviews and analyzed using a combination of consensual qualitative research methodology and thematic analysis.

**Results:** School demands and leisure time activities, particularly online socialization with peers, have been identified as one of the main themes related to why adolescents go to sleep late. Adolescents reported difficulties managing these competing activities during the day after school, often postponing them until late at night and prioritizing them to sleep. Adolescents also mentioned bedtime distress as a barrier to falling asleep. However, some adolescents did not perceive late bedtime as a problem, but rather as a habit and personal choice. They reported that better time management, less homework, engagement in physical activity, parent-set bedtime, and less time spent online in the evening would help them to go to bed earlier.

**Conclusion:** Our findings suggest that interventions to improve sleep timing in adolescents should focus on reducing school pressure, building supportive social networks; strengthening adolescents' self-regulation skills; and enhancing parental involvement in establishing sleep and daily routines for their adolescents.

**Keywords:** sleep timing, teenagers, school pressure, leisure time activities, self-regulation, parent-set bedtime

## Introduction

Good sleep is essential for optimal health, functioning and well-being of adolescents.<sup>1,2</sup> It is characterized by subjective satisfaction, appropriate timing, adequate duration for age, high efficiency, sustained alertness during waking hours, and healthy sleep behaviors.<sup>3,4</sup> Evidence shows that up to 50% of adolescents sleep less than recommended and have sleep problems.<sup>5–7</sup> Later sleep timing is argued to be a key determinant of lower sleep duration and quality in adolescents.<sup>8</sup> However, it is associated with short sleep duration only during school days when early school start times force adolescents to wake up earlier than their natural sleep patterns would allow.<sup>9</sup> Recent evidence suggests that later sleep timing increases the risk of poorer physical and mental health outcomes and unhealthy behaviors in adolescents independent of sleep duration.<sup>8,10–12</sup> Various intrinsic and extrinsic factors are associated with later sleep timing in adolescence. Circadian shifts, coupled with increasing bedtime autonomy, response to academic pressure, and widespread availability and use of technology and social networking in the evening, collectively push sleep to a later time in adolescence.<sup>13,14</sup> The negative effects of bedtime procrastination and poor self-regulation on sleep timing have also been discussed.<sup>15</sup>

Gaining insights into adolescents' perspectives is crucial for understanding why they delay bedtime on school nights, despite being aware of potential sleep costs. Several qualitative studies have investigated the barriers to healthy sleep in adolescents and found that adolescents prioritize bedtime activities other than sleep, such as social networking, electronic media use, and schoolwork, and view late bedtime as a socially driven behavior.<sup>16–18</sup> Adolescents have also identified



stress levels and striving for a sense of well-being as factors delaying their bedtime.<sup>17,19</sup> However, little is known about the role of daytime activities and daily routines, whether and how they influence bedtime activities and sleep timing during school days. Moreover, research exploring adolescents' perceptions and attitudes to late bedtime is scarce. Therefore, the study aims to investigate why adolescents go to bed late on schooldays, focusing on the roles of bedtime and daytime activities and exploring the barriers and facilitators of earlier bedtimes. The findings of this study could potentially inform interventions and policies aimed at improving adolescent sleep patterns and, consequently, their overall health and well-being.

## Materials and Methods

### Design of the Study

Our qualitative study was conducted as part of the international HBSC (Health Behaviour in School-aged Children) study, utilizing a combination of the consensual qualitative research (CQR) methodology<sup>20</sup> and thematic analysis.<sup>21</sup> The study protocol was approved by the Ethics Committee of the Faculty of Medicine at Pavol Jozef Safarik University in Kosice (19N/2020). The research adhered to the ethical standards outlined in the Declaration of Helsinki (1964) and followed the consolidated criteria for reporting qualitative research (COREQ).<sup>22</sup>

### Study Setting and Recruitment of Participants

Sampling for this qualitative study was conducted in several phases. Initially, we contacted school administrators to inform them about the study's purpose. After obtaining their consent for participation, we reached out to the parents of potential participants and secured their informed consent via an online platform. With parental consent, we then approached the adolescents to obtain their informed consent. The participants and parental informed consent included publication of anonymized direct quotes. Class teachers managed communication with parents and adolescents through the EduPage platform, a cloud-based school management system that ensures communication between schools, teachers, administrators, students, and parents, to prevent researchers from accessing contact information directly. Participation in the study was entirely voluntary and confidential, with respondents free to withdraw at any time.

We obtained qualitative data based on realized interviews with adolescents in the first year of Slovak high school. We received informed consent from 106 adolescents and we invited all of them to participate in the online interviews. The final sample consisted of 24 participants who agreed to participate (7 boys; 14–17 years old, mean age = 15.17). The participants were from various schools representing all types of high schools in Kosice region, Slovakia; ie grammar schools (with A levels graduation), secondary schools with GCSE (General Certificate of Secondary Education) graduation and secondary schools with apprenticeship certificate graduation. These types of schools might differ slightly in average age of their students in the first year of studies, hence the wider age range (14–17 years). The background characteristics of the sample are presented in [Table 1](#).

### Procedure and Measures

We conducted 11 online semi-structured individual (one) and group interviews (ten) in the period between November 2020 and June 2021. The number of adolescents varied from two to twelve per group interview. Before the interviews, adolescents completed a brief questionnaire about gender, age, location (city, village), and type of school (secondary school; secondary vocational school, ie with a general certificate of secondary education; secondary vocational school, ie with vocational certificate). The interviews were then conducted by a trained psychologist with extensive experience working with adolescents on an online counseling platform. Members of the research team (M.K., Z.D.V., L.S., E.D.), who included both senior and junior researchers with diverse backgrounds in psychology, public health, and education, alternated in their attendance in the interviews as silent observers. During interviews, only one silent observer was present in addition to the trained psychologist who conducted the interviews. The silent observer was introduced at the beginning of the interview session; however, she remained silent for the rest of the interview and did not intervene at all. The trained psychologist started the interview with a short introduction and warm-up conversation to make the

**Table 1** Characteristics of the Sample (N = 24, 14–17-Year-Old Slovak Adolescents, Data Collected in 2021)

Characteristic	N (%)
<b>Gender</b>	
Boys	7 (29.2)
Girls	17 (70.8)
<b>Age</b>	
14 years old	5 (20.8)
15 years old	12 (50.0)
16 years old	5 (20.8)
17 years old	2 (8.3)
<b>Location</b>	
City	15 (62.5)
Town	2 (8.3)
Countryside	7 (29.2)
<b>Type of school</b>	
Secondary school	12 (50)
Secondary vocational school (with GCSE)	10 (41.7)
Secondary vocational school (with vocational certificate)	2 (8.3)

**Abbreviation:** GCSE, general certificate of secondary education.

adolescents feel more comfortable. Even though adolescents were from various schools, there was a possibility they could know each other. However, they did not mention it, and we did not inquire about it either.

The interviews were conducted using a thematic guide that included the following questions: 1. Sleep is important for good health, and we know that many school children go to bed late on school days. What do you think why? 2. What prevents you from going to bed earlier? 3. What would help you to go to bed earlier?

The interviews were conducted in the Slovak language, lasted approximately 45–60 minutes and were audio and video-recorded. The interviews were done via Zoom online during the second wave of the COVID-19 pandemic. The government measures at that time did not allow to conduct face-to-face interviews.

## Data Handling and Analyses

We processed the obtained data by transcribing audio- and video-recorded interviews verbatim in Slovak for further analysis, ensuring the anonymity of the respondents. The transcriptions were then checked for accuracy and uploaded into MAXQDA the standard platform for data analysis (VERBI Software. (2021). MAXQDA 2022 [computer software]. VERBI Software. Available from maxqda.com). We coded the data using CQR methodology<sup>20</sup> and thematic analysis.<sup>21</sup> We used inductive thematic analysis, which is data-driven without a prior theoretical framework. The codes and themes were derived from the data. The consensual qualitative methodology aimed to reach richer interpretations of the data and it was collaborative and reflexive.<sup>23</sup> The authors applied semantic coding in order to explore the chosen topic according to our aim.

The coding team included the lead investigator (Z.D.V.), senior (M.K., L.S.) and junior researcher (E.D.), all of whom were trained in the CQR methodology. The research team chose the CQR methodology to strengthen the validity and reliability of the data analysis. Through the constant comparison of codes and themes, the coders had the opportunity to reflect on their approach to coding. First, members of the research team carefully read transcripts and field notes, segmented texts and created codes. M.K. and E.D. generated codes individually and after the completion of the coding process, they exchanged coding outputs to cross-check for coding quality. If there were disagreements or requests for re-coding, the team members held coding meetings to discuss the issues until a consensus was reached on the final coding. Next, the team conducted a thematic analysis of the entire transcript, identifying codes related to why adolescents go to bed late on school days and what would help them go to bed earlier. These codes were then grouped into subthemes and

themes. Initially, this was done by M.K. and E.D., after which the team met to share and discuss the subthemes and themes until an agreement was reached on the final thematic model.

## Results

We organized the results into two main categories: barriers to earlier bedtimes and facilitators of earlier bedtimes.

### Barriers to Earlier Bedtimes

Five main themes related to why adolescents go to bed late on school days were identified in the thematic analysis: (1) Schoolwork demands, (2) Leisure time activities, (3) Feeling distressed, (4) Having a lot of energy and (5) My bedtime, my choice. The five main themes and sub-themes interact together during daytime and bedtime as presented in Figure 1. Management of the activities and tasks during the day after school had an impact on adolescents' bedtime activities and the time when they went to bed and sleep. Schoolwork demands, organized leisure-time activities, and unstructured activities were mentioned as competing daytime activities during the school day. The lack of time made the prioritization and management of activities challenging and often led to the postponement of some activities and tasks until bedtime. Schoolwork, screen-based and non-screen-based activities were mentioned as the bedtime competing activities, that prevent adolescents from going to sleep earlier. Emotional and physical distress was also highlighted as a factor associated with late bedtime/sleep time in adolescents. However, some adolescents reported that they did not perceive the late bedtime as a problem and were used to or preferred to go to bed late at night. The main themes, subthemes and illustrative quotes related to the barriers to earlier bedtimes are described in Table 2.

### Schoolwork Demands

Adolescents mentioned schoolwork demands as one of the reasons they went to bed late at night. The adolescents reported having to do a lot of homework and complained about the school logistics and high academic pressure. They

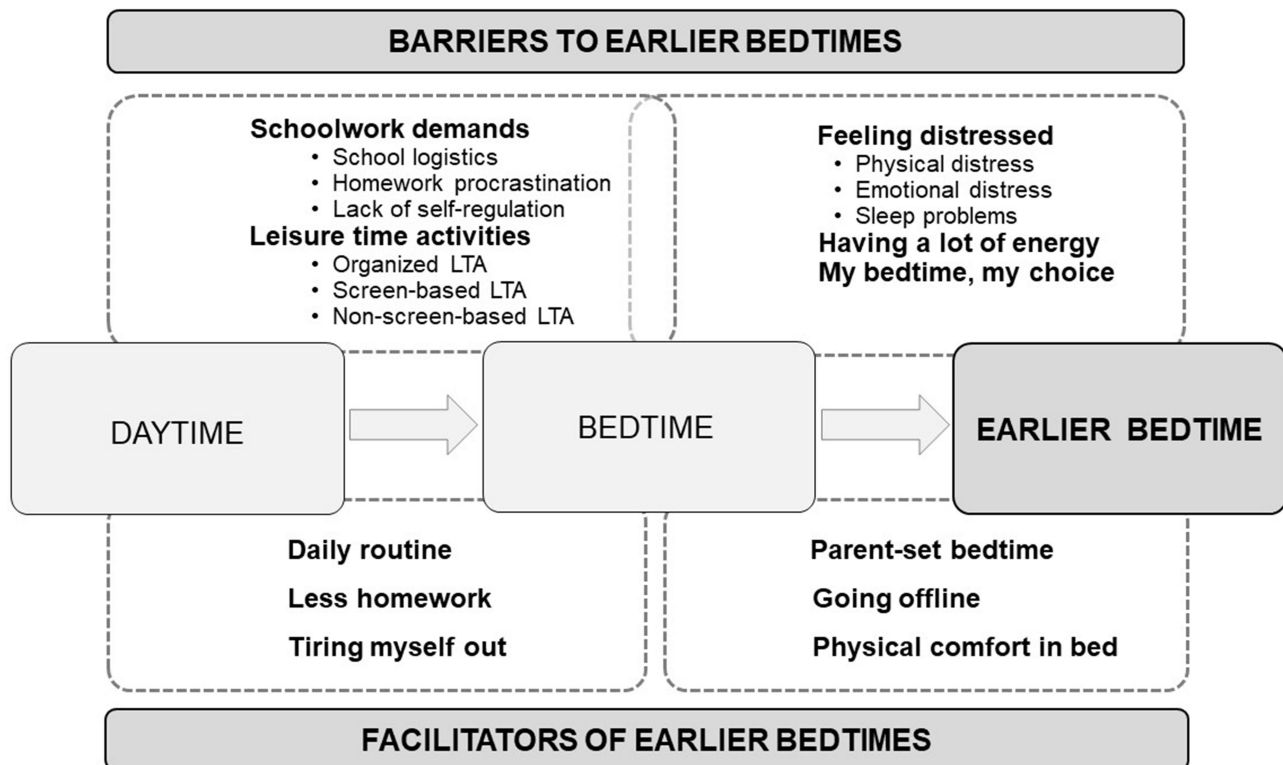


Figure 1 Barriers and facilitators of earlier bedtimes in adolescents.

**Table 2** Barriers to Earlier Bedtimes: Main Themes, Sub-Themes and Illustrative Quotes

Themes/ Sub-themes	Illustrative Quotes
<b>Schoolwork demands</b> School pressure  Homework procrastination  I better study at night	<ul style="list-style-type: none"> <li>• "...So I think, that we go sleep late, because school is about, that they give us a lot of homework and then we learn at home at night ..." (11-R4)</li> <li>• "I go to sleep late as sometimes you have a lot to do in one day - like those tests, and you just have to study for it all, and it's an awful lot. And if there's, like, you have to learn 15 pages for that, and you write three tests like that".(12-R2)</li> <li>• "... I want to have a rest after school and then I have time to study only in the evening". (13-R5)</li> <li>• "Sometimes I come home and just relax for a while and then when I go back to homework it is evening". (12-R2)</li> <li>• "I study better at night, I do everything faster and better. it suits me quite well because I know that I can keep something for that time and no one bothers anymore because everyone is already asleep". (11-R4)</li> <li>• "I remember things better in the evening, and sometimes when I try to learn something around, for example, four o'clock or so, I do not remember it as well as I do in the evening before going to bed. (18-R2)</li> </ul>
<b>Leisure time activities</b> Organized leisure-time activities  Screen-based activities  Non-screen-based activities	<ul style="list-style-type: none"> <li>• "I spend an hour getting to the horse club, spend two hours there, and then another hour getting back, which leaves me with very little free time that I'd like to have. So, I end up making up for it at night". (11-R4)</li> <li>• "I come home from the club at seven and I have to start to study for school and I finish at midnight". (11-R1)</li> <li>• "Most of us spend the evening watching TV and on social networks. Or we chat with friends. This is the reason, why we go to bed late".(12-R2)</li> <li>• "If I did not have my phone, I probably have nothing to do and go to sleep". (11-R3)</li> <li>• "My friends always call someone at night. Either they have a group where they call each other at three in the morning and maybe they call others to keep them awake". (15-R1)</li> <li>• "They might go to sleep, but social media or staying in touch with others is more important to them". (18-R2)</li> <li>• "It's been happening more lately that I'm with my parents in the evenings, that I'm just spending time with them, or at least trying to". (17-R1)</li> <li>• "Some classmates go out late in the evening and come back late in the evening, so they go to bed late". (12-R2)</li> <li>• "I go to bed late, I used to read late into the night". (13-R5)</li> </ul>
<b>Feeling distressed</b> Physical stress  Emotional stress  Sleep problems	<ul style="list-style-type: none"> <li>• "So I can't sleep because I don't feel comfortable in bed. Something's always pushing me, or I am uncomfortable, something itches or something". (12-R4)</li> <li>• "I can't sleep when I argue with someone - for example, some personal reasons..." (15-R1)</li> <li>• "I can't sleep because my brain is still thinking about all those things that I still need for school. That I need to learn, on what day this and I still need to do this, I do not have this yet, well". (13-R5)</li> <li>• "Sometimes I have so many thoughts in my head that I do not sleep at night". (15-R1)</li> <li>• "Some people can't sleep because they have some sleep problems, some insomnia". (19-R1)</li> <li>• "I can't fall asleep very well and I have such sleep problems in general". (11-R4)</li> </ul>
<b>Having a lot of energy</b>	<ul style="list-style-type: none"> <li>• "I just cannot fall asleep that early and even when I try I just cannot. I am not even on my mobile when I cannot fall asleep, but I just lie there and do nothing". (16-R1)</li> <li>• "I have quite a lot of energy at night, I'm more of a night person. I usually go to bed around one or two. Sometimes it happens at three". (11-R1)</li> <li>• "But I'm not tired at all. I don't know. But then again, when I wake up in the morning, I'm so tired. But then again, I gather a lot of energy during the day and I can't fall asleep at night" (16-R1)</li> </ul>
<b>My bedtime, my choice</b>	<ul style="list-style-type: none"> <li>• "If I decide to go to sleep, I go. No one stops me". (13-R5)</li> <li>• "I have the option to go to bed earlier and I'm so comfortable going to bed later, it's more up to me that's how I decide". (13-R4)</li> <li>• "Personally, no one is stopping me from going to bed early. Not even school. Not even tests, not even my parents. I think it's really just a matter of us when we're going to sleep and how we're going to help ourselves". (12-R2)</li> </ul>

**Abbreviations:** I, Interview; R, respondent.

also struggled with the lack of time and the need to relax and have free time. Some adolescents do homework when they return home from school to have free time in the evening. However, many of them were involved in homework procrastination and deliberately postponed schoolwork tasks until the evening to enjoy free time and leisure time activities till late evening. The others reported not having time to do homework in the afternoon because of time spent on organized leisure time activities and catching up on the homework in the evening. Finally, some adolescents preferred to do homework in the evening as they could learn better at this time.

*So I think that we go sleep late, because school is about that they give us a lot of homework and then we learn at home at night. (11-R4)*

### Leisure Time Activities

Organized leisure-time activities after school were reported by adolescents as time-consuming activities and the reason why adolescents had to postpone homework and other leisure-time activities until evening. Screen-based activities were reported as the popular unstructured leisure time activities during the day and evening. Adolescents argued that the evening hours are often the only time when they can finally enjoy free time, relax, and do what they want. Adolescents reported that online social networking was one of the reasons, why they went to bed late and sacrificed their sleep to be connected and communicate with friends. Watching movies, TV, and playing video games were mentioned as other screen-based activities in which adolescents were voluntarily engaged during bedtime and preferred to sleep. However, some of them admitted that if they did not have access to electronic media, they would have probably gone to sleep earlier. Physical social networking was also mentioned as a barrier to an earlier bedtime. Some adolescents stated, that they delayed their bedtime because they wanted to spend time with their parents or go out with friends in the evening. Finally, reading books until late at night was also reported as a popular non-screen-based bedtime activity among adolescents.

*They might go to sleep, but social media or staying in touch with others is more important to them. (18-R2)*

### Feeling Distressed

Adolescents also reported physical and emotional distress as barriers to sleep and causes of late bedtime. Noise and uncomfortable beds were mentioned as the physical barriers. Some adolescents reported that they could not fall asleep because they had so many thoughts and could not switch off their brains. Worries about tomorrow, stress from school, personal conflicts, and sleep problems were also barriers that prevented adolescents from falling asleep.

*I can't sleep because my brain is still thinking about all those things that I still need for school. That I need to learn, on what day this and I still need to do this, I don't have this yet, well. (13-R5)*

### Having a Lot of Energy

Some adolescents consider themselves evening people or night owls. They reported that they did not feel tired, had a lot of energy in the late evening, and could not fall asleep sooner even though they tried to turn off electronic devices. They mentioned that when they went to bed late, they felt tired in the morning, but then they gained energy during the day, and they could not fall asleep in the evening again.

*I have quite a lot of energy at night, I'm more of a night person. I usually go to bed around one or two. Sometimes it happens at three. (11-R1)*

### My Bedtime, My Choice

Adolescents also stated that late bedtime is a habit and did not consider it a problem. They reported that they were used and it suited them well to go to bed late. Self-control of bedtime activities seemed to play an important role in the

regulation of adolescents' sleep time. Adolescents stressed that it was up to them when they went to sleep and no one and nothing prevented them from going to sleep earlier.

*I have the option to go to bed earlier and I'm so comfortable going to bed later, it's more up to me that's how I decide. (11-R4)*

## Facilitators of Earlier Bedtimes

As presented in Figure 1, six main themes related to what would help adolescents go to bed earlier were identified in the thematic analysis: (1) Daily routine, (2) Less homework, (3) Tiring myself out, (4) Parent-set bedtime, (5) Going offline and (6) Physical comfort in bed. Some themes applied to both daytime and bedtime, like following a daily routine, having less homework and doing physical activities. Others, like parents setting bedtime, turning off the internet, and being comfortable in bed, were only related to bedtime. The main themes with illustrative quotes are listed in Table 3.

### Daily Routine

Adolescents reported that having a daily routine and more control over their daily schedule and bedtime would help them manage their time better and go to bed earlier. They said they often did things at the last minute, putting off tasks until

**Table 3** Facilitators of Earlier Bedtimes: Main Themes and Illustrative Quotes

Themes	Illustrative Quotes
<b>Daily routine</b>	<ul style="list-style-type: none"> <li>• "Make a plan for the day, and do not leave everything for the last minute in the evening; spread it out. Actually, create a list and write down the tasks you need to do. The things you have to do first, you do first, and the things you have to do last, you do last". (12-R2)</li> <li>• "And also, prepare all things properly, so we do not think of them at night, that we may have a restful sleep. That is to say, to prepare ourselves properly for the days ahead". (14-R4)</li> <li>• <i>Because I am the kind of person who always does everything at the last minute, so if I spread out my study time more, maybe I'd go to bed earlier at night". (15-R1)</i></li> </ul>
<b>Less homework</b>	<ul style="list-style-type: none"> <li>• "So in my opinion, it would help with the sleep, if there was less learning at school, less homework". (13-R5)</li> <li>• "We wouldn't have to go to bed late if the teachers scheduled the tests throughout the week. They could check when the class has a test and plan accordingly". (12-R2)</li> <li>• "What would help me go to bed earlier? I think there's no straightforward answer because there won't be less material to learn in school, so I don't know". (17-R1)</li> </ul>
<b>Parent-set bedtime</b>	<ul style="list-style-type: none"> <li>• <i>"So on school days, I usually go to bed earlier, and that's because my parents make me, too". (11-R1)</i></li> <li>• "I don't know how it is in other families, but my mom turns off the Wi-Fi at half past ten to make me go to bed". (15-R1)</li> <li>• "Parents, maybe with the younger ones, they just say, okay, you're done with electronics at nine o'clock and go to bed". (19-R1)</li> </ul>
<b>Tiring myself out</b>	<ul style="list-style-type: none"> <li>• "During the day, when I have training and I'm so tired, I fall asleep at night that I don't even know how". (14-R4)</li> <li>• "I think it's more about some kind of relaxation. For example, going for a walk or, rather, reading a book. It works for some people. They start reading and fall asleep. That's how it is for me". (11-R4)</li> </ul>
<b>Going offline</b>	<ul style="list-style-type: none"> <li>• "So, in my opinion, it's probably the phone because when I don't have my phone, I might not have anything to do, and I go to sleep. I voluntarily take the phone". (11-R4)</li> <li>• "Overall, turn off the internet and just say, okay, I won't use my phone because I'm going to sleep." (18-R2)</li> <li>• "...For example, in my experience, I cannot simply tell my friends when I am texting, 'I'm going to sleep, good night, bye.' We just keep starting new topics and going on and on, and I struggle to tell myself that enough is enough because I have to get up in the morning and function the next day. I should be able to tell myself 'no.'" (12-R4)</li> </ul>
<b>Physical comfort in bed</b>	<ul style="list-style-type: none"> <li>• "When we go to bed, we should make ourselves comfortable so we don't wake up feeling something is biting us or something. We need to prepare that comfort in advance". (14-R4)</li> <li>• "That I try to have complete darkness and complete silence when I go to bed". (16-R1)</li> </ul>

**Abbreviations:** I, Interview; R, respondent.

late at night. Because of this, they reported that having a plan with a list of tasks to follow would help them stay on track. They emphasized that planning ahead would improve their sleep, and it is more about how they organize the time and when they go to sleep. They had to make themselves go to bed earlier because they knew they would be tired the next day otherwise

*Make a plan for the day, and don't leave everything for the last minute in the evening; spread it out. Actually, create a list and write down the tasks you need to do. The things you have to do first, you do first, and the things you have to do last, you do last. (I2-R2)*

### Less Homework

In adolescents' opinion, lower academic pressure, less homework, and better schoolwork scheduling would help them go to bed earlier. They reported that if teachers scheduled tests and exams better throughout the week and assigned less homework, they would not have to stay up late studying. However, they were skeptical that this would actually happen.

*So in my opinion, it would help with the sleep, if there was less learning at school, less homework. (I3-R5)*

### Tiring Myself Out

Adolescents also mentioned that engaging in physical activity during the day facilitated an earlier bedtime. They reported feeling tired after having training during the day or walking in the evening, which helped them fall asleep quickly. Moreover, they noted that participating in relaxing bedtime activities, such as reading a book helped them fall asleep earlier as well.

*During the day, when I have training and I'm so tired, I fall asleep at night that I don't even know how. (I4-R4)*

### Parent-Set Bedtimes

Some adolescents went to bed earlier because their parents set a bedtime. They reported that on school nights, their parents made them go to bed earlier and turned off the Wi-Fi at specific times. However, some of them speculated that parental control over bedtime was only effective for younger children.

*I don't know how it is in other families, but my mom turns off the Wi-Fi at half past ten to make me go to bed. (I5-R1)*

### Going Offline

Adolescents preferred being online, chatting with friends, and using their mobile phones before going to sleep. They reported that if they did not have their phones, they would probably have nothing to do and would go to bed earlier. They said it would help them to improve their bedtime if they had the ability to cut off communication with friends, go offline, or put down their phones.

*So, in my opinion, it's probably the phone because when I don't have my phone, I might not have anything to do, and I go to sleep. I voluntarily take the phone. (I1-R4)*

### Physical Comfort in Bed

Adolescents reported that comfort in bed is important for their sleep and earlier bedtime. They stressed the importance of physical comfort, such as a comfortable bed, darkness, and silence in the room. They also noted that they should prepare for this comfort in advance.

*When we go to bed, we should make ourselves comfortable so we don't wake up feeling something is biting us or something. We need to prepare that comfort in advance. (I4-R4)*

## Discussion

This study aimed to investigate why adolescents go to bed late on schooldays and would help them go to bed earlier, focusing on the roles of bedtime and daytime activities and exploring the barriers and facilitators of earlier bedtimes. Late



bedtime was found to be the result of interactions between school demands and leisure time activities during the day after school and in the evening. Adolescents reported the ability to effectively manage these competing activities as important skill that might improve their bedtime. They also mentioned school stress and high school demands as barriers to an earlier bedtime. Some of them perceived the late bedtime as a habit and their choice. Adolescents reported that better time management, less homework, engagement in physical activity, parent-set bedtime, and less time spent online in the evening would help them to go to bed earlier.

Adolescents reported a high amount of schoolwork, school stress and homework procrastination as the school demands subthemes contributing to late bedtime. The association of school pressure with sleep onset difficulties was confirmed by several studies conducted in European countries.<sup>24–26</sup> Based on Swedish qualitative studies school stress as the cause of sleeping difficulties was found to be a result of school demands that adolescents place on themselves and external academic expectations from parents, teachers, and society.<sup>27,28</sup> The evidence from East Asian countries with competitive academic environments and a strong emphasis on academic achievements shows that time spent on homework is a significant barrier to sleep in adolescents.<sup>29,30</sup> According to the OECD Programme for International Student Assessment (PISA), 15-year-old adolescents from East Asian countries had the best academic performance results and spent the most time on homework among 81 countries in 2022. Adolescents from Singapore spent, on average, 2.3 hours daily on homework during school days compared to Slovak adolescents, who spent 1.2 hours, and Finnish, 0.8 hours.<sup>31</sup> Therefore, we assume that the perception of school demands as a barrier to an earlier bedtime is more about the ability of adolescents to organize tasks during the day and homework procrastination than the high amount of school demands. However, adolescents reported that less homework and better schoolwork scheduling would help them to go to bed earlier. Furthermore, school stress manifested as worries and ruminations about school were also mentioned by adolescents as barriers to falling asleep. This is in line with the Perseverative Cognition Hypothesis<sup>32</sup> and the findings from the recent systematic review<sup>33</sup> that perseverative cognition manifested as worry and rumination, is a common stress response and appears to be a significant predictor of poor sleep and health. Excessive worrying and ruminating related to school demands were identified to be the cause of delayed sleep latency time also by adolescents in a Belgian qualitative study.<sup>19</sup> Moreover, evidence shows that school stress and sleep problems are intertwined issues associated with emotional and behavioral problems in adolescents,<sup>26,34,35</sup> which in turn may aggravate the problems with sleep and negatively impact school performance.

Leisure time activities (LTA), both organized and unstructured, were reported by adolescents as another barrier to an earlier bedtime. Adolescents involved in organized leisure time activities (OLTA), such as sports clubs, complained about having little time left for unorganized activities and homework during the day after school, often postponing them until the evening at the cost of sleep. However, some adolescents mentioned the benefits of physical training for their bedtime, as feeling tired helped them fall asleep earlier. This finding is supported by the evidence from systematic reviews about the beneficial effect of physical activity on adolescents' sleep.<sup>36,37</sup> Moreover, evidence shows that participation in OLTA is associated with lower levels of school stress, better academic achievement,<sup>38</sup> well-being,<sup>39</sup> and less problematic technology use<sup>40</sup> as it helps adolescents to build supportive social networks and develop goal-oriented and self-control skills.

Self-control skills are important in relation to bedtime. Evidence suggests that people with lower self-control capacity are more likely to be involved in bedtime procrastination, they fail to go to bed at the intended time because of having trouble quitting other activities.<sup>41,42</sup> Bedtime procrastination is found to be challenging, especially in adolescents, due to the combined effects of increased bedtime autonomy, later chronotype, and still-developing self-control with a negative impact on sleep timing and duration on school nights.<sup>15</sup> This aligns with our findings, as adolescents mentioned that having a daily routine and more control over their time management would help them go to bed earlier. Moreover, adolescents reported they did not feel tired late in the evening and it was under their control when they went to sleep. However, adolescents noted that having rules from their parents related to bedtime helped them go to bed earlier. Social relationships with parents, teachers, trainers, and peers are important for developing adolescent self-regulation.<sup>43</sup> However, this is true only for OLTA, as the evidence shows that adolescents engaged in unstructured socializing activities such as hanging out, meeting friends, and social networking have poorer self-control skills and are more likely to participate in health-risk behaviours and reported worse academic performance.<sup>44,45</sup> Furthermore, evidence from

recent systematic reviews suggests that bedtime online social networking, despite its importance for adolescent well-being and peer relationships, is associated with sleep-onset difficulties, poor sleep quality, and insufficient sleep in adolescents.<sup>46–48</sup> This could be explained by evidence from qualitative research, which shows that due to the lack of control over bedtime social media usage, the fear of missing out, and the pressure to conform to social communication expectations, adolescents feel torn between the need for sleep and the desire for social belonging.<sup>16–18,27</sup> However, some adolescents reported that using electronic media for reading, listening to music, audiobooks, generating white noise and scrolling helped them to relax, reduce stress and fall asleep.<sup>17,19,49,50</sup> These findings are in line with the results of our study. Adolescents viewed screen-based activities, as a form of bedtime relaxation and peer socialization important for their well-being, often prioritizing these activities over sleep despite being aware of potential sleep costs. They reported that their bedtime could improve if they had the ability to disconnect from friends and go offline. Non-screen-based leisure bedtime activities such as reading, walking and interacting with family and friends were reported both as barriers and facilitators to an earlier bedtime. The evidence suggests that reading and time spent with family have a positive impact on sleep duration and quality.<sup>51,52</sup> As we have already mentioned, the adolescents reported that having parental rules about bedtime and internet use helped them go to bed earlier. This is in line with the findings from the recent systematic review, which suggests that parental bedtime rules are effective only when they include explicit rules concerning electronic media use and internet access.<sup>53</sup> As supported by evidence from qualitative studies, if the rules include just fixed bedtime, adolescents go to bed on time, but stay awake using their electronic devices and being online.<sup>16,54</sup> However, some adolescents argued that parent-set bedtimes worked only for young children. Although adolescents may find parental involvement and rules annoying, qualitative data show they recognize their importance, as these provide a sense of security, support better sleep and help them establish healthy sleep habits.<sup>17,27</sup> Moreover, findings from a recent longitudinal study suggest that maintaining or re-introducing a parent-set bedtime later in adolescence may be possible and beneficial for adolescents' bedtimes and sleep duration.<sup>55</sup>

## Strengths

Several strengths of our study need to be noted. First, the qualitative design enables us to understand adolescents' perceptions of late bedtime and explore the barriers and facilitators of earlier bedtime from their perspective. Second, the study is a part of the HBSC (Health Behaviour in School-aged Children) study and adds new insights to our previous research on adolescents' sleep habits using HBSC data.<sup>56,57</sup> Third, the use of consensual qualitative research methodology helps to mitigate the bias during analysis and interpretation of the data which could arise from the researchers' subjectivity. Fourth, the group interviews are beneficial as they gather shared views in an interactive atmosphere that fosters thoughtful discussion and a range of opinions. Finally, conducting interviews online has practical benefits compared to face-to-face interviews such as better time availability for the participants, efficiency, being more comfortable for expressing opinions, and being suitable for the young population.<sup>58</sup>

## Limitations

Our study also has several limitations. First, because of the small sample, we could not generalize the findings to the whole adolescent population group. However, we reached data saturation and the findings provided an in-depth understanding of adolescents' bedtime behavior. Second, participants were mostly girls, aged 14–17, which might also influence the generalizability of the findings. Third, interviews were conducted online. Because of the restrictions during the COVID-19 pandemic, it was not possible to conduct them face-to-face. The online environment, despite its benefits, could have affected the group's dynamic and openness and raised technical problems. However, the moderator was an experienced psychologist in online counseling for children and he was able to create a positive and creative conversational atmosphere. Moreover, one silent observer joined each online interview to manage the technical problems if needed. Fourth, conducting the interviews during the COVID-19 pandemic could bias the answers about bedtime behavior. Therefore, the adolescents were informed at the beginning of each interview that the questions were related to their bedtime behaviour before the pandemic. Fifth, no data were collected about the sleep behavior and bedtime of participants, which must be considered when interpreting the findings. Finally, the first question in the interview was formulated: "Why do you think that many adolescents go to bed late on schooldays?" Therefore, the answers might reflect the opinions of participants on others' sleep behavior, not theirs.

## Conclusion

Our findings suggest that late bedtime in adolescents results from a combination of school and social pressures and adolescents' ability to effectively manage competing activities throughout the day, both after school and before bedtime. Increased bedtime autonomy and decreased parental control over bedtime also play an important role. Adolescents reported struggling to balance the demands of sleep, relaxation, socialization, and schoolwork, often prioritizing other activities over sleep. They noted that a structured daily routine, less homework, engagement in physical activity, and parental rules for bedtime and internet use would help them go to bed earlier. We suggest that interventions aimed at improving sleep timing in adolescents should focus on reducing school pressure from teachers, parents, and society; building supportive social networks at home, school, and other settings; strengthening adolescents' self-regulation skills; and enhancing parental involvement in maintaining or reintroducing sleep and daily routines for their adolescents.

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## Disclosure

The authors report no conflicts of interest in this work.

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