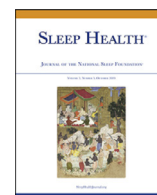


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How do children and adolescents of separated parents sleep? An investigation of custody arrangements, sleep habits, sleep problems, and sleep duration in Sweden

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ABSTRACT

Objectives: An increasing number of children and adolescents divide their time between their separated parents' homes. Although marital conflict is disadvantageous for children's sleep, little is known about how children of separated parents sleep. The objective was to investigate the association between children's custody arrangements and sleep habits and sleep initiation difficulties.

Design: Cross sectional nationally representative samples of adolescents from the WHO study Health Behaviour in School-aged Children (HBSC) (n = 11,802).

Setting: Sweden in 2013/2014 and 2017/2018.

Participants: Adolescents in grades 5, 7, and 9 from Swedish compulsory comprehensive school.

Measurements: The survey included questions on sleep behaviors including bedtime, wake-up time and frequency of sleep onset problems. The analysis methods used were ordinary least squares and logistic regression.

Results: The results show differences by custody arrangement, but they are not uniform across the dependent variables. Children and adolescents in sole maternal custody were less likely to sleep as much as recommended ($P < .001$), more likely to have late bedtimes ($P < .001$), report sleep initiation difficulties ($P < .01$) and to report social jetlag between school mornings and weekends ($P < .05$) compared to those in 2-parent families. Shared physical custody was associated with a higher likelihood of late bedtimes ($P < .05$) and sleep initiation difficulties ($P < .05$) compared to those in 2-parent families, but not of sleeping less than recommended or reporting social jetlag. Less-than-equal sharing was generally associated with worse sleep than in 2-parent families.

Conclusions: As custody arrangements seem to be associated with sleep, it is important to understand the mechanisms behind the findings.

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Introduction

Adolescent sleep research often assumes that teenagers have one bedroom and are affected by only one family's habits and rules regarding sleep. However, an increasing number of children and adolescents share their time between their separated parents' homes and may be influenced by 2 different sleeping arrangements and sets of rules.

Parents divorcing or separating has become common in many countries. Recent research showed that 28% of Swedish children and adolescents experienced a parental union disruption before the age of 15.¹ Of the children whose parents divorced or separated, 72% were in a shared legal custody arrangement,² which is the Swedish legal default option after a divorce or nonmarital parental separation. Shared legal custody means that both parents have the right to decide in matters regarding the child, such as school and medical issues. While the parental separation rate has stabilized in the new millennium,³ the proportion of parents who have shared legal custody has increased,² as has shared physical custody.⁴ Shared physical custody means that in addition to equal rights and obligations in decisions regarding the child, children divide their time roughly

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equally between 2 households. Shared physical custody has increased from 1% of children of separated parents in the 1980s to 28% in 2018.⁵

During a similar period (1985–2013), we have also seen changes in the sleep habits of Swedish children and adolescents.⁶ More teenagers go to bed late on school nights and fewer attain the recommended amount of sleep per night. This change has also been observed in other industrialized countries.⁷ Insufficient sleep is associated with negative consequences for teenagers' health, both mentally and somatically (see 8 for a summary). Other sleep phenomena often observed in adolescence are difficulties initiating sleep, a common insomnia symptom which is a risk factor for depression,⁹ and great differences between weekend nights and school nights regarding bedtimes and rise times.¹⁰ The latter, known as social jetlag, results in a delayed circadian rhythm and is associated with an impaired ability to concentrate and learn during school and a negative impact on mood.^{11,12} Taken together, these changes in adolescent sleep and sleep habits are concerning from a public health perspective.

Previous research has shown that children's sleep is associated with various positive and negative family factors, such as their parents' sleep, parenting abilities, attachment style, mental health problems and marital aggression (see 13 for a review). Children in families with a high degree of parental conflict sleep less, take longer to fall asleep, and are awake more often during the night.¹⁴ Sleep problems have been associated with parental union dissolution for infants, toddlers, and older children.^{15,16} How children and adolescents of separated parents sleep in various custody arrangements, is less known. We know from research on other psychosomatic outcomes, however, that family structure, including having siblings and the presence of stepparents, is associated with children's well-being.¹⁷ While recent research has shown that shared physical custody is linked to multiple aspects of youths' well-being, including fewer internalizing and externalizing symptoms, greater academic development and better family relationships in comparison to sole custody households (for summaries see 18,19,20), only one study has investigated shared custody arrangements and sleep. This research by Bergström et al.²¹ concluded that self-reported sleep initiation difficulties were more common among children living with one parent, or mostly with one parent, than among those with shared physical custody or living in nonseparated 2-parent families. Studies comparing single parents with 2-parent families have reported that that single mothers were less likely to engage in regular bedtime routines for 3-year-olds than 2-parent families and that 15-year-olds living with a single parent sleep less on weekends and sleep less efficiently during the school weeks than teenagers living in 2-parent families.^{22,23} The latter study found no difference in sleep duration. We have not been able to find any studies regarding shared physical custody, sleep duration and sleep habits, but it is plausible that shared physical custody, with children living in 2 parental households, could create instability in sleep habits, potentially leading to sleep problems. Children and adolescents may be influenced by 2 different parenting regimens with different demands and expectations for bedtime and rise time, as well as whether sleep-disturbing activities such as smartphone use is allowed prior to bedtime or in bed. However, shared custody requires a certain level of cooperation between parents is needed, which may result in a joint set of rules. Single-parent households may have the advantage of only involving one parenting regimen, but it is known from research on other health outcomes that children and adolescents growing up with only one parent more frequently report psychosomatic symptoms such as pains and negative emotions.²¹ One reason for this might be that the adult of a single-parent household may have less opportunity to monitor their child's sleep habits if they work late shifts or longer work hours to cope with financial strain.

Aim

The aim of this study is to investigate the associations between adolescent sleep, including bedtimes, sleep duration, social jetlag, and sleep initiation difficulties and custody arrangement. Children and adolescents living in nonseparated 2-parent families will be compared to those with separated parents living in equal shared custody, in single parent households, or in a custody arrangement with some, but not equal, time sharing.

Our hypotheses were as follows:

- H1: Children and adolescents in shared custody will be associated with similar proportions of late bedtimes, less opportunity to obtain sufficient sleep, social jetlag and self-reported insomnia symptoms as for those with 2 nonseparated parents. We base this on research into other areas of well-being that have demonstrated that children and adolescents in shared custody do roughly as well as peers with nonseparated parents.^{24,25}
- H2: Other custody arrangements (eg, single parent households with some, but not equal, time spent at the other parent's home) would be associated with greater proportions of late bedtimes, less opportunity to obtain sufficient sleep, more social jetlag and more self-reported insomnia symptoms than those with nonseparated parents. We base this on research into other areas of well-being that have demonstrated that children and adolescents growing up in single parent households report more problems than children and adolescents growing up in nonseparated 2-parent families.²⁶

Participants and methods

Data

Cross-sectional data were obtained from the Swedish national sample of The Health Behaviour in School-aged Children (HBSC) study from the data collections in 2013/2014 and 2016/2017. HBSC is a World Health Organization collaborative cross-national survey in schools with self-report questionnaires administered in classrooms. Informed consent was obtained from the children, and parents received written information about the study and were instructed to inform their children's teachers if they did not want their children to participate. A standard protocol was followed to ensure nationally representative samples for ages 11, 13 and 15. In 2013/14, 77% of schools participated in the survey. In 2017/18, the school response rate was 47%. The response rate among the children and adolescents in the participating schools was 90% (n = 7867) at the 2013/14 data collection and 89% in 2017/18 (n = 4294).²⁷ After excluding respondents who did not live with either parent, our final analytical sample was 11,802 adolescents of whom 7719 participated in the 2013/14 survey and 4083 participated in 2017/18.

Measures

Dependent variables

We investigated 4 aspects of youth sleep: bedtime, opportunity for obtaining the recommended nighttime sleep duration by age, social jetlag, and sleep initiation difficulties.

Bedtime was measured with the following item: "At what time do you usually go to bed when you are going to school the morning after?" Responses were reported as follows: "Around 9 PM or earlier," "Around 9:30 PM," "Around 10 PM," "Around 10:30 PM," and "Around 11 PM or later".

Whether participants had the opportunity to achieve their recommended sleep duration was calculated by estimating the time

between bedtime and rise time on school nights. The recommended sleep time is 8 hours for 15-year-olds and 9 hours for 11- and 13-year-olds.²⁸ The variable was the dichotomized giving value 1 if the child is in ninth grade and has reported a time in bed of at least 8 hours or is in fifth or seventh grade and has reported a time in bed of at least 9 hours. This division has been used in previous studies where differences in various psychosomatic symptoms were evident between those who had the opportunity to sleep as much as recommended and those who spend shorter time than the recommended sleep duration in bed.²⁹

Social jetlag was calculated by using wake-up time for school nights and weekends, respectively. Wake-up time was measured in 30-minute increments ranging from “5:00 AM or before” to “8:00 AM or later” for school mornings and “5:00 AM or before” to “2 PM or later” for weekends. It is dichotomized at “sleeping-in 2 hours or more,” as this cut-off has been shown to be related to sleep initiation difficulties and significantly greater daytime fatigue and sleepiness.¹²

Sleep initiation difficulties were measured with an item from the HBSC Symptom Check List (HBSC-SCL): “How often have you had the following symptoms during the past 6 months? Difficulties falling asleep.” Responses were reported on a 5-point Likert scale as follows: 1 = “Almost daily”; 2 = “More than once per week”; 3 = “About once per week”; 4 = “About once per month”; and 5 = “Seldom or never”. Sleep initiation difficulties several times per week are considered a clinically relevant symptom of insomnia,³⁰ thus ‘More than once per week’ and ‘Almost daily’ were operationalized as having sleep onset difficulties whereas less frequent problems were considered as not having sleep onset difficulties.

Independent variable

The measure for the child's living arrangement is based of 4 questions: 1. With whom does the child live in his or her primary household (mother, father, other); 2. Does the child also lives in a secondary household; and if so, 3. How frequently does the child live in the secondary household; and 4. With whom does the child live in the secondary household? Using this information, we constructed a measure with 7 categories. In a 2-parent family, the child lives with both parents in the same household; in a sole maternal custody family the child lives with the mother (with or without a stepparent), in a sole paternal custody family the child lives with the father (with or without a stepparent); and in an equally shared custody arrangement the child spends equal time with both the mother and the father in 2 separate households (with or without stepparents). Children also reported living regularly in 2 separate parental households but sharing time unequally, living in one of the parental households “sometimes” or “almost never.”

Controls

The multivariate analyses controlled for the child's sex, school grade (5, 7 or 9, which corresponds to the ages 11, 13, and 15 in the Swedish school system), and whether the child lives with siblings or with a stepparent in either home. We controlled for the presence of a stepparent, which may have an important role in children's adjustment after a parental union dissolution,³¹ and children are more likely to live with a stepparent in a shared physical custody arrangement.³² The models also controlled for wealth as measured by the Perceived Family Affluence Scale, a 4-item measure of family wealth developed in the HBSC study.^{33–35} The children and adolescents were asked “Does your family own a car? Do you have your own bedroom for yourself? During the past 12 months, how many times did you travel away on holiday with your family? and How many computers does your family own?” Using these items, a composite score ranging from 0 to 9 was created and divided into 3 categories: low affluence (0–2), middle affluence^{3–5} and high affluence^{6–9} in accordance with the procedure suggested by Boyce et al.³³

Analysis

All analyses were carried out using Stata/SE version 16. *Bedtime* was analyzed by ordinary least squares regression, and the binary variables *opportunity for recommended sleep time*, *social jetlag*, and *sleep initiation difficulties* were analyzed with logistic regression and presented as average marginal effects (AME). The AME shows the average change in the probability of our binary outcome when the independent variable changes one unit. Although AME has been used less in health research than in social sciences, it is more intuitive to interpret than odds ratios or log-odds, allowing for an easier interpretation of the magnitude of a correlation.³⁶ We used list-wise deletion of missing data for the dependent variables but created separate categories for missing values on independent variables (see Table 1). Respondents reporting low perceived family affluence were more likely to have item nonresponse on the dependent variables. Besides this, we did not detect any systematic patterns in item nonresponse. We used sampling weights to adjust for the sampling design. We tested for interaction effects between each independent variable and all other variables for all dependent variables. The only significant

Table 1
Descriptive statistics

	Mean	St. dev.
Bedtime	10:15 PM	65 min.
	Frequency	Percent
Opportunity to sleep as long as recommended		
Yes	4211	36
No	6712	57
Missing	879	7
Sleep initiation difficulties		
Yes	7942	67
No	3536	30
Missing	324	3
Social jetlag		
Yes	9371	79
No	1504	13
Missing	927	8
Living arrangement		
Both parents	8239	70
Maternal custody	831	7
Paternal custody	141	1
Equally shared custody	1214	10
Unqually shared custody	360	3
Sometimes shared	452	4
Almost never shared	418	4
Missing	147	1
School grade		
5	3764	32
7	3629	31
9	4341	37
Missing	68	1
Child's sex		
Boy	5763	49
Girl	5911	50
Missing	128	1
Family affluence		
Low	134	1
Medium	2317	20
High	8835	75
Missing	516	4
Stepfamily		
Yes	10,211	87
No	1591	13
Siblings		
Yes	1020	9
No	10,782	91
Survey year		
2017/18	7719	65
2013/14	4083	35

Source: The Swedish Health Behaviour in School-aged Children (HBSC) study 2013/14 & 2017/18.

interaction effect ($P < .05$) found was between family affluence and living arrangement for the analysis of difference in wake-up time during school nights and nonschool nights. As an interaction effect was only found for one of the 4 outcomes, we chose to present symmetrical models with the same specification and the main effects for all 4 outcomes. This research was approved by the Swedish Ethics Review Authority (record number 2020-03406).

Results

Table 1 shows the distribution of all the variables in our sample. The average bedtime was around 10 PM, and 57% of children and adolescents reported waking up fewer hours after bedtime than would afford them the recommended amount of sleep. Two-thirds of the respondents also report experiencing sleep initiation difficulties daily or more than once per week, which is considered a clinically relevant symptom of insomnia.²⁷ For social jetlag (ie, waking up 2 hours or more later on weekends than on school mornings), almost 8 out of 10 (79%) respondents reported this behavior.

The distribution of the living arrangement variables shows that 7 out of 10 children and adolescents live with both parents and that shared physical custody is slightly more common (10%) than living in sole maternal custody (7%). Only 1% report living only with a father.

Tables 2 to 5 present the results from the 4 multivariate analyses. There are some differences between residential arrangements in opportunity to get the recommended sleep for one's age group (Table 2). Compared to children and adolescents living with both parents, those living in sole maternal custody without custody sharing report a lower likelihood of having the opportunity to get as much sleep as recommended. There was no statistically significant difference in opportunity for sleep between children and adolescents in equally shared physical custody, those who have regular but non-equal custody sharing, and those in 2-parent families. Those with irregular living ("sometimes" and "almost never") in the secondary home reported a lower likelihood of having the opportunity to get the recommended amount of sleep.

A similar pattern is presented in Table 3, which shows that children and adolescents living in sole maternal custody, those with irregularly shared physical custody, and those in equally shared physical custody report later bedtimes than those living in 2-parent families. For sleep initiation difficulties (Table 4), all categories of residential arrangements, except children and adolescents living with only their fathers, reported a statistically significantly higher likelihood of experiencing difficulties falling asleep at least twice per week compared with children and adolescents living in 2-parent families and children living only with their mother.

Differences also emerged in the likelihood of experiencing social jetlag on the weekends (waking up at least 2 hours later on weekends compared to weekdays). Again, children and adolescents living full-time with only their mother are more likely to experience social jetlag on weekends, as are those who have unequal shared physical custody. The group living equally with both parents did not differ significantly from those living with both parents in the same household.

For the other independent variables in our models, a pattern emerged, wherein girls reported earlier bedtime than boys but, a lower probability of having the opportunity to sleep as long as recommended and a higher probability of experiencing social jetlag and sleep initiation difficulties compared to boys. There is a positive age gradient in bedtime and in the likelihood of social jetlag. There were no age differences in sleep initiation difficulties. Perceived family affluence, having siblings, or living in a stepfamily setting were not significantly correlated to any of our 4 sleep behaviors.

Using equally shared custody as a reference category instead of 2-parent families (not presented in tables) revealed no statistically significant difference between children and adolescents in equally

Table 2

Average marginal effects: difference in the probability of having the opportunity to sleep as long as recommended

	Estimate	Std. err.	95% conf. interval	
Living arrangement				
Both parents (ref.)	-			
Maternal custody	-0.08***	0.22	-0.13	-0.04
Paternal custody	-0.07	0.05	-0.16	0.02
Equally shared custody	-0.04	0.02	-0.08	0.00
Unequally shared custody	-0.03	0.02	-0.09	0.03
Sometimes shared	-0.09**	0.03	-0.15	-0.03
Almost never shared	-0.15***	0.03	-0.21	-0.09
School grade				
5	0.37***	0.01	0.34	0.39
7 (ref.)	-			
9	0.21***	0.01	0.19	0.24
Child's sex				
Boy (ref.)	-			
Girl	-0.04***	0.01	-0.06	-0.02
Family affluence				
Low	-0.05	0.05	-0.15	0.05
Medium (ref.)	-			
High	0.00	0.01	-0.03	0.03
Stepfamily				
Yes	-0.03	0.02	-0.07	0.01
No (ref.)	-			
Siblings				
Yes	0.00	0.02	-0.04	0.04
No (ref.)	-			
Survey year				
2017/18	-0.01	0.01	-0.03	0.01
2013/14 (ref.)	-			
N	10,923			

Source: The Swedish Health Behaviour in School-aged Children (HBSC) study 2013/14 & 2017/18.

The AME shows the average change in the probability of the outcome when the independent variable changes one unit, controlled for the other variables.

Note:

* $P < .05$.

** $P < .01$.

*** $P < .001$.

shared custody and those with regular but nonequal sharing, except for the case of social jetlag, where those with unequal custody had a 9 percentage points higher likelihood to sleep in on weekends. There is a difference between equally shared physical custody and nonregular custody sharing for all outcomes. Children and adolescents living with the one of their parent "sometimes" report worse sleep patterns than those in equally shared physical custody on all measures except having the opportunity to get the recommended time of sleep. Those who "almost never" live with one of their parents go to bed later and are less likely to have the opportunity get the recommended amount of sleep and they are not more likely to have social jetlag or experience sleep initiation difficulties. Children and adolescents living in sole maternal custody show consistently worse sleep habits on all measures than those living with a single. However, the small number (141 cases; roughly 1%) of respondents living in paternal custody likely keeps us from reaching statistical significance in our estimates.

Discussion

Although it is known that exposure to marital conflict has a negative impact on children's and adolescents' sleep,¹⁴ less is known about children's sleep after parental separation. The few studies that have compared nonseparated 2-parent families with single parents

Table 3
Ordinary least squares regression: bedtime

	Coef.	Std. err.	95% conf. interval	
Living arrangement				
Both parents (ref.)	-			
Maternal custody	0.38***	0.10	0.18	0.57
Paternal custody	0.22	0.19	-0.16	0.60
Equally shared custody	0.15*	0.08	0.01	0.30
Unequally shared custody	0.01	0.10	-0.19	0.21
Sometimes shared	0.55***	0.13	0.29	0.82
Almost never shared	0.79***	0.14	0.50	1.07
School grade				
5	-1.51***	0.05	-1.60	-1.41
7 (ref.)	-			
9	1.14***	0.05	1.04	1.25
Child's sex				
Boy (ref.)	-			
Girl	-0.14***	0.04	-0.22	-0.06
Family affluence				
Low	0.40	0.26	-0.10	0.90
Medium (ref.)	-			
High	0.02	0.05	-0.09	0.12
Stepfamily				
Yes	0.05	0.08	-0.11	0.20
No (ref.)	-			
Siblings				
Yes	-0.04	0.08	-0.20	0.11
No (ref.)	-			
Survey year				
2017/18	-0.11**	0.04	-0.18	-0.04
2013/14 (ref.)	-			
N	11,243			
R ²	0.28			

Source: The Swedish Health Behaviour in School-aged Children (HBSC) study 2013/14 & 2017/18.

Bedtime is measured in 30 minute increments. A higher coefficient represents a later bedtime.

Note:

* $P < .05$;

** $P < .01$;

*** $P < .001$.

have found that children and adolescents with single parents are at disadvantage when it comes to sleep,^{21–23} presumably due to lower socioeconomic status and less parental involvement. Because separated families vary in terms of residential arrangements, with an increase in shared physical custody, it is of interest to investigate the sleep of children and adolescents who move between their parents' homes, as regular habits are beneficial for sleep. This study found small differences in sleep initiation difficulties and sleep habits between custody arrangements.

Compared with children and adolescents living with both parents in the same household, those in equally shared physical custody did not sleep less or have worse social jetlag, but they were slightly more likely to have self-reported sleep initiation difficulties and to go to bed late on school nights. Thus, our first hypothesis was partially rejected, but the magnitudes of the effects were small. In conclusion, the results are in line with research on other health outcomes that has demonstrated found similar outcomes between shared physical custody and nonseparated 2-parent families.^{24,25}

The second hypothesis, that children and adolescents in sole or nonequally shared custody will present worse sleep patterns, was confirmed for sole maternal custody and nonregular sharing of physical custody (living with one parent "sometimes" or "almost never"). Children and adolescents who alternated regularly between parents

Table 4
Average marginal effects: difference in the probability of sleep initiation difficulties

	Estimate	Std. err.	95% conf. interval	
Living arrangement				
Both parents (ref.)	-			
Maternal custody	0.06**	0.02	0.02	0.10
Paternal custody	0.04	0.05	-0.06	0.13
Equally shared custody	0.06**	0.02	0.02	0.10
Unequally shared custody	0.11**	0.03	0.04	0.17
Sometimes shared	0.15***	0.03	0.09	0.21
Almost never shared	0.11***	0.03	0.06	0.17
School grade				
5	-0.02	0.01	-0.04	0.01
7 (ref.)	-			
9	-0.00	0.01	-0.02	0.02
Child's sex				
Boy (ref.)	-			
Girl	0.08***	0.01	0.06	0.10
Family affluence				
Low	-0.08	0.05	-0.18	0.02
Medium (ref.)	-			
High	-0.01	0.01	-0.03	0.02
Stepfamily				
Yes	-0.00	0.02	-0.04	0.03
No (ref.)	-			
Siblings				
Yes	-0.00	0.02	-0.04	0.03
No (ref.)	-			
Survey year				
2017/18	-0.00	0.01	-0.03	0.01
2013/14 (ref.)	-			
N	11,478			

Source: The Swedish Health Behaviour in School-aged Children (HBSC) study 2013/14 & 2017/18.

The AME shows the average change in the probability of the outcome when the independent variable changes one unit, controlled for the other variables.

Note:

* $P < .05$.

** $P < .01$.

*** $P < .001$.

but did not live equal amount of time in both households were more likely to report sleep initiation difficulties and social jetlag. However, compared to those living with both parents in the same household, children who alternated regularly between parents did not report later bedtimes or spending an insufficient amount of time in their beds to have the opportunity to achieve the recommended sleep duration.

Regularly spending time with both parents is associated with better sleep than irregular contact or sole maternal custody. Thus, living in 2 households with potentially 2 different parenting regimens and sleep routines may affect children's and adolescents' sleep less than whether or not there is predictability in alternating between parents. A possible explanation to investigate further is parents' ability to cooperate with each other. Irregular shared physical custody may be a consequence of co-parenting conflicts.

As previously emphasized, the differences between different living arrangements regarding sleep and sleep habits were small, but difficulty with sleep initiation and short sleep duration on school nights were common regardless of custody arrangement. A general recommendation for professionals working with 11- to 15-year-olds is to look for signs of sleep problems and recommend strategies to improve sleep. Although cognitive behavior therapy is an evidence-

Table 5

Average marginal effects: difference in the probability of experiencing social jetlag during weekends

	Estimate	Std. err.	95% conf. interval	
Living arrangement				
Both parents (ref.)	-			
Maternal custody	0.04*	0.02	0.01	0.07
Paternal custody	0.06	0.03	-0.01	0.12
Equally shared custody	0.02	0.02	-0.01	0.05
Unequally shared custody	0.09***	0.02	0.05	0.13
Sometimes shared	0.07**	0.02	0.03	0.11
Almost never shared	0.05*	0.03	0.00	0.10
School grade				
5	-0.15***	0.01	0.12	0.17
7 (ref.)	-			
9	0.21***	0.01	0.19	0.23
Child's sex				
Boy (ref.)	-			
Girl	0.06***	0.01	0.05	0.08
Family affluence				
Low	-0.05	0.04	-0.14	0.03
Medium (ref.)	-			
High	0.00	0.01	-0.04	0.05
Stepfamily				
Yes	-0.00	0.02	-0.03	0.03
No (ref.)	-			
Siblings				
Yes	0.01	0.01	-0.02	0.04
No (ref.)	-			
Survey year				
2017/18	-0.08***	0.01	-0.10	-0.07
2013/14 (ref.)	-			
N	10,875			

Source: The Swedish Health Behaviour in School-aged Children (HBSC) study 2013/14 & 2017/18.

The AME shows the average change in the probability of the outcome when the independent variable changes one unit, controlled for the other variables.

Note:

* $P < .05$.** $P < .01$.*** $P < .001$.

based treatment for insomnia in this age group,³⁷ the importance of parental involvement has also been emphasized.³⁸ Parents influence their teenagers' sleep habits by role modeling their own bedtimes and by disabling social media use, for example by turning off the Wi-Fi at night.³⁹ Further, bedtimes set by parents are associated with earlier bedtimes, longer sleep and less tiredness during the days for children and adolescents.⁴⁰ Parents, regardless of whether they are living together or not, should be made aware of their ability to impact their children's sleep.

Some weaknesses should be kept in mind when interpreting the results. First, the cross-sectional design means it cannot inform whether or not differences in both residential arrangements and sleep habits are caused by a nonobserved factor like parental personalities or inter-parental conflicts. For example, growing up in "high-conflict" families has been associated with sleep issues many years later.¹⁴ Also, children's and adolescents' sleep problems may share a bidirectional association with parental conflict, like when a child's sleep problems lead to marital strain.¹⁴ Sleep problems may, thus, precede a separation and influence custody arrangements if, for example, one parent is more skilled than the other at settling the child at night. Second, the composite variable "time spent in bed" was based on categorical 30-minute time spans and did not take into account any sleep onset latency or time awake during the night. This

means that estimates of sleep duration were likely somewhat exaggerated. Still, the composite variable corresponds well with indicators of psychological and somatic symptoms when used to estimate whether children and adolescents achieve the recommended sleep duration or not.²⁹ Furthermore, the data did not allow an assessment of the proximity of the parental union dissolution or the duration of the current living arrangement, which could impact outcomes. In addition, the present study does not include psychological variables such as symptoms of anxiety or depression. Such internalizing concerns could predispose a child or adolescent to difficulty adjusting to a parental union dissolution. It should also be noted that as the present study's focus is on the link between residential arrangements and sleep, many other aspects of the sleep environment and school/social context that could impact bedtime and sleep duration were not measured. For instance, access to electronics at bedtime, school start times, physical activity as well as caffeine and nicotine use all impact child and adolescent sleep schedules.^{41,42}

Conclusions

As custody arrangements are differentially associated with sleep, it is vital to understand the pathways to child and adolescent sleep outcomes. Longitudinal surveys of children's and adolescents' sleep habits should include repeated measures of custody arrangements, parental relations, health, sleep habits, the use of bedtime routines, and residential arrangements to facilitate estimates of the effects of changes on sleep patterns.

Difficulties initiating sleep, insufficient sleep, and social jetlag can affect children's and adolescents' well-being and school performance and indicate a higher risk of future health problems. Thus, it is important to consider family factors when designing prevention and intervention programs regarding sleep.

Declaration of conflicts of interest

The authors do not have any conflicts of interest to declare.

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