Y12 Sleep Study

Social Sciences: Pendleton College Sixth Form

Abstract

Aim: The current piece of research aimed to investigate the different factors that could affect students' sleeping habits and attempted to find evidence to support various strategies to improve student sleep hygiene.

Method: The study used a sample of 18 Year 12 psychology students who were randomly allocated to one of three conditions: (1) consistent bedtime (going to bed at the same time each night), (2) no blue light one hour before bed (activating night mode on phones or avoiding screen use), and (3) no food or drink (except water) two hours before bed. Students recorded their mood daily for one week as a baseline, and again for a week while implementing their assigned sleep strategy. Differences in mood were then compared and analysed.

Findings: Results indicated that no single strategy was statistically significant ($p<0.05$) in improving mood before and after the strategy. However, students reported qualitative findings suggesting that the implementation of strategies was easy (specifically in the no blue light condition). Importantly, student's awareness of their own sleeping habits and hygiene increased: students were actively having positive, meaningful discussions with friends and family about sleep.

Conclusion: Further research and a larger sample size is needed for statistical significance, and potentially sleep isn't the only factor that can improve a student's wellbeing. However, the research does highlight the ease in which students are able to implement research-informed strategies to improve their sleep hygiene. Furthermore, the study has prompted conversations between a group of 16–18-year-olds about sleep, why it's important and the things they can do to improve it. This indirect positive influence remains the shining light of the research: by making students active players in their own wellbeing, it encourages positive discussions which could potentially permanently impact their mood.

Introduction

Teenagers typically don't get enough sleep, or if they do, not enough of the right sleep. Researchers have suggested that sleep patterns have become disrupted due to academic stress, screen time and inconsistent routines. Therefore, finding strategies to improve the sleep hygiene of A-Level students is a priority, since poor sleep hygiene is known to correlate with reduced mood, cognitive performance, and general wellbeing. This study focuses on three evidence-based strategies and their potential benefits on sleep and mood in students.

The Phone Crisis: Stopping Blue Light

Students theorised that one possible way to improve sleep hygiene was to remove mobile phones. However, they realised that removing the phone completely may be unrealistic, therefore suggested that a simple and quick solution would be to implement a no-blue-light setting on their phones one hour before bed. Students felt this was a win-win scenario: they could still access their phone, speak to friends and explore social media, whilst also limiting the effect of blue light on their eyes.

Research by Chang et al. (2015) found that exposure to blue light from electronic devices suppresses melatonin production and disrupts circadian rhythms. Participants who used light-emitting e-readers before bed took longer to fall asleep, had lower evening sleepiness, and experienced reduced morning alertness. Reducing blue light—by using night mode—was associated with better sleep quality and improved next-day mood.

Further research demonstrates the same effect. Harvard's (2020) study found that blue light exposure from devices (such as smartphones) before bed significantly reduces melatonin secretion, delaying sleep onset and reducing sleep quality. Participants who limited screen time in the hour before sleeping experienced improved sleep duration and quality, with fewer reports of waking up during the night.

Both studies demonstrated to students the importance of withdrawing from blue-light at least one hour before bed. The studies demonstrate that blue light can impact on circadian rhythms, as well as having psychological effects with the research indicating improved mood and alertness in their participants. This informed the study's first sleep strategy: limited blue light exposure one hour before bed by using night mode on smartphones.

Dreaming of Digestion: Refraining from Eating Before Bed

Students brainstormed other ways in which they could improve their sleep hygiene. Some students suggested that drinking caffeine may influence sleeping habits in a negative way. This led to a wider discussion around eating and drinking habits before bed generally, and how eating and drinking anything could impact digestion and therefore interrupt sleeping. Students were able to find background research to support this effect.

One piece of research demonstrated that eating close to bedtime can negatively impact sleep quality. St-Onge et al. (2016) suggested that late-night snacking increases the risk of fragmented sleep and reduces REM sleep duration. Abstaining from food and drink (except water) in the hours before bed allows the body to begin digestion earlier, leading to a more restful and uninterrupted sleep. The students hypothesised that therefore, this could, in turn, enhance emotional regulation and improve mood upon waking.

Further research indicates a similar picture. The Journal of Clinical Sleep Medicine's (2021) recent study examined the impact of late-night eating on sleep and metabolism in a group of healthy adults. Researchers found that eating food high in sugar or fat within two hours of bedtime led to disrupted sleep, including delayed sleep onset and decreased REM sleep. The authors concluded that refraining from eating late at night can improve sleep quality and help stabilise digestion. These findings strongly support the idea that avoiding food and drink (except water) before bed can enhance sleep quality and overall health, particularly for students who may have irregular eating patterns. Therefore, informing the second strategy students could use to improve their sleep habits: refrain from eating food or drinking anything (except water) for two hours before bed.

Consistency is Key: Bedtime Routine

For the final strategy, students relied on anecdotal experiences to inform their hypothesis. Students talked about what their parents and teachers have said to them about their sleep – with most students being instructed to have consistency. Students joked that this was something they could only hope to achieve, but importantly, wanted to test if the adults in their life were telling the truth.

Research indicates that a consistent bedtime, even weekends, helps to synchronise the body's internal clock. Phillips et al. (2017) was able to show that students who went to bed at a consistent time every night felt more well-rested, alter and emotionally balanced compared to those with irregular patterns. Furthermore, inconsistent sleep schedules were associated with decreased academic performance and lower mood ratings. Much to the student's dismay, this proved the adults correct – is a consistent bedtime is effective at improving sleep hygiene?

Further research has shown the same effect. Wheaton's (2019) longitudinal study explored how bedtime variability affected sleep health in adolescents over a period of 12 months. The study found that inconsistent bedtimes, particularly those involving later sleep times on weekends, were associated with poorer sleep quality, shorter sleep duration, and increased daytime sleepiness. However, adolescents with consistent bedtimes experienced better sleep quality and were less likely to suffer from mood disturbances or academic underperformance. This supports the idea that consistent sleep patterns help regulate circadian rhythms and improve overall wellbeing, which is particularly relevant to adolescent sleep hygiene. This informed the third and final strategy: students were to have a consistent bedtime every night.

Capturing Mood: Operationalising Wellbeing

Once students had agreed upon the three strategies to improve their sleep hygiene, discussion began around how the effectiveness of these strategies could be measured. Students quickly decided that wellbeing and mood (as shown in the research outlined above) was the most useful measure for sleep hygiene effectiveness. Students began to consider the different ways to operationalise mood. As the group were Psychology students, they enjoyed the discussion around how we could fully operationalise mood to measure it. Students considered the different types of questions they could ask and what would be the most appropriate measure, as well as the most holistic. Students agreed upon semantic differential as a measure of mood. This led to research being found to support this approach.

The foundational work by Osgood et al. (1957) on the semantic differential scale laid the groundwork for mood measurement. Their research showed that using bipolar adjective pairs allows

for a more complete understanding of emotional states, reflecting both positive and negative moods across different contexts. The scale is particularly effective because it can assess mood in a holistic manner, capturing multiple dimensions of affective experience (e.g., calm vs. anxious, happy vs. sad) in a single measure. Osgood's study supports the validity of using a combined score of mood measures to create an overall score for emotional wellbeing. Students therefore agreed that semantic differential questioning would provide this holistic measure.

In a more recent study, Watson and Tellegen (1985) developed the Positive and Negative Affect Schedule (PANAS), which also uses semantic differential scales to assess emotional states. The PANAS is a widely used instrument in psychological research, comprising two sets of adjectives to measure positive affect (PA) and negative affect (NA). Their research found that using bipolar adjectives (such as "excited" vs. "bored" or "calm" vs. "anxious") effectively captures the core dimensions of mood. Their work demonstrates that combining individual scale items into a single global mood score can provide a more holistic understanding of emotional states.

Overall, therefore, this informed the student's operationalisation of mood. The use of semantic differential scales to assess mood, as operationalised in this study (e.g., sad - happy, bored - excited, anxious - calm), is well-supported by psychological research as a valid and reliable method. Studies have shown that these scales effectively capture both the positive and negative dimensions of mood, providing a holistic measure of emotional states. The combination of these individual mood measures into a single score offers a comprehensive snapshot of mood, making it an ideal operationalisation for tracking changes in mood throughout the baseline and intervention periods of the study.

Present Study: Aim & Hypothesis

Together, these studies provided the rationale for the current investigation into how these specific behaviours might impact students' mood and sleep quality. This informed the aim and hypothesis of the current research.

Students aimed to investigate the influence that implementing simple strategies to improve sleep hygiene can have on mood and wellbeing. Students had developed three strategies to implement: consistent bedtime, no blue light before bed and no food/drink before bed. The students hypothesised that implementing these strategies will lead to an improvement in self-reported mood scores after one week. Students specifically thought that a consistent bedtime would have the most profound effect on wellbeing.

Method

Participants

Eighteen Year 12 A Level Psychology students (aged 16–17) from Pendleton College Sixth Form took part in the study. There was a mix of genders and students were only doing the A-Level provision. Students had been studying A-Level Psychology for around 4 months before volunteering to take part (volunteer sample). Some students were encouraged to take part as a means of meeting new people, engaging in Psychology and to try and hopefully, improve their wellbeing. All students agreed to take part and attended weekly sessions to design the study, create resources, source background evidence and complete the intervention themselves.

Design & Variables

The study used an independent groups design, with the students taking part in only one of the three conditions. The study utilises mixed methods (field experiment and self-report) and took place over a two-week period. The first week measured participant's mood as a baseline, whilst the second week instructed them to implement the strategy and measure differences in their mood on the same scale.

The independent variable in this study was the three different conditions to which participants were randomly assigned:

1. Consistent Bedtime (going to bed at the same time every night – regardless of what that was, just making sure it is the same every night),
2. No Blue Light Before Bed (avoiding screens or using night mode on devices one hour before bed, made easy by switching on night mode on their phones),
3. No Food/Drink Before Bed (only water allowed two hours before bed).

The dependent variable was the measurement of participants' mood. This was tracked and measured in participant's 'Mood Tracker' was assessed using a combined score derived from three 1-7 semantic differential scales, which participants completed twice a day (once in the morning and once in the evening) during both the baseline and intervention weeks. The three scales were as follows:

- Sad - Happy
- Bored - Excited
- Anxious - Calm

Each of these three scales provided a score on a 1-7 range, with higher numbers indicating more positive mood states. The scores from these three items were then added together to create an overall mood score for both morning and evening ratings.

For analysis, the total mood score for each participant was calculated by summing the scores from the three scales across the entire week, which was then averaged to create a final morning average and afternoon average mood score for the baseline week. These baseline scores were compared with the mood scores during the intervention week, both for the morning average and afternoon average. This allowed for a comparison of mood changes before and after implementing the sleep hygiene strategies.

There was a second dependent variable gathered at the end of the study. Participant's thoughts, feelings and attitudes were gathered using a semi-structured, informal interview. Discussions were had by all students about how they felt during the study and their overall wellbeing before and after.

Procedure

Students were given a 'Mood Tracker' and told to begin the baseline measure on the following Monday. They were told they had to track their morning (30 minutes after waking up) and evening (30 minutes before going to bed) mood. This was measured on the three 7 point scales as described above. Students were told to complete one full week of baseline measure (Monday-Sunday).

On the Sunday evening, students were then to implement the strategy that they had been randomly allocated in. Students would then implement this sleep hygiene strategy for the next week, continuing to track their mood both morning and in the evening as completed in baseline. By the end of the following Sunday, students had completed a fully filled in Mood Tracker – with an individual morning and evening score for each day of baseline and intervention. These scores would be added by the students at the end of the study to give them four descriptive scores: Baseline AM / Baseline PM / Intervention AM / Intervention PM.

Data Analysis

Mood ratings before and after the intervention were compared using Mann-Whitney U test to ascertain statistical significance between the mood ratings from the baseline compared to the intervention. Furthermore, qualitative reflections were thematically analysed to identify common patterns or insights.

Findings

Quantitative analysis revealed no statistically significant differences in mood scores before and after the interventions across all three groups ($p > 0.05$). While small improvements in mean mood scores were observed across some participants across all conditions, specifically the consistent bedtime condition, these changes were not sufficient to be considered significant. There were also no significant differences between mood reported in the morning or evening across all conditions. Therefore, for descriptive analysis, data for both evening and morning were combined across the strategies for both baseline/ interventions. The descriptive statistics can be found in Table 1 below, all showing a positive improvement in mood from baseline to intervention across all three strategies.

Strategy	Mood Scores	
	Baseline	Intervention
Consistent Bedtime	88.5	105.8
No Blue Light	83.6	85.9
No Food / Drink	66.33	77

However, qualitative feedback provided useful insights about student's attitudes and responses to taking part in the study. All students, regardless of the condition they were allocated in, reported having more conversations with family and friends about sleep and their overall sleep hygiene. Some students had outlined that these conversations were positive and made them more aware of their own habits and as well as helping their close friends and family be aware of their own.

Students in the No Blue Light condition reported finding the strategy easy to implement, stating words like 'accessible' and 'not invasive' when referencing the settings, they could alter in their food. Not all strategies were as easy, for example in the consistent bedtime, some students reported difficulty in always being able to achieve this consistency. Despite this, students from this group did say that they felt slightly better regardless of the mood score and that it got easier as the week progressed. Those not eating or drinking before bed reported feeling less hungry too due to the routine they had to follow. All students found the tracking enjoyable and felt it went quickly.

Discussion

While the findings of this study did not demonstrate statistically significant improvements in mood for any of the sleep hygiene strategies tested, several meaningful conclusions can still be drawn from the process and outcomes. The study provided valuable insights into the feasibility, acceptability, and subjective impact of three evidence-informed strategies aimed at improving student sleep hygiene.

Ecological Validity

One of the key strengths of this research was its ecological validity. The strategies were simple, low-cost, and easy to implement within the students' real-life routines, which makes them promising candidates for wider application in school-based wellbeing interventions. Many students reported a positive experience with the interventions, particularly the "no blue light before bed" condition, which they found easy to follow and helpful in creating a calmer, more mindful bedtime environment. These findings support previous studies (Chang et al., 2015) that suggest reducing screen exposure can help improve sleep quality and next-day alertness.

Sample Size and Statistical Power

The most significant limitation was the small sample size (N=18), with only six students in each experimental condition. This low number greatly reduced the statistical power of the study, making it difficult to detect significant differences even if they existed. Larger samples are generally required in psychological research. With such a small group, even one participant's outlier score could heavily influence the mean, reducing the reliability of the results. For future research, increasing the sample size to at least 30 participants per condition would strengthen the study's power and allow for more robust statistical analyses, including between-group comparisons.

Extraneous Variables

Another important consideration is the high risk of individual differences impacting the results. Each participant came into the study with a unique set of habits, lifestyle factors, stress levels, and sleep histories. This was not necessarily something which we could have controlled. Some students may have already had relatively healthy sleep routines, while others might have experienced significant sleep disturbances unrelated to the strategies tested. These individual variations can mask the effects of the interventions and have acted as an extraneous variable. Future studies around wellbeing could address this by collecting more detailed baseline data on participants' existing sleep habits, stress levels, screen time, and lifestyle factors. This would help researchers control for confounding variables and better understand how each strategy interacts with pre-existing conditions.

This study also had a high risk of extraneous variables that were not controlled for. Unfortunately, the study could not have implemented every strategy to improve sleep, thus we did not have fully control over extraneous variables. For example, factors such as caffeine intake, exercise levels, school workload, and family routines could all have affected mood and sleep independently of the assigned intervention. Without controlling for these, it is difficult to isolate the effect of the strategy itself. Moreover, there was no control group (a group that did not implement any strategy), which

means we cannot determine whether any observed changes were due to the strategies or simply natural fluctuations in mood over time. Additionally, the reliance on self-reported mood ratings introduces subjectivity and potential bias. Participants may have rated their mood higher or lower due to unrelated events, or they may have reported what they thought the researcher wanted to hear. Objective measures to assess mood may have been more appropriate – however, this may not be achievable within the college setup.

Qualitative Insights and Educational Value

Despite these limitations, the study succeeded in raising students' awareness of their sleep hygiene and gave them an opportunity to reflect on how small behavioural changes could impact their daily mood and energy levels. Several participants reported that even if their mood did not drastically change, they felt more mindful of their bedtime routines and better equipped to make healthier choices in the future. This aligns with the broader educational goal of the study: to encourage students to take more ownership of their wellbeing through accessible and sustainable behavioural strategies.

The usefulness of the research can be extended to what this informs us about sleep habits generally. The research demonstrated that students, when asked to think about sleep, are then engaging in positive, meaningful conversations with their peers and family about it. Sleep is often something which teenagers talk about having too much or too little of – with jokes made about sleeping habits which are poor. However, for our current sample, talking about sleep in a positive way as a way to improve their mood led to more mindful conversations which have been longer-lasting. These effects are therefore significant. If we are able to get students to introspect and consider their sleeping habits and what they could do to improve them – we are halfway there to improving their overall sleep hygiene. Awareness and education can go a long way and despite not having immediate effects on mood, the research's applications could have permanent effect on sleep attitude.

Therefore, the current research has led to and will inform the following applications informed by the research's conclusions and findings:

- A short, engaging 2-minute video will be created to promote good sleep hygiene and can be accessed on the #WELLSTUDENT portal
- A leaflet/poster will be made with the study's findings and suggestions on how students can achieve good sleep hygiene, these will then be promoted around college
- A PowerPoint slide will be created and shown in tutorials to promote good sleep hygiene during Mental Health Awareness Week

Conclusion

The Y12 Sleep Study aimed to evaluate three common sleep hygiene strategies—avoiding blue light, maintaining a consistent bedtime, and refraining from food and drink before sleep—and their effects on student mood. While none of the interventions significantly improved mood in the short term, qualitative data suggest that students found the strategies manageable and beneficial in subtle ways. The findings underline the importance of sleep hygiene education for students and suggest that even minor changes to nightly routines can increase self-awareness and potentially improve sleep and wellbeing over tim

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