

Sleep disruption in adolescent inpatients: Prevalence, associations with clinical outcomes, and clinician perspectives.

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Submitted to: Journal of Sleep Research

Manuscript words = 4703

Short title: Sleep disruption in adolescent inpatients

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Acknowledgements

We would like to thank the young people and all the staff members at the Highfield Unit, Oxford Health NHS Foundation Trust for supporting this work.

Abstract

Sleep problems are common for adolescents with psychiatric disorders, and sleep treatment may aid mental health recovery. Inpatient admissions are likely a particularly challenging time for sleep. Despite this little is known about the nature of sleep problems, and how sleep treatments could be optimised for this setting. This mixed-methods study set out to better understand sleep disturbances in adolescent inpatients. Study one examined the prevalence of SCI assessed insomnia at admission and associations with psychiatric symptoms and admission length in 100 inpatients (11-17 years) on one unit in Oxford. Data were gathered from admission routine measures and medical records. Associations were analysed using linear regressions. Half of the inpatients ($n=50$) screened positive for insomnia at admission. Moderate-large significant associations were observed between more severe insomnia and more severe depression ($\beta=-0.56$), anxiety ($\beta=-0.51$), self-harm ($\beta=-0.49$), psychotic experiences ($\beta=-0.32$), and conduct problems ($\beta=-0.30$), but not admission length. Study two gained 12 clinicians' perspectives on sleep problems on the unit via, a focus group and semi-structured interviews, analysed using thematic analysis. Ward staff observed insomnia and excessive daytime sleepiness in adolescent inpatients and a reciprocal relationship with mental health symptoms. Ward processes were barriers (e.g. night time observations) and facilitators (e.g. regular routines) of sleep. CBT for insomnia was not routinely offered, but viewed as potentially helpful. Insomnia may be a common problem for adolescent inpatients, associated with greater psychopathology, but not admission length. The possible benefits of psychological sleep interventions for adolescents admitted to psychiatric units now require testing.

Keywords: Insomnia, sleep disruption, adolescents, inpatient, psychiatric ward

Introduction

Sleep problems are highly prevalent in young people attending mental health services: around half of those with depression and a third of those with anxiety, for example, also report insomnia (Hysing et al. 2022). Sleep problems have historically been viewed as a consequence or symptom of mental health problems and hence their treatment has often been overlooked (Freeman et al., 2020). Recent evidence however, supports the view that sleep problems causally contribute to a range of mental health problems (Freeman et al. 2020). Evidence from adults shows that treating insomnia with Cognitive Behavioural Therapy (CBTi) - the first line recommended treatment in adults (NICE, 2021; Qaseem et al., 2016; Riemann et al., 2017) leads to improvements in psychiatric symptoms including depression, anxiety, and psychotic experiences (Espie et al., 2019; Freeman et al., 2017; Gee et al., 2019). In adolescents, emerging evidence from pilot trials also suggests that treating sleep disruption at this age has the potential to improve a range of psychiatric symptoms, including affective and behavioural problems (de Bruin et al., 2018) and psychotic experiences (Bradley et al., 2018; Waite et al., 2023).

Sleep problems may be a particularly important consideration for adolescents admitted to a psychiatric ward. There is evidence that sleep disturbance in young people is associated with higher levels of suicidality (Goldstein & Franzen, 2020), which, in turn, is a primary reason for psychiatric admissions. Studies show that sleep problems in adolescent inpatients are associated with higher levels of self-harm, borderline personality disorder symptoms, and emotional dysregulation (Kaplan et al., 2014; Wall et al. 2020). One recent study also found that sleep problems in adolescent inpatients are associated with more complex profiles of psychiatric symptoms and a higher likelihood of medication changes during admission (Baofu et al. 2021).

If, as the emerging evidence suggests, sleep disruption is causally related to mental health problems, then treating it may provide a novel route to reducing a range of distressing symptoms, alleviating suicidal thoughts and improving functioning in adolescent inpatients. CBTi is a brief treatment – typically 6 sessions, and it has also proven feasible to deliver intensively over 2 weeks in adult inpatients (Sheaves et al. 2017). Sleep problems could therefore provide a focused treatment target within the limited time frame of an admission. Adolescents in crisis may also find it easier to discuss sleep than their main mental health difficulties which may feel too overwhelming, or even frightening due to self-stigma or a fear

of losing control (Bradley et al., 2018; Gregory & Sadeh, 2016). As a result, sleep problems could be an acceptable and accessible treatment target for young people soon after admission to hospital. Preliminary evidence from adults further suggests that improving sleep has the potential to reduce admission length (Sheaves et al. 2018).

Guidelines for developing complex interventions highlight the importance of considering the moderating effect that a new context can have on the effectiveness of an intervention (Skivington et al., 2021). This is particularly important to consider in complex settings such as inpatient wards. There are likely factors related to a hospital admission which disrupt young people's sleep. Frequent night-time observations and a noisy environment (Sheaves et al., 2018), in combination with adjusting to being away from home and disruption to education (Gowers et al., 2000) could plausibly exacerbate sleep disruption. An understanding of the ward environment and its impact on sleep is therefore necessary in order to optimise sleep interventions in this setting.

This study used a mixed-method approach to examine sleep disturbance in an adolescent psychiatric inpatient setting. The first objective was to identify the prevalence of insomnia in a sample of adolescent inpatients at the point of admission. The second objective was to examine associations between insomnia severity and mental health symptoms, educational functioning, and admission length. We hypothesised that more severe insomnia would be associated with greater symptomology (depression, anxiety, conduct problems, hyperactivity, psychotic experiences, self-harm, and borderline features), educational difficulties, and a longer admission. The third objective was to obtain clinician perspectives on the experience of sleep for patients on the ward. Clinicians provide 24-hour support to patients on adolescent inpatient settings and hence can provide insights into the nature of sleep problems in this group (the treatment target), the potential perceived benefits of better sleep (the patients' and clinicians' motivation for sleep treatment), current sleep management approaches and adaptations that could be necessary to optimise existing evidence-based sleep treatment for an adolescent inpatient setting.

Study 1

Method

Setting

Study 1 used a cross-sectional design with pre-existing data from routine outcome measures (ROMs) collected at the point of admission on an adolescent inpatient unit in Oxford Health NHS Foundation Trust. The 18-bed, mixed gender ward provides inpatient assessment and treatment for adolescents (11-17 years) experiencing a range of acute mental health difficulties. The purpose is to provide a safe, supportive and therapeutic environment whilst the young people are in an acute and vulnerable stage of mental illness. Typical mental health treatments include medication, individual and group psychological therapies and family support. These are offered dependent on clinical need and UK treatment guidelines. Education is embedded into the unit. The study was reviewed and approved by the Oxford Health NHS Foundation Trust Quality and Audit team.

Participants

Historical admission ROMs data were obtained from adolescent inpatients with a completed (<25% of items missing) Sleep Condition Indicator (SCI). The earliest available data was from 04/11/2015, after which all consecutive patients with ROMs data were considered for inclusion, until the date of data collection (21/10/2019, data collection window = 4 years). Completed ROMs data from 111 patients were identified. Patients with questionnaires completed *prior* to admission (i.e., as part of planned admission; $n=5$) or without a completion date ($n=2$), and patients who had not yet been discharged ($n=4$), were excluded. This provided a final sample of 100 participants for analysis, representing 40% of total admissions ($n=251$) during the data collection window.

The reason for each participant's admission was coded based on the diagnosis recorded on medical records (if present) and presenting problems described on the admission referral form (Bird et al., 2021; see supplementary materials for the coding system). Admission length data was obtained from medical records, calculating total days between admission and discharge dates. Medication data was collected from Ascribe pharmacy software. Patients were coded as positive for prescribed sleep medication at the point of admission when that medication

had been prescribed for the specific purpose of aiding sleep, as determined by pharmacist notes.

Measures

Sleep Condition Indicator (SCI)

The SCI (Espie et al., 2014) is an 8-item self-report questionnaire assessing insomnia symptoms according to DSM-5 criteria. Questions are rated over the past month on a 5-point scale (0–4), with higher scores indicating better sleep. The phrasing of the questionnaire is simple and hence considered appropriate for use with adolescents. Responses to all items are summed to create a total insomnia severity score. In adults, a score of <16 is indicative of likely insomnia. Internal consistency in the current sample was good ($\alpha=0.88$). In the current study the scale was used as both a dimensional scale of insomnia severity, using the total score and as a screening tool for the presence of probable insomnia disorder using the clinical cut off (<16).

Revised Child Anxiety and Depression Scale (RCADS)

The RCADS (Chorpita et al., 2000) is a 47-item, self-report questionnaire assessing affective symptoms in young people. Items are rated on a 4-point scale. Higher scores indicate more severe symptoms. The 37-item anxiety total score and the 10-item depression subscale were used for this study. An item measuring sleep problems (“I have trouble sleeping”) was omitted from the depression subscale due to criteria contamination, resulting in a 9-item scale. Internal reliability in this sample was high for both total anxiety ($\alpha=0.96$) and the 9-item depression scale ($\alpha=0.91$).

Strengths and Difficulties Questionnaire (SDQ)

The SDQ (Goodman, 1997) is a 25-item self-report mental health screening questionnaire for children and adolescents, including subscales for emotional, conduct, hyperactivity, and peer difficulties. Items are rated over the last 6-months on a 3-point scale. Higher scores indicate greater difficulties. This study used the 5-item conduct problems and 5-item hyperactivity subscale scores only. Internal reliability in the current sample was acceptable for both scales (conduct $\alpha=0.69$, hyperactivity $\alpha=0.72$).

The Health of the Nation Outcome Scale for Children (HoNOSCA)

The HoNOSCA (Gowers et al., 1999) is a 13-item self-report questionnaire examining a range of psychiatric symptoms and indicators of social functioning in children. Items are rated over the previous two weeks on a 5-point scale, with higher scores indicating greater difficulties. This study used three single HoNOSCA items to provide separate indicators of the severity of 1) self-harm, 2) psychotic experiences, and 3) educational difficulties.

Borderline Personality Features Scale for Children (BPFSC-11)

The BPFSC-11 (Sharp et al., 2014) is an 11-item self-report screening measure of borderline personality traits in children. Questions relate to behaviours associated with core features of borderline personality disorder, including emotional dysregulation, negative relationships, and identity problems. Internal consistency for this sample ($n=14$) was good ($\alpha=0.88$).

Statistical Analysis

Analyses were conducted using SPSS for Mac (Version 25). Overall rates of missing data were low (1%). For each questionnaire, participants with more than 20% missing items were excluded from the analysis. Missing items were pro-rated on each questionnaire for participants with less than 20% missing items ($n=13$). Visual inspection of the data and tests of normality, skewness, and kurtosis confirmed the data met criteria for parametric analysis.

Prevalence of insomnia was assessed using the SCI total score and the proportion of participants scoring below the validated threshold (<16). To examine the association between insomnia and individual symptoms, a series of simple linear regressions were conducted. The association between insomnia and admission length controlled for the number of days between admission and completion of ROMs. Due to the small number of participants with complete BPFSC-11 data ($n=14$), this exploratory analysis focussed on the magnitude of the relationship and associated confidence intervals (CIs), not p values.

Visual inspection of the residuals for each regression model suggested the assumption of equal variances was met. Un-standardised (B) and standardised (β) Beta coefficients with 95% CIs are presented with R^2 values. The Hochberg step-up method (Hochberg, 1988) was used to adjust for multiple comparisons. Supplementary analyses were conducted with highly correlated dependent variables ($r>0.7$) by controlling for the correlated variable in the regression. This applied to the anxiety and depression variables only.

Results

Participant Demographics

Of the 100 included participants, 76 were female (76%), 23 were male (23%), and one preferred not to say. Mean age was 15.34 years (SD=1.41, range=11-17). Most were White British ($n=81$, 81%). A full break down of ethnicity is in the supplementary materials. The most common presenting problems leading to admission were emotion dysregulation, anxiety/depression, and eating disorders (Table 1). A third ($n=31$) were admitted after a suicide attempt.

--- Table 1 ---

Descriptive data

Fifty percent ($n=50$) of the adolescent inpatients screened positive for insomnia on the SCI at the time of admission. At the point of admission, 23 participants were prescribed medication specifically to address sleep problems which included melatonin ($n=13$), zopiclone ($n=8$), quetiapine ($n=1$), and olanzapine ($n=1$). Of these 23 adolescents, 74% ($n=17$) scored within the clinical range for insomnia on the SCI.

Descriptive statistics illustrating mean scores are shown in Table 2, alongside the mean scores split by insomnia status. A total of 44% and 35% of participants scored in the clinical range on the RCADS for depression and anxiety, respectively. The range in admission length was wide, from 8 to 289 days (9 months). The average number of days between admission and ROMs completion was 9 days (SD=12, range=0-69).

--- Table 2 ---

Clinical associations

Associations between insomnia severity, mental health variables, educational difficulties, and admission length are presented in Table 3.

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Significant large associations were observed between greater insomnia severity and worse depression and anxiety. Insomnia accounted for 32% and 26% of the variance in these variables, respectively. However, as anxiety and depression were highly correlated ($r>0.7$), these analyses were repeated whilst controlling for each other. When controlling for anxiety, the association between insomnia severity and depression reduced from a large to a small effect which remained significant ($\beta=-0.23$, 95% CI=-0.37, -0.09, $p=0.002$). When controlling for depression, the association between insomnia severity and anxiety reduced to a small, non-significant effect ($\beta=-0.10$, 95% CI=-0.26, 0.05, $p=0.19$).

Medium, significant, associations were also observed between greater insomnia severity and worse hyperactivity, conduct problems, educational difficulties, psychotic experiences, and self-harm. Notably, insomnia severity explained 24% of the variance in self-harm. The association between insomnia severity and admission length was of negligible effect size and non-significant.

The exploratory analysis between insomnia severity and the small subsample ($n=14$) of participants with complete data for borderline personality features showed a large association between greater insomnia severity and higher levels of borderline traits ($\beta=-0.70$, 95% CI=-1.12, -0.25).

--- Table 3 ---

Study 2

Method

Design

Study 2 was a qualitative analysis of clinician perspectives, elicited through a focus group and individual interviews, on the experience of sleep for adolescent patients on the same inpatient ward described in Study 1.

Participants

Eight clinicians from the ward participated in a focus group during the weekly nursing team meeting. A brief statement was issued to all clinicians informing them of the topic for discussion prior to the meeting. Participants included nurses, health care assistants, and occupational therapists. Individual interviews were conducted with a Psychiatrist and a Clinical Psychologist to gain a diversity of professional perspectives. Seven of the clinicians were female and three were male. The majority ($n=9$) had worked on the ward for over a year.

Procedure

A semi-structured interview schedule was developed and used for both the focus group and interviews (see supplementary materials). Questions explored clinician's observations of sleep in the young patients, barriers and facilitators to sleep on the ward, what happens on the ward when a young person is struggling with sleep, and the perceived impact of these sleep problems. Additional questions in the individual interviews explored the perspectives on delivering a brief CBTi intervention on the ward. Interview length ranged from 23-34 minutes (mean=29, SD=5.26). All interviews were led by LJ (trainee clinical psychologist). The focus group was cofacilitated by BS. Interviews were audio recorded and transcribed verbatim.

Data analysis

Coding and analysis were led by LJ, following guidance from Braun and Clarke (2006) and using NVivo 12 (QSR International Pty Ltd, 2018). First, recordings were listened to and

transcripts read and re-read to increase familiarity with the data. Initial codes were generated through a deductive process based on the structure of the interview schedule. As analysis progressed, these codes were grouped into themes which were regularly reviewed and refined by LJ. A thematic map was generated and checked to ensure it represented the accounts. Second coding of the data was undertaken by BS, after which themes were discussed and refined. The accepted themes and supporting quotes were subsequently reviewed by JB and refined until consensus was reached.

Results

Clinician perspectives of sleep problems in adolescent inpatients were represented by three superordinate themes, each with subthemes. The three themes reflected 1) the experience of sleep problems for adolescent patients on the ward, 2) the perceived barriers and facilitators of sleep on the ward, and 3) typical management of sleep problems by clinicians. A summary of the findings is presented below. A detailed account of the results with additional quotes are in the supplement.

The experience of sleep problems in adolescent inpatients

“It’s remarkable how little sleep some people [...] actually have” (P9)

Staff clearly described insomnia symptoms in the young people with comments on a short sleep duration *“4 hours per night I mean that’s not that uncommon actually in our population”*

(P9) observed during night-time checks. Excessive daytime sleeping was also noted, either to compensate for lack of sleep at night or possibly reflective of circadian dysregulation (day night reversal: *“sleep a lot during the day but they’re up quite a lot during the night”*, P1) or hypersomnia (*“just sleep a lot in general”*, P1). Clinicians commented that sleep problems often pre-existed the index admission, but that the transition to hospital could also trigger, or exacerbate, sleep disruption. There was recognition of a reciprocal relationship between sleep problems and mental health difficulties including depression, bipolar disorder, psychosis, anxiety, OCD, and eating disorders. Sleep disturbance was identified as *“one of the things*

that's [...] exacerbating their illness," and as "sleep improves, their mental state improves quite significantly" (P7). There was also a general belief that if patients had improved sleep, then they would be better able to engage with the therapy and support on offer from the ward.

Barriers and facilitators of sleep on a ward

"First thing I think of when I think of sleep here is that it's probably quite disrupted just because of the observations [...], as a very minimum the young people are checked on every 30 minutes" (P4)

"We still maintain their day night cycle [...], there's more [patients] awake in the day for sure and then there's more asleep at night [...]. And we've got bedtimes, and routine around that" (P4)

Clinicians identified several factors which influenced sleep on the ward. Aspects of the hospital environment were described as disruptive for young people's sleep - ward noise, lack of personalised temperature control, and corridor lighting, as well as adjusting to being away from home and being around other "young people who are distressed." (P10). Night-time safety checks require clinicians to observe the patient breathing a minimum of every 30 minutes. Clinicians explained "creaky doors, cos you have to open the door to actually look in" (P8), "Shin[ing] the torch against the wall" (P8) and relying on corridor lights, were sources of disruption, particularly in the context of pre-existing sleep problems. For some young people, it was acknowledged that psychiatric medications could be stimulating, or worsen the quality of sleep. Psychological factors could also interfere with sleep processes, such as sleeping during the day as an "avoidance technique" or engaging in anxious rituals or rumination which were "coming more at night-time" (P1).

Despite these barriers, clinicians also highlighted ways the ward could promote sleep. This included the daily routines and ward structure that helped to regulate a "basic day/night cycle" (P4), and an element of safety, stability, and privacy that may have been missing at home. Other patients' role modelling good sleep practice and the availability of clinicians for support in regulating distress and reducing hyperarousal before bedtime were also seen as beneficial to sleep.

Managing sleep problems on the ward

"The first step is assessing what the issues are, why are they sleeping poorly?" (P7)

The caring, considerate approach of the nursing staff to managing sleep problems was evident across accounts. Clinicians described trying to minimise the disruption of safety checks, taking time to assess sleep difficulties through observations, and assisting with “*winding young people down*” (P10) in preparation for sleep. Sleep hygiene was a commonly used intervention which could be adapted “*depending on what they need*” (P2). More specific interventions included reviewing medication and, in some cases, prescribing hypnotic medication - a practice they thought to have increased over recent years. Other medical treatment included psychiatric medications with sedating properties (e.g. quetiapine), melatonin (a circadian regulator), and adjusting the timing of medication. Referral to a specialist sleep clinic was said to be a possibility when sleep “*looked like a problem in its own right*” (P9). A psychological sleep intervention was viewed as potentially helpful, however it was not routinely offered: “*I suppose CBT for sleep does happen on the rare occasion depending on capacity*” (P10). Clinicians also described the importance of ensuring therapy was appropriately adapted for the varying ages and ability of patients.

Discussion

The first part of this study assessed the prevalence and clinical correlates of insomnia in an adolescent psychiatric inpatient ward setting. Results showed that half of the adolescent inpatients scored in the clinical range for insomnia at the point of admission. Insomnia symptoms were individually associated with a broad range of mental health symptoms, including more severe affective symptoms, behavioural problems, self-harm, and psychotic experiences, and greater difficulties with education. These findings were consistent with the qualitative reports of clinicians from the same adolescent inpatient ward who observed sleep disruption as a common problem for patients that interacted with their other mental health problems. Clinicians also viewed sleep problems as interfering with the patients’ access to therapeutic opportunities and education on the ward. Some aspects of the environment were regarded as disruptive to sleep (e.g., night-time observations of patients), but clear benefits were noted too - for example, the regular ward routines which may act as a circadian regulator and staff who provide night-time support to help patients wind down in preparation for sleep. Medication was prescribed to address sleep problems in half of patients with sleep disturbance, but response was sub-optimal: three quarters of those prescribed medications for sleep scored in the clinical range for insomnia. Psychological interventions were viewed as potentially helpful, but not routinely offered.

In this study, insomnia showed the strongest associations with both depression and anxiety. Insomnia continued to predict depression whilst controlling for anxiety (albeit to a smaller degree), but the significant association with anxiety was lost after controlling for depression. The reduction in effects for both outcomes suggests that insomnia severity explains variance that is shared by both depression and anxiety. This is consistent with factor analytic studies showing that anxiety and depression are separable but overlapping clinical constructs in young people (Szabó, 2010). This study shows that insomnia is also uniquely associated with depression, but not anxiety. Encouragingly however, treating insomnia can lessen both problems, with typically a slightly larger effect for depression than anxiety (Espie et al., 2019; Freeman et al., 2017).

The moderate to large association between insomnia severity and self-harm is especially important given the prominence of emotional dysregulation and suicidality as reasons for the young people's admission. This observed relationship supports existing findings in adolescent inpatients (Kaplan et al., 2014) and raises the possibility that improving sleep could reduce risk events for young people during admission. Furthermore, although data on borderline personality disorder symptoms was only available for a small number of young people, the observed large association with insomnia is noteworthy and consistent with previous findings from adolescent inpatients showing that sleep difficulties at admission were associated with borderline features at discharge (Wall et al., 2020).

Contrary to previous findings from the adult literature (Haynes et al., 2011; Sheaves et al. 2018), we found no association between young people's insomnia symptoms on admission and length of stay. It is important to note, however, that adolescents typically have a significantly longer inpatient stay of 116 days on average (NHS England, 2014) compared to 49 days in adult acute settings (Wyatt et al., 2019). Adolescents also often experience delays to discharge due to the lack of availability of suitable mental health or social care packages in the community (Frith, 2017). In circumstances where delays in discharge are linked to reasons other than mental state, it follows that insomnia severity may have less of an impact on length of stay. Despite this, the high prevalence of insomnia and association with a range of psychiatric symptomatology suggests sleep disruption is a significant problem in adolescent inpatients and there may be broad benefits to offering targeted sleep treatment.

Limitations and future directions

Several limitations must be acknowledged. The sample is not fully representative because it was limited by the availability of existing service data. The findings may therefore misrepresent the true prevalence of insomnia across adolescent inpatient wards. However, the inclusion of any patient with complete sleep data, regardless of their reason for admission, mitigates this to some degree. The cross-sectional design requires very cautious interpretation with regards to the direction of relationships between insomnia and mental health symptoms. Assessment of some variables (self-harm, psychotic experiences, and educational difficulties) were likely limited due to using single-item measures. The SCI cut-off score for insomnia used in the study has also only validated in an adult population (Espie et al., 2014); it is not clear if the cut-off is valid in adolescents. Although clinician perspectives were obtained, the voice of the patients was notably absent. Further research exploring the experience of sleep problems – from a first-person perspective - in adolescent inpatients would therefore be valuable. Lastly, a delayed sleep-wake cycle, underpinned by later melatonin secretion, is a normative change observed during adolescence, yet circadian functioning and the timings of sleep were not assessed in this study. It is therefore possible that for at least some of the participant group, their insomnia symptoms reflect a contradiction between underlying circadian biology and the time that sleep is attempted (Carskadon, Vieira & Acebo, 1993). Although no causal inferences can be made from this cross-sectional study, it provides a valuable insight into the co-occurrence of sleep disruption and psychiatric symptoms in adolescent inpatients at the point of admission. Although we assessed these relationships individually, it is important to acknowledge that they will not exist in isolation - different symptoms will likely interact in their association with sleep. Based on existing research, it is likely that some psychiatric symptoms have direct relationships with insomnia, whilst other variables are associated indirectly with insomnia via other mediating variables. For example, evidence shows that the association between sleep disruption and psychotic experiences is largely mediated by negative affect (Reeve et al., 2018). Examining the patterns of direct and indirect association with sleep would require a larger sample with greater power and more sophisticated statistical techniques, such as network analysis (Borsboom & Cramer, 2013), which was beyond the scope of this study.

Conclusion

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Our qualitative findings highlighted how clinicians on the ward put care and effort into supporting young people to achieve better sleep by helping them to wind down and offering sleep hygiene advice. Yet CBTi, the recommended first line treatment for insomnia which is shown to be effective in adolescents (de Bruin et al., 2018), was rarely offered. This study suggests adapting CBTi to optimise its acceptability and potential efficacy for young people in a psychiatric inpatient setting could be beneficial. Such adaptations should include consideration of the benefits and limitations of the ward environment for young people's sleep. Our findings suggest that clinicians would welcome such an intervention, given both their recognition of the negative sequelae of sleep disruption and already established interest in supporting young people to sleep better.

Funding details

This project was conducted as part of LJ's Doctorate in Clinical Psychology at the Oxford Institute of Clinical Psychology Training. BS is funded by a HEE/NIHR clinical doctoral research fellowship (ICA-CDRF-2017-03-088). The views expressed are those of the authors and not necessarily those of the NHS, HEE, the NIHR, or the Department of Health and Social Care.

Conflict of interest

All authors declare that they have no competing or potential conflicts of interest.

Author contributions

LJ led all aspects of the data inputting, analysis, and write up for this study. BS and JCB supervised the project and contributed to the study design, data analysis, and interpretation of the findings. PS provided additional supervision, contributing to the study design and interpretation of findings. ACJ and HJS led the collection of data on the adolescent inpatient unit. LJ drafted the manuscript; all authors edited it and approved the final version for publication.

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