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Delivering a sleep intervention across a youth mental health service using non-expert practitioners: A service evaluation

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Abstract

Aims: Poor sleep is highly prevalent in young people and increases risk of mental health difficulties, yet access to sleep interventions remains limited. This paper evaluates the use of a sleep intervention delivered by non-expert practitioners in a secondary care youth mental health service.

Method: Assistant psychologists were trained to deliver a six-session 1:1 cognitive-behavioural sleep intervention adapted for use with young people with mental health difficulties. A within-subject design assessed clinical outcomes relating to sleep (Insomnia Severity Index), psychological distress and personal goals (Goal Based Outcome Measures) at four time points.

Results: High referral, intervention take-up (82.82%) and completion (70%) rates were reported, together with high baseline levels of insomnia (Insomnia Severity Index mean 20.47, SD 3.68) and poor sleep efficiency (56.36%, SD 17.23). Fifty-six young people (average age 19.2 years, SD 3.25) were included in the outcome analysis. Statistically and clinically significant improvements were seen across all outcome measures, with 68% no longer meeting clinical threshold (ISI ≥15) for insomnia at endpoint.

Conclusions: This study demonstrates exceptionally high levels of clinical need and engagement with a sleep intervention adapted specifically for young people with mental health difficulties. Whilst limited by the uncontrolled design, large improvements in insomnia and psychological distress support its effectiveness and utility in clinical settings. More robust implementation and evaluation is warranted in broader youth mental health services to promote earlier access.

KEYWORDS
adolescents, cognitive behavioural therapy (CBT), insomnia, sleep, treatment, youth mental health

1 | INTRODUCTION

Longitudinal studies suggest a reciprocal relationship between sleep and mental health, with sleep difficulties tending to precede and significantly increase risk of later mental health difficulties (Orchard et al., 2020; Hertenstein et al., 2019; McMakin & Alfano, 2015). This is a transdiagnostic phenomenon, with sleep difficulties like insomnia increasing risk of most known mental health difficulties, including anxiety, depression, post-traumatic stress disorder and psychosis (Harvey, 2008; Harvey, 2011; Hertenstein et al., 2019; Qiu & Morales-Muñoz, 2022).

More specifically, restricted or poor quality sleep in young people is associated with increased suicidality (Glenn et al., 2021; McManimen et al., 2022); self-harm (Khazaie et al., 2020; Liu et al., 2017); reduced positive affect and increased perception of threat (Talbot et al., 2010); increased impulsivity (Short & Weber, 2018); hopelessness (Winsler et al., 2015); anxiety (Roberts & Duong, 2017); emotional dysregulation (Baum et al., 2014) and impaired response to psychological therapies (McGlinchey et al., 2017).

Young people with mental health difficulties are more likely to report significant insomnia symptoms, with estimates ranging up to 70% (Hysing et al., 2022; Newlove-Delgado et al., 2021; Orchard et al., 2017; Rollinson et al., 2019) with this higher rate attributed to physiological delays in their circadian system coupled with societal demands for early waking (Carskadon, 2011; Crowley et al., 2018; Gradisar et al., 2022).

There is strong evidence for the effectiveness of cognitive behavioural therapy (CBT) for Insomnia (CBTi) for adults (van Straten et al., 2018) and adolescents (Blake et al., 2017; de Bruin et al., 2018; Harvey et al., 2018), with it recommended across the United Kingdom, United States and European Union as a first-line treatment for insomnia (Wilson et al., 2019; National Institute of Health and Care Excellence, 1999, 2024; Qaseem et al., 2016; Riemann et al., 2017). There is relatively little research on the effectiveness of CBTi for young people with mental health difficulties, but a number of feasibility studies have reported positive outcomes with CBTi delivered by qualified therapists (Bradley et al., 2018; Clarke et al., 2015) or via digital platforms (Cliffe et al., 2020; Mathews et al., 2022).

As an alternative to these modalities, we have previously reported an initial case-series with a form of CBTi adapted to (a) be appropriate for young people (14 to 25 years) in secondary mental health services, and (b) delivered by non-expert practitioners (Rollinson et al., 2021).

The current study examines the feasibility of embedding this intervention across multiple teams within a youth mental health service by considering rates of intervention uptake and completion alongside feedback from practitioners and service users. Employing a pre-post comparison within-subject design, this study will consider clinical effectiveness in terms of changes in sleep, psychological distress and progress towards personal goals.

2 | DESIGN AND METHODOLOGY

2.1 | Participants

Participants were service users within the Norfolk and Suffolk NHS Foundation Trust (NSFT) Youth Mental Health service. The service is comprised of 10 teams and works with 14- to 25-year-olds with a range of severe and complex mental health presentations who usually present with a significant degree of risk in their presentation.

Service users were offered the intervention (The Better Sleep Programme) if their sleep difficulties were clinically significant (i.e., above clinical cut off for Insomnia Severity Index [ISI]; ≥15 for over 18 years and ≥9 for under 18 years, [Morin et al., 2011; Chung et al., 2011]), had been present for at least 2 months, and they were wanting help with their sleep. Service users with acute risk of suicide, or with a primary presentation of psychosis, were excluded from the intervention but referred on for intervention elsewhere. All service users included in the evaluation had an allocated lead care professional.

2.2 | Design

This study reports on the accessibility, acceptability and clinical outcomes of offering a six-session, formulation-based sleep intervention (The Better Sleep Programme) for young people aged 14–25 years, being seen within a community-based, secondary mental health service. A within-subject design is used to compare clinical outcomes assessed at baseline, midpoint (session 3), endpoint (session 6) and at follow-up 4 weeks following the end of the intervention. Follow-up assessments were made with a different practitioner to the primary therapist. The service evaluation reports on a study period between 7 December 2020 and 23 November 2021 (a resurgence in Covid-19 cases disrupted service provision after this date).

2.3 | Measures

2.3.1 | Feasibility indices

Accessibility

Accessibility of the intervention was monitored through demographic characteristics of service users referred (age, gender and ethnicity), rates of referral, training uptake, caseload sizes, waiting times, adherence to the therapy model and adverse events.

Adherence to the therapy model was monitored using the sessional, practitioner-completed, adherence checklist summarized in Table 1. Any adverse events were reported by the assistant psychologists (APs) delivering the intervention.

Acceptability

The acceptability of the intervention was monitored through intervention uptake and completion rate, measure completion rate, feedback

TABLE 1 Outline of intervention elements and rates of usage.

Component	Description	*n* (%) sessions where used (*N* = 332)	*n* (%) participants (*N* = 56)
Psychoeducation	Understanding sleep, role of sleep effort	166 (50.00%)	56 (100%)
Sleep hygiene	Lifestyle factors, sleep environment	139 (41.87%)	53 (94.64%)
Stimulus control	Associating bed with sleep, 15-min rule, wind down routine	118 (35.54%)	50 (89.29%)
Sleep scheduling	(Low intensity): bed when sleepy and set wake-up time.	161 (48.49%)	52 (92.86%)
Increase daytime activity	Behavioural activation	89 (26.81%)	50 (89.29%)
Relaxation	Grounding strategies, progressive muscular relaxation	142 (42.77%)	53 (94.64%)
Cognitive strategies	Beliefs about sleep, fear of nightmares, worry management, mindfulness and defusion techniques	139 (41.87%)	53 (94.64%)

from service users and practitioners (collected via online survey) and demographics of those who disengaged.

2.3.2 | Clinical outcomes

Sleep measures

Questionnaire measures were completed at baseline, midpoint, endpoint and four-week follow-up. The Sleep Efficiency Quotient (SEQ) was calculated at baseline and endpoint.

Insomnia Severity Index. The ISI is a seven-item self-report questionnaire assessing the nature, severity and impact of insomnia. It has been shown to be a valid and reliable tool to detect insomnia in community, clinical and adolescent populations (Morin et al., 2011). The ISI is a valid and sensitive measure to detect changes in perceived sleep difficulties with treatment interventions in research (Bastien et al., 2001).

Sleep Efficiency Quotient. The SEQ (Espie et al., 2006; Reed & Sacco, 2016) is a calculation based on a week's sleep diary recording that reflects the proportion of time spent in bed that is spent sleeping. An SEQ of 85% and above is considered within the range of a good sleeper (Hysing et al., 2013; Reed & Sacco, 2016). A sleep diary was used that was adapted from the consensus sleep diary (Carney et al., 2012) to be appropriate for a youth population. Where a sleep diary was unavailable, detailed retrospective analysis of the previous three nights was accepted.

2.3.3 | Psychological distress

Under 18s: The Revised Child Anxiety and Depression Scale (Chorpita et al., 2000)
The Revised Child Anxiety and Depression Scale (RCADS) is a 47-item self-report questionnaire routinely used with children and adolescents under the age of 18. It measures the reported frequency of symptoms of anxiety and low mood and has shown good

reliability for use in both primary and secondary care (Chorpita et al., 2005).

Over 18s: The CORE Outcome Measure (Evans et al., 2002)
The CORE Outcome Measure (CORE-OM) is a 34-item measure of psychological distress in adolescents and adults aged over 18 assessing the frequency of experiences related to well-being, functioning, symptoms and risk. Higher scores reflect greater pathology. The CORE-OM is a widely used outcome measure used in both primary and secondary care.

2.3.4 | Progress towards personal goals

Goal Based Outcome Measures

Goal Based Outcome Measures (GBOM) (Law & Jacob, 2013) were used to identify and track change on factors of most concern to the young person. Up to three goals were identified at assessment with progress towards each goal rated out of 10. An average was taken to account for variation in number of goals set.

3 | PROCEDURE

3.1 | Training and supervision

The training and supervision programme was developed and delivered by the clinical leads; a clinical psychologist (RR) and CBT therapist (AG). Training was offered online over 1.5 days to all APs working in Youth teams (Local APs) and their supervisors. Local APs attended monthly sleep-specific supervision groups held by the clinical leads. Two APs were employed specifically for the project (Sleep APs).

3.2 | Intervention

An initial assessment session was used to complete baseline measures and a semi-structured assessment interview. This was used to inform

an individualized 'Five-P' formulation (Dudley & Kuyken, 2006) emphasizing factors maintaining their sleep difficulty and interventions that would best target these.

Six subsequent intervention sessions were offered remotely (via telephone or online video calls) or face to face. Family members were invited to participate in sessions where clinically indicated but this was not often the case in practise. The intervention consists of cognitive and behavioural interventions for insomnia, such as psychoeducation, stimulus control, worry management and behavioural activation, alongside acceptance and commitment therapy strategies such as cognitive defusion and mindfulness. See Table 1 and Rollinson et al. (2021) for further detail. Adaptations included a lower intensity form of sleep restriction (following Conroy et al., 2019), focusing on going to bed when sleepy and setting a fixed wake-up time, use of low-intensity cognitive strategies, and an awareness of the likelihood of past traumatic experiences and a need to focus on perceived safety as well as soothing.

3.3 | Statistical analyses

Descriptive statistics were first calculated for all measures related to the accessibility and acceptability of the intervention detailed above and for all outcome measures.

Clinical impact was then examined by a clinical threshold analysis calculating the percentage of service users whose scores had fallen below established clinical thresholds at each time point, followed by a statistical analysis investigating the statistical significance of group level changes in scores over time. A repeated measures ANOVA and calculation of Cohen's D effect sizes were used when assessing three datapoints and a paired sample t-test for measures completed at baseline and endpoint only (SEQ). Follow-up scores were not included in the statistical analysis due to the small samples at this time point.

3.4 | Ethical considerations

Service users were given the opportunity to opt out of their anonymized, routinely collected data being used in the current study, without this affecting the service offered (15 service users withheld consent). Data were anonymized and stored on secure NHS servers using a restricted access database.

Monthly steering group meetings were held to monitor adherence to the evaluation protocol, governance issues and any adverse incidents. The service evaluation was registered with and approved by the NSFT Research and Development department (2020MH26-SE) and as such, did not require full research ethics approval.

4 | RESULTS

Figure 1 shows the consort diagram reflecting progress through phases of the service evaluation from 7 December 2020 up until 22 November 2021 when all available data were included for analysis.

4.1 | Feasibility analysis

4.1.1 | Accessibility of the intervention

Good accessibility is indicated by the similarity of the demographic characteristics of the 80 young people that started the intervention with the wider caseload seen within NSFT youth services and local UK census data (UK Census, 2021). Service users were mostly female (68.75%) and white (92.5%) with an average age of 19 (range 13–25, SD 3.25).

A high referral rate was seen from all eight teams that accepted the offer of training and supervision. A total of 222 referrals were received over the 50 weeks of recruitment.

All APs across the youth service ($n = 11$) and nine clinical supervisors were trained in the intervention during the evaluation period.

Local APs saw an average of two clients each within the evaluation period (range 1–4). In contrast, the APs employed directly on the project or within the lead author's youth team, saw an average of 9.4 service users each.

The waiting time from referral to assessment rose from 26.8 days in the second month to 64.2 days in the eleventh month.

In terms of therapy adherence, 56 service users who completed the intervention received an average of seven sessions (baseline assessment plus six intervention sessions) (SD 0.77, range 4–9) over an average of 61 days (SD 16.32, range 41–118). Most sessions were delivered using video calls (62%), with 26% delivered over the phone and 12% face to face. (This was largely a reflection of practise restrictions related to Covid-19.) Table 1 indicates the relative use of intervention elements. Comparison of elements used in the first and last three sessions indicated a tendency to cover psychoeducation and sleep hygiene first, followed by sleep-specific behavioural interventions, with increased daytime activity, relaxation and cognitive strategies more likely to be used in the final three sessions.

Adverse events

All reported adverse events were reviewed by the steering group. Three events were considered directly related to providing the intervention (distress whilst completing the wellbeing measure, distress during a mindfulness exercise and distress discussing childhood memories). Adaptations were consequently made to future training material. No events threatened the safety of service users or practitioners or related specifically to a sleep intervention.

4.1.2 | Acceptability of the intervention

Intervention uptake was high with 135 (82.82%) of those eligible for the intervention, agreeing to take part (Figure 1). Of the 80 service users who started the intervention, 70% (56) completed it (attended all sessions and completed measures at baseline and endpoint).

In terms of those who completed the intervention and those that disengaged early, there was a slight tendency noted for under 18s to be more likely to end early (58% of the 24 that disengaged). No other differences were noted with a similar gender profile across
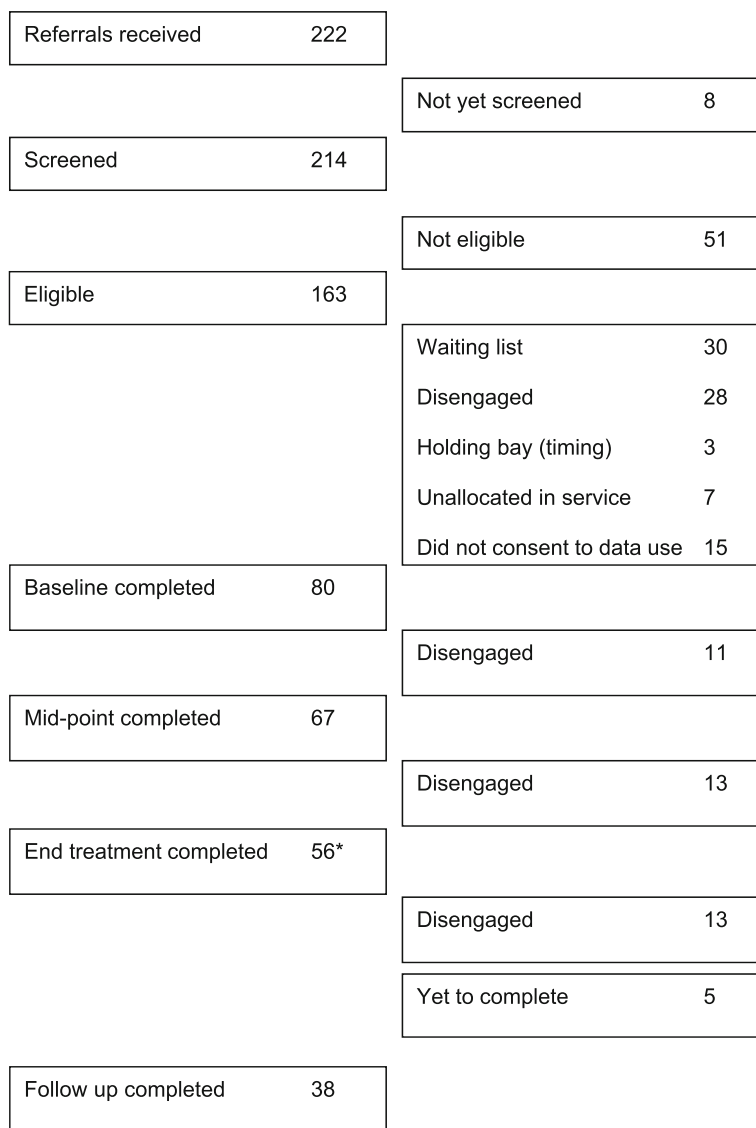
FIGURE 1   Consort diagram.

| Referrals received | 222 |

| Not yet screened | 8 |

| Screened | 214 |

| Not eligible | 51 |

| Eligible | 163 |

Waiting list	30
Disengaged	28
Holding bay (timing)	3
Unallocated in service	7
Did not consent to data use	15

| Baseline completed | 80 |

| Disengaged | 11 |

| Mid-point completed | 67 |

| Disengaged | 13 |

| End treatment completed | 56* |

| Disengaged | 13 |
| Yet to complete | 5 |

| Follow up completed | 38 |

*Two service users completed the intervention at session four. Their midpoint data was therefore treated as endpoint data.

both groups (77% of the 56 that completed identified as female, compared with 75% of the 24 that disengaged), and similar baseline scores (mean ISI 20.47 and 19.79; mean GBOM 1.63 and 1.75; mean RCADS 76.24 and 74.25; and mean CORE 76.50 and 82.11, respectively).

The average measure completion rate at mid-point was 81.93% and 66.46% at end of treatment. Most missing data were due to early disengagement from the intervention, suggesting that the measures used were acceptable to the service users taking part. Extensive feedback was collected from service users and practitioners and has informed further development of the intervention. See Tables 2 and 3 for a summary. Overall, high levels of satisfaction and perceived helpfulness were reported from both groups.

TABLE 2   Summary of service user feedback scale ($n = 40$).

	n	%
Rated helpfulness as ≥8/10	37	92.5%
Rated satisfaction with outcomes as ≥8/10	31	77.5%
Would recommend to family or friends	38	95%

TABLE 3   Summary of practitioner feedback scale ($n = 8$).

	n	%
Rated confidence in delivering the intervention as ≥4/5	8	100%
Rated helpfulness to service users as ≥4/5	6	75%
Rated enjoyment delivering the intervention as ≥4/5	6	75%

4.2 | Outcome analysis

The outcome analysis was completed for the 56 service users who completed the intervention.

4.2.1 | Descriptive statistics

Descriptive statistics for outcome measures are summarized in Table 4.

4.3 | Clinical threshold analysis

4.3.1 | Insomnia Severity Index

All service users, except one under 18, met the adult threshold for insomnia at baseline. At endpoint, 68% ($n = 38$) no longer met this threshold. This was maintained at 58% ($n = 22/38$) in the smaller follow-up sample.

Forty-two percent ($n = 23/55$) of service users scored above threshold for 'severe' insomnia (≥22) at baseline. This dropped to 12.5% ($n = 7/56$) at endpoint and 11% ($n = 4/38$) at follow-up.

4.3.2 | Psychological distress

In the over 18s, the number of service users scoring as 'Severe' or 'Very Severe' on the CORE was 22 (64.71%) at baseline and dropped to 12 (36.36%) at endpoint. In the under 18s, the number scoring in the clinical range of the RCADS was 14 (67%) at baseline and dropped to 6 (29%) at endpoint.

4.3.3 | GBOM

Reliable change (≥2.45 [Edbrooke-Childs et al., 2015]) was seen in 39 of the 54 (72.22%) service users completing GBOM at baseline and endpoint.

4.4 | Tests of statistical significance

Table 5 provides a summary of the repeated measures ANOVA showing the mean differences at each time point and where these differences were found to be statistically significant in pairwise comparisons. In all cases, the Mauchly's test of sphericity was significant, so the Greenhouse–Geisser adjustment was used. The ANOVA was significant at $p < .001$ for all measures. Follow-up scores were not included in the statistical analysis due to the small samples at this time point.

The only non-statistical change in the pairwise comparisons was the change in CORE from midpoint to endpoint which produced a p value of .067.

TABLE 4 Descriptive statistics for measures of sleep, personal goals and psychological distress ($n = 56$ that completed the intervention).

	Sleep measures						Personal goals			Psychological distress over-18			Psychological distress under-18					
	ISI			SEQ (%)			Average GBOM			CORE			RCADS raw			RCADS t score		
	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n	Mean	SD	n
Baseline	20.47	3.68	55	56.36	17.23	53	1.63	1.28	54	76.50	22.66	34	81.29	23.41	21	76.24	13.63	21
Mid-intervention	16.20	4.47	54	NA			3.63	2.09	53	64.76	22.98	34	74.50	21.40	18	72.11	12.31	18
End of intervention	11.96	7.17	56	79.51	11.24	47	5.81	2.59	56	60.10	22.90	33	62.10	27.50	21	64.86	15.42	21
1 month follow-up	12.16	6.58	38	NA			5.75	2.97	38	63.10	22.86	24	63.18	25.74	11	65.73	16.57	11

Abbreviations: CORE; Clinical Outcomes in Routine Evaluation; GBOM; Goal Based Outcome Measures; ISI, Insomnia Severity Index; RCADS, Revised Child Anxiety and Depression Scale; SEQ; Sleep Efficient Quotient.

TABLE 5 Summary of repeated measures ANOVA.

| Measure | N | Mean difference | | | | | |
| | | Baseline to midpoint | | Midpoint to endpoint | | Baseline to endpoint | | |
		Mean difference	Standard error	Mean difference	Standard error	Mean difference	Standard error	Effect size (d)
ISI	53	4.32**	.58	3.91**	.74	8.23**	.90	−0.79
CORE	31	10.13**	2.99	5.61	2.33	15.74**	3.98	−0.72
RCADS	18	5.28*	1.99	4.89*	1.77	10.17*	3.15	−0.78
GBOM	52	1.97**	.27	2.14**	2.32	4.11**	.34	2.2

Note: In all cases, the Mauchly's test of sphericity was significant, and the Greenhouse–Geisser adjustment used. Cases were deleted on a listwise basis so only those service users with complete data for the measure in question are shown.

Abbreviations: CORE; Clinical Outcomes in Routine Evaluation; GBOM; Goal Based Outcome Measures; ISI, Insomnia Severity Index; RCADS, Revised Child Anxiety and Depression Scale.

**p < .01.*p < .05.

Baseline and endpoint SEQ scores were compared using a paired samples *t*-test. A mean difference of 24 percentage points (reflecting an increase in time spent in bed asleep) was recorded across the 46 service users with measures completed at each time point. This difference was statistically significant (SD 16.72, $t = -9.71$, df = 45, and $p < .001$).

5 | DISCUSSION

5.1 | Main findings

Accessibility of the intervention was strongly supported, with high referral rates and high levels of insomnia amongst those referred, supporting the need for an early sleep intervention in the youth mental health context. The acceptability of the intervention was also strongly supported, with very high intervention uptake (82.82%) and completion rates (70%) and positive feedback, suggesting this is an area young people want to work on. Clinical effectiveness is supported by statistically and clinically significant improvements across all measures of sleep, psychological distress and progress towards personal goals. Almost 70% of all service users who completed the intervention no longer met clinical threshold (set at ≥15) for insomnia by the end of the intervention. Improvements seemed to be maintained at follow-up, albeit in a smaller sample.

Implementation issues needing further consideration are the increase in wait-times during the evaluation period, the lower case-load in practitioners less invested in the intervention and the tendency for under-18s to be more likely to disengage. The intervention was primarily offered remotely (88% of sessions) due to Covid-19 restrictions. It is not clear how this might influence engagement and outcomes.

5.2 | Clinical implications

The very high levels of baseline insomnia seen in such a young sample is of concern, especially given the consistency of this finding across the few feasibility studies carried out in youth mental health settings (Bradley et al., 2018; Cliffe et al., 2020; Mathews et al., 2022; Rollinson et al., 2021). These baseline levels are strikingly higher than studies recruiting from community-based youth samples (de Bruin et al., 2018; Conroy et al., 2019; Palermo et al., 2017), reinforcing the need for further research into the association between sleep and mental health in young people.

The positive outcomes seen across both sleep and mental health measures are in-keeping with the role of sleep as an important moderator of mental health difficulties (Baglioni & Riemann, 2012; Harvey, 2008) and in line with existing literature relating to adults (Blom et al., 2015; Carney et al., 2017) and adolescents (Cliffe et al., 2020; Mathews et al., 2022) across both in-person and digital modalities.

The high acceptability findings have important service implications in a clinical population that often presents with complex engagement needs. We are seeing a high level of need in an area young people want help with. The transdiagnostic nature of a sleep intervention, together with the use of either non-expert practitioners as in the current study or digital interventions as used by Mathews et al. (2022), widens the potential for positive impact even further (Espie, 2009).

Prevalence studies are urgently needed to better understand the nature of the sleep difficulties seen in this population and their association with mental health presentation, risk and service use, whilst more rigorous implementation research is needed if we are to truly embed effective help with sleep within routine service provision.

5.3 | Limitations

The current feasibility study was limited by a lack of a control condition and the collection of outcome measures by the primary therapist. It was also challenging to collect follow-up data and the subjective measures of sleep quality used did not allow more objective sleep variables such as total sleep time, fragmentation or onset latency to be reported. It is also unclear the extent to which circadian difficulties may have been primary to insomnia in some service users. The lower

completion rates in under-18 s also limits the representativeness of the findings for this age group and suggests a possible need to adapt the intervention further for these patients.

5.4 | Conclusions

Disturbed sleep plays a critical role in the onset and maintenance of mental health difficulties. We are seeing high levels of need around sleep in young people accessing mental health services with medication being the main treatment routinely offered. A programme involving training and supervising non-expert therapists to provide a brief (six-session) formulation-based sleep intervention shows good feasibility and indicates good outcomes on measures of sleep, psychological distress and progress towards personal goals. Following consistent results reported by multiple feasibility studies, more robust research is now needed to examine the prevalence of sleep difficulties in this clinical population and to investigate the longer-term outcomes, implementation issues and cost-effectiveness of psychological interventions for insomnia.

CONFLICT OF INTEREST STATEMENT
The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

PATIENT CONSENT STATEMENT
Patient consent was obtained from all service users included in the study. Withholding consent did not affect availability of the intervention.

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