

SERVICE MODELS, FORMS OF DELIVERY AND CULTURAL ADAPTATIONS OF CBT

A pilot service evaluation of cognitive behavioural therapy for insomnia (CBT-I) within an NHS Talking Therapies for Anxiety and Depression service

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Abstract

Insomnia disorder is highly prevalent and frequently co-exists with other mental health conditions. Evidence suggests that targeting insomnia may improve overall mental health. Although the effectiveness of cognitive behavioural therapy for insomnia (CBT-I) is well established, it is rarely offered to patients as a discrete treatment. This study aimed to evaluate the outcomes of CBT-I delivered at Step 2 for reducing symptoms of insomnia, as well as anxiety, depression, and impaired functioning, following its implementation within an NHS Talking Therapies service. We examined routinely collected pre- and post-treatment outcomes from 35 patients (median age 60 years, interquartile range 44–68, 63% female) who received CBT-I. Insomnia severity was assessed during the first and last session using the Insomnia Severity Index, while secondary outcomes, including depression, anxiety, and impaired functioning were completed at each session. Intention-to-treat analyses demonstrated significant improvements in insomnia symptoms from pre- to post-treatment, with a large effect size ($d = 0.85$). Significant improvements were also observed across all secondary outcomes, with large effect sizes for depression ($d = 1.01$) and anxiety ($d = 0.89$), and a medium effect size for functioning ($d = 0.58$). The complete case analysis yielded larger effect sizes across most outcomes. These findings provide preliminary support for the potential benefits of CBT-I as a primary treatment for symptoms of insomnia, with secondary benefits for anxiety, depression, and functioning in patients presenting with mental health difficulties within an NHS Talking Therapies service. Implications for the service and future service evaluations are discussed.

Key learning aims

- (1) To develop understanding of the evidence base for CBT-I for sleep and mental health outcomes.
- (2) To consider the outcomes of CBT-I when delivered by Psychological Wellbeing Practitioners in an NHS Talking Therapies service.
- (3) To evaluate clinical recovery rates in line with NHS Talking Therapies criteria.

Keywords: anxiety; cognitive behavioural therapy; depression; insomnia; NHS Talking Therapies for Anxiety and Depression; sleep

Introduction

Insomnia disorder is characterised by dissatisfaction with sleep, specifically difficulty in initiating and/or maintaining sleep, which causes significant distress and daytime impairment (American Psychiatric Association, 2013). Population-based data indicate that approximately one-third of the general population report symptoms of insomnia and between 6% and 10% meet diagnostic criteria (Morin and Jarrin, 2022). Insomnia can co-occur with other psychiatric conditions (Khurshid, 2018) and is also a symptom of depressive and anxiety disorders (American Psychiatric Association, 2013). However, insomnia accompanying these mental health conditions has historically been regarded as secondary (Harvey, 2001) and is frequently neglected as a treatment target by mental health care professionals (Freeman *et al.*, 2020). This is despite clear evidence that insomnia can predict future psychopathology, particularly anxiety (odds ratio [OR] = 3.23) and depression (OR = 2.83; Hertenstein *et al.*, 2019), and that other mental health problems tend to lessen when insomnia is treated (Ellis *et al.*, 2014; Freeman *et al.*, 2020).

Cognitive behavioural therapy for insomnia (CBT-I) is the recommended first-line treatment for patients with insomnia disorder (Qaseem *et al.*, 2016; Riemann *et al.*, 2023). To date, several meta-analyses have demonstrated its effectiveness in treating insomnia in individuals both with (Hertenstein *et al.*, 2022) and without co-morbid conditions (Trauer *et al.*, 2015). CBT-I is available in various formats, including individual, group, telephone, digitally assisted, and guided or unguided self-help. Among these, individual, group, and digitally assisted formats have shown the greatest effectiveness, with digitally assisted CBT-I emerging as the primary alternative to face-to-face treatment (Gao *et al.*, 2022). Additionally, CBT-I is a cost-effective intervention (Natsky *et al.*, 2020) that leads to sustained improvements over time (van der Zweerde *et al.*, 2019). Beyond improving sleep, growing evidence suggests that CBT-I significantly reduces co-morbid symptoms of depression and anxiety (Belleville *et al.*, 2011; Hertenstein *et al.*, 2022; Koffel *et al.*, 2015; Lee *et al.*, 2023; Xu *et al.*, 2021; Ye *et al.*, 2015). However, CBT-I is rarely offered to patients as a standalone treatment (Riemann *et al.*, 2017; Wilson *et al.*, 2019). This is due, in part, to a lack of CBT-I providers, cost, and limited awareness of the treatment. Commonly, mental health professionals or general practitioners incorporate elements of CBT-I, such as sleep hygiene or relaxation, alongside treatment for other mental health conditions. However, the effectiveness of this integrative approach remains unclear (Everitt *et al.*, 2014; Koffel *et al.*, 2018).

The NHS Talking Therapies for Anxiety and Depression programme in England (previously known as the Improving Access to Psychological Therapies) assesses over one million individuals annually and provides evidence-based psychological interventions primarily for depression and anxiety disorders (Clark, 2018; NHS England, 2024). Treatment is delivered following the principles of a ‘stepped care’ approach, where most patients start with low-intensity interventions such as computerised CBT, guided self-help, and psychoeducation groups, delivered by Psychological Wellbeing Practitioners (PWP). Patients who do not benefit from this step, or for whom low-intensity therapy is not indicated, are ‘stepped up’ to more intensive treatments provided by psychological therapists trained in specific evidence-based models for the identified disorder.

The focus of NHS Talking Therapies for Anxiety and Depression services is on directly treating depression and specific anxiety disorders, and as such, treatment specifically for insomnia is understandably not referred to within the NHS Talking Therapies for Anxiety and Depression Manual (National Collaborating Centre for Mental Health, 2024) or described as one of the interventions delivered. However, PWPs have routinely been trained to offer ‘sleep hygiene’ as one of their interventions since the inception of NHS Talking Therapies (Health Education England, 2022a) and the current High Intensity CBT curriculum also includes a module on ‘Sleep Disturbance’ (Health Education England, 2022b).

CBT-I has been introduced to several NHS Talking Therapies services, typically in a computerised format. While the number of studies examining the effects of CBT-I in these settings

is limited, existing research supports its effectiveness in reducing symptoms of insomnia, depression, and anxiety, both as a standalone intervention (Luik *et al.*, 2017; Wogan *et al.*, 2021) and as an adjunctive treatment alongside standard care (Stott *et al.*, 2021). Additionally, evidence suggests that group-based CBT-I improves sleep outcomes post-treatment more effectively than routine advice and CBT-based self-help for insomnia when used as an adjunct to other mental health treatments (Cape *et al.*, 2016).

An NHS Talking Therapies service located in North West England (covering a largely rural area with small towns and one small city) introduced face-to-face CBT-I as a standalone treatment due to frequent informal reports of insomnia during patient assessments and the stronger evidence base for CBT-I compared with 'Sleep Hygiene', and trained a cohort of PWP's in delivering this intervention at Step 2. The main objective of this service evaluation is to examine the outcomes of PWP-delivered CBT-I in reducing symptoms of insomnia. A secondary aim is to evaluate whether CBT-I is associated with a reduction in symptoms of anxiety, depression, and functional impairment. We hypothesised that the introduction of PWP-delivered CBT for insomnia as a standalone treatment would be associated with improvements in mental health outcomes. This evaluation aims to help the service determine whether PWP-delivered CBT-I constitutes a feasible service-delivery model, enabling informed decisions regarding the future continuation (or discontinuation) of this intervention.

Method

Design

We conducted a service evaluation of practitioner-delivered CBT-I within an NHS Talking Therapies service. We employed a pre-post design to measure the degree of change between baseline and end-of-treatment scores across all outcome measures. Participants were informed at the time of initial assessment that their clinical data could be used for service audits and evaluations, and they consented to the use of their anonymised data for this purpose. This evaluation was registered and approved by the Cumbria, Northumberland, Tyne and Wear NHS Foundation Trust Research & Development Department (reference SER-24-247).

Participants

Participants were patients entering one NHS Talking Therapies for Anxiety and Depression service in North West England over a 6-month period. The decision to end recruitment for this service evaluation was based on time rather than participant numbers, with the 6-month period selected pragmatically to enable early assessment and timely feedback for clinicians and stakeholders. All Step 2 patients presenting with sleep difficulties alongside depression and/or an anxiety disorder, for whom sleep was identified as the main problem they wished to address, were offered a choice of CBT-I or treatment for the depression or anxiety disorder following an explanation of what treatment might entail. The group included in this evaluation therefore represents a small subset of patients presenting with depression and/or an anxiety disorder who also reported sleep difficulties. Specifically, these were individuals who chose to prioritise their sleep difficulties and to engage in CBT-I with an understanding of the nature of the intervention. Unfortunately, data were not collected on how many patients were offered CBT-I but declined. All participants met criteria for Step 2 treatment; patients who would typically be seen only at Step 3 (for example, those presenting with PTSD or significant risk issues) were not offered CBT-I as an option. Patients were informed that volunteering to receive CBT-I would not have any implications for future treatment options. Subsequently, they were provided a brief rationale supporting the evidence base for CBT-I and that improved sleep is beneficial for depression and anxiety. Patients were not offered CBT-I if they had an untreated major physical illness, substance

misuse, sleep disorder other than insomnia (e.g. excessive daytime sleepiness, sleep apnoea, or other specific sleep disorder), pregnancy, and/or irregular work schedules. Sleep medication or advice provided by general medical practitioners was not controlled for.

Intervention and staff training

CBT for insomnia consisted of eight individual face-to-face sessions, scheduled either weekly or fortnightly. The initial session lasted 45 minutes, while the subsequent seven sessions were 30 minutes each. Following evidence-based CBT principles for insomnia, treatment included psychoeducation about sleep (e.g. circadian rhythm), introducing the 3 P Model of Insomnia (Spielman *et al.*, 1987), sleep hygiene, sleep restriction, relaxation training, stimulus control, and cognitive strategies (Baglioni *et al.*, 2020). Each session followed a structured format, which included: (a) reviewing homework and sleep diaries, (b) addressing any challenges with homework adherence, (c) introducing new treatment components, and (d) assigning further homework tasks. Sleep diaries were used to establish an initial sleep window for the upcoming week, which was subsequently reviewed and adjusted on a weekly basis according to the participant's sleep efficiency. Sleep efficiency, defined as the ratio of total sleep time to time spent in bed, multiplied by 100, was considered optimal at 85% or higher (Schutte-Rodin *et al.*, 2008). Adjustments to the sleep window were made in 15-minute increments based on whether the participant's sleep efficiency fell below or exceeded the 85% threshold. The treatment was administered by NHS Talking Therapies PWP's who had received two days of training (plus limited *ad hoc* supervision) from a CBT-I expert. The training was offered to all 32 PWP's and 27 attended. All PWP's received weekly case management supervision where all patients were discussed.

Outcome measures

This evaluation employed measures that are routinely collected across Talking Therapies services in England, including the Generalised Anxiety Disorder-7 (GAD-7; Spitzer *et al.*, 2006) to assess anxiety (scores range from 0 to 21, with higher scores reflecting greater symptom severity), the Patient Health Questionnaire-9 (PHQ-9; Kroenke *et al.*, 2001) to assess depression (scores range from 0 to 27, with higher scores indicating more severe depressive symptoms), and the Work and Social Adjustment Scale (WSAS; Mundt *et al.*, 2002) to evaluate functional impairment (scores range from 0 to 40, with higher scores indicating greater difficulty in adjustment). All three measures have demonstrated strong validity and reliability across diverse samples and settings (Jansson-Fröjmark, 2013; Kroenke *et al.*, 2001; Löwe *et al.*, 2008; Martin *et al.*, 2006; Mundt *et al.*, 2002; Spitzer *et al.*, 2006).

Additionally, insomnia severity was assessed using the Insomnia Severity Index (ISI), a 7-item questionnaire rated on a 5-point scale (0–4), with a total score ranging from 0 to 28, capturing both night-time and daytime symptoms (Bastien *et al.*, 2001). The ISI is a valid and reliable measure that is sensitive to treatment response in clinical patients (Morin *et al.*, 2011). The ISI was administered at baseline and at the end of treatment, while all other measures were collected on a weekly basis.

Statistical analyses

We used an intent-to-treat analysis using the last observation carried forward (LOCF) method ($n = 35$), as well as a complete case analysis of data from patients who completed both pre- and post-treatment outcome measures ($n = 28$). Given the naturalistic design of this service evaluation, post-treatment scores for patients who completed therapy earlier than anticipated were taken from their last available session (Clark, 2011).

Table 1. Intent-to-treat ($n = 35$) pre- versus post-treatment outcome measures

Outcome	Baseline mean (SD)	Post CBT-I mean (SD)	Mean difference (95% CI); p -value	Effect size, Cohen's d (95% CI)
ISI ($n = 33$)	16.90 (5.34)	11.78 (6.93)	5.12 (3.00–7.25); $p < .001$	0.85 (0.46–1.25)
PHQ-9 ($n = 35$)	10.65 (4.89)	6.26 (4.76)	4.38 (2.88–5.89); $p < .001$	1.01 (0.60–1.43)
GAD-7 ($n = 35$)	8.05 (5.22)	4.03 (4.34)	4.03 (2.47–5.58); $p < .001$	0.89 (0.50–1.28)
WSAS ($n = 31$)	14.68 (10.10)	10.61 (9.17)	4.07 (1.50–6.64); $p = .003$	0.58 (0.20–0.96)

CI, confidence interval; SD, standard deviation; ISI, Insomnia Severity Index; PHQ-9, Patient Health Questionnaire-Depression; GAD-7, Generalised Anxiety Disorder; WSAS, Work and Social Adjustment Scale.

The results of the Shapiro–Wilk test showed that the data distribution was normal for all outcomes ($p > .05$). Paired sample t -tests were conducted to evaluate pre- to post-treatment change. We report the mean difference in outcomes, Cohen's d effect size estimates, and corresponding 95% confidence intervals for both. Effect sizes were calculated as the mean pre-post treatment difference, divided by the standard deviation of the difference, and interpreted based on Cohen's d criteria (Cohen, 1988).

The percentages of patients achieving recovery, reliable improvement, and reliable recovery were also reported. Reliable improvement was defined as an 8-point reduction in ISI scores from baseline to post-treatment, with insomnia recovery indicated by a post-treatment ISI score of ≤ 9 (Morin *et al.*, 2011). Standard NHS Talking Therapies reliable change indices (RCIs) were used as cut-offs to measure reliable improvement, specified as a reduction of at least 4 points on the GAD-7 and at least 6 points on the PHQ-9. Recovery was defined as scoring below the clinical caseness thresholds on both measures at post-treatment (GAD-7 ≤ 7 and PHQ-9 ≤ 9), and reliable recovery was defined as the percentage of patients who achieved both reliable improvement and recovery (National Collaborating Centre for Mental Health, 2024). All patient data were anonymised, and statistical analyses were conducted using Stata 18.

Results

Baseline characteristics

During the initial pilot, a total of 48 patients chose to focus on their sleep and were allocated to CBT-I; of these, five individuals attended only an initial appointment, eight did not want to engage in treatment, and 35 patients (73%) completed more than two sessions (median = 6, interquartile range [IQR] = 4–8) and had outcome data available for at least one time point. The median age of participants was 60 years (IQR = 44–68), and 62.9% were female. At baseline, 42.9% were employed (full-time or part-time), 42.9% were retired, 8.6% were unemployed, 2.8% were students, and 2.8% were on long-term sick leave. All described themselves as White British with respect to ethnicity. Eighty per cent met initial caseness, defined as having a baseline PHQ-9 score of ≥ 10 and/or a baseline GAD-7 score of ≥ 8 . ISI scores were not used to determine caseness. No significant differences were found between the LOCF sample and the complete case sample in terms of age, gender, employment status, self-reported insomnia, anxiety, depression, or functional impairment at baseline (all $p > .05$).

Treatment outcomes

Intent-to-treat analysis ($n = 35$), using the LOCF method, is presented in Table 1. Pre-post analysis showed a statistically significant improvement in patient scores across all outcome measures. A paired-samples t -test indicated that insomnia scores were significantly lower at post-treatment compared with baseline (mean difference ISI score 5.12, 95% CI 3.00–7.25, $p < .001$). Lower levels of anxiety (mean difference GAD-7 score 4.03, 95% CI 2.47–5.58, $p < .001$),

Table 2. Complete case ($n = 28$) pre- versus post-treatment outcome measures

Outcome	Baseline mean (SD)	Post CBT-I mean (SD)	Mean difference (95% CI); p -value	Effect size, Cohen's d (95% CI)
ISI ($n = 28$)	17.07 (5.33)	10.48 (5.82)	6.59 (4.30–8.89); $p < .001$	1.14 (0.65–1.62)
PHQ-9 ($n = 28$)	10.90 (5.17)	6.54 (4.97)	4.36 (2.58–6.13); $p < .001$	0.95 (0.51–1.40)
GAD-7 ($n = 28$)	8.32 (5.22)	4.03 (4.63)	4.29 (2.49–6.09); $p < .001$	0.92 (0.48–1.37)
WSAS ($n = 28$)	15.18 (9.40)	9.93 (8.66)	5.25 (2.34–8.16); $p = .001$	0.70 (0.29–1.11)

CI, confidence interval; SD, standard deviation; ISI, Insomnia Severity Index; PHQ-9, Patient Health Questionnaire-Depression; GAD-7, Generalised Anxiety Disorder; WSAS, Work and Social Adjustment Scale.

depression (mean difference PHQ-9 score 4.38, 95% CI 2.88–5.89, $p < .001$), and functional impairment scores (mean difference WSAS score 4.07, 95% CI 1.50–6.64, $p = .003$) were reported at post-treatment compared with baseline. Effect sizes were large for depression reduction ($d = 1.01$), anxiety ($d = 0.89$), and insomnia ($d = 0.85$), and medium for improvements in functioning ($d = 0.58$).

Table 2 presents the pre–post analysis of the complete case sample ($n = 28$). A paired-samples t -test showed that insomnia scores were significantly lower at post-treatment compared with baseline (mean difference ISI score 6.59, 95% CI 4.30–8.89, $p < .001$), yielding a large pre–post effect size of 1.14. Similarly, the mean pre–post differences in anxiety (4.29, 95% CI 2.49–6.09, $p < .001$), depression (4.36, 95% CI 2.58–6.13, $p < .001$) and functional impairment (5.25, 95% CI 2.34–8.16, $p = .001$) were statistically significant. This equated to large pre–post effect sizes for depression ($d = 0.95$) and anxiety ($d = 0.92$), and a moderate effect size for functional impairment ($d = 0.70$).

Clinical significance of change

At baseline, 94% (31/33) of participants in the LOCF sample who had baseline ISI data scored above the ISI threshold. Of these, 45% (14/31) moved to recovery by the end of treatment, 39% (12/31) demonstrated reliable improvement, and 32% (10/31) achieved reliable recovery. When only complete cases were analysed, 89% (25/27) of participants with baseline ISI data scored above the ISI threshold at baseline. Of these, 48% (12/25) moved to recovery by the end of treatment, 36% (9/25) showed reliable improvement, and 32% (8/25) achieved reliable recovery.

Sixteen clients (57%) of the 28 no longer met the threshold for caseness on either the GAD-7 or PHQ-9 when the last observation was carried forward. Additionally, 17 clients (60%) demonstrated reliable improvement, and 13 (46%) achieved a Talking Therapies-defined reliable recovery. When only complete cases were analysed, 15 of 24 clients (62%) no longer met the threshold for caseness, 17 (70%) showed reliable improvement, and 12 (50%) met the criteria for a Talking Therapies-defined reliable recovery. No-one showed reliable deterioration on any of the outcome measures (PHQ-9, GAD-7, ISI). For general local context, during this approximate period the recovery rate for the whole of Step 2 was 62.5%, reliable improvement was 75.2%, and reliable recovery was 60.4%.

Discussion

Summary of outcomes

This service evaluation aimed to make a preliminary assessment of the outcomes of face-to-face, PWP-delivered CBT-I for patients accessing an NHS Talking Therapies service at Step 2. Pre- and post-treatment scores on outcome measures indicated significant improvements in insomnia, anxiety, depression, and functioning following CBT-I. These findings suggest potential mental health benefits, consistent with findings from a recent systematic review and meta-analysis of

randomised controlled trials (Xu *et al.*, 2021). Previous research in Talking Therapies settings has also demonstrated similar outcomes (Luik *et al.*, 2017; Wogan *et al.*, 2021). However, to our knowledge, this study is the first to provide preliminary outcome data on PWP-delivered CBT-I in a face-to-face, one-on-one format within a Talking Therapies setting.

Patients who completed CBT-I achieved a Talking Therapies recovery rate of 57%, a reliable improvement rate of 60%, and a reliable recovery rate of 46% in the intent-to-treat analysis. In the complete case analysis, these rates increased to 62%, 70%, and 50%, respectively. Compared with overall Step 2 outcomes during the same period (recovery = 62.5%, reliable improvement = 75.2%, reliable recovery = 60.4%), CBT-I results were slightly lower, particularly in the intent-to-treat analysis. However, the complete case recovery rate (62%) closely matched the Step 2 benchmark, indicating broadly comparable outcomes among participants with complete data. National NHS Talking Therapies outcomes for August 2025 (NHS England, 2025b) reported recovery, reliable improvement, and reliable recovery rates of 49.8%, 67.6%, and 46.9%, respectively, suggesting that our CBT-I outcomes were comparable and, in some instances, more favourable. Specifically, both the intent-to-treat and complete case recovery rates exceeded national benchmarks, suggesting that CBT-I may be associated with clinically meaningful improvements in symptoms of anxiety and depression. These findings align with evidence that sleep disturbance is an independent treatment target rather than merely a symptom, and that improving sleep can yield secondary benefits for mental health (Christensen *et al.*, 2016). Insomnia outcomes (ISI) were excluded from these analyses, as these data are not routinely collected in Talking Therapies services. Nevertheless, 45% of the intent-to-treat sample and 48% of the complete case sample recovered from insomnia by the end of treatment. Reliable improvement in insomnia symptoms was observed in 39% of participants in the intent-to-treat analysis and 36% in the complete-case analysis. These rates are higher than the 27% reported by another Talking Therapies service that used internet-delivered CBT for insomnia (Wogan *et al.*, 2021).

Strengths and limitations

A strength of our real-world service evaluation included the use of both an intent-to-treat analysis, which provided an estimate of treatment-related change that tends to be more conservative and accounts for all participants, including those who did not complete the full treatment, as well as a complete case analysis. Moreover, the naturalistic design of this study increases ecological validity, as no additional exclusion criteria were applied beyond the service's own referral criteria, thereby improving the generalisability of the findings to similar primary care services.

However, several limitations must be considered when interpreting these findings. First, the absence of a control group (e.g. treatment as usual or an active control arm) and repeated baseline measures limits the ability to attribute observed improvements solely to the CBT-I intervention. This introduces the possibility that results could be influenced by regression to the mean or spontaneous recovery. Second, the reliance on self-report data introduces potential self-report bias, indicating that future evaluations would benefit from incorporating more objective measures such as actigraphy to provide more accurate assessments of sleep patterns. Third, as this study was conducted within an NHS Talking Therapies context, its generalisability to other primary or secondary mental healthcare settings beyond NHS Talking Therapies services remains uncertain. Fourth, variable treatment lengths, with participants completing the intervention at different paces, might have resulted in differing treatment doses, potentially affecting the observation of the intervention's full effects. Fifth, the lack of follow-up data limits our understanding of whether the observed benefits of CBT-I are sustained over time. Longitudinal studies are needed to assess the durability of treatment effects. Sixth, the use of self-report measures for symptoms, rather than clinical diagnoses, limits our findings to symptoms of sleep, low mood, and anxiety, rather than clinical diagnoses of insomnia, depression, and anxiety disorders. Seventh, the median participant age was 60 years, which may limit generalisability across the wider NHS Talking Therapies

population, given that older age is itself a risk factor for insomnia and prevalence, sleep needs, and symptom patterns differ across the lifespan (Morin and Jarrin, 2022). Eighth, the relatively small sample size (and associated limited diversity of ethnicity) limits statistical power and may reduce the confidence in the generalisability of these results. The lack of ethnic variation is likely to reflect the demographics of Cumbria, where 94.9% of residents identified as White British in 2021 (Office for National Statistics, 2022). Future studies with larger and more ethnically diverse samples are necessary to confirm these findings and detect smaller effect sizes. Finally, the sample in this study was self-selected, as all participants chose to focus on their sleep rather than mood or anxiety and opted to receive CBT-I with full awareness of what the intervention entailed. Consequently, these findings do not provide information about outcomes for patients who are allocated to CBT-I without actively choosing this treatment or without making an informed decision to do so.

Service implications and future directions

Based on these findings, the continuation of PWP-delivered CBT-I within this service is supported. This approach may contribute to better mental health outcomes for patients experiencing insomnia alongside co-morbid anxiety and/or depression appropriate for Step 2, consistent with evidence from a recent meta-analysis showing that improvements in sleep quality are associated with better mental health outcomes (Scott *et al.*, 2021). For this service, maintaining access to CBT-I and ensuring that PWPs receive appropriate training and ongoing clinical supervision may help sustain high-quality delivery. Incorporating questions about sleep into initial assessments could further support the identification of patients who view sleep as their primary difficulty and are likely to benefit most from CBT-I. This focus is particularly relevant given the high prevalence of sleep difficulties among individuals presenting with anxiety and depression (Alvaro *et al.*, 2013; Cox and Olatunji, 2016).

During implementation, offering CBT-I to patients with mild to moderate depression or anxiety who would ordinarily be suitable for Step 2 interventions highlighted a service gap. Specifically, some patients presenting with issues such as elevated risk, greater severity, or conditions like PTSD were unable to access CBT-I. Further work is required to determine whether similar outcomes would be observed among patients requiring Step 3 interventions, as well as to establish who would be best placed to deliver this treatment. It is worth noting that the current NHS Talking Therapies High Intensity CBT Curriculum (NHS England, 2025a) includes the competency: ‘Ability to help the patient introduce new behaviours such as sleep hygiene, a specific “up time”, bed or sleep restriction, stimulus control’ (p. 37). However, this is described as a skill to be integrated within treatment for depression or anxiety disorders rather than provided as a standalone intervention.

Further evaluations of CBT-I outcomes over a longer term are necessary to determine whether the observed improvements in sleep outcomes, as well as reductions in residual anxiety and depressive symptoms and risk of relapse, are maintained. While a systematic review and meta-analysis of controlled studies has shown that sleep gains are generally sustained following CBT-I (van der Zweerde *et al.*, 2019), this needs to be demonstrated through pragmatic studies in similar service settings. Moreover, conducting qualitative studies is essential to understand the adoption and impact of CBT-I, as well as the facilitators and barriers to its optimal implementation in routine mental health care. Such studies should assess the acceptability of CBT-I among service users, carers, and staff; evaluate the appropriateness of the intervention; ensure fidelity to the protocol; and examine the costs and sustainability of implementation.

While our service evaluation provides preliminary evidence for the potential benefits of face-to-face CBT-I, optimal strategies for integrating CBT-I into this setting remain unclear. A recent systematic review and meta-analysis strongly supported the effectiveness of digital CBT-I (dCBT-I) in treating insomnia (Soh *et al.*, 2020). dCBT-I, particularly in its fully automated formats, offers the potential to enhance accessibility, facilitate earlier intervention, improve treatment adherence, and

reach more service users with insomnia symptoms than traditional face-to-face interventions. Its effectiveness has also been established in other NHS Talking Therapies contexts (Luik *et al.*, 2017; Wogan *et al.*, 2021), further supporting its suitability for integration into this service.

Conclusions

Overall, the service evaluation highlighted that face-to-face PWP-delivered CBT-I may be associated with improved symptoms of insomnia, depression, anxiety, and functioning in an NHS Talking Therapies setting. Further research is needed to replicate this study with a larger sample, along with additional qualitative and quantitative evaluations to better establish the effectiveness and implementation of this intervention within Talking Therapies services. Nonetheless, there is a growing argument for offering CBT-I as a standard intervention for sleep in place of the current Sleep Hygiene intervention.

Key practice points

- (1) This service evaluation offers preliminary evidence that face-to-face CBT-I may be associated with positive outcomes when provided as a primary treatment within an NHS Talking Therapies service. The observed improvements in symptoms of insomnia, depression, anxiety, and general functioning suggest potential clinical value in offering CBT-I in this primary care context.
- (2) If further evaluation and higher quality evidence support it, NHS Talking Therapies may need to reconsider the role of sleep-focused interventions, with potential for CBT-I to replace Sleep Hygiene as the standard intervention delivered by PWPs.
- (3) CBT-I may be most suitable for patients who identify sleep as their primary difficulty and have a clear understanding of what the treatment involves.

Further reading

- Hertenstein, E., Trinca, E., Wunderlin, M., Schneider, C. L., Züst, M. A., Fehér, K. D., Su, T., Straten, A. v., Berger, T., & Baglioni, C. (2022). Cognitive behavioral therapy for insomnia in patients with mental disorders and comorbid insomnia: a systematic review and meta-analysis. *Sleep Medicine Reviews*, 62, 101597. <https://doi.org/10.1016/j.smr.2022.101597>
- Luik, A. I., Bostock, S., Chisnall, L., Kyle, S. D., Lidbetter, N., Baldwin, N., & Espie, C. A. (2017). Treating depression and anxiety with digital cognitive behavioural therapy for insomnia: a real world NHS evaluation using standardized outcome measures. *Behavioural and Cognitive Psychotherapy*, 45, 91–96. <https://doi.org/10.1017/s1352465816000369>
- Wogan, R., Enrique, A., Adegoke, A., Earley, C., Sollesse, S., Gale, S., Chellingsworth, M., & Richards, D. (2021). Internet-delivered CBT intervention (Space for Sleep) for insomnia in a routine care setting: results from an open pilot study. *Internet Interventions*, 26, 100443. <https://doi.org/10.1016/j.invent.2021.100443>

Data availability statement. Data are available upon request from the authors.

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References

- Alvaro, P. K., Roberts, R. M., & Harris, J. K. (2013). A systematic review assessing bidirectionality between sleep disturbances, anxiety, and depression. *Sleep*, 36, 1059–1068. <https://doi.org/10.5665/sleep.2810>
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th edn). <https://doi.org/10.1176/appi.books.9780890425596>
- Baglioni, C., Altena, E., Bjorvatn, B., Blom, K., Bothelius, K., Devoto, A., Espie, C. A., Frase, L., Gavrilloff, D., & Tuulikki, H. (2020). The European Academy for Cognitive Behavioural Therapy for Insomnia: an initiative of the European Insomnia Network to promote implementation and dissemination of treatment. *Journal of Sleep Research*, 29, e12967. <https://doi.org/10.1111/jsr.12967>
- Bastien, C. H., Vallières, A., & Morin, C. M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine*, 2, 297–307. [https://doi.org/10.1016/s1389-9457\(00\)00065-4](https://doi.org/10.1016/s1389-9457(00)00065-4)
- Belleville, G., Cousineau, H., Levrier, K., & St-Pierre-Delorme, M.-È. (2011). Meta-analytic review of the impact of cognitive-behavior therapy for insomnia on concomitant anxiety. *Clinical Psychology Review*, 31, 638–652. <https://doi.org/10.1016/j.cpr.2011.02.004>
- Cape, J., Leibowitz, J., Whittington, C., Espie, C., & Pilling, S. (2016). Group cognitive behavioural treatment for insomnia in primary care: a randomized controlled trial. *Psychological Medicine*, 46, 1015–1025. <https://doi.org/10.1017/s0033291715002561>
- Christensen, H., Batterham, P. J., Gosling, J. A., Ritterband, L. M., Griffiths, K. M., Thorndike, F. P., ... & Mackinnon, A. J. (2016). Effectiveness of an online insomnia program (SHUTi) for prevention of depressive episodes (the GoodNight Study): a randomised controlled trial. *The Lancet Psychiatry*, 3, 333–341. [https://doi.org/10.1016/S2215-0366\(15\)00536-2](https://doi.org/10.1016/S2215-0366(15)00536-2)
- Clark, D. M. (2011). Implementing NICE guidelines for the psychological treatment of depression and anxiety disorders: the IAPT experience. *International Review of Psychiatry*, 23, 318–327. <https://doi.org/10.3109/09540261.2011.606803>
- Clark, D. M. (2018). Realizing the mass public benefit of evidence-based psychological therapies: the IAPT program. *Annual Review of Clinical Psychology*, 14, 159–183. <https://doi.org/10.1146/annurev-clinpsy-050817-084833>
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. Routledge.
- Cox, R. C., & Olatunji, B. O. (2016). A systematic review of sleep disturbance in anxiety and related disorders. *Journal of Anxiety Disorders*, 37, 104–129. <https://doi.org/10.1016/j.janxdis.2015.12.001>
- Ellis, J. G., Perlis, M. L., Bastien, C. H., Gardani, M., & Espie, C. A. (2014). The natural history of insomnia: acute insomnia and first-onset depression. *Sleep*, 37, 97–106. <https://doi.org/10.5665/sleep.3316>
- Everitt, H., McDermott, L., Leydon, G., Yules, H., Baldwin, D., & Little, P. (2014). GPs' management strategies for patients with insomnia: a survey and qualitative interview study. *British Journal of General Practice*, 64, e112–e119. <https://doi.org/10.3399/bjgp14x677176>
- Freeman, D., Sheaves, B., Waite, F., Harvey, A. G., & Harrison, P. J. (2020). Sleep disturbance and psychiatric disorders. *The Lancet Psychiatry*, 7, 628–637. [https://doi.org/10.1016/s2215-0366\(20\)30136-x](https://doi.org/10.1016/s2215-0366(20)30136-x)
- Gao, Y., Ge, L., Liu, M., Niu, M., Chen, Y., Sun, Y., Chen, J., Yao, L., Wang, Q., Li, Z., Xu, J., Li, M., Hou, L., Shi, J., Yang, K., Cai, Y., Li, L., Zhang, J., & Tian, J. (2022). Comparative efficacy and acceptability of cognitive behavioral therapy delivery formats for insomnia in adults: a systematic review and network meta-analysis. *Sleep Medicine Reviews*, 64, 101648. <https://doi.org/10.1016/j.smrv.2022.101648>
- Harvey, A. G. (2001). Insomnia: symptom or diagnosis? *Clinical Psychology Review*, 21, 1037–1059. [https://doi.org/10.1016/s0272-7358\(00\)00083-0](https://doi.org/10.1016/s0272-7358(00)00083-0)
- Health Education England (2022a). *National Curriculum for Psychological Wellbeing Practitioner (PWP) Programmes Courses, Fourth edition*. https://www.ucl.ac.uk/pals/sites/pals/files/pwp_review_-_final_report.pdf
- Health Education England (2022b). *National Curriculum for High Intensity Cognitive Behavioural Therapy Courses, Fourth edition*. https://www.hee.nhs.uk/sites/default/files/documents/HIT%20CBT%20Curriculum%204th%20Edition%202022_10%20Nov%202022.pdf
- Hertenstein, E., Feige, B., Gmeiner, T., Kienzler, C., Spiegelhalter, K., Johann, A., Jansson-Fröjmark, M., Palagini, L., Rücker, G., & Riemann, D. (2019). Insomnia as a predictor of mental disorders: a systematic review and meta-analysis. *Sleep Medicine Reviews*, 43, 96–105. <https://doi.org/10.1016/j.smrv.2018.10.006>

- Hertenstein, E., Trinca, E., Wunderlin, M., Schneider, C. L., Züst, M. A., Fehér, K. D., Su, T., Straten, A. v., Berger, T., & Baglioni, C. (2022). Cognitive behavioral therapy for insomnia in patients with mental disorders and comorbid insomnia: a systematic review and meta-analysis. *Sleep Medicine Reviews*, 62, 101597. <https://doi.org/10.1016/j.smrv.2022.101597>
- Jansson-Fröjmark, M. (2013). The Work and Social Adjustment Scale as a measure of dysfunction in chronic insomnia: reliability and validity. *Behavioural and Cognitive Psychotherapy*, 42, 186–198. <https://doi.org/10.1017/s135246581200104x>
- Khurshid, K. A. (2018). Comorbid insomnia and psychiatric disorders: an update. *Innovations in Clinical Neuroscience*, 15, 28.
- Koffel, E., Bramoweth, A. D., & Ulmer, C. S. (2018). Increasing access to and utilization of cognitive behavioral therapy for insomnia (CBT-I): a narrative review. *Journal of General Internal Medicine*, 33, 955–962. <https://doi.org/10.1007/s11606-018-4390-1>
- Koffel, E. A., Koffel, J. B., & Gehrman, P. R. (2015). A meta-analysis of group cognitive behavioral therapy for insomnia. *Sleep Medicine Reviews*, 19, 6–16. <https://doi.org/10.1016/j.smrv.2014.05.001>
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16, 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>
- Lee, S., Oh, J. W., Park, K. M., Lee, S., & Lee, E. (2023). Digital cognitive behavioral therapy for insomnia on depression and anxiety: a systematic review and meta-analysis. *NPJ Digital Medicine*, 6, 52. <https://doi.org/10.1038/s41746-023-00800-3>
- Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the general population. *Medical Care*, 46, 266–274. <https://doi.org/10.1097/mlr.0b013e318160d093>
- Luik, A. I., Bostock, S., Chisnall, L., Kyle, S. D., Lidbetter, N., Baldwin, N., & Espie, C. A. (2017). Treating depression and anxiety with digital cognitive behavioural therapy for insomnia: a real world NHS evaluation using standardized outcome measures. *Behavioural and Cognitive Psychotherapy*, 45, 91–96. <https://doi.org/10.1017/s1352465816000369>
- Martin, A., Rief, W., Klaiberg, A., & Braehler, E. (2006). Validity of the brief patient health questionnaire mood scale (PHQ-9) in the general population. *General Hospital Psychiatry*, 28, 71–77. <https://doi.org/10.1016/j.genhosppsych.2005.07.003>
- Morin, C. M., Belleville, G., Bélanger, L., & Ivers, H. (2011). The Insomnia Severity Index: psychometric indicators to detect insomnia cases and evaluate treatment response. *Sleep*, 34, 601–608. <https://doi.org/10.1093/sleep/34.5.601>
- Morin, C. M., & Jarrin, D. C. (2022). Epidemiology of insomnia: Prevalence, course, risk factors, and public health burden. *Sleep Medicine Clinics*, 17(2), 173–191. <https://doi.org/10.1016/j.jsmc.2022.03.003>
- Mundt, J. C., Marks, I. M., Shear, M. K., & Greist, J. M. (2002). The Work and Social Adjustment Scale: a simple measure of impairment in functioning. *British Journal of Psychiatry*, 180, 461–464. <https://doi.org/10.1192/bjp.180.5.461>
- National Collaborating Centre for Mental Health (2024). NHS talking therapies for anxiety and depression manual. <https://www.england.nhs.uk/wp-content/uploads/2018/06/nhs-talking-therapies-manual-v7.1-updated.pdf>
- Natsky, A. N., Vakulin, A., Chai-Coetzer, C. L., Lack, L., McEvoy, R. D., Lovato, N., Sweetman, A., Gordon, C. J., Adams, R. J., & Kaambwa, B. (2020). Economic evaluation of cognitive behavioural therapy for insomnia (CBT-I) for improving health outcomes in adult populations: a systematic review. *Sleep Medicine Reviews*, 54, 101351. <https://doi.org/10.1016/j.smrv.2020.101351>
- NHS England (2024). *NHS Talking Therapies, for Anxiety and Depression, Annual Reports, 2023–24*. <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-talking-therapies-for-anxiety-and-depression-annual-reports/2023-24> (accessed 17 October 2025).
- NHS England (2025a). *NHS Talking Therapies for anxiety and depression National Curriculum for High Intensity Cognitive Behavioural Therapy Courses Fourth edition (July 2022) (version 4.1 updated May 2025)*. https://www.hee.nhs.uk/sites/default/files/documents/HIT%20CBT%20Curriculum%204th%20Edition%202022_10%20Nov%202022.pdf (accessed 17 October 2025).
- NHS England (2025b). *NHS Talking Therapies Monthly Statistics Including Employment Advisors, Performance August 2025. Part of NHS Talking Therapies Monthly Statistics Including Employment Advisors*. <https://digital.nhs.uk/data-and-information/publications/statistical/nhs-talking-therapies-monthly-statistics-including-employment-advisors/performance-august-2025#related-links> (accessed 17 October 2025).
- Office for National Statistics (2022). Ethnicity, Language and Religion at Census Day 2021. In *Census 2021*. <https://cumbria.gov.uk/eLibrary/Content/Internet/536/671/4674/17217/17218/4489611119.pdf> (accessed 26 September 2025).
- Qaseem, A., Kansagara, D., Forciea, M. A., Cooke, M., Denberg, T. D., & Clinical Guidelines Committee of the American College of Physicians (2016). Management of chronic insomnia disorder in adults: a clinical practice guideline from the American College of Physicians. *Annals of Internal Medicine*, 165, 125–133. <https://doi.org/10.7326/M15-2175>
- Riemann, D., Baglioni, C., Bassetti, C., Bjorvatn, B., Dolenc Groselj, L., Ellis, J. G., Espie, C. A., Garcia-Borreguero, D., Gjerstad, M., & Gonçalves, M. (2017). European guideline for the diagnosis and treatment of insomnia. *Journal of Sleep Research*, 26, 675–700. <https://doi.org/10.1111/jsr.12594>
- Riemann, D., Espie, C. A., Altena, E., Arnardottir, E. S., Baglioni, C., Bassetti, C. L. A., Bastien, C., Berzina, N., Bjorvatn, B., Dikeos, D., Dolenc Groselj, L., Ellis, J. G., Garcia-Borreguero, D., Geoffroy, P. A., Gjerstad, M., Gonçalves, M., Hertenstein, E., Hoedlmoser, K., Hion, T., ... & Spiegelhalder, K. (2023). The European Insomnia

- Guideline: an update on the diagnosis and treatment of insomnia 2023. *Journal of Sleep Research*, 32, e14035. <https://doi.org/10.1111/jsr.14035>
- Schutte-Rodin, S., Broch, L., Buysse, D., Dorsey, C., & Sateia, M.** (2008). Clinical guideline for the evaluation and management of chronic insomnia in adults. *Journal of Clinical Sleep Medicine*, 4, 487–504. <https://doi.org/10.5664/jcsm.27286>
- Scott, A. J., Webb, T. L., Martyn-St James, M., Rowse, G., & Weich, S.** (2021). Improving sleep quality leads to better mental health: a meta-analysis of randomised controlled trials. *Sleep Medicine Reviews*, 60, 101556. <https://doi.org/10.1016/j.smrv.2021.101556>
- Soh, H. L., Ho, R. C., Ho, C. S., & Tam, W. W.** (2020). Efficacy of digital cognitive behavioural therapy for insomnia: a meta-analysis of randomised controlled trials. *Sleep Medicine*, 75, 315–325. <https://doi.org/10.1016/j.sleep.2020.08.020>
- Spielman, A. J., Caruso, L. S., & Glovinsky, P. B.** (1987). A behavioral perspective on insomnia treatment. *The Psychiatric clinics of North America*, 10, 541–553.
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B.** (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of Internal Medicine*, 166, 1092–1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Stott, R., Pimm, J., Emsley, R., Miller, C. B., & Espie, C. A.** (2021). Does adjunctive digital CBT for insomnia improve clinical outcomes in an improving access to psychological therapies service? *Behaviour Research and Therapy*, 144, 103922. <https://doi.org/10.1016/j.brat.2021.103922>
- Trauer, J. M., Qian, M. Y., Doyle, J. S., Rajaratnam, S. M., & Cunnington, D.** (2015). Cognitive behavioral therapy for chronic insomnia: a systematic review and meta-analysis. *Annals of Internal Medicine*, 163, 191–204. <https://doi.org/10.7326/m14-2841>
- van der Zweerde, T., Bisdounis, L., Kyle, S. D., Lancee, J., & van Straten, A.** (2019). Cognitive behavioral therapy for insomnia: a meta-analysis of long-term effects in controlled studies. *Sleep Medicine Reviews*, 48, 101208. <https://doi.org/10.1016/j.smrv.2019.08.002>
- Wilson, S., Anderson, K., Baldwin, D., Dijk, D.-J., Espie, A., Espie, C., Gringras, P., Krystal, A., Nutt, D., & Selsick, H.** (2019). British Association for Psychopharmacology consensus statement on evidence-based treatment of insomnia, parasomnias and circadian rhythm disorders: an update. *Journal of Psychopharmacology*, 33, 923–947. <https://doi.org/10.1177/0269881119855343>
- Wogan, R., Enrique, A., Adegoke, A., Earley, C., Sollesse, S., Gale, S., Chellingsworth, M., & Richards, D.** (2021). Internet-delivered CBT intervention (Space for Sleep) for insomnia in a routine care setting: results from an open pilot study. *Internet Interventions*, 26, 100443. <https://doi.org/10.1016/j.invent.2021.100443>
- Xu, D., Cardell, E., Broadley, S. A., & Sun, J.** (2021). Efficacy of face-to-face delivered cognitive behavioral therapy in improving health status of patients with insomnia: a meta-analysis. *Frontiers in Psychiatry*, 12, 798453. <https://doi.org/10.3389/fpsy.2021.798453>
- Ye, Y.-Y., Zhang, Y.-f., Chen, J., Liu, J., Li, X.-j., Liu, Y.-z., Lang, Y., Lin, L., Yang, X.-J., & Jiang, X.-J.** (2015). Internet-based cognitive behavioral therapy for insomnia (ICBT-i) improves comorbid anxiety and depression – a meta-analysis of randomized controlled trials. *PloS One*, 10, e0142258. <https://doi.org/10.1371/journal.pone.0142258>