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Cognitive behavioural therapy for insomnia: Can we make it work for shift work?

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Insomnia disorder affects 10-20% of individuals across the adult lifespan,(1–3) and for many, persists over time. For adults living with insomnia, this often means managing chronic insomnia symptoms in addition to occupational demands across their working life. Adverse consequences for productivity(4,5) and both workplace and road safety(6,7) highlight the importance of effectively managing this prevalent sleep disorder. In this issue, Takano and colleagues(8) consider the effectiveness of first line insomnia treatment, cognitive behavioral therapy for insomnia (CBTi), in samples of working-age adults.

This review reports improvements in insomnia symptoms in daytime workers following CBTi, most evident in this sample of studies with face-to-face delivery. Specific inclusion criteria around employment status reported within the manuscripts mean this review draws on a very focussed and specific sub-sample of CBTi trials in working-age adults. Some requirements for studies included in this review were that the workers be identifiable according to their employment status ($\geq$50% were required to be employed for inclusion), only include CBTi as an intervention, and only contain participants aged 18-65 years – which may explain why some studies with a significant proportion of workers were not included in the review(9,10).

Taken in context, it is perhaps unsurprising that the effects for day workers on insomnia with CBTi in the present review overlap with broader findings including larger trials which find that CBTi is efficacious for working-age adults. Modality (face to face versus digital) remains a consideration for further studies of day workers, noting that the conclusions from this review in relation to modality differences may reflect inclusion criteria for the studies rather than limited efficacy of digital interventions, particularly for day workers.

So, do we need further CBTi trials in working adults? We agree with the authors that a number of questions remain unanswered in working-age adults, but this may not require exploring CBTi across all working adults as a broad group. Rather, more focussed intervention trials in vulnerable groups of working-age adults should be prioritised. We are starting to see more targeted trials in adults with additional stressors which impact their sleep opportunities – for example, in new parents,(11) and in those managing comorbid mental and physical health conditions with insomnia, including but not limited to chronic pain,(12) depression,(13) bipolar disorder(14) and cancer.(15) Further trials of CBTi tailored to chronic conditions, and in consideration of individual contexts (including social, cultural, and environmental considerations) are needed in working-age adults, and this is well summarised in a recent review by Crowther *et al*.(16)

Relevant to this review, and more specific to workplace-related influences on insomnia treatment, it is increasingly apparent that one working group in need of tailored intervention for insomnia are those required to work non-standard hours, including shift workers(17). For example, we need to determine: 1) best-practice treatment approaches with CBTi when circadian disruption is a prevailing factor, including if specific elements of CBTi are efficacious in this context; 2) the extent of workplace involvement in treatment and patient preferences related to this; 3) how to effectively manage insomnia around uncertain or inconsistent work schedules, and 4) ensuring worker and public safety whilst managing CBTi interventions and workplace requirements. Some questions will be answerable in randomised controlled trials. Others will require detailed qualitative methodologies and collaboration with shift workers living with insomnia and/or shift work disorder if we are to meaningfully progress treatment approaches.

As highlighted by Järnefelt and Spiegelhalder in a recent review,(18) many aspects of CBTi need to be modified for shift workers. This likely explains why there is modest evidence of improvement in insomnia symptoms in the small number of existing trials of CBTi for shift workers.(17) Some of the proposed modifications include adding extra time in bed relative to shift timing, providing advice on timed light exposure, planning anchor sleeps, and tailoring the implementation of sleep restriction therapy across both day and night sleeps.(18,19) To date, none of these modifications have been rigorously tested in sufficiently powered clinical trials, with most limited to pilot investigations. In addition, two behavioral mainstays of CBTi, sleep restriction therapy and stimulus control therapy, may need to be further refined because sleep opportunities are likely to have individual variability related to schedules and personal commitments around the clock(18). Considering perspectives from clinicians with expertise in insomnia management, together with shift workers with lived experience, should provide the foundation for careful treatment development moving forward.(17)

The field must also consider that adverse events are historically not well monitored or reported in existing CBTi trials(20), although a recent large-scale trial (*n*=642) assessed both serious and non-serious adverse events in a trial of sleep restriction therapy, finding no difference relative to sleep hygiene(21). The potential for adverse events may be especially relevant to shift workers, and should be rigorously evaluated and reported in future trials. The combination of circadian disruption plus the potential for increased sleepiness with CBTi must be considered when designing

future trials, and when making recommendations for these workers. Careful attention, and most likely caution, is warranted with shift workers who meet criteria for shift work disorder for whom excessive sleepiness forms a component of diagnostic criteria(22) and could have road and/or workplace safety implications.

Where do we go from here? Findings in the day workers analysed in this review largely confirm what is more broadly known about CBTi for insomnia in working age adults – it works. Attention must be turned to the needs of shift workers with insomnia and/or shift work disorder. It is clear that we need more insight into the characteristics of workers most likely to need these tailored approaches. Understanding and reporting the active ingredients of CBTi which benefit shift workers will be important, and the field could benefit from trial methodologies utilised in the psychological treatment of mental health problems (23). Clarifying the suitability of sleep restriction therapy in shift workers, and the circumstances in which use is appropriate, will be an essential first step.

The field may also need to consider the potential for pharmacological interventions in combination with CBTi for workers where sleep restriction therapy is either not appropriate, or is trialled and found to be minimally effective. This is likely to depend on the presenting features for each worker, and further emphasises the need to tailor treatment approaches. For example, trials of CBTi components with acute pharmacological interventions (e.g. modafinil(24)) to manage sleepiness during treatment may be beneficial when excessive sleepiness is a concern, noting that availability and access will vary by region. Acute use of pharmacotherapy for day sleeps alongside CBTi may also be useful for some workers. The dual hypocretin receptor antagonist, Surovexant, increases total sleep time by more than an hour during day sleeps in shift workers compared with placebo in a recent pilot study.(25) The effect of the dual orexin receptor antagonist Lemborexant on daytime sleep is currently under investigation in shift workers (NCT05344443).

The blunted effect of CBTi we see in the existing (albeit, extremely modest) literature for shift workers is a reminder that we need to look towards integrated therapeutic approaches in this worker group, understand the active ingredients which improve insomnia symptoms, and transparently report sequencing and efficacy of all aspects of CBTi in order to inform future trials in shift workers. This review reminds us that now is the time to invest in treatment design and development. We need to ensure that future approaches meet the needs of those who are working, but most notably, for those who are working around the clock.

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