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Ready, willing, and able? Sleep hygiene education, motivational interviewing and cognitive behaviour therapy for insomnia in an Australian high school setting.

Cognitive behaviour therapy for insomnia (CBT-i) is well-regarded as an effective treatment for insomnia in adults. Previous studies also suggest that CBT-i can be successfully applied to adolescents experiencing insomnia and other sleep problems, which most commonly involve delayed sleep timing (Bootzin & Stevens, 2005; Gradisar et al., 2011). The recommended treatment involves a combined program of morning bright light therapy, stimulus control therapy, and education about sleep hygiene (see Lack & Wright, 2007, for further details). Improving sleep pattern regularity by getting up earlier on weekends (i.e., at a time closer to the weekday wake-up time) can play a particularly important role in increasing total sleep time during the week and decreasing daytime sleepiness (Taylor, Wright, & Lack, 2008).

Recent research suggests that the school classroom may be a promising arena for the dissemination of sleep interventions for adolescents (for a review, see Blunden, Chapman, & Rigney, 2012). However, many of the earlier studies in this area have been plagued by problems such as inappropriate outcome measures, small sample size, lack of control group, and lack of follow-up data. Reporting has also been poor, with a number of studies presented only in abstract form. Results have been mixed: some studies showed improved knowledge about sleep, despite having no data about actual changes in sleep habits or behaviours (Azevedo et al., 2008; Cortesi et al., 2004); another study measured sleep habits but found no change from pre- to post-treatment (de Sousa et al., 2007). Finally, some studies found changes in sleep habits from pre- to post-treatment, although these results must be interpreted with caution due to the previously mentioned problems of small sample size, lack of control group, and lack of follow-up data (Rossi et al., 2002; Vo et al., 2003).

School-based intervention programs

A series of two studies conducted by researchers at Flinders University in Adelaide, Australia, attempted to overcome the limitations of previous research by conducting randomised controlled trials evaluating school-based intervention programs aimed at improving the sleep of adolescents (Cain, Gradisar, & Moseley, 2011; Moseley & Gradisar, 2009). Full details of these studies can be found in earlier publications; however, an outline of the main findings are presented here, along with recommendations for others planning school-based interventions for adolescent sleep problems.

Study 1 (Moseley & Gradisar, 2009)

Participants were 81 Year 11 students from two co-educational high schools, with 41 adolescents attending four sleep education classes (once per week for four weeks) and 40 adolescents participating as the control group (i.e., attending classes-as-usual). Sleep content was embedded in an "adolescent well-being" program in order to reduce demand effects, and was based on principles of CBT-i. This included sleep hygiene education, simple cognitive restructuring, goal-setting, relaxation strategies, and recommendations to reduce weekend sleep-ins.

Baseline data revealed that students had considerable sleep problems, with 53% of students getting insufficient sleep on school nights and 78% of students having a clinically significant discrepancy between their weekend and weekday out of bed times (suggesting that

a sleep education program was relevant to this group of adolescents). Students in the intervention group improved significantly in their sleep knowledge from baseline to post-program. When examining actual sleep habits, however, there were no significant improvements in any of the target sleep variables. Nonetheless, data from a subgroup of students who were classified as having a delayed sleep timing revealed a significant reduction in the discrepancy between weekday and weekend rise times (i.e., less sleeping-in on weekends).

Surprisingly, demand effects were limited as students honestly stated that they were not motivated to change their weekend and school-morning behaviour in order to get more sleep. This suggests that program content did not need to be disguised and non-sleep content could be replaced with more sleep information aimed at motivating adolescents to change their behaviour. It was also concluded that one lesson of cognitive therapy was inappropriate, as it introduced the students to their unhelpful thoughts and beliefs but did not provide enough time to fully work through them (due to time constraints in the program). Considering the findings that students improved in their knowledge about sleep but were not convinced about why they should get up earlier on weekends, it was concluded that principles of motivational interviewing (Miller & Rollnick, 2002) may be appropriate to help students improve their overall motivation to attempt and maintain changes in key sleep-related behaviours. Motivational interviewing is an effective, evidence-based approach to overcoming feelings of ambivalence that prevent many people from making desired changes in their lives, and has been successfully applied with adolescents (Miller & Rollnick, 2002).

Study 2 (Cain et al., 2011)

This study aimed to develop a revised sleep education program for Year 11 students based upon the conclusions of Moseley and Gradisar (2009) and feedback received from students and teachers. The primary aims of the revised program were: (1) to increase students' knowledge about sleep, (2) to improve students' motivation to get up earlier on weekends, and (3) to improve students' sleep-related behaviours and daytime functioning.

Participants were 104 Year 11 students from three co-educational high schools. Again approximately half of these students attended four 50-minute sleep education classes, held once per week for four weeks, and the remaining students attended classes-as-usual. The lessons were tailored to fit a motivational interviewing framework, although they also retained some aspects of the earlier CBT-i framework (e.g., sleep hygiene education, relaxation strategies, recommendations to reduce weekend sleep-ins and increase morning bright light exposure).

Baseline prevalence of sleep problems was again high, with 37.9% of the sample reporting difficulty initiating sleep, 59.2% reporting insufficient sleep on school nights, and 74.8% reporting a clinically significant discrepancy between their weekend and weekday out of bed times. Over the course of the program, students in the intervention group improved significantly in their sleep knowledge over time relative to the control group. Within the intervention group, students' motivation to get up about the same time every day also improved during the program, and there was a trend towards improved motivation to increase average total sleep time. In addition, students reported attempting to make changes to their sleep behaviour during the program. However, their increase in motivation and initial attempts at changing their sleep habits failed to translate into longer-term behavioural change.

Conclusions

The results of our research, along with recent research from other groups (Azevedo et al., 2008; Cortesi et al., 2004), suggest that school-based interventions are an effective method of increasing adolescents' knowledge about sleep. Furthermore, these interventions appear to improve students' motivation to change their sleep habits, despite difficulties in maintaining any attempted changes beyond the duration of the program.

Several key sleep-related behaviours were targeted in these school-based sleep intervention programs. We observed improvements in students' motivation to regularise their out-of-bed times and to increase their average total sleep time during the program. However, students were not

convinced that they should spend half an hour outside soon after waking up (to increase exposure to morning bright light). This finding is consistent with clinical observations that adolescents with delayed sleep timing have a tendency to avoid morning bright light, despite this being commonly recommended as a component of treatment (Gradisar et al., 2011). This suggests that improving motivation to use morning bright light may be a key to improving adolescent sleep habits. Future school-based sleep interventions could provide students with alternative ways of obtaining morning bright light, without necessitating exposure to sunlight (i.e., with the use of portable light devices; e.g., see www.re-timer.com).

According to Miller and Rollnick (2002), behavioural change requires the individual to be "ready, willing and able" (p.10). This means that the individual must consider the proposed change to be important (i.e., willing), must have confidence in their own ability to change (i.e., able), and feel that this is the right time for change to occur (i.e., ready). While our second study focused on improving adolescents' perception of the importance of change, future school-based sleep interventions should incorporate exercises designed to improve all three of these components of motivation to improve the likelihood that improvements in motivation will translate to longer-term behaviour change. For example, activities that may enhance students' confidence in their ability to change could include a review of past successes, brainstorming specifically how change could be achieved, and considering who else could support their attempt to change their behaviour (Miller & Rollnick, 2002). Interestingly, the inclusion of parent information sessions was also spontaneously suggested by two out of the three teachers involved in the program, when asked for their recommendations for future interventions. Recent research also suggests that parent-set bedtimes are associated with improved sleep and daytime functioning among adolescents (Short et al., 2011).

Recommendations for future research and practice

School-based interventions are effective in improving sleep knowledge among adolescents; however, an increase in sleep-related knowledge does not always translate into changes in behaviour that are maintained over time. While school-based interventions can improve students' motivation to change sleep-related behaviours, and students are happy to engage with homework-based behavioural experiments, future work in this area should focus on motivating students to maintain these changes over time. This could include providing students with artificial sources of morning bright light (Gradisar et al., 2011), offering sleep education sessions for parents and/or encouraging parental involvement in treatment (Short et al., 2011), and encouraging students to consider how to overcome potential obstacles before they arise.

Feedback from students and teachers suggests that school-based sleep intervention programs are generally found to be interesting and enjoyable (Blunden, 2007; Cain et al., 2011; Cortesi et al., 2004; Moseley & Gradisar, 2009). In particular, our research has found that interactive learning activities promote student engagement (Cain et al., 2011), so these should also be an important component of any future school-based sleep intervention.

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