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A review of interventions for adolescents with insomnia and the role of the educational and child psychologist: when sleep does not come easily

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ABSTRACT

The role of an educational and child psychologist involves the promotion of mental health and wellbeing. While adolescents who have insomnia are usually referred to Primary Healthcare services, it might be argued that insomnia can be seen as a barometer of psychological wellbeing and should warrant a psychological intervention. A search of PSYCHINFO and Medline revealed that interventions carried out thus far with adolescents who have difficulty initiating and/or maintaining quality sleep include Sleep Hygiene and Sleep Education, Cognitive Behavioural and Multi Component interventions. In this review it will be posited that using multi-modal approaches which are tailored to specific needs may have the most positive outcomes in the treatment of insomnia, by helping adolescents to develop a sense of self-efficacy and emotional regulation in the context of family and peer support. Educational and child psychologists are ideally placed to offer this type of input to adolescents with insomnia.

KEYWORDS

Educational psychology; adolescents; sleep; insomnia; interventions; mental health

The negative impact of insomnia

Insomnia affects mental health, behaviour and academic progress. Studies show that poor sleep is associated with depression (Frederiksen, Rhodes, Reddy, & Way, 2004; Gass et al., 2010; Holm & Dahl, 2009).

Relationships have also been found between sleep quality, time in bed, and adolescent problem behaviour (Meijer et al., 2010): Other studies have found links between lack of sleep and aggression (Ireland & Culpin, 2006; Haynes et al., 2006) and lack of sleep and substance use (Britton et al., 2010).

Daytime functioning, including academic achievement, attention and working memory can be affected by poor sleep (Curcio, Ferrara, & De Gennaro, 2006; De Bruin, Dewald Kaufman, Oort, Bogels, & Meijer, 2015; Gradisar, Terrill, Johnstone, & Douglas, 2008; Limoges, Bolduc, Berhtiaume, Mottron, & Godbout, 2013; Roberts, Roberts, & Duong, 2008). Furthermore, sleep is essential for overall physical and mental health (Moore & Moltzer, 2008).

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The definition of insomnia

The paucity of research into the area of adolescent insomnia may, in part, be a consequence of the confusion around terminology, or parental and even professional ignorance or misunderstanding (Stores, 1996). One problem is that the phrases "sleep difficulties", "sleep disorders" and "sleep problems" have been used interchangeably. While one study may include adolescents with "sleep difficulties" other studies may only include adolescents with insomnia whose difficulties fulfilled the DSM-1V (*Diagnostic and Statistical Manual of Mental Disorders*, fourth edition) criteria (American Psychiatric Association [APA], 2000, p. 553). The DSM-1V criteria were described as follows:

> Insomnia is a subjectively reported complaint and is seen in terms of: difficulties falling asleep, staying asleep and its having a negative impact on daytime functioning despite adequate opportunities for sleep.

In the revised fifth edition of the DSM (DSM-V), published in May 2013, "insomnia disorder" is defined as a combination of both dissatisfaction with sleep and a significant negative impact on daytime functioning. "Dissatisfaction with sleep" is further defined as: difficulty initiating and/or maintaining sleep or non-restorative sleep, on at least three nights per week for at least three months, despite adequate opportunity to sleep (Sleepio, 2015).

The studies reviewed in this article have used the DSM-V criteria unless otherwise stated.

In search of an effective intervention

It may be important, when examining the effectiveness of any intervention, to identify factors that may lead to better compliance, such as better targeting of the subjectively perceived sleep problems, motivation and parental support. As Espie (2012) writes, an insomniac would need to be willing, able, and ready for an intervention to work. Educational and child psychologists understand that they need to work within motivational and developmental boundaries with the young person in the context of their families and their social context.

Insomnia and adolescence

Adolescence can be seen as a unique developmental period of both vulnerability and opportunity, and during adolescence links are established between affective and cognitive processes. At a time when adolescents appear physically stronger, older and more mature, expectations by adults and carers around adolescents' emotional and behavioural needs and abilities can be mismatched, because adolescents' emotional and behavioural control lags behind their cognitive skills (Dahl, 2004). In other words, when adults believe adolescents in their care no longer need as much guidance, paradoxically this can be a time when they may need more, not less, support. This has been found to be the case regarding supporting adolescents' bedtime routines (Shorts et al., 2011). Opportunities can be taken to promote good sleep habits and to intervene during times of insomnia in adolescence, so that trajectories can be altered and lifelong difficulties with insomnia prevented (Dregan & Armstrong, 2010).

It is puzzling that so few documented interventions have been carried out with adolescents with insomnia. A search of PSYCHINFO and Medline, reviewing the literature from 1990 to the present day, revealed only 10 studies.

Lifestyle factors and sleep hygiene

Adolescence is a time which sees changes in lifestyle factors that could have a negative effect on sleep quality, for example the use of caffeine, alcohol, smoking and substance use, or excessive use of the computer and being too "busy" for sleep due to social demands. These factors are all more likely to be salient in adolescents as compared to children (Carskadon, 2002; Roehrs & Roth, 2008) and may therefore help to explain the emergence of new sleep difficulties during this developmental period.

Tobacco use has been associated with a change in total sleep time (TST) and daytime sleepiness, however the association between smoking and individual insomnia remains inconclusive (Mak, Ho, Thomas, & Cheuk, 2010). Substance use has also been linked with sleep difficulties in adolescence (Wong, Brower, & Zucker, 2009; Haynes et al., 2006) although the direction of effect is not clear.

> A study to investigate a possible association between excessive computer use and insomnia in adolescents found that the duration of time spent on the computer was longer in those adolescents who reported insomnia as compared to those who did not. There was found to be a link between the category of computer use, that is, excessive, moderate or no computer usage and the scores on the Athens Insomnia Scale (AIS) (Siomos, Braimiotis, Floros, Dafoulis, & Angelopoulos, 2010). Those with higher scores on the AIS tended to have used a personal computer for a longer period of time. The reasons for the reported association between excessive computer use and insomnia in adolescence have yet to be established, although it might be posited that playing games can cause high arousal, excitement and alertness at a time when relaxation is needed for sleep.

The interventions to treat sleep problems associated with lifestyle factors can be described as "Sleep Education" or "Sleep Hygiene" programmes. In one study the two terms were combined (De Sousa, Araijo, & Azevedo, 2007). There is a lack of consensus on the exact definition of Sleep Hygiene (Stepanski & Wyatt, 2003), however it usually refers to the behaviours that are believed to promote improved quality and quantity of sleep, whereas "Sleep Education" gives both biological information about sleep and Sleep Hygiene information. The International Classification of Sleep Disorders' (ICSD) definition (American Academy of Sleep Disorders, 1979) of inadequate Sleep Hygiene includes: "following poor sleep wake schedules; the consumption of alcohol, tobacco or caffeine close to bedtime; the use of the bed for non-sleep related activities; having an uncomfortable bed and carrying out mental activity too close to bedtime" (p. 31).

In Brazil an intervention in the form of a Sleep Education and Sleep Hygiene programme was delivered to 58 adolescents in a school (De Sousa et al., 2007). One hundred and seventy-three adolescents were originally recruited to the programme: after the programme only 33.52% of the participants completed the post-programme questionnaire. None of the participants had a sleep disorder and the intervention was described as being preventative. The adolescents who took part in the programme did, however, report sleeping for shorter times than they would like. The programme took place in school every day over one typical week. Components included: the dissemination of information about the biology of sleep and the importance of Sleep Hygiene. At the end of the intervention there was found to be a reduction in sleep onset latency (SOL – the length of time that it takes to accomplish the transition from full wakefulness to sleep) by an average of four minutes, as reported in sleep diaries, but sleep quality and daytime sleepiness scores showed no improvement. While the reduction of only four minutes SOL is not convincing of efficacy, also of note would be the

poor engagement rate, but it would seem that the students themselves did not regard their sleep as an issue necessitating external support, and nor did the parents, as only 71 out of 170 signed consent forms for their sons or daughters to participate.

In Australia a school based intervention designed to increase knowledge about adolescent sleep needs was delivered and evaluated in two schools (Moseley & Gradisar, 2009). The intervention resulted in only small behavioural changes in that there was a reduction in the discrepancy between school-week and weekend out of bed times by 30 minutes. It was recognised that the participants' motivation to change sleep habits was low, so that although their knowledge around the importance of sleep increased, the adolescents preferred to maintain their lifestyle with the incurring sleepiness.

A second intervention in Australia (Cain, Gradisar, & Moseley, 2011) set out to address the issue of motivation to change sleep habits although, again, the adolescents had not spontaneously come forward to report problems with their own sleep. A hundred and four participants were selected from secondary schools. Fifty-three took part in the programme while 51 acted as controls.

Questionnaires were completed at baseline, post-intervention, and a six week follow up. Students were asked about sleep patterns, and given a sleep knowledge quiz, the Depression Anxiety Stress Scale and the Behavioural Intentions Questionnaire. Sleep diaries were also kept. At baseline, 37.9% of the sample reported difficulty initiating sleep, 59.2% reported insufficient sleep on school nights and 74.85% reported discrepant school-weekend out of bed times. Post-intervention there were differences between the groups on depression scores, but no significant differences between groups for the target sleep parameters, daytime sleepiness or sleep knowledge.

A suggestion made by the authors was that parental involvement in the programme may help in future studies, which is a recurring theme throughout the documented interventions. The argument could also be made that it is not an effective use of an educational and child psychologist's time to intervene unless the young people and their parents see themselves as being in need of help, or are educated into the benefits of adequate sleep.

Biological factors in adolescent sleep

It is important to understand typical developmental changes in adolescent sleep patterns, as strategies for interventions that aim to improve sleep and to prevent chronic insomnia will need to take these changes into consideration (Carskadon, 2011). Circadian changes that accompany pubertal development may create a risk of chronic insomnia (Johnson et al., 2006).

As compared to pre-pubertal children, adolescents sleep less, and the timing of their sleep onset is delayed. The latter discrepancy is particularly noticeable at the weekend. (Carskadon, 2002; Sadeh, Dahl, Shahar, & Rosenblatt-Stein, 2009).

Insomnia and autism spectrum disorder in adolescence

It is also important to look at sleep disorders in those who have atypical development. Sleep disorders are prevalent in adolescents with autism (Wiggs & Stores, 2004; Limoges et al., 2013) and this group of adolescents has been reported as suffering from sleep problems more frequently than other groups (Richdale, 1999; DeMeyer, 1979; Schreck & Mulick, 2000).

Limoges et al point out that while poor sleep is common in autism, the individuals themselves do not necessarily complain, which begs the question regarding for whom the poor sleep is an issue. However, if it can be shown that poor sleep is having a negative impact on an individual's wellbeing, an intervention to help might be justified whether or not the individual has the insight to link poor sleep and its negative impact.

It has been established that parents of children with autism experience increased levels of stress and are more susceptible to negative outcomes compared with parents of children with other disabilities (Dunn, Burbine, Bowers, & Tantell-Dunn, 2001). This level of stress is more prevalent in parents of children with autism who have sleep problems (Hoffman et al., 2008).

Sleep problems identified in adolescents with autism include: falling asleep later at night, having longer sleep latencies, sleeping less at night and spending a significant period of time awake during the night (Patzold, Richdale, & Tonge, 1998). Earlier morning awakening time has also been found in adolescents with autism (Hering, Epstein, Elroy, Iancu, & Zelnik, 1999) It has been proposed that this is likely to be due to: deviant and delayed social and communication skills; poor adherence to routines; fear and anxiety, or to an abnormality in the secretion of melatonin (Richdale, 1999).

Interventions which are thought to be effective with this group of adolescents include behavioural interventions, such as standard extinction and scheduled awakenings (Vriend, Corkum, Moon, & Smith, 2011). However, there is currently little research examining the treatment of sleep problems in this group and the case could be made to devise an intervention which would lessen the level of stress.

As behavioural interventions have been seen to be successful in supporting sleep disorders and also in treating many aspects of behaviour in individuals with autism (Hall, 1997), it would be advantageous to look into the use of these interventions to support adolescents with autism and insomnia. It has been argued that positive reinforcement is an extremely effective way to manage behaviour in adolescents with autism (Moyes, 2002), therefore future research is suggested that examines the effectiveness of reward charts and other positive reinforcers in managing behaviour around bedtime routines. In line with executive functioning theory, visual schedules which emphasise clear and concise routines are widely and effectively used to support organisational skills and anxiety in individuals with autism (Dettmer, Simpson, Myles, & Ganz, 2014). The use of these to highlight clear bedtime routines could also be explored in future research, as routines have been shown to be important for sufficient sleep. In addition, predictability may reduce anxieties around bedtime.

Social Stories have been suggested to be an effective way of managing appropriate behaviours with adolescents with autism (Gray & Garand, 1993) and therefore future research could look into the effectiveness of implementing these to explain the social conventions around difficulties the adolescent is facing, for example, appropriate times to go to bed, where to sleep, and why sleeping at night is important. Discussing individual anxieties may prove to be helpful, for example an adolescent with autism may fear going to sleep in case they have a repeat nightmare, or in case they do not wake up again.

The use of melatonin

It is important to distinguish whether or not an adolescent (with or without autism) has insomnia or a Circadian Rhythm Sleep Disorder (CRSD) as the treatment will be different.

According to the ICSD CRSDs occur when there is a misalignment between the person's sleep pattern and that which is desired or regarded as the norm in society. Hiller, Lovato, Gradisar, Oliver, and Slater (2014) argue that, in their clinical experience, Delayed Sleep Phase onset is the most common complaint about sleep, but this is not the same as insomnia, and the intervention should take this into account.

Melatonin is widely prescribed for symptomatic treatment of Delayed Sleep Phase in the UK (Famuyima & Adewaya, 2008). Melatonin has both hypnotic and sleep–wake regulating properties (Hardeland, 2009). It is a hormone that helps to regulate the timing of the central circadian pacemaker in the hypothalamus. Its use is seen to be effective in the control of Delayed Sleep Phase Syndrome but there are few studies providing evidence to support its use for treating insomnia (Owens, Rosen, Mindell, & Kirchner, 2010; Hardeland 2009). This is possibly because the causes and maintenance of insomnia are primarily behavioural or psychological, and the question might also be asked "for whom is the late bedtime a problem?" In the authors' experience, parents and carers may, understandably, want their child to go to sleep at an earlier than optimal time for the young person's natural time of sleep onset.

Insomnia and comorbid difficulties

One difficulty which is associated with insomnia is heightened emotional reactivity and difficulties with emotional regulation (Baglioni, Spiegelhalder, Lombardo, & Riemann, 2010). This association appears to be bidirectional. Some emotional states may be triggered more quickly and/or with greater intensity in adolescence than in other developmental periods (Dahl, 2004). Sleep may play a facilitating role in regulating emotional stress and may serve as a buffer between stress and negative affect (Dahl, 2004; Vanderkechove & Clydts, 2010). However, the reasons for the increase in emotional reactivity are unclear.

The drive in adolescents to experience intense feelings of reward may, in some cases, lead to experimentation with substance use, which is associated with poor sleep (Wong et al., 2009; Haynes et al., 2006). However the direction of association is not entirely clear, but there seems to be a link between sleep problems, emotional reactivity and reward seeking behaviour in adolescents.

One pilot study in Arizona targeted adolescents who were experiencing emotional dysregulation (Haynes et al., 2006). The adolescents in this study carried out aggressive acts, and had a history of substance use and sleep disturbances. Haynes suggested that the causal link may well have been that the adolescents who had experienced sleep disturbances as younger children had turned to substance use in adolescence, compounding the sleep difficulties. The hypothesis in the pilot study was that adolescents who experienced aggressive thoughts or actions after the sleep treatment would have worse treatment trajectories than adolescents with no aggressive thoughts or behaviours after treatment, and at follow up. The sleep treatment consisted of six sessions of a multi-component small group treatment of adolescents aged between 13 to 19 years, with two to six adolescents in each group. Weekly sessions used a "stepped care" approach, with some time given to Sleep Education and Sleep Hygiene, as well as addressing the issue of substance abuse. The treatment was effective in treating insomnia in that all the completers of the programme reported significant improvements in all measures of sleep and sleep quality across the course of the treatment. It would have been useful to investigate the views of the adolescents about which components of the sessions they felt to be the most supportive; for example it may have been the case that

they benefited from social support by being in a group, and that this had more impact than the information about sleep hygiene. Future designs could use a qualitative approach to complement the statistical analysis of the intervention.

The developmental differences cognitively between a typical 13 year old and 19 year old would also need to be considered in future interventions. There may have been differences in impact on the adolescents in this study due to developmental maturity in terms of self-efficacy skills and emotional regulation. The involvement of parents in interventions should be addressed: in this intervention only one parent gave consent for their child's participation.

Ruminating, catastrophising and dysfunctional beliefs about sleep

Cognitive arousal has been found to be a stronger predictor than somatic arousal in children (Gregory, Willis, Wiggs, Harvey, & the STEPS team, 2008). Those who reported not being able to stop thinking had higher levels of sleep disturbance. In a study to examine the links between catastrophising and symptoms of sleep disturbances in children (Gregory, Noone, Eley, Harvey, & the STEPS team, 2010) the number of catastrophising thoughts reported predicted the level of sleep disturbance. It is possible, however, that a person who catastrophises about their sleep may experience feelings of loss of control and have self- deprecating thoughts, which lead to more somatic arousal. Associations between catastrophising, anxiety and SOL were examined in 40 adolescents (Hiller et al., 2014). The study found a link between specifically sleep-related catastrophising and SOL.

It is argued that educational and child psychologists have the skills to find out from the young people which psychological components of interventions would be most effective in treating rumination, catastrophising and dysfunctional beliefs about sleep.

Anxiety

There are links between insomnia, depression and anxiety, although the aetiology of each may be independent (Johnson et al., 2006; Vanderlinda et al., 2014).

Cognitive Behavioural Therapy for the treatment of insomnia (CBT-I) uses a number of techniques with the intention of changing thoughts, beliefs and behaviours around sleep. A CBT-I therapist will aim to identify, along with the patient, maladaptive thoughts and feelings around sleep, looking at the patient's attributions as to the cause of the difficulties and discussing outcome expectations and self-efficacy (Morin et al., 2006) so that information and accurate thinking around sleep adjusts thoughts and feelings towards sleep, resulting in better sleep quality.

The arguments for the use of CBT-I in adults are strong (Morin et al., 2006) so this begs the question as to why CBT-I is not used routinely as a treatment for adolescents with insomnia. It could be due to lack of training in CBT-I amongst professionals, or perhaps because addressing insomnia through psychological intervention is not seen as a priority issue by mental health practitioners.

One intervention in which CBT-I was used with adolescents took place in Sweden (Novell-Clarke, Nyander, & Jansson-Fröjmark, 2011). This study specifically aimed to investigate the effects of CBT-I for insomnia on youths. The study aimed to replicate a previous study (Harvey, Sharpley, Ree, Stinson, & Clark, 2007). Three adolescent participants were assessed, using interviews, questionnaires, diaries and self-reports around sleep.

The intervention consisted of weekly one hour sessions over seven weeks. Homework tasks were set. A treatment rationale was given and a treatment manual was adhered to. In all three participants there was a change in scores of insomnia severity from "clinical insomnia of moderate severity" to "sub-threshold insomnia" at post-treatment and three month follow up. Although the study was only small scale, the results would indicate further investigation of CBT-I as a treatment for insomnia in adolescents. One intervention used CBT-I online with 32 adolescents, using DSM-V criteria for insomnia as inclusion criteria for the study, and actigraphs, sleep logs and questionnaires as ways of measuring impact. The authors reported that Sleep Efficiency improved, and that there were improvements in comparison with a waiting for treatment group on visuo-spatial processing, selective attention and phonological working memory (De Bruin et al., 2015)

Usual techniques of CBT-I include: questioning, interacting with others, and the use of imagery and role playing, yet these activities may be difficult to employ at a time when adolescents are self-conscious. This may be a reason why an online programme may have been successful. The successful therapist would provide a safe and non-judgemental context, which an educational and child psychologist could offer. The techniques can rely on complex symbolic processes which often require a high level of cognitive development, for example being able to self-reflect and problem solve in the context of society (Dahl, 2004). Educational psychologists, with their knowledge of child development, would be able to differentiate the materials and activities. Some adolescents, as in this study, may respond to an online CBT-I, while others may wish to discuss the emotional issues behind their sleep difficulties, in which case face-to-face intervention with an educational and child psychologist would be indicated.

Relaxation techniques

In order to be able to sleep, both the mind and body need to be relaxed. Physiologically, relaxation is associated with deeper and slower breathing, a reduction in muscle tone and a lowering of heart rate. At the psychological level, relaxation involves detachment from the immediate environment, with a focus instead on pleasant sensations or experiences and a reduction of mental effort and anxiety (Morin et al., 2006). There are various techniques used to bring about relaxation; for example, yoga promotes both physical and mental relaxation. The rationale behind the practice of yoga specifically for adolescents with insomnia would make sense because yoga aims to relax both the mind and body through posture, breathing and meditation. Studies on the use of yoga specifically for adolescents with insomnia have not been documented, but might provide a rich avenue for future research.

Several studies have shown the benefits of using music to promote sleep in adults (Oxtoby, Sacre, & Lurie-Beck, 2013) but none has been specifically documented with adolescents. Another technique used by qualified therapists to induce a state of physical and mental relaxation is hypnosis or hypnotherapy. It has been found that for adults, and some children, hypnosis can be effective in treating insomnia, particularly if the techniques are integrated into a multi-modal intervention with CBT (Ng & Lee, 2008). They concluded that "Hypnosis can be useful for inducing a state of physical relaxation that is at least compatible with sleep, diminishing the sympathetic arousal usually associated with anxious preoccupation" (p. 685).

A retrospective review was made of school-aged children treated between 1998 and 2008 with hypnosis for sleep difficulties (Anbar & Slothower, 2006). The authors examined

children's subjective self-reports and found that 90% of the 84 children and adolescent participants, who were aged between seven and 17 years, reported a reduction in SOL. Fifty-two percent of the participants reported a reduction in the number of night time awakenings. It would be interesting to determine the most influential components of the hypnotherapy treatment, for example the use of imagery, or the feelings of greater self-control. Evaluating the use of hypnosis for adolescent insomnia would provide a fruitful area for future research.

Multi-component interventions

A multi-modal sleep intervention which included the use of guided imagery and hypnotherapeutic elements was developed in Germany for use with 11 to 17 year olds (Schlarb, Liddle, & Hautzinger, 2011). Eighteen adolescents aged 11 to 16 years took part in the study after being screened by means of an interview and fulfilling the criteria for insomnia. Participants filled in sleep scales, a diary, a questionnaire and a sleep disorder interview. Parents filled in the Child Behaviour Checklist and an Anxiety Disorders Interview.

The intervention took place over six weeks on a group basis, with four to eight adolescents in each group. Parents were also invited to the third session where they were given information about sleep and parental behaviour. The multi-modal intervention included presenting information about Sleep Hygiene, CBT, hypnotherapy and progressive muscle relaxation. Each session ended with a hypnotherapeutic trance. The attendance rates were high (88.89% attended all sessions and 11.11% missed one session). Participants gave very positive feedback.

At post-measurement on a *t*-test the adolescents showed significant improvements in all measures: SOL was reduced on average from 32 minutes to 16 minutes; Sleep Efficiency improved from 88.7% to 94% and TST increased from 493 minutes to 520 minutes. Perhaps it was the case that the less the participants worried about sleep, the lower the pre-sleep arousal so that sleep could come more easily. Although not discussed in the paper, one of the factors which might have contributed to the success of the programme may have been the positive relations between the therapists and adolescents, combined with the parental support. It would have been interesting to gain the views of the adolescents on this.

Mindfulness techniques

In order to be able to sleep, a person needs minimal cognitive processing, effort, cognitive drive and affective load. One potential way of intervening to prevent a negative cycle of anxiety and mental challenge at bedtime is to adopt a so called "mindful" approach to life and to practise mindfulness techniques during the day. This is because insomnia could be conceptualised as a 24 hour disorder of arousal (Riemann, Kloepfer, & Berger, 2009) rather than a difficulty specifically at bedtime. When people become more mindful they learn how to look at their lives in a more accepting and non-judgmental way by, for example, learning how to accept the presence of thoughts and feelings that keep them awake at night. As a result they experience greater emotional balance and less sleep disturbance (Greeson, 2009).

Williams and Penman (2011) explain that self-criticism does not solve the problem of insomnia. Adopting a "being" instead of "doing" "mode" means that people can be accepting about thoughts and worries about sleep, observing thoughts and sensations rather than ruminating about them. Being attentive to, and aware of, the present moment with an

ability to accept experiences and regulate attention is at the heart of Mindfulness (Howell, Digdon, & Buro, 2010; Lundh, 2005). Challenging one's thoughts and learning to generate alternative thoughts about sleep leads to more cognitive arousal at a time when the mind needs to switch off.

A multi-component intervention with adolescents using Mindfulness based stress reduction (MBSR) was devised by Britton et al. (2010). They hypothesised that MBSR would help alleviate the difficulties of a racing mind and thereby promote sleep. Participants aged between 13 and 19 years who had complaints either about sleep disturbance or daytime sleepiness were included in the programme, which took place over nine weeks. Participants were taught how to use Mindful meditations (MMs). In order to measure the impact on sleep of practising MM, the amount of meditation sessions was measured and compared with the variables of sleep. It was found in this study that the number of meditations was associated with significantly lower scores on the hyper arousal scales, and that the decrease in sympathetic arousal could be associated with improvements on measures of TST, Time in Bed, Sleep Efficiency and Insomnia Severity. Mindfulness techniques to promote sleep therefore look promising, and educational psychologists are well placed to offer such interventions and explore the views of young people about this.

This intervention would seem to have great potential. However, it is an uncontrolled pilot study and future research could aim to develop the work with larger numbers and a control group as well as incorporating the views of the young people involved in the intervention and their parents. Careful attention should be paid to the correlations of each intervention component with aspects of sleep, but also the importance of motivation, personality, life circumstances and parental and peer support need to be considered. Educational and child psychologists could devise such programmes.

The study was partially replicated in Australia (Bei Bei et al., 2013). One hundred and fifty students at a private girls' school were invited to take part in a survey about sleep. Sixty-two girls who took part after parental consent was given were screened for sleep difficulties and nine girls completed the intervention. Aspects of sleep were measured pre- and post-intervention and were evaluated with participant feedback. The Mindfulness techniques used in the intervention included the body scan, breath awareness and guided mindfulness practice to develop non-judgmental awareness.

Improvements were seen pre- to post-intervention, with SOL the most improved variable. SOL was almost halved on subjective and objective measures. There was an improvement in TST and Sleep Efficiancy. Anxiety scores before the intervention were below the clinical cutoff point, yet they rose during the intervention. The scores were a mean score, and so it might have been the case that one participant may have reacted with anxiety to an independent event and her score may have skewed the group figures.

Conclusions

Each intervention to help with insomnia should be catered to the individual, focussing on their specific presenting needs. Research should use mixed methods, so that a clear picture can emerge of the effectiveness of the programmes both in terms of statistical analysis of variables and outcomes on sleep measures, but also in terms of the views, perceptions and motivational factors that the participants themselves offer. There is an apparent need for work around insomnia with adolescents who have atypical development, such as autism.

In order to maximise the effectiveness of an intervention to help treat adolescents with insomnia, the following factors have been identified:

- There needs to be greater awareness among parents, professionals, including educational and child psychologists, and adolescents themselves of typical and atypical development of sleep patterns, and of developmental changes, particularly around emotional and behavioural issues during adolescence, with greater knowledge of the role that lifestyle factors play in enabling healthy sleep. There should be particular emphasis on emotional regulation and the ability to control arousal, both cognitively and somatically.
- Educational and child psychologists could contribute to multi-agency interventions by way of training teachers, parents and young people in the issues of development and psychology of sleep, and by using appropriate assessments that help to determine the nature of the difficulties before devising and delivering programmes.
- Parents or carers need to be involved and the motivational factors for this explored with the educational and child psychologist before implementing strategies.
- Adolescents who report poor sleep can be given information in schools about Sleep Hygiene as a measure to prevent the onset of chronic insomnia.
- An effective intervention for insomnia should identify the nature of the sleep difficulty, and ensure first of all that there has been adequate opportunity for sleep. Should there be no concern around Sleep Hygiene, then the focus should turn to emotional and psychological issues and aim to promote a sense of mastery, that is, choice with control within the context of parental and peer support.
- The adolescent needs to be willing, able and ready to participate in an intervention. Adolescents with autism and/or atypical development face further problems, such as a heightened need for routine around sleep, sensory issues which cause somatic arousal and/or anxiety or fears about sleep, all of which need to be addressed at an individual level.
- Effective interventions promote relaxation of mind and body in a 24 hour cycle, rather than focussing solely on bedtime.
- Melatonin is effective for circadian rhythm disorders but is not as effective in promoting sleep for adolescents whose insomnia is due to psychological issues.
- Multi-component group interventions with an emphasis on psychology, such as CBT and Mindfulness stress reduction have shown the most promising outcomes especially in improved scores on SOL, Sleep Efficiency and TST.

Up to now, the most effective interventions offer a mix of CBT, including Sleep Hygiene as the first step, and methods to promote relaxation about sleep, such as avoiding catastrophising or discussing possible fears about sleep or the sleep environment. MMs have been shown to be a promising technique to help promote self-acceptance and lower arousal. The use of hypnosis, yoga and music to promote relaxation and sleep might also show promise with adults, but their use has not been evaluated with adolescents. Behavioural methods have been used most frequently with adolescents with autism, although there is a case to be made for further research into the use of multi-methods with this population.

In conclusion, it would seem that when sleep hygiene issues have been addressed, and insomnia persists, psychological skills are needed to calm an aroused mind in order to sleep. These vital skills should help to prevent the onset of chronic insomnia during a unique period of development and help to set adolescents on a more positive trajectory of well-being for a lifetime.

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