



THEORETICAL REVIEW

Interpersonal factors in insomnia: A model for integrating bed partners into cognitive behavioral therapy for insomnia

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SUMMARY

Sleep has largely been conceptualized as an individual phenomenon, despite the fact that most adults share their bed with a partner at some time in their life. Only recently have researchers begun to examine the dyadic nature of sleep, and there is growing evidence that bed partners can play a role in the onset and maintenance of insomnia. Additionally, emerging evidence suggests that bed partners can be powerful agents of social control in terms of promoting adaptive health and sleep-related behaviors, and shared social rhythms between partners can help foster an environment that is conducive to good sleep. As such, the aim of the present article is to review the social context of the sleep environment and how best to include bed partners in insomnia treatment. Based on a synthesis of relevant literatures, a model for integrating bed partners into cognitive behavior therapy for insomnia (CBT-I) is presented and directions for future research are discussed.

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Introduction

Insomnia is one of the most prevalent psychological health problems facing adults.¹ Although most adults share their bed with a partner at some time in their lives, a review of the literature reveals that sleep has largely been conceptualized and investigated as an individual phenomenon. In fact, a survey of some of the most commonly used assessment tools in insomnia research revealed that none of the standard assessment measures take into account the dyadic nature of the sleep environment for adults.² Similarly, to date there have been no psychosocial interventions developed for insomnia that take into account interpersonal factors related to sleep. Meanwhile, most individuals describe sleep as a social experience that can lead to complicated and challenging issues for bed partners, and can play a central role in the relationship functioning of couples.³ A previous review highlighted the evidence for a bidirectional association between relationship functioning and insomnia among co-sleeping dyads, and proposed mechanisms by which bed partners may help maintain insomnia.⁴ The goal of the

current review is to extend beyond this foundational work, by articulating the manner in which: 1) relationship issues can be conceptualized in cognitive behavioral treatments for insomnia, and 2) partners may be integrated into such therapies to maximize their effectiveness.

A survey of over 1500 adults in the United States revealed that 61% of individuals slept with a partner on most nights, and that individuals who took longer than 30 min to fall asleep were significantly more likely to report relationship problems due to their own or their partner's sleep disorder.⁵ Furthermore, 30% of individuals who were married or cohabitating slept in a separate bed or bedroom as a result of their own or their partner's sleep problem. Although most conceptualizations of insomnia do not explicitly discuss the role that bed partners may play in the onset and maintenance of chronic insomnia, research has shown that there may be some objective costs to co-sleeping. Specifically, research suggests that the sleep architecture of dyads improves when they sleep alone versus together.⁷ However, despite these changes in sleep architecture, participants subjectively reported that their sleep was worse when they were alone. Similarly, although the majority of couples endorse a general preference for sleeping with their partner rather than sleeping alone, actigraph estimates suggest that sleep quality is worse when sleeping together.⁸ In fact, research suggests that approximately one-third of nocturnal awakenings are concordant between bed partners, even though couples do not seem to be consciously aware of this.^{1,9}

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Furthermore, women appear to be more reactive to the movement of another individual in their bed than men, which may account for the higher prevalence of sleep disorders in women.¹⁰ Sharing a bed with a partner appears to have significant implications for sleep, making this information useful to the development of an accurate case conceptualization in terms of hypothesized predisposing, precipitating, and perpetuating factors of insomnia.

Cognitive behavioral conceptualization of insomnia

Spielman and colleagues¹¹ model of insomnia suggests that acute insomnia develops as a result of an interaction between an individual's trait vulnerability to sleep difficulties (i.e., predisposing factors) and specific precipitating circumstances that introduce stress into the system (e.g., life event, abrupt change in sleep schedule). For some individuals, the acute insomnia episode is temporary and their sleep normalizes shortly after the stressor subsides. However, for a subset of individuals, the acute insomnia becomes chronic when it is reinforced by various maladaptive psychological and behavioral coping strategies that are developed in response to the sleep difficulty (i.e., perpetuating factors), such as spending an excessive amount of time in bed, going to bed earlier in the evening, and getting out of bed later in the morning to increase the opportunity for sleep.¹² Discomfort associated with acute sleep difficulty may also activate beliefs about efforts to "fix" the sleep problem or provoke maladaptive sleep-related cognitive processes and content (e.g., selective attention to threats to sleep, misperception of sleep deficits) that are maintained and exacerbated by poor coping behaviors (e.g., drinking excessive caffeine to cope with fatigue).^{13,14}

Thus, both cognitive and behavioral perpetuating factors can ultimately turn an acute sleep disturbance into chronic insomnia. Furthermore, these perpetuating factors can have adverse effects on sleep regulatory processes,^{14,15} and it is the interaction between the perpetuating factors and these sleep regulatory processes that maintain insomnia. Notably, the predisposing, precipitating, and perpetuating factors associated with insomnia are not intended to be mutually exclusive (i.e., the same variable may be conceptualized as falling into several categories) and there are some limitations inherent in placing these factors into circumscribed categories. However, this model provides a schematic for developing a case conceptualization of an individual's insomnia and serves to inform treatment. Cognitive behavioral therapy for insomnia (CBT-I) is designed to directly target the cognitive and behavioral factors that perpetuate insomnia by modifying poor sleep habits (e.g., spending too much time in bed, irregular sleep schedule), correcting faulty beliefs about sleep, and developing more adaptive coping skills.^{16,17} Because of the considerable data supporting the efficacy, effectiveness, and long-term durability of treatment effects, CBT-I is the first-line recommended treatment for chronic insomnia.^{6, 18–20}

The role of bed partners in promoting insomnia

Predisposing factors in insomnia

With regard to predisposing factors, research suggests that being a woman,²¹ sensitivity to light,²² and the inclination to worry²³ are associated with insomnia. Furthermore, research has shown that poor sleepers tend to have anxious and perfectionistic personality styles^{24,25} and cope with stressful life events by either internalizing or somatizing their reactions.²⁶

From an interpersonal perspective, additional predisposing variables may serve to increase one's propensity for insomnia, for example, attachment style. Attachment refers to the emotional

bond that develops between a child and a caregiver in early life.²⁷ According to attachment theory, early interactions with caregivers lead to the formation of expectations regarding the degree to which the caregiver will be consistently warm, nurturing, and responsive to one's needs.²⁷ One's attachment style is thought to be a stable trait that is carried forward into adulthood and can manifest with romantic partners.²⁸ Among adults, insecure attachment relationships have been categorized into two distinct dimensions, namely, anxious attachment (characterized by anxiety about the potential of abandonment) and avoidant attachment (characterized by difficulty with being close to others).²⁹

Within the context of sleep, attachment is hypothesized to play a central role in regulating bedtime affect and arousal. Secure attachment is associated with feelings of safety and security, which provides the optimal affective environment for deep, consolidated sleep. Conversely, the hypervigilance and alertness that is characteristic of insecure attachment is in many ways antithetical to the sleep state.^{28,30} Research suggests that insecure attachment that is specifically characterized by anxiety about abandonment in intimate relationships (i.e., anxious attachment style) is associated with a greater proportion of sleep in which alpha waves are present, which is suggestive of a hypervigilant or hyperaroused state during sleep.³¹ This elevated vigilance and arousal, in turn, increases sensitivity to stimuli within the environment, resulting in non-restorative sleep. Those with an anxious attachment style experience more difficulties with their sleep relative to those who are securely attached. It has been suggested that individuals with an anxious attachment style tend to be characteristically vigilant, anxious, and difficult to soothe, and they may therefore experience difficulty down-regulating this arousal completely when going to sleep.³¹ This could contribute to their heightened arousal during sleep and the daytime.

In a study of 78 married couples, anxious attachment was associated with greater sleep difficulty after statistically accounting for depression.³² Scharfe and Eldredge³³ reported similar results based on a sample of college students who reported being in a committed relationship. Interestingly, even though both studies failed to find a relationship between sleep difficulty and avoidant attachment among individuals who share their bed with a partner, avoidant attachment was positively associated with sleep difficulty among single participants who generally slept alone. Perhaps those who dismiss their need for attachment may experience physical symptoms of distress that can also serve as a risk factor for the development of a sleep disorder.³³

In a study of attachment style and sleep in women with recurrent depression, depressed women who were anxiously attached exhibited a lower percentage of stage 3 and 4 sleep, particularly if the women were previously married and experienced a rupture in their relationship.³⁴ This is consistent with the finding that individuals undergoing divorce experience a reduced percentage of stage 3 and 4 sleep relative to individuals for whom the divorce has been finalized,³⁵ suggesting that ongoing relational conflict may reduce the ability to get deep, restorative sleep. Additionally, these findings may partially explain the higher prevalence of insomnia among women,²¹ given findings that women tend to be more sensitive to interpersonal stressors,^{36–38} which may subsequently interfere with their sleep.

Moreover, there appears to be a relationship between temporary physical separation from a partner (e.g., for business-related travel) and self-reported sleep difficulties, and this is particularly exacerbated when the homebound partner exhibits an anxious attachment style.³⁹ Furthermore, homebound partners with an anxious attachment style display increases in their daily hypothalamic-pituitary-adrenal axis (HPA) activity throughout the duration of the separation,³⁹ which may play a causal role in

insomnia.⁴⁰ Taken together, these findings suggest that attachment may moderate the relationship between sleep quality and sleep context (i.e., sleeping alone or with a partner), and serve as an important predisposing factor for insomnia onset.

Precipitating factors in insomnia

Events that can indirectly precipitate the onset of insomnia can be categorized into psychological and physical dysfunctions, elements related to one's environment or family, and work-related factors.¹⁶ Research suggests that negative and stressful life events are amongst the most common precipitants of insomnia, particularly events leading to significant loss such as through separation, divorce, or death of a loved one.⁴¹ Other factors found to precipitate the onset of insomnia include problems related to health (e.g., pain, general medical illness), work or school (e.g., conflict with supervisors or colleagues, workload), and family relationships, particularly marital conflict.⁴²

Research suggests that relationship status is significantly related to sleep outcomes, such that divorced individuals tend to experience more difficulties with their sleep than their married or single counterparts.⁴³ Furthermore, individuals in the midst of divorce report significantly reduced percentages of delta wave sleep relative to those for whom a divorce has been finalized, resulting in less restorative sleep and worse daytime functioning among these individuals.³⁵ Relationship quality has also been shown to predict sleep difficulties beyond relationship status alone. For instance, in a diverse sample of over 2000 women, happily married women reported fewer sleep difficulties than women reporting lower marital satisfaction.⁴⁴ Cumulatively, these findings suggest that ongoing relational conflict between partners may create a stressful environment that precipitates the onset of insomnia and can have a negative impact on sleep outcomes, resulting in reduced ability to get deep, restorative sleep. These findings are consistent with other research suggesting a relationship between marital distress and a variety of other mental health conditions.⁴⁵

It is important to note that the association between relational conflict and sleep outcomes does not appear to be unidirectional. Rather, research supports a bidirectional relationship between sleep outcomes and conflict in interpersonal interactions. In a prospective study of 29 heterosexual dyads,⁴⁶ there were sex differences in the associations between sleep and daytime functioning. Specifically, negative daytime interactions predicted worse sleep efficiency among women, whereas more positive daytime interactions from the woman's perspective predicted better sleep efficiency for both the female and male partners.⁴⁶ Research also suggests that when statistically accounting for one's own sleep difficulties, there remains a significant association between a partner's sleep problems and level of one's own relationship satisfaction.⁴⁷ These findings suggest that relationship functioning and sleep are dynamic processes that are interdependent and reciprocally related among bed partners, and can play a role in the onset of insomnia.

Psychological abuse, including the use of intimate information regarding a partner's weaknesses as a weapon against them,⁴⁸ is another construct shown to predict sleep difficulties in dyads. In a longitudinal study of 241 married couples, Rauer and colleagues⁴⁹ found that higher levels of psychological abuse at baseline, as well as subsequent increases in psychological abuse over time, predicted greater sleep difficulties in both partners at a three-year follow-up. Additionally, it has been suggested that marital conflict may lead partners to actively modify their sleep-wake rhythms in an effort to avoid their spouse.²⁸ This further supports the hypothesis that the quality of the relationship among bed partners can have profound effects on sleep over time, and serve as a factor that can precipitate the onset of acute insomnia. Given that sleep problems and

relationship difficulties often co-occur, particularly during times of key life transition, these variables may have important implications for the long-term health trajectories of the individual, the couple, and their family. This is particularly important, given that marital conflict and chronic family stress has been shown to predict sleep difficulties in studies of couples' offspring,⁵⁰ and shown to have adverse effects on their offspring's physical and mental well-being.⁵¹

Perpetuating factors in insomnia

Perpetuating factors in insomnia are variables that cause insomnia to persist by making the sleep disturbance functionally autonomous.⁵² These variables consist of maladaptive behaviors that the individual uses to alleviate their insomnia or compensate for their sleep loss, which in combination with dysfunctional beliefs and attitudes about sleep (e.g., rumination over daytime fatigue, worry about sleep loss), serve to perpetuate the sleep difficulty, even though the insomnia may have been temporary otherwise. Research suggests that maladaptive sleep habits, and the development of dysfunctional beliefs about sleep, can maintain insomnia long after the precipitating variables that initiated it have dissipated.¹⁶ Therefore, these maladaptive behaviors and cognitions are typically the focus of cognitive behavioral treatments for insomnia.

From a dyadic perspective, one variable that may perpetuate insomnia is mismatch of a couple's circadian rhythms. Chronobiological research has established that the basic sleep-wake cycle is one example of a rhythmic activity that occurs on approximately a 24-h interval and is regulated by the interaction between one's internal, biological "clock" and time cues in their environment.¹⁶ The most important of these time cues is the light–dark cycle, which allows humans to reset their internal clock so that their sleep-wake pattern is in harmony with the day–night cycle.⁵³ Circadian rhythms vary from person to person. Although trait morningness–eveningness is usually measured on a continuum, individuals located at each end of the spectrum are characterized as morning types (colloquially termed "larks" in the literature) or evening types (termed "owls").⁵⁴ Larks typically prefer morning hours for intellectual and physical activities, whereas owls tend to prefer the late afternoon or evening hours. Research suggests that approximately 50% of the variance in preference for morningness versus eveningness is accounted for by genetics,⁵⁵ but other factors, such as age,⁵⁶ are also implicated.

Research reveals a moderate positive relationship between couples in terms of preference for morningness versus eveningness, which persists after correcting for age.⁵⁷ Furthermore, correlations exist between partners' sleep-wake variables (rise time and bedtime) on weekdays and on the weekends, with the association higher on weekends. When taking into account the length of the relationship between partners, there does not appear to be a correlation between dissimilarity in morningness–eveningness and relationship satisfaction, suggesting that the relatively high concordance rate between partners' chronotypes is the result of assortative mating (i.e., the propensity for like to marry like) rather than a consequence of adaptation to one's partner following cohabitation.⁵⁷ This suggests that negative implications from the perspective of sleep may arise when partners are mismatched in terms of their circadian inclinations (i.e., a morning lark partnered with a night owl).

One study of 55 dyads found that couples who were mismatched in terms of their preferred sleep-wake cycle exhibited lower scores on a measure of marital adjustment than their matched counterparts.⁵⁸ Similarly, Larson and colleagues⁵⁹ found in a sample study of 150 heterosexual couples, when sleep-wake patterns were mismatched, couples reported significantly less relationship

adjustment, more conflict, less time spent in shared activities or in serious conversation, and less frequent sexual intercourse relative to matched couples.⁵⁹ These results parallel those of Adams and Cromwell,⁶⁰ who conducted a qualitative investigation of 28 married heterosexual individuals. Among individuals who reported a mismatch between themselves and their partner in terms of diurnal preference, responses tended to be characterized by open conflict, criticism, and arguments related to rise and bedtimes. For example, one participant was quoted as saying; “This mismatch affects us when it is my bedtime. We’ve had many arguments about this. I feel so alone when I go to bed by myself. He is frustrated if he goes to bed early – because he’s not ready”.⁶⁰

Given the bidirectional association between intimate relationship conflict and sleep difficulties,⁴⁴ the recurrence of these types of arguments may place both partners at risk for insomnia. Furthermore, although incongruence between partners’ chronotypes in and of itself may be conceptualized as a predisposing factor for insomnia, the mismatch between partners only leads to insomnia if one or both partners continually compromise their own circadian inclinations in an effort to appease their partner, thus introducing stress into the system and perpetuating the insomnia. Adams and Cromwell⁶⁰ highlighted the fact that partners often reported making compromises with respect to their sleep schedule in order to ameliorate relationship difficulties, and reported subsequently engaging in maladaptive sleep-related behaviors that were intended to help them compensate for their sleep loss. For example, a number of morning type participants reported that they often took on the sleep schedule of their partner and attempted to compensate for sleep loss by taking daytime naps.⁶⁰ Conversely, it is plausible to suspect that a mismatched couple may negotiate a shared bedtime so that partners can go to bed together, even though this bedtime may go against both of their individual circadian patterns. Although such strategies may seem benign on the surface, they can be a serious problem for those with insomnia. Core components of CBT-I are sleep restriction and stimulus control, whereby the individual limits the amount of time they spend in bed to an amount of time that closely matches the amount of sleep they are currently producing. This reduced sleep opportunity is scheduled with set bedtimes and rise times, and sleep opportunities outside this schedule (e.g., naps) are not permitted. In addition to more firmly establishing the bed/bedroom as the place for sleep, these instructions facilitate the accumulation of sufficient sleep drive to fall asleep relatively quickly, and provide regular, necessary input to the circadian clock.^{16,17}

Meadows and colleagues⁹ examined the extent to which couples’ sleep-wake cycles were interdependent using actigraphy to monitor each partner’s sleep over the course of one week. Results from this study indicated that a large proportion of the variance for actual bedtime was significant at the couple level, suggesting that couple dynamics played a role in the timing of the couple going to bed. However, in terms of preferred bedtime, the largest proportion of the variance was accounted for at the individual level, suggesting that individual partners did not necessarily want to go to bed at their shared bedtime. This is consistent with Adams and Cromwell’s⁶⁰ observation that couples who were mismatched in terms of their diurnal preference tended to negotiate a common bedtime or compromise their own circadian inclinations to take on their partner’s sleep schedule. Taken together, these findings suggest that bed partners can play an important role in decisions regarding the timing of sleep-wake cycles, and these decisions can, in turn, significantly influence sleep quality and serve to perpetuate insomnia among vulnerable partners.

There are additional ways in which diurnal preference may play a role in the perpetuation of insomnia. For one, it is critical to consider age and its relation to the morningness–eveningness

typology. Research indicates that older individuals are more likely to be morning-oriented than younger individuals.⁵⁶ This becomes relevant from a dyadic perspective when bed partners have significant age discrepancies, in which case chronotype mismatch would become more likely.

A survey by the National Sleep Foundation⁵ also revealed that individuals who self-identify as night owls tend to be at greater risk for insomnia than their counterparts. They were also more likely to experience at least one symptom of insomnia and report experiencing daytime sleepiness on at least three separate days per week. These findings make sense in light of research demonstrating that morning types tend to be more regular in their activities,⁶¹ which is related to better sleep.⁶² In terms of co-sleeping dyads, this becomes relevant if mismatched partners choose a shared bed or rise time, particularly if it is the partner with a preference for morningness that is doing the compromising.

It has also been suggested that when there is a significant discrepancy between the “social clock” and the “biological clock” that governs one’s sleep-wake cycle, it is possible to develop a chronic form of jetlag, termed “social jetlag”.⁶³ Social jetlag is typically conceptualized as occurring when societal norms in terms of the timing of specific activities (e.g., work schedules) are in direct opposition to an individual’s biological sleep preferences.⁶³ Theoretically, it has been suggested that this form of mismatch between biological and social clocks can lead to an increase in sleep debt over the course of the workweek that one must then compensate for on the weekends.⁶³ From a dyadic perspective, social jetlag may ensue when one partner repeatedly adjusts the timing of their bedtime in accordance with the biological sleep preferences of their bed partner, leading to sleep deprivation for which they must eventually compensate. For example, a night owl may go to bed early on weekdays with their lark partner, and then compensate for their sleep loss on weekends by awaking later in the morning on those days. Although this may seem like a fair compromise for good sleepers, research suggests that when individuals without insomnia shift their sleep and activity times by several hours between the workweek and the weekend, their reaction is akin to jetlag and is correlated with lower sleep quality and higher stimulant consumption.⁶³ Although this phenomenon has not been investigated in insomnia populations, one would suspect that their reaction would be even more pronounced.

Sexual activity in the bed or bedroom is another dyadic factor that may perpetuate insomnia. As part of treatment, stimulus control instructions stipulate that the bed should not be used for any activity other than sleep.⁶⁴ These instructions are based on the assumption that insomnia is maintained as a result of maladaptive conditioning between the sleep environment and activities/behaviors that are arousing and therefore incompatible with sleep (e.g., watching TV or worrying in bed). Therefore, the goal of this intervention is to reestablish the association between sleep and the stimulus conditions under which it typically occurs.¹⁶ However, an exception to this rule is typically made for sexual activity. Although research in this area is scarce, there is some indication that individuals with insomnia may have some impairment in sexual libido. For example, in a study by Carney and colleagues,⁶⁵ it was found that individuals with primary insomnia and those with insomnia comorbid with major depression reported a loss of interest in sexual activity, and there were no significant differences between these two groups in terms of libidinal loss, despite the fact that decreased interest in sexual activity is a part of the diagnostic criteria for major depression and not typically thought to be associated with insomnia. Clinically, an individual with insomnia may have the belief that sexual contact with a partner will be arousing and will interfere with their subsequent sleep, or they may avoid sexual contact due to fatigue or decreased libido.

Interestingly, research indicates that sexual contact between bed partners appears to disrupt sleep quality as determined by actigraph measurements; however, subjective assessments of sleep quality are improved by sexual contact.¹⁰ Although it is currently unclear whether sexual involvement at bedtime would serve to disrupt or promote sleep for individuals with insomnia, this highlights a significant gap in the literature that may have important implications for insomnia treatment. In particular, given previous findings regarding the reciprocal association between relationship functioning and insomnia, it would be reasonable to suspect that decreased libido and sexual avoidance may lead to relationship difficulties that may in turn precipitate insomnia. Similarly, choosing to sleep in separate beds may also serve as an important insomnia maintenance factor from this perspective, as individuals may sacrifice opportunities for emotional and physical intimacy in an effort to get better sleep, but inadvertently increase relationship conflict or disconnection and adversely affect relationship satisfaction.

Cognitive processes may also perpetuate insomnia from a dyadic perspective. Harvey's¹⁴ model suggests that maladaptive cognitive processes that are utilized to cope with insomnia at night and throughout the day may paradoxically maintain or exacerbate this condition. Although these processes have traditionally been described in terms of the individual with insomnia, one's partner may also play a role in perpetuating these cognitive strategies. For example, relationship difficulties between partners can lead to ruminative thoughts about the conflict, particularly at night when one is lying next to the object of their upset.²⁸ Additionally, Harvey¹⁴ described the tendency of individuals with insomnia to pay selective attention to stimuli in their internal and external environment that may be a threat to their sleep by monitoring these stimuli closely. Given that bed partners are sensitive to each other's movement during sleep,^{8,9} an individual with insomnia would presumably be particularly vigilant and sensitive to these disruptions in their sleep environment. For example, if one's partner is a restless sleeper, an individual with insomnia may increase their attention toward this perceived threat in their sleep environment, which would increase their anxiety about not being able to sleep. Consequently, the increased cognitive and physiological arousal experienced by the individual as a result of this increase in anxiety would, in turn, interfere with their ability to sleep.

In addition, partners of those with insomnia may reinforce attentional preoccupation with sleep by asking them how their sleep was in the morning, or by encouraging the use of safety behaviors that may reinforce the insomnia (e.g., suggesting they cancel appointments or go back to bed after a bad night's sleep). Although the bed partner's behavior may be well-intentioned, it can inadvertently perpetuate or exacerbate the insomnia patient's symptoms. For example, among individuals with chronic pain, the perception of problematic spousal support behaviors (i.e., unhelpful advice, being overly controlling or trying to change the patient) has been positively associated with pain severity.^{66–69}

Summary

Etiologic models have focused on sleep as an individual phenomenon, despite the fact that the majority of adults share a bed with a spouse or partner and compelling evidence that couple-level variables affect sleep. From a dyadic perspective, circadian mismatch and attachment style may play a role in predisposing individuals to sleep difficulty, whereas relationship problems and distress may be powerful factors that can precipitate the onset of insomnia. Furthermore, sexual activity in the sleep environment and one's partner's role in perpetuating dysfunctional cognitive processes that interfere with sleep may all play a role in maintaining insomnia, turning it into a chronic condition.

The role of bed partners in promoting good sleep

As reviewed above, partners can interfere with sleep and can play a role in the maintenance of insomnia, but bed partners may also serve to promote good sleep. Potential positive roles that partners can play in sleep are reviewed here. Individuals who are married tend to be healthier overall and live longer than single individuals, including those who have never been married, are widowed, or divorced.⁷⁰ Although some research indicates a biological sex difference in the health advantages of marriage, such that the health benefits appear to be greater for men than women,⁷¹ sex differences are not consistently supported in the literature.^{72,73}

Although it is unclear whether it is marriage that leads to health benefits, or whether healthier individuals are more likely to marry,^{74,75} Umberson⁷⁶ proposes that social control of health behavior is one of the primary mechanisms through which marriage may promote good health. Research suggests that the primary agent of social control for a married man is his spouse, whereas women report multiple agents of social control, including their spouses, parents, and children.⁷⁶ Specifically, social control involves the monitoring of health and health-related behaviors of an individual by their partner, including elements such as healthy diet, exercise, compliance with medical regimens, and the consumption of alcohol and cigarettes. It has been suggested that consistent regulation of such health behaviors provides married individuals with health benefits relative to those who do not have the same level of consistent regulation of their behavior.

This hypothesis is supported by a recent investigation of commuter marriages, which involve partners who are married but do not live together, typically because of work constraints. In this study, Fuller⁷⁷ found that, although the health status of commuter partners did not differ from married individuals who were cohabitating with their spouse, their health behaviors tended to be more maladaptive than those of married couples who live together. Specifically, commuter men tended to smoke more cigarettes and commuter women tended to binge drink more often than traditionally cohabitating couples,⁷⁷ both of which have implications for sleep. This may be due to the fact that individuals living with their spouse are subject to more social control and regulation when it comes to these behaviors, relative to those individuals living apart from their partner.⁷⁷ Although the sleep patterns of individuals in commuter marriages did not differ from those of individuals in cohabitating marriages in this study, it is notable that sleep was assessed using only a single question in this study. As such, this null effect may be the result of a measurement issue and additional research is necessary to clarify whether differences in sleep actually exist.

Research supports the idea that living with a partner improves sleep. For example, living with a partner has been shown to be associated with more adaptive beliefs about sleep, shorter sleep onset latency, greater sleep efficiency, and less daytime fatigue, relative to individuals living alone.^{4,78} Among individuals living alone, it was found that men tended to report the greatest amount of maladaptive beliefs about sleep.⁴ Additionally, analyses of women's relationship histories over a period of six to eight years reveal advantages in terms of sleep quality for women who were consistently partnered, relative to those who were not partnered, had lost their partner, or had only recently gained a partner.⁷⁹ These findings indicate that the presence of a partner may be an independent correlate of better sleep quality and continuity among both men and women.

Lifestyle regularity and routine is one variable shown to be associated with better sleep. Research suggests that daily routine (termed "social rhythms") in terms of bed and rise times, exercise, work or school schedule, recreation, and social activities are related

to better subjective sleep quality.^{61,62} Social rhythms that are synchronized with one's circadian rhythm provide an optimal condition for deep and restorative sleep, whereas social rhythms that conflict with one's natural circadian patterns can serve to be sleep disruptive.⁸⁰ Specifically, research suggests that individuals leading sedentary or inactive lifestyles and those who have irregular daily routines are more prone to insomnia, whereas individuals with active and routinized schedules tend to have better quality sleep.^{61,62,80–82} Some evidence also suggests that leading a consistent lifestyle moderates the effects of circadian rhythm changes on sleep among the elderly.^{83–86} Additionally, as highlighted earlier, the timing of social rhythms can also affect sleep quality, with individuals prone to morningness exhibiting more active lifestyles and regular social rhythms than individuals prone to eveningness.^{80,81}

From a couple's perspective, a partner can serve as an influential source of social control when it comes to health and health-related behaviors, including maintaining an exercise regimen, healthy diet and weight, and adhering to important medical routines. Additionally, although light exposure is considered to be the most powerful zeitgeber for regulating the human sleep-wake cycle, partners may serve as important "social zeitgebers" by regulating critical social rhythms that allow for optimal exposure to the more primary circadian zeitgebers.⁴ For example, partners may encourage engagement in daily activities based on socially prescribed time conventions, including meal times, bedtimes, and wake times. They also likely increase the regularity of the activities one engages in relative to individuals living alone, which is in turn beneficial for sleep.^{80,81} Therefore, healthy relationship functioning may contribute to greater uniformity in the daily sleep and wake routines of dyads, creating a more optimal environment for sleep. In contrast, the social rhythms of distressed couples may serve to disrupt the regularity of exposure to important circadian zeitgebers and thereby interfere with sleep, particularly if partners purposely alter their social rhythms in an effort to avoid one another.^{4,59}

A model for integrating bed partners into cognitive behavioral therapy for insomnia

Although there appear to be some objective costs to sharing a bed with a partner, co-sleeping has the potential to motivate individuals to adhere to relatively consistent daytime and nighttime routines, creating a more conducive environment for sleep. Furthermore, incorporating bed partners into assessment and treatment has shown some promising results for several other sleep disorders, such as obstructive sleep apnea.^{87,88} As such, incorporating bed partners into insomnia treatment may provide for a unique opportunity to capitalize on the partner's ability to promote healthy sleep-related behaviors, and simultaneously ameliorate their potential role in maintaining insomnia.

We considered different ways in which a bed partner might be integrated into CBT-I to further enhance its efficacy. Baucom and colleagues⁸⁹ have offered up various methods of using couple-level interventions to treat individual mental health problems. One class of treatments include "partner-assisted" interventions in which the partner acts as a surrogate therapist or coach in assisting the identified patient with conducting various exercises outside of the therapy office. We consider this method of integrating bed partners to best fit the treatment needs and goals of those with insomnia. The reasoning behind this conceptualization is two-fold. The extant literature suggests that although couple-level variables are important, individual variables seem to be more predictive of insomnia.¹⁶ Moreover, "disorder-specific" couple therapy, in which the treatment focus is the couple and their interactions presumed to maintain individual psychopathology, generally requires both

partners to participate in each session of therapy, and relationship distress is typically presumed. Given practical realities and the relatively circumscribed, but important, role of partners as agents of social control, we think that a partner-assisted approach to the integration of bed partners in insomnia treatment is most appropriate. That said, based on prior research in panic disorder,⁹⁰ if a couple presents with severe relationship distress, a partner-assisted approach may not be sufficient. These couples may benefit from undergoing individual or partner-assisted CBT-I in tandem with the dyad receiving general couple therapy. Below we provide more specific details about integrating a spouse or partner into CBT-I components.

The goal of CBT-I is to directly target variables that perpetuate insomnia, including factors such as spending excessive amounts of time in bed, daytime napping, irregular sleep-wake schedules, excessive concern over sleep loss and rumination about the daytime consequences of poor sleep, and performance anxiety.⁹¹ The first component of treatment consists of a comprehensive assessment of the insomnia (e.g., the nature, course, and severity of the sleep complaint), and providing an overview of the treatment for the patient.⁹¹ The assessment typically includes a clinical interview, as well as the completion of several sleep-related questionnaires and a sleep diary,⁹² which are ideally provided to the patient several weeks prior to the assessment session, so that the results of these measures are available to the clinician during the assessment session to allow for treatment planning. Including a partner in the clinical assessment session could be important for a number of reasons. First, this session could orient both the patient and their partner to the treatment, which could be helpful for increasing treatment adherence. Cognitive and behavioral interventions for insomnia require patients to make several significant lifestyle changes that are likely to not only affect that patient, but their partner as well.¹⁶ Getting support from a significant other could be critical in some cases for the successful implementation of treatment recommendations. Collateral assessment also allows the clinician and client to begin to develop a collaborative case conceptualization related to the insomnia, and to identify whether including the partner in the treatment would be useful for the client. It would be critical to identify whether the client would like to involve their partner in treatment, whether the partner wants to be involved, and the quality of the relationship between the couple. Couples experiencing significant relationship distress and/or partner violence may not be suitable for a partner-assisted approach, and it may be recommended that they receive general couple therapy to address these issues.

Partners should therefore be invited to attend the assessment session with the patient. At the very least, having the partner present for part of the clinical interview could provide the clinician with important information regarding the patient's complaints and an additional perspective on the problem. For example, a patient may arrive complaining of non-restorative sleep, without being aware that they are snoring throughout the night and experiencing short periods of breathing disruption, as is the case in sleep apnea. Therefore, a partner may be able to provide details that are not evident to the client, which could be helpful for the differential diagnosis of various sleep disorders, and provide accuracy and insight into elements of the insomnia that may be outside of the patient's awareness. Suggestions of relationship relevant questions that could be asked during the interview are outlined in Table 1.

If there is increased relationship strain reported in the assessment, in addition to asking patients to monitor their sleep via a sleep log, it may be useful for the patient to monitor the state of their relationship with their partner throughout the two-week assessment period. The partner could also be provided with a means of monitoring relationship distress over the course of this

Table 1
Questions to consider in conducting a clinical interview with the patient's partner.

Sample questions
1. Do you and your partner share the same bed and/or bedroom?
2. Have you noticed your partner snoring, breathing heavily, gasping for air, or grinding their teeth while asleep?
3. Does your partner tend to avoid sexual activity or physical intimacy prior to sleep?
4. How severe do you perceive your partner's sleep difficulties to be?
5. How much do you think your partner's sleep difficulties interfere with their daytime functioning? In what ways do they interfere?
6. Do you consider yourself a morning or night person? Does your preference match-up with that of your partner?
7. How would you describe your partner's use of sleep aids, including medications and substances such as alcohol and marijuana?
8. In your view, what is your partner's level of day-to-day stress? Does it contribute to their sleep difficulties?
9. How would you describe your relationship? Are there any ongoing conflicts?
10. How routine is your partner's daytime and sleep schedule?
11. Is there anything about your partner's sleep or daytime difficulties that you think I should know?

period, in order to provide corroborating evidence. Given the bidirectional relationship between couple distress and insomnia, this information may be germane to the development of an accurate case conceptualization and functional analysis of the patient's insomnia. Furthermore, if relationship distress becomes apparent and is seen to play a role in perpetuating the insomnia, these issues may need to be resolved within the context of therapy, or it may be necessary to refer the couple for additional couple therapy to help them resolve issues that are significant and beyond the scope of this treatment. A summary of ways in which partners may be incorporated into partner-assisted CBT-I is included in Table 2.

Incorporating partners into psychoeducational and behavioral components of treatment

The goal of the psychoeducational component of CBT-I is to provide the patient with proper expectations for sleep and to deliver sleep hygiene instructions, which consist of guidelines for minimizing the influence of various health practices (e.g., diet, exercise, substance use) and environmental conditions (e.g., light, noise, and room temperature) on sleep.⁹¹ Although sleep hygiene is not a supported monotherapy for insomnia,¹⁹ providing patients with this information addresses lifestyle practices that could

interfere with optimal sleep,⁹¹ and partners may be helpful in promoting these lifestyle changes. In addition to being supportive of these changes and encouraging adherence to sleep hygiene guidelines, incorporating the partner into this aspect of treatment allows for the opportunity to explore any potential ways in which the partner may be inadvertently contributing to an environment that is counter-productive to the patient's sleep. For example, a patient who is sensitive to temperature may experience significant difficulty sleeping if their partner routinely decreases the temperature at night. Another benefit of incorporating bed partners into this component of treatment is that it provides an opportunity to address issues related to chronotype mismatch between partners. Given research suggesting that partners' diurnal preferences do not tend to converge over time, it may be necessary to focus on creating acceptance of this difference and facilitate negotiation of strategies for meeting the needs of both partners without them necessarily having the same bed and rise time. As such, including the partner in this component of treatment may allow for problem solving to take place and provide opportunity for partners to discuss issues that may otherwise be avoided due to concerns about possible conflict.

There are also a number of ways in which partners could be incorporated into the behavioral components of treatment. First, partners could be helpful in the implementation of stimulus control instructions. For example, it is common for couples to enjoy reading or watching television together in bed prior to going to sleep.¹⁶ However, as part of stimulus control, performing wakeful activities in bed needs to be discontinued and patients may require some assistance in negotiating compromises with their partner while they are in treatment in order to comply with these requirements. This is particularly important for couples that are mismatched in terms of their circadian rhythms. In these situations, the patient may require some additional assistance in negotiating with their partner in order to follow a schedule that is in line with their own diurnal preference.

It may also be necessary for patients to alter their bedtime routines or even move the television out of the bedroom for a period of time, so having their significant other's support in terms of the treatment plan may be critical to its implementation. Furthermore, as agents of social control, partners may be able to gently remind the patient of stimulus control rules and help them comply with these procedures by encouraging them to get out of bed if they have not fallen asleep within 15 min, or by helping them keep to a routine wakeup time in the morning. Similarly, patients

Table 2
Areas for integrating bed partner into partner-assisted version of CBT-I.

Session	Treatment component	Ways of integrating partner
1	Pre-treatment assessment and treatment overview	<i>Clinical interview:</i> Gather corroborating information <i>Sleep log:</i> Consider questions regarding relationship with partner, and ask partner to monitor patient's sleep/relationship <i>Treatment overview:</i> Include partner in overview of insomnia, establishment of treatment goals, and treatment planning components
2	Psychoeducational and behavioral components	<i>Stimulus control:</i> Role of partner is to help with adherence. Also opportunity to address issues related to circadian mismatch between partners <i>Sleep restriction:</i> Provide support and help with adherence <i>Sleep hygiene:</i> Partner promotes good sleep hygiene, address ways in which partner may be interfering with good sleep hygiene
3	Cognitive components	<i>Sleep preoccupation:</i> Partner avoids colluding with patient's sleep preoccupation, takes attention away from worry regarding poor sleep <i>Safety behaviors:</i> Monitor partner and gently remind to refrain from engaging in sleep-related safety behaviors
4 and onward	Follow-up/troubleshooting	<i>Behavioral experiments/thought records:</i> Partner assists and provides outside perspective Partner assists with identifying high risk situations and relapse prevention plan; helps design methods of promoting adherence following treatment

Note. Adapted from Edinger JD & Carney CE. Overcoming insomnia: A cognitive behavioral therapy approach. Therapist guide. New York, NY: Oxford University Press, USA 2008.

may benefit from the support of their partner during the sleep restriction phase of treatment. Sleep restriction entails limiting the opportunity for sleep to match the average amount of sleep currently produced.¹¹ Limiting the sleep opportunity can be an anxiety-provoking component of treatment for some patients.⁹¹ A partner may be helpful in assisting with sleep restriction if they understand the rationale for this treatment strategy, as they could help the patient stay awake until the prescribed earliest bedtime by engaging in joint activity. Engaging in an enjoyable but non-arousing activity may make this process easier for the patient. The bed partner can also play an instrumental role in supporting the patient when they are attempting to discontinue sleep medication use, should this be a goal in therapy. It would, however, be important to teach partners how to best support the patient (e.g., to refrain from using criticism) during this process, in order to avoid causing further distress for the patient and the couple.

Incorporating bed partners into cognitive components of treatment

There are a number of ways in which partners may assist with the cognitive components of insomnia treatment. Individuals with insomnia tend to be very sleep-focused in their cognitive processing, and research suggests that they hold more unrealistic expectations about their sleep requirements and stronger beliefs about the negative consequences of sleep loss relative to normal sleepers.^{14,93} Key cognitive tools are behavioral experiments that test whether these beliefs are helpful or true, and challenging beliefs directly with in-session Socratic questioning or through thought records.^{91,92}

From a dyadic perspective, it is important for partners to be aware of these cognitive processes, so as to not collude with the patient's misperceptions and attentional preoccupation related to their sleep. For example, it would be helpful for the partner to refrain from asking the patient how their sleep was the morning after a difficult night. Partners could be helpful when patients experience difficulty with challenging beliefs, as they could provide an outside perspective on the validity of these beliefs. Furthermore, partners could be helpful in gently discouraging patients from engaging in sleep-interfering safety behaviors, such as canceling appointments or calling in sick for work following a night of poor sleep.

Practice points

Incorporating bed partners into insomnia treatment may:

1. Provide a unique opportunity to capitalize on the partner's ability to promote healthy sleep-related behaviors and treatment adherence;
2. Ameliorate the partner's role in maintaining the insomnia;
3. Enlist partner in assisting the patient with the challenging cognitive and/or behavioral components of CBT-I.

Conclusion and future directions

Insomnia is generally conceptualized, researched, and treated as an individual phenomenon, despite the fact that the majority of adults share their bed with a partner. Only recently have researchers begun to examine the dyadic nature of sleep, and there

is growing evidence that bed partners can play a significant role in the onset and maintenance of insomnia. Additionally, emerging evidence suggests that bed partners can be powerful agents of social control in terms of promoting adaptive health and sleep-related behaviors, and shared social rhythms between partners can help foster an environment that is conducive to good sleep. As reviewed, there are important interpersonal factors that serve as, or interact with individual, predisposing, precipitating and perpetuating insomnia factors. Based on a synthesis of relevant literatures, a partner-assisted model for integrating bed partners into CBT-I has been offered.

There remain a number of unanswered questions, and it is our hope that researchers take on the challenge of addressing these gaps in the insomnia literature in order to advance this line of research. First, although it is important to recognize the nascent nature of the study of co-sleeping partners, few prospective or longitudinal methodologies have been implemented thus far, which preclude any conclusions from being drawn regarding the causality or direction of the association between relationship functioning and insomnia. Additionally, to our knowledge, studies have investigated these phenomena among heterosexual couples only and without investigation of gender roles. It is unclear as to how these findings would apply to same-sex couples or to individuals with varying gender role adherence. Furthermore, although the phenomenon of bed sharing that includes multiple members, particularly children, has been well documented,^{94,95} the impact of sharing the bed with multiple members has not been investigated within the context of insomnia.

A review of the literature suggests that, whereas objective measures of sleep tend to support poor sleep quality among co-sleepers, subjective measures appear to indicate better quality sleep when a bed partner is present.^{7–9} Similar findings were reported for the influence of sexual involvement prior to sleep, such that sexual contact was found to interfere with objective measures of sleep, whereas subjective assessments of sleep quality were improved by sexual contact, particularly for men.¹⁰ Future research should attempt to discern the discrepancy between subjective and objective assessments of sleep quality as they pertain to co-sleeping and pre-sleep sexual activity. For example, it may be that the need for attachment and intimacy with significant others surpasses our need for uninterrupted sleep. However, this hypothesis remains to be empirically validated.

A model for integrating significant others into CBT-I was presented. Notably, the outlined recommendations have not yet been subject to empirical validation or shown to affect treatment response, and thus warrant future investigation by researchers. Future research should aim to evaluate whether this model or a variation of it does in fact improve treatment outcomes for this already efficacious treatment. Although CBT-I is currently considered the gold standard in terms of insomnia treatment,¹⁹ research suggests that individuals who respond to treatment typically improve by only 50%–60%, and between 19% and 26% of individuals do not respond to this treatment.^{96–98} Therefore, it is important to determine whether incorporating partners into CBT-I may provide the opportunity to improve treatment outcomes among this population. Regardless of partner inclusion in treatment, insomnia assessment and treatment efforts may benefit from integrating questions related to bed partners and relationship functioning into validated assessment measures. Likewise, couple assessments that take place prior to general couple therapy would likely benefit from incorporating validated sleep measures. Given the reciprocal association between relationship functioning and insomnia, asking dyads seeking couple therapy questions related to their sleep may provide an opportunity to incorporate CBT-I strategies into treatment.

Although we offer recommendations about the sessions in which partners might be included in CBT-I, the most efficient role that partners might play in treatment is untested. Additionally, there may be circumstances under which incorporating the bed partner into insomnia treatment may be contraindicated. Research within the context of other chronic health conditions has shown that spousal involvement in treatment is not always helpful,⁹⁹ and thus should be evaluated on a case-by-case basis. As mentioned previously, even for couples interested in partner-assisted CBT-I, it may not be necessary for partners to attend every therapy session. Rather, it may be most critical to include bed partners in the pre-treatment assessment and overview session, as well as the session where behavioral strategies are introduced, and handouts or educational materials may be useful when it is not necessary for the partner to be physically present in treatment. Nonetheless, this model highlights the potential utility of incorporating bed partners into the case formulation process and treatment of individuals with insomnia. By recognizing the implications associated with the social context of the sleep environment, key mechanisms in the etiology and maintenance of insomnia may be revealed and serve to inform effective treatment from a dyadic framework.

Research agenda

In the future, researchers should aim to evaluate the role of bed partners in insomnia by:

1. Conducting prospective or longitudinal investigations of the association between relationship functioning and insomnia in order to determine the direction of this relationship;
2. Determining whether incorporating bed partners into cognitive behavioral therapy for insomnia incrementally improves treatment outcomes;
3. Examining marital satisfaction as a potential mediating and/or moderating variable in treatment outcome;
4. Determining the ideal level of partner involvement in treatment;
5. Identifying which patient characteristics determine the optimal level of treatment (individual versus partner-assisted) that would lead to improved treatment outcomes.

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