



Triggers of Parasomnias - What Sleep Experts Think?

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Abstract

Introduction: Parasomnias are broadly defined as undesirable physical or experimental phenomena that occur during sleep and can result in complex behaviors. A literature review on the factors that can trigger parasomnias yields very limited data. The evidence regarding alcohol as a possible trigger of parasomnia is still ambiguous.

Objectives: The purpose of this study is to evaluate the opinion of large number of experts in sleep medicine field regarding the most common modifier of parasomnia and the role of alcohol specifically as one of these modifiers.

Method: A questionnaire for sleep medicine experts was created to gauge responses to varying questions about parasomnias. The questionnaires were randomly given to experts who attended three international annual conferences in sleep medicine.

Results: A total of 308 randomly selected sleep experts (47% MD, 7% psychologist, 18% technicians, 10% researchers and 18% others) completed the short questionnaire to establish their views about the triggers of parasomnias. The clear majority of sleep experts agree on the factors that cause parasomnia based on their reading and experience. Sleep deprivation, stress, childhood parasomnia, alcohol sleep apnea and Parkinson's Disease were the most common triggers of parasomnia that was chosen by the experts in this study. Conclusion: This study illustrated that the clear majority of sleep experts agreed on the factors that can trigger parasomnias. Alcohol was reported as one of the top listed triggers, however, controlled studies are needed to examine this association.

Keywords: Parasomnias; Arousals; Sleep walking; Polysomnography; Alcohol; Medications

Introduction

Parasomnias are broadly defined as undesirable physical or experimental phenomena that occur during sleep and can result in complex behaviors [1]. Parasomnias can occur throughout one's lifespan beginning in early childhood through to old age [2]. However, different types of parasomnias are more common at different age group. While some parasomnias are very common at certain times of the lifespan and they may be considered "normal" for that specific period of development. Other parasomnias, however, may carry substantial risks to health and well-being. There are indications that parasomnias can be a sign of serious medical conditions, including mental disorders [3].

The International Classification of Sleep Disorders-third edition classifies parasomnia into three major categories: non-rapid eye-movement (NREM) sleep-related parasomnia; rapid eye-movement (REM) sleep-related parasomnia; and other parasomnias [1] (Table1).

Lifetime prevalence of parasomnias in the general population varies between 4% to 67 % [2]. Parasomnias are more common in children than adults, especially non-REM parasomnias. The prevalence of parasomnias in the adult population is estimated to be around 2% to 5% [4]. Violent behavior during sleep has been reported in about 2% of large adolescent and adult populations, with a higher rate in males than females [2].

The pathophysiology of parasomnia remains unclear. The current understanding is based on the counterintuitive concept that sleep and wakefulness are not mutually exclusive states of being. As a person falls asleep and transitions through different stages of sleep, the shift to the sleep stages is not a complete "on and off switch" phenomenon; rather, it involves the transition of various neuronal events for an unequivocal stage to declare itself. It is during this transitional period of

sleep-wake dissociation that an individual can experience an admixture of different states of being. The overlap between these states can result in complex behaviors, such as parasomnia [5].

<p>NREM Sleep –Related Parasomnias</p> <ol style="list-style-type: none"> 1. Disorder of arousal (from NREM sleep) <ul style="list-style-type: none"> • Confusional arousals • Sleepwalking • Sleep terrors 2. Sleep related eating disorder 3. Sleep sex (sexomnia) <p>REM Sleep Related Parasomnia</p> <ul style="list-style-type: none"> • REM sleep behavior disorder • Recurrent isolated sleep paralysis • Nightmare disorder <p>Other parasomnias</p> <ul style="list-style-type: none"> • Exploding head syndrome • Sleep related hallucination • Sleep enuresis • Parasomnia due to medical condition • Parasomnia due to medication or substance • Parasomnia, unspecified

Table 1: Parasomnia classification (ICSD-3)

The diagnosis of parasomnias is usually based on a detailed clinical history that includes the timing, expression, and form of behavior. Complete medical history, a sleep log, and a collateral history from the partner/parent are useful adjunctive information. Polysomnography is thought to be “not necessary” for the diagnosis of most NREM parasomnias, but it is essential if REM behavior disorder is suspected. It is also required if obstructive sleep apnea or epilepsy is suspected [6].

Unfortunately, this approach often results in a misdiagnosis. There are many anecdotal reports where children and their caregivers were told that parasomnia is suspected but there is no detrimental effect of parasomnia. when subsequently conducting a sleep study on such children, other problem has been detected (for example, nocturnal epilepsy) which would not have been diagnosed without a sleep study. Secondly, parasomnias have been thought to be benign (and almost humorous). If one were to reflect on how much that was the case with snoring 20 years ago, one would quickly realize that this is not trivial and merits appropriate attention, investigation, and management. Furthermore, the observation that parasomnia leads to excessive daytime sleepiness in both adults and children [4,7], and leads to deficits in performance bolsters the argument for requiring detailed assessment and management. Referral to a sleep specialist is classically indicated if the patient is potentially harmful or disturbing to others. Sleep specialists’ referral is also required when there is a forensic implication of the parasomnias. However, from the points above, we would argue that more patients merit evaluations than these restrictive criteria indicate, and the advent of home testing with a full EEG recording will facilitate this approach.

A literature review on the factors that can precipitate or predispose parasomnias yields very limited data. Genetic susceptibility is one of the factors that can make parasomnias more likely [8]. Medical conditions, activities, and substances that increase slow wave sleep or that lead to increased arousals can trigger parasomnia [9]. Among well-known factors include sleep deprivation, alcohol, fever, medication, situation stress, and sleep apnea [10]. A list of factors that can trigger parasomnia are shown in Table 2.

Sleep deprivation	Restless leg syndrome RLS	Childhood history of parasomnia
pain	Periodic limb movement disorder PLMD	Family history of parasomnia
Stress	medication	Sleep apnea
Fever, illness	alcohol	Other medical condition (e.g. Parkinson disease)
Noise	Touch	PTSD
Full bladder	Sleeping in unfamiliar places	Shift work

Table 1: Factors that can trigger parasomnia

One of the debated areas in literature currently is the effect of alcohol on NREM parasomnias [11,12]. The debate divides into two groups of experts who have published in this area and who have come to diametrically opposite conclusions. This led to the removal of alcohol as a trigger for parasomnia in the International Classification of Sleep Disorder,

third edition (ICSD-3) [1]. A recent paper published in the Journal of Clinical Sleep Medicine by [12], examined the association between alcohol and parasomnia, and concluded that alcohol can act as a trigger for parasomnia, therefore recommending alcohol to be reintroduced as a trigger for parasomnia in a future edition of the International Classification of Sleep Disorder (ICSD).

The purpose of this study is to evaluate the opinion of the experts in sleep medicine field regarding the most common modifier of parasomnia and the role of alcohol, specifically, as one of these possible modifiers.

Method

A questionnaire for sleep medicine experts was created to gauge responses to varying questions about parasomnias. In the first question, experts were given a list of 27 items of possible triggers of parasomnia and were asked to indicate which items they thought may be a trigger of parasomnia. There were some items that would be widely recognized as triggers, and some items that were “bogus” items. The second and third questions asked to rank in order (1,2,3) the three factors that are most likely to trigger parasomnias. There was the possibility of adding in items beyond the 27 items listed. the forth question addressed the frequency of parasomnias in different age groups. The subsequent question asked if alcohol can trigger parasomnias as well as the relation of alcohol and slow wave sleep with an increased risk of parasomnias.

The questionnaires were randomly distributed to experts from all over the world who attended three international annual conferences in sleep medicine. The first one was Sleep 2017, which was the 31st annual meeting of the Associated Professional Sleep Society LLC (APSS), which is a joint venture of the American Academy of Sleep Medicine (AASM) and the Sleep Research Society (SRC). The second meeting was the Canadian Sleep Society Meeting 2017. The third meeting was the World Sleep Congress 2017 in Prague.

Results

A total of 308 randomly selected sleep experts (47% MD, 7% psychologist, 18% technicians, 10% researchers and 18% others) completed the short questionnaire to establish their views about the triggers of parasomnias.

The six items that resulted in the highest response rate were: Sleep deprivation; sleeping in a strange place; history of childhood parasomnia; stress; alcohol; and apnea (Figure 1).

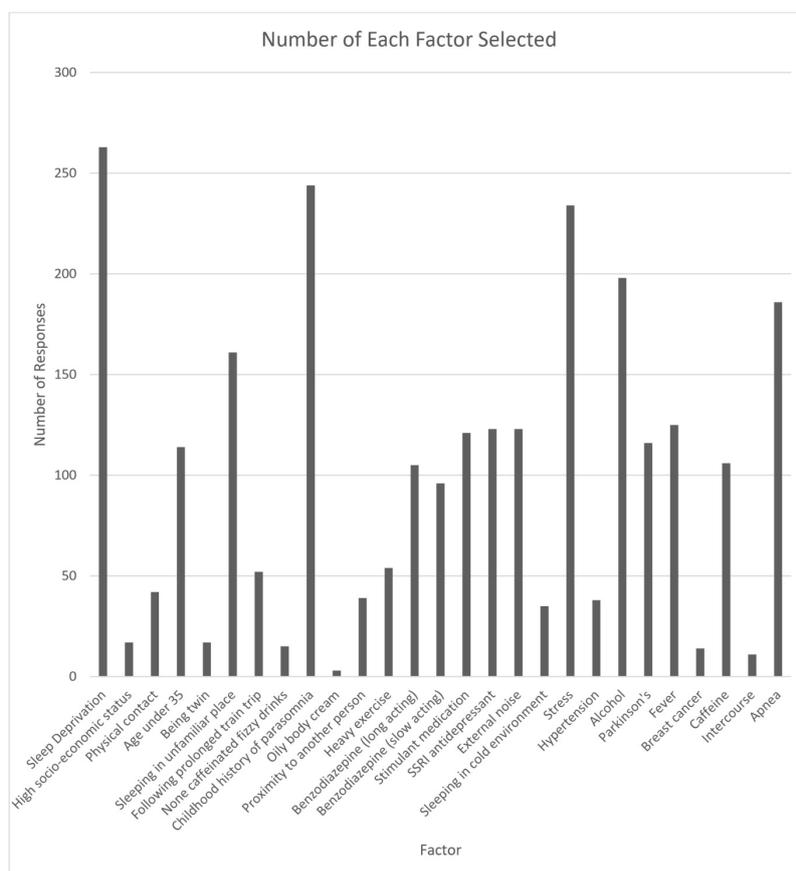


Figure 1: Number of each factor selected

Experts were then asked to rank, in order, the three most potent causes of parasomnia. Using a simple system to evaluate the proportion that listed any item in the top three triggers, the six most commonly ranked items from highest to lowest were: 1) sleep deprivation 2) stress 3) childhood parasomnia 4) alcohol 5) apnea 6) Parkinson’s Disease (Figure 2). The likelihood of having parasomnia was viewed as highest at younger ages, with a steady decline with increasing age. However, there was a slight upward deflection in the 65-80-year-old group (Figure 3). When specifically asked, “Can alcohol trigger parasomnia?” 94% percent answered “yes” and “possibly”, while 6% answered “probably not” and “no” (Figure 4). When specifically asked, “Do you believe you can experience parasomnia when drunk?” 93% said “yes” and 6% said “no,” while 1% omitted answering the question entirely (Figure 5). When asked if alcohol can increase slow wave sleep, there was a 65% vs. 35% split, with the majority responding in the affirmative; of those in the majority, many indicated “only in the 1st half of the night” (Figure 6). Regarding the causes of arousals during sleep which a risk for parasomnias, 98 % thought that alcohol can trigger arousals. Of these, over 45% thought this was “more in the 2nd half of the night” (Figure 7).

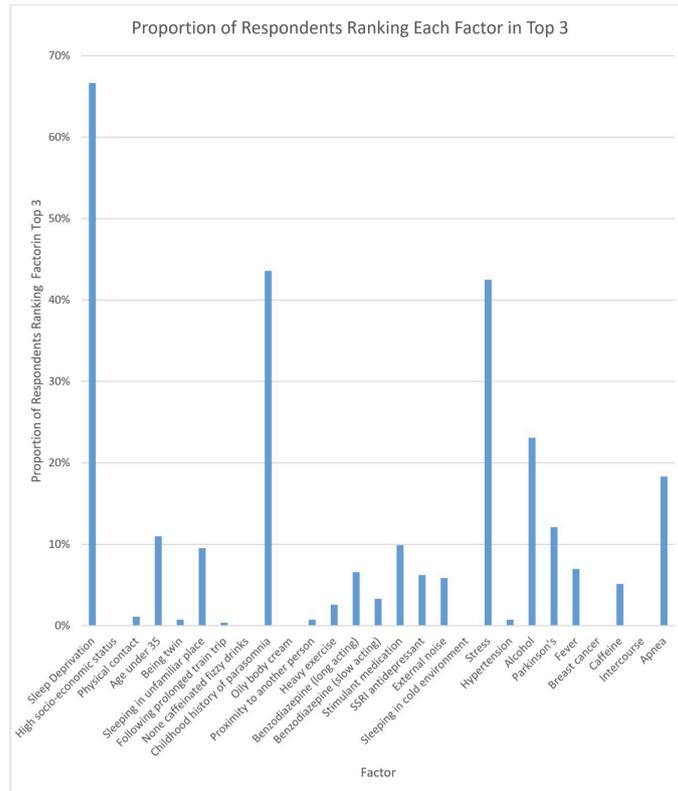


Figure 2: Proportion of respondents ranking each factor in top 3

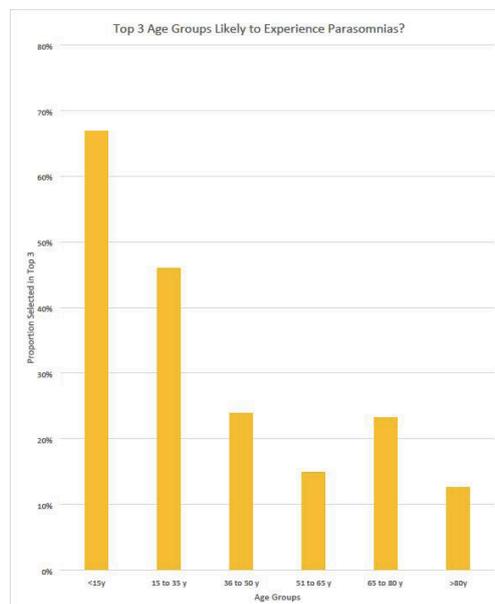


Figure 3: Top 3 Age groups likely to Experience parasomnias?

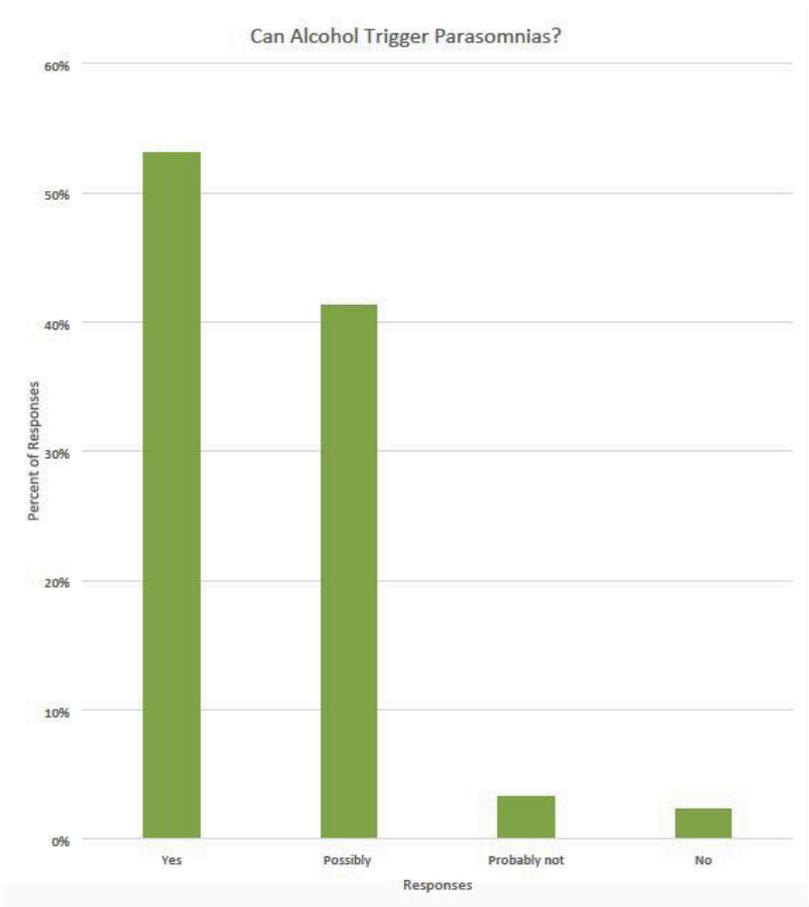


Figure 4: Can alcohol trigger parasomnias?

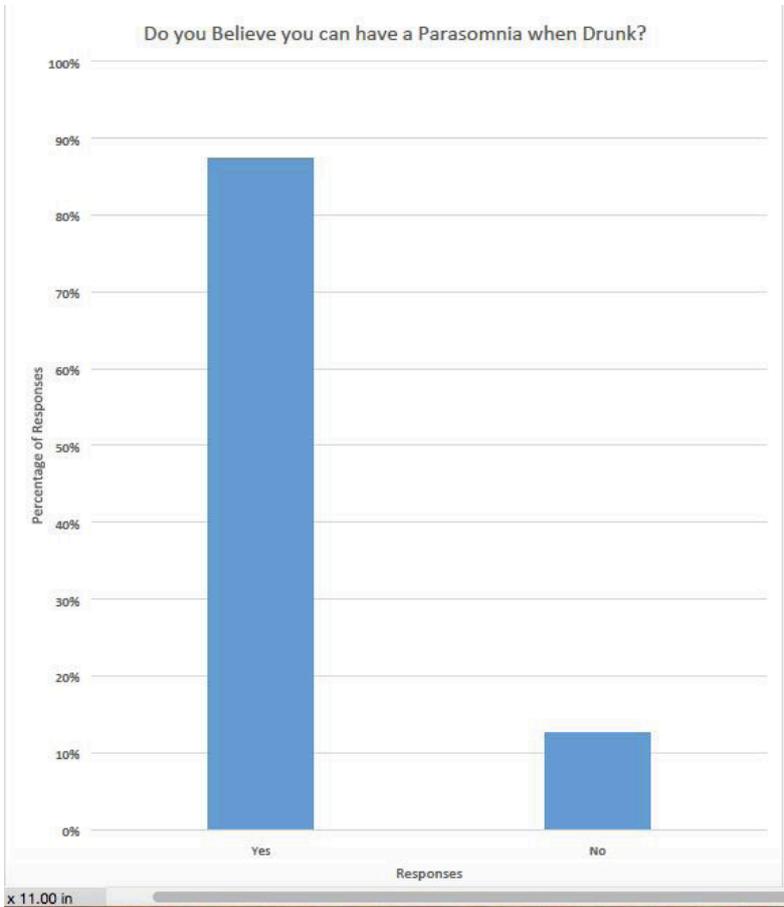


Figure 5: Do you believe you can have a parasomnia when drunk?

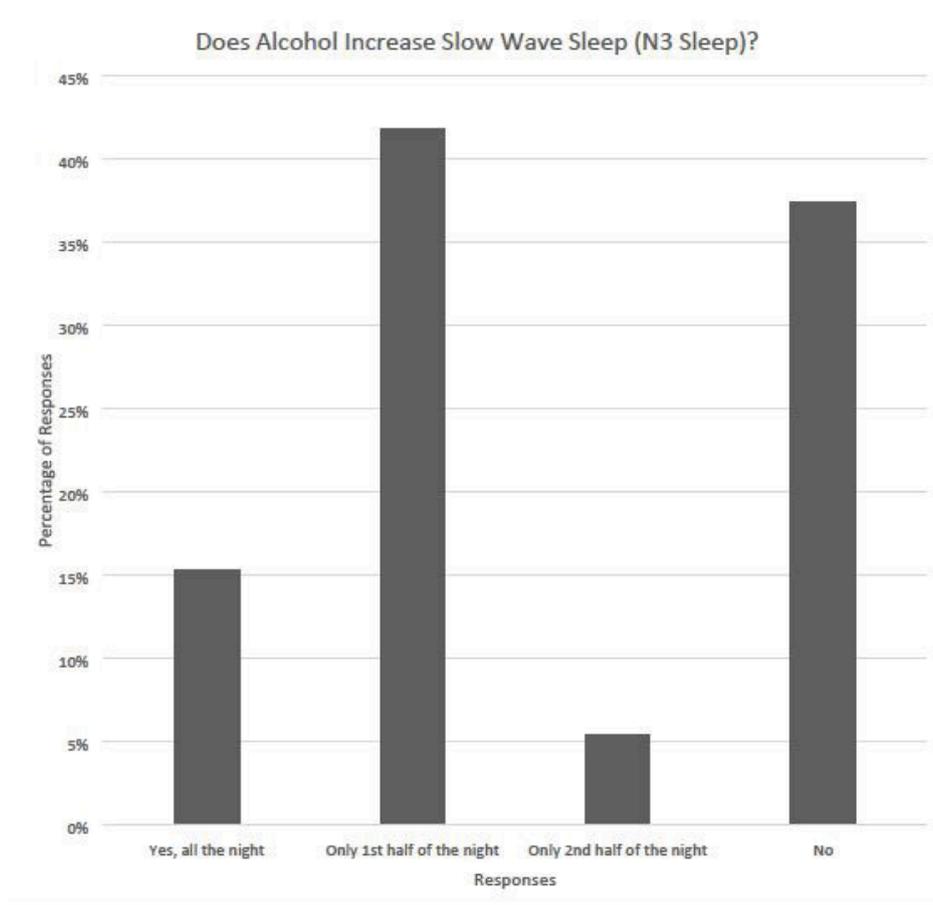


Figure 6: Does alcohol increase slow wave sleep (N3 sleep)?

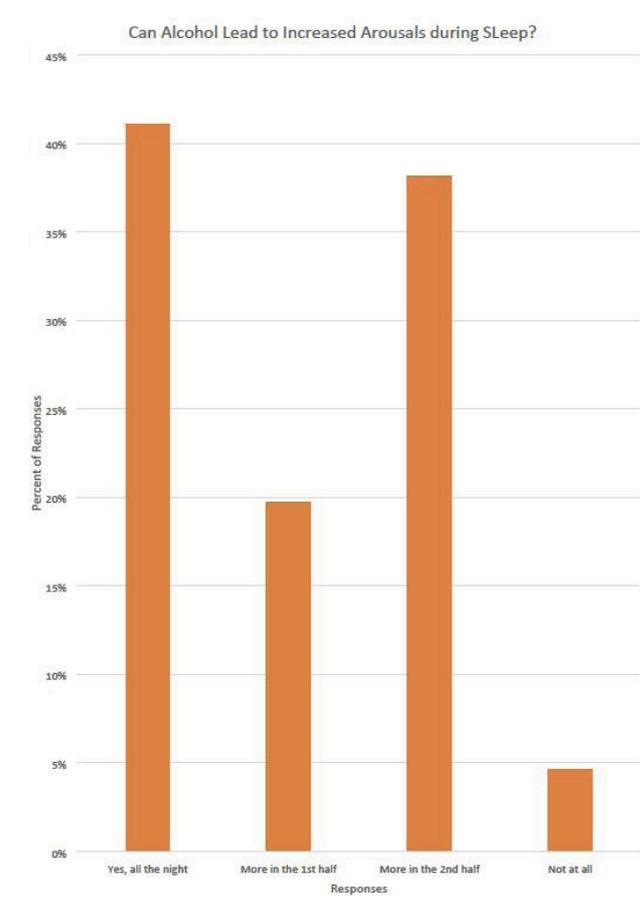


Figure 7: Can alcohol lead to increased arousals during sleep?

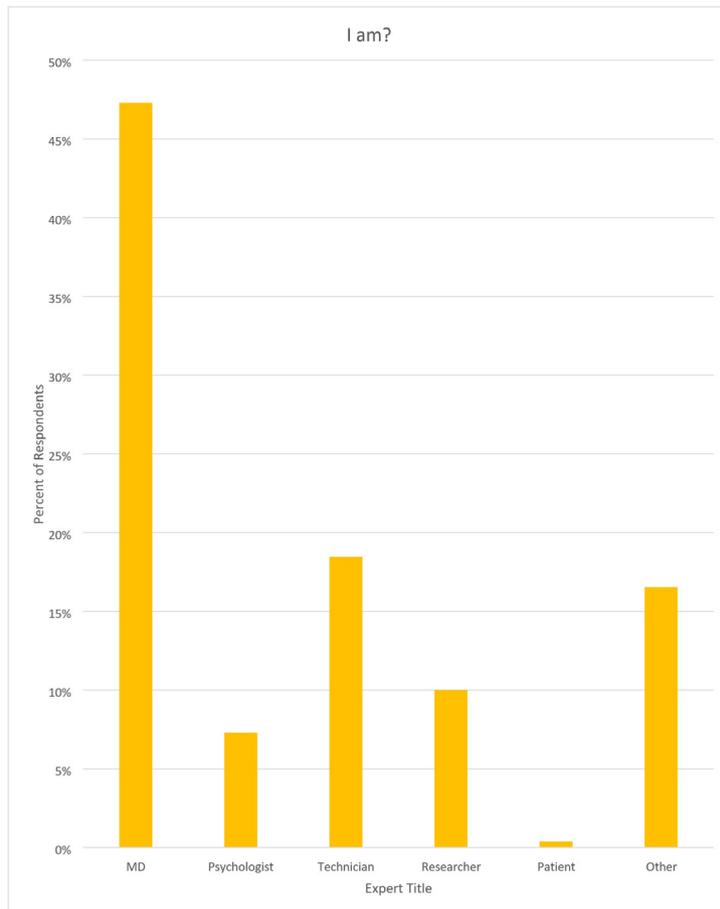


Figure 8: I am?

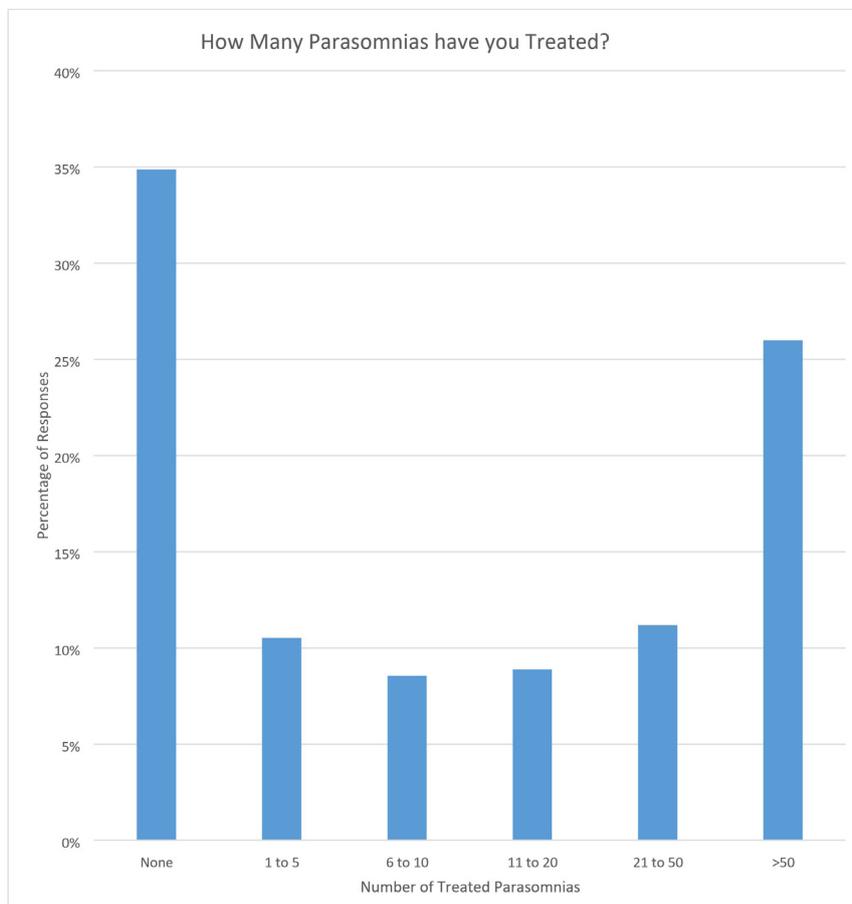


Figure 9: How many parasomnias have you treated?

Discussion

It is clear that the majority of sleep experts agree on the factors that cause parasomnia based on their reading and experience. Sleep deprivation, stress, childhood parasomnia, alcohol sleep apnea and Parkinson's Disease were the most common triggers chosen by the experts in this study. The majority of sleep expert also believe that alcohol consumption increase risk of parasomnia by increasing slow wave sleep and increasing arousals.

In the forensic area, a very small number of individuals who previously believed, and had published to that effect, that alcohol is one such trigger has reversed their opinions and suggested that this was an "urban legend". Another reason for this change in view is due to "societal acceptance", implying that they could not "condone" the use of parasomnia as a defense if there was alcohol involved. This very small group of individuals have used their positions on committees drawing up guidelines to promulgate their view regarding alcohol and parasomnia. In our opinion, this has left the field supposedly following a downward path of "junk science", supported by selective review of literature by those with relatively little scientific credibility and contrary to large formal epidemiological studies [4].

This issue going credence when one has the clinical experience of a twenty-year-old female student who states that "the only time I walk in my sleep is if I have had alcohol in the evening". Given that parasomnias are an occasional experience-and may not be recalled each time it occurs-it is hypothetically plausible that a person who drinks heavily twice a month and has a parasomnia episode on half of their occasion i.e., 12 times a year, but on non-drinking nights also has a parasomnia twice per month, will not recognize the link of their parasomnia to their alcohol consumption. Roughly the rate of parasomnia are 12/24 drinking nights (i.e., 50%) versus 24/(365-24) i.e., 341 nights (i.e., 3.4%). The simple difference in proportionality is telling that the patient may simply view the fact that more episodes occur without alcohol and therefore does not recognize the trigger.

Conclusion

Parasomnias are the result of an often-complex set of interacting factors in individuals who are genetically susceptible to them. This study illustrated that the clear majority of sleep experts from all over the world agreed on the factors that can trigger parasomnias. Alcohol was reported as one of the top listed triggers of parasomnia by majority of sleep medicine experts. Controlled studies are further needed to examine the association between alcohol and parasomnia.

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