ORIGINAL RESEARCH

Sleep Paralysis: Prevalence in Indian College Students, Locus of Control and Susceptibility to Stress

Aliza Reshi

Received on: 25 March 2023; *Accepted on:* 25 April 2023; *Published on:* 15 July 2023

Abstract

Sleep paralysis (SP) is a sleep disorder characterized by a waking state and an inability to move (paralysis) occurring suddenly during sleep. Although the prevalence rate in the general population is usually around 7.6%, it is elevated in the college student population to around 28.3%. Furthermore, research has linked the experience of SP episodes to the cultural background and paranormal beliefs of an individual.

Aims: The present study hence aims to determine: (1) the prevalence of SP in the Indian college population, (2) the relationship between the locus of control (LOC) of an individual with the frequency and intensity of SP episodes based on a hypothesized pathway of an individual experiencing less fear with an increased sense of control, and (3) the relationship between proneness to stress of an individual and the experience of SP episodes. The study also incorporates an exploratory analysis to investigate relationships between the proneness of stress, LOC and the experience of SP including intensity and frequency of the first episode, and of the latest episode.

Materials and methods: An online survey method is used with voluntary response sampling. A total of 150 participants responded to the survey, measuring SP experience, intensity and frequency, LOC, and proneness to stress.

Results: No significant differences were found in the intensity and frequency of SP episodes among the three LOCs (external chance, external powerful others, and internal), or in people with high proneness to stress and in people with low proneness to stress. A significant relationship was found between the external LOC and the presence of the intruder hallucination, and between the fear intensity of the first episode and the number of lifetime episodes.

Conclusion: The experience of SP is not related to LOCs, but the frequency of episodes is related to the fear felt during the first episode.

Clinical significance: Sleep paralysis interventions can target fear associated with SP to bring down the frequency of episodes.

Keywords: Indian college students, Locus of control, Sleep paralysis, Stress proneness, Stress susceptibility.

Indian Journal of Sleep Medicine (2023): 10.5005/jp-journals-10069-0111

Introduction

Sleep paralysis (SP) is defined as a period during which voluntary muscle movements are inhibited, while the perception of the immediate environment becomes clear; ocular and respiratory movements are not altered.[1] Hallucinations are frequently present alongside these episodes in three different forms: Intruder hallucinations – sensing an evil presence, incubus hallucinations – feeling pressure on the chest, and finally vestibular-motor (V-M) hallucinations – feeling illusory movements.[2] Sleep paralysis episodes are commonly associated with extreme fear, arising from reactions to atonia and also to the hallucinatory content.[3] Literature refers to episodes of SP that present without any comorbid sleep disorders as isolated SP. The term recurrent isolated SP is used to refer to episodes that occur repeatedly. However, there is no consensus on how often the episodes need to occur for this term to be used, yet.[4,5]

The reports of prevalence rates for SP greatly vary across literature, ranging from 2 to 60%.[6] This is widely attributed to two factors including the lack of a "gold standard" measure, and the lack of precise terminology for self-reporting, which affects reporting rates.[4,6] Nevertheless, a systematic review revealed that the prevalence of SP in the general population is 7.6%, and is highly elevated in the college student population with the rate being 28.3%.[4]

Sleep Paralysis and Locus of Control

Locus of control (LOC) was a construct first defined by Julian Rotter as a part of the social learning theory.[7] It refers to an individual's expectations or beliefs about what controls events in their lives. This could be either the belief of these events are controlled by their own behavior and abilities (internal LOC), or by external forces, such as powerful others, chance, fate, or luck (External LOC). Studies have continually shown that SP is common in certain cultures, ethnicities, and populations.[8] Beliefs have been found to be correlated to the frequency and intensity of SP.[9,10]

Although no studies have yet investigated directly the relationship between SP episodes and LOC, the relationship between sleep and LOC has been briefly researched. Research has suggested that difficult or unpredictable situations tend an individual toward both an external LOC and less sleep in general.[11] A study demonstrated that although sleep did not linearly correlate to LOC orientation, a quadratic effect was observed between sleep loss and an external LOC. Individuals experiencing sleep loss exhibit

Department of Psychology, Christ University, Bengaluru, Karnataka, India

Corresponding Author: Aliza Reshi, Department of Psychology, Christ University, Bengaluru, Karnataka, India, Phone: +918217791583, e-mail: aliza25reshi@gmail.com

How to cite this article: Reshi A. Sleep Paralysis: Prevalence in Indian College Students, Locus of Control and Susceptibility to Stress. Indian J Sleep Med 2023;18(1):7–10.

Source of support: Nil

Conflict of interest: None

an external LOC, but as sleep time increases so does a tendency toward an internal LOC.[12]

Sleep Paralysis and Proneness to Stress

Associations have been established between life stress and the intensity of SP episodes.[9] A study that correlated life stress, determined from the Perceived Stress Scale found that SPSS frequency is associated with higher scores indicating greater stress on the scale. However, the direction of the association was not established.[10] However, no studies have investigated the relationship between "proneness" to stress and the frequency or intensity of SP episodes.

Present Study

The present study had four aims. The first aim was to determine the prevalence of recurrent SP in the Indian college population. The expected prevalence rate is around 28.3% based on previous research on college students from different countries. It further aims to determine whether the LOC of an individual affects the experience of SP episodes. The study investigates whether there exist differences between the frequency and intensity of fear in SP episodes in individuals with different LOCs, and with the levels of proneness to stress in the individual. Furthermore, an exploratory design was adopted to investigate any correlations between the variables.

The first null hypothesis was that there would be no significant differences in the frequency of SP episodes, in a lifetime, and in the past year and in the intensity of fear experienced in the first and latest episode for people who have different LOCs (external chance, external powerful others, and internal).

The second null hypothesis was that there would be no significant differences in the frequency of SP episodes, in a lifetime, and in the past year and in the intensity of fear experienced in the first and latest episode for people who have high proneness to stress and people who have low proneness to stress.

The third null hypothesis was that no significant relationships were expected between different LOCs and experiences of SP episodes (Intensity and frequency). No significant relationships are expected between the level of proneness to stress and between the frequency and intensity.

Materials and Methods

Participants

The participants consisted of 150 college students in the age range of 18–25. The data were used to determine the prevalence of SP. Out of the 150 participants, 42 participants were identified who had experienced more than 1 episode of SP, and their data were used in the second part of the data analysis. The exclusion criteria were any comorbid sleep disorder diagnosis.

Measures

Sleep Paralysis Questionnaire

The measure is adapted from a questionnaire used by Rauf,[13] and is a self-reporting tool for an SP experience. The measure explains an episode of SP and then asks the participants if they have experienced the same:

"Sleep paralysis is an experience that can occur in some people as they fall asleep or when they wake up. Sleep paralysis can involve feeling physically paralyzed (unable to move), perhaps as if a weight is on one's chest, and may also involve auditory, visual, or other hallucinations. It is not a nightmare, because people are aware of being awake when it is happening. Have you ever experienced "sleep paralysis"?

If the participant responds with a 'Yes, further questions on the nature of the experiences and the type of hallucinations experienced will be provided, including a 10-point Likert to measure fear, from 1 being pleasant to 10 being extremely frightening. The number of episodes in a lifetime, in the previous year and the fear intensity of the first episode and the latest episode are recorded. The type of hallucination is determined by reporting aspects of hallucinations present.

Levenson's Multidimensional Locus of Control Scale

The scale is a 24-item measure of the LOC and it measures the construct as multidimensional. It is divided into three subscales with eight items each, measuring the internal LOC, external LOC, and finally, the "powerful others" dimension of the external LOC, respectively. The scale has good reliability scores, ranging between 0.60 and mid-0.70.

Stress Questionnaire (ISMA, 2013)

The scale gives an overview of the susceptibility of subjects to stress and is a 25-item scale with dichotomous responses (yes/no).

Procedure

A cumulative questionnaire with all the scales was sent online to the participants. The scales were preceded by an informed consent which explained the study to the participants and informed them of their right to withdraw, and their right to confidentiality. Demographics were then collected. Participants had to answer an initial question about ever experiencing SP. If the participants responded with a yes, the other scales were administered automatically on Google Forms. A voluntary response sampling method was used.

Variables

Independent Variables

The LOC of an individual was the first independent variable, and the proneness to stress was the second independent variable.

Dependent Variables

The dependent variables were the intensity and frequency of SP episodes, both rated on a scale of 10.

Ethical Clearance and Considerations

Institutional review board (IRB) guidelines were followed. The scales were open for public use. Informed consent was obtained from all the participants, which informed them about their right to withdraw at any time, and their right to confidentiality. Data collected on Google Forms were password protected to maintain confidentiality. It was not necessary for the participants to provide an e-mail address to maintain anonymity. All names were converted to initials to remove identifiers from the data.

Data Analyses

Jamovi version 2.2.5 was used for the statistical analysis of the data collected. After determining the data descriptives, tests of normality (Shapiro–Wilk) and homogeneity (Levene's test) were conducted. The nonparametric equivalent of ANOVA, the Kruskal–Wallis test was conducted on the data. A pairwise comparison was also conducted on the data. Prevalence was calculated by determining the percentage of the sample that was reported of having SP.

Table 1: Descriptive data

	Episodes in lifetime	*Fear intensity (first experience)*	*Pleasant/unpleasant (first)*	*Fear intensity (latest)*	*Pleasant/unpleasant (latest)*	*Proneness to stress*
N	42	42	42	42	42	42
Missing	1	0	0	1	1	1
Mean	7.57	8.40	8.60	6.64	7.50	16.5
Median	3.00	9	9	6.50	8.50	16.0
Standard deviation	12.7	2.10	1.45	2.47	2.21	3.08
Minimum	1	2	5	2	4	12
Maximum	50	10	10	10	10	24

Table 2: Normality tests (Shapiro–Wilk)

	W	*p*
Proneness to stress	0.855	0.026
Episodes in lifetime	0.652	<0.001
Fear intensity (first experience)	0.849	0.017
Pleasant/unpleasant (first)	0.955	0.605
Fear intensity (latest)	0.955	0.635
Pleasant/unpleasant (latest)	0.938	0.395

Table 3: Homogeneity of variances test (Levene's)

	F	*df1*	*df2*	*p*
Proneness to stress	3.20	2	11	0.080
Episodes in lifetime	1.64	2	11	0.238
Fear intensity (first experience)	2.93	2	12	0.092
Pleasant/unpleasant (first)	7.74	2	12	0.007
Fear intensity (latest)	2.86	2	11	0.100
Pleasant/unpleasant (latest)	5.72	2	11	0.020

Results

The group descriptives are given in Table 1. Results from the tests of normality and homogeneity of variance are given in Tables 2 and 3, respectively. Assumptions of normality were not met for proneness to stress, episodes in a lifetime, episodes in the previous year, and fear intensity of the first episode.

The assumption of homogeneity of variance was not met by episodes in lifetime, pleasant/unpleasant (first episode), pleasant/unpleasant (latest).

Nonparametric ANOVA showed there were no significant differences in the three groups of LOC (external powerful others, external chance, and internal LOC) intensity of fear and unpleasantness, episode frequency, and proneness to stress.

Exploratory correlation analysis was also done to explore any relationships between the variables. A significant positive relationship was also found between the number of episodes in a lifetime and the fear intensity of the first episode, with $R = 0.597$, $p = 0.019$.

The prevalence was 42/150*100 = 28%.

Discussion

The prevalence of SP was found to be 28%, which is very close to the prevalence generally reported in the college student population.[5] The experience of SP has been linked previously to the types of beliefs an individual holds, with paranormal beliefs being significantly linked to SP. The present study aimed to determine whether the general mechanism of belief formation may also be related to SP, in its experience. According to the study by Drinkwater and colleagues,[13] a relationship might be expected between an external LOC (by chance or powerful others) and SP, as paranormal beliefs are clubbed under these LOCs. However, the current study showed no relationship existed between the type of LOC of an individual and the aspects of SP. This may indicate that the mechanism by which paranormal beliefs of an individual relate to the experience of SP might operate from a more specific or narrow pathway, rather than the more general pathway of belief formation. Future research must focus on further exploring the mechanism of the relationship between paranormal cognitions and the experience of SP.

No significant relationships were observed between proneness to stress and aspects of SP either. Previous research has linked the frequency and intensity of SP with lifetime stressors, traumatic events, and levels of stress in general.[14] The direction of the level of stress and SP has not been established yet in literature, which means the levels of stress may cause an individual to be more vulnerable to the experience of SP or the experience of SP may make an individual to become more stressed out as the experience of SP can be frightful, anxiety-inducing and may also disrupt sleep in individuals. The present study shows that individuals with high susceptibility to stress do not significantly differ in the frequency or intensity of SP episodes than the individuals who have a lower susceptibility. This might indicate that stress Precedes the increase in SP episodes. However, this requires further research and is a future direction.

A significant relationship was revealed by the exploratory analysis between the number of episodes in a lifetime and the fear intensity of the first episode. Drawing conclusions from this relationship is speculative, but the relationship might indicate that a fearful first experience of a SP episode predisposes an individual to experience a higher frequency of SP episodes. This might be linked to experiencing higher anxiety related to having SP, further making the individual susceptible to having more experiences of SP. Previous research has linked anxiety to more SP as well.[14]

The study does have its limitations which include a smaller sample size, essentially for the correlation analysis. The exploratory analysis part of the analysis will benefit from a larger sample size. The prevalence rates include students from both bachelor's courses, as well as master's courses which may have differing schedules and different lifestyles of the students. The occurrence of SP might also differ according to more stress-inducing courses. Future research might look into differing prevalence in more stress-inducing courses. A lack of a gold standard measure for SP also persists. A more comprehensive questionnaire is required that lists out diagnostic criteria for SP based on the DSM-V.

Conclusion

In conclusion, the prevalence of SP in Indian college students (28%) is similar to the global prevalence rates observed in college students. The experience of SP, although related to the types of beliefs held by an individual, is not related to a more general outlook on life, or the more general belief system held by an individual. Proneness to stress is also not related to either the frequency or the intensity of SP episodes. A more fearful first experience is also positively related to a higher frequency of SP episodes.

Clinical Significance

The current study shows that SP does not relate to paranormal beliefs through a mechanism of perceived control of an individual. This may indicate that this mechanism may operate from a more specific or narrow pathway, rather than the more general pathway of belief formation.

The present study also shows that individuals with high susceptibility to stress do not significantly differ in their frequency or intensity of SP episodes than individuals who have a lower susceptibility, hence, establishing a direction of the previously established relationship between stress and SP, with stress preceding SP episodes.

Finally, the moderate positive relationship between the perceived fear felt in the first episode and the frequency might be used in developing interventions for SP.

References

1. Sateia MJ. International classification of sleep disorders – third edition: highlights and modifications. Chest 2014;146(5):1387–1394. DOI: 10.1378/chest.14-0970.
2. Cheyne JA, Rueffer SD, Newby-Clark IR. Hypnagogic and hypnopompic hallucinations during sleep paralysis: neurological and cultural construction of the night-mare. Consciousness and Cognition 1999;8(3):319–337. DOI: 10.1006/ccog.1999.0404.
3. Cheyne JA. Sleep paralysis and the structure of waking-nightmare hallucinations. Dreaming 2006;16(1):1–10. DOI: 10.1023/A:1025373412722.
4. Sharpless BA, Barber JP. Lifetime prevalence rates of sleep paralysis: a systematic review. Sleep Med Rev. 2011;15(5):311–315. DOI: 10.1016/j.smrv.2011.01.007.
5. O'Hanlon J, Murphy M, Di Blasi Z. Experiences of sleep paralysis in a sample of Irish university students. Irish J Medi Sci 2011;180(4):917–919. DOI: 10.1007/s11845-011-0732-2.
6. Sharpless BA, Doghramji K. Sleep paralysis: historical, psychological, and medical perspectives. Oxford University Press. New York, 2015. DOI: 10.1093/med/9780199313808.001.0001.
7. Rotter JB. Generalized expectancies for internal versus external control of reinforcement. Psychological monographs: Gen Appl 1966;80(1):1–28. DOI: 10.1037/h0092976.
8. Jalal B, Hinton DE. Rates and characteristics of sleep paralysis in the general population of Denmark and Egypt. Culture, Medicine, and Psychiatry 2013;37(3):534–548. DOI: 10.1007/s11013-013-9327-x.
9. Spanos NP, McNulty SA, duBreuil SC. The frequency and correlates of sleep paralysis in a university sample. J Res Personality. 1995;29(3):285–305. DOI:10.1006/jrpe.1995.1017.
10. Denis D, Poerio GL. Terror and bliss? Commonalities and dissociations between sleep paralysis, lucid dreaming, and their associations with waking life experiences. J Sleep Res 2016;25(2):222–230. DOI: 10.1111/jsr.12441.
11. Figueredo AJ, Vásquez G, Brumbach BH, et al. Consilience and life history theory: from genes to brain to reproductive strategy. Dev Rev 2006;26(2):243–275. DOI: 10.1016/j.dr.2006.02.002.
12. Rucas SL, Miller BD. The relationship between sleep and locus of control: A meta-analytic review. Personality and Individual Differences. 2013;55(8):917–922. DOI: 10.1016/j.smrv.2021.101514.
13. Rauf B, Rotem Perach, Sánchez-Romera JF, et al. "The associations between paranormal beliefs and sleep variables." Personality and Individual Differences. 2023;55(8):917–922. DOI: 10.1111/jsr.13810.
14. Denis D, Poerio GL, Wangyal T, et al. The neuroscience of lucid dreaming. Neurosci Biobehav Rev 2018;100:305–323. DOI: 10.1016/j.neubiorev.2019.03.008.