



PREVALENCE AND CAUSE OF SLEEP PARALYSIS MORE AMONG 22-25YRS AGE GROUP FEMALE MEDICAL STUDENTS: AN EVIDENCE-BASED SURVEY STUDY

Sruthi Krishna¹, Devi Amritha. S.S², Suman Sankar. A. S¹, Athith Sesha K V³,
Sibin R.A⁴

1. Assistant Professor, Department of Homoeopathic Repertory and Case Taking, Sarada Krishna Homoeopathic Medical College, (Affiliated to The Tamil Nadu Dr M.G.R.Medical University, Chennai) Tamil Nadu 629161, India.

2. Medical officer, Amritha Clinic, Registration no:15023, Saranya, Sarada Manthiram, Vishwambaram Road, Pappanamcode, Thiruvananthapuram 695018, India

3. Professor, Department of Homoeopathic Repertory and Case Taking, Sarada Krishna Homoeopathic Medical College, (Affiliated to The Tamil Nadu Dr M.G.R.Medical University, Chennai) Tamil Nadu 629161, India.

3. Intern, Sarada Krishna Homoeopathic Medical College, (Affiliated to The Tamil Nadu Dr M.G.R.Medical University, Chennai) Tamil Nadu 629161, India.

4. Assistant Professor, Department of Organon of Medicine and Homoeopathic Philosophy, Sarada Krishna Homoeopathic Medical College, (Affiliated to The Tamil Nadu Dr M.G.R.Medical University, Chennai) Tamil Nadu 629161, India.

ABSTRACT

Background: Sleep paralysis (SP) is a condition characterized by temporary paralysis upon falling asleep or waking up. This study explores the prevalence, characteristics, and psychological features of SP among medical students in India. Objectives: To identify characteristic features of SP, determine the most affected age group and gender, and investigate potential underlying causes. Methods: A survey was conducted among undergraduate and postgraduate students of Sarada Krishna Homoeopathic Medical College using a 30-question questionnaire distributed via Google Forms. A total of 130 responses were collected and analysed. Results: The most affected age group was 22-25 years (55.4%). Females reported higher prevalence (85.4%) compared to males (13.8%). Key symptoms included muscle atonia, hallucinations, and chest pressure. Conclusion: The study provides insights into the prevalence and characteristics of SP among medical students in India, highlighting the need for further research on the condition's underlying causes.

KEYWORDS

Sleep paralysis, Prevalence, Hallucinations.

INTRODUCTION

Sleep paralysis (SP) is a condition where individuals, upon falling asleep or waking up, experience an inability to move, speak, or react. This transient episode is often accompanied by a sensation of an evil presence or threat (1,2). SP primarily affects young adults, with a significant prevalence among students and psychiatric patients (3,4). SP is a psychobiological phenomenon linked to desynchrony in REM sleep, affecting approximately 7.6% of the general population (5). This study aims to assess the prevalence of SP in India, especially among students, and to explore associated psychological and lifestyle factors. The study objectives are to identify characteristic features of SP and associated psychological features, determine the age group and gender most commonly affected, and investigate potential underlying causes. Symptoms of SP include temporary paralysis of voluntary muscles, muscle atonia, hallucinations, and rare symptoms like breathing difficulties or chest pressure (6,7). Causes can be physical fatigue, lack of sleep, mental stress, certain medications, and preexisting sleep disorders (8,9). Pathophysiologically, SP is linked to reduced respiratory muscle activity during REM sleep, resulting in irregular breathing, skeletal muscle hypotonia, and hypercapnia (10,11). Hypervigilance during REM sleep contributes to the fear and paranoia experienced during SP episodes (12). Episodes typically occur before sleeping or upon waking, often preceded by stressful events (13). Physical examination during SP reveals REM sleep characteristics like rapid eye movement, muscle atonia, and increased heart rate (14). This study reviews the causes, symptoms, and the need for further research into SP's prevalence in India, particularly among medical students (15).

MATERIALS AND METHODS

The survey was conducted among undergraduate and postgraduate students of Sarada Krishna Homoeopathic Medical College using a Google Forms questionnaire. A sample size of 130 cases was selected through purposive sampling. A 30-question questionnaire was distributed among the students, and the data collected was statistically analysed. The study included both sexes, within the age group of 18 to 32 years, and excluded individuals above 35 years and those with severe systemic illnesses. The study design was a survey carried out at Sarada Krishna Homoeopathic Medical College and Hospital.

QUESTIONNAIRE

1. What is your age group?
2. What is your gender?
3. What is your BMI category?
4. How many hours do you typically sleep?
5. Have you ever faced any form of abuse?
6. Which hobbies do you prefer?
7. Are you a day scholar or hosteler?
8. Whether you feel homesickness?
9. What type of diet do you prefer?
10. Are you conscious during sleep?
11. Do you feel that you can't move during sleep?
12. Whether you have night fear during sleep or in between sleep?
13. Whether you feel any evil or spirit or dark image near you while sleeping?
14. Do you feel any presence while sleeping?

15. Do you experience chest pressure during sleep?
16. Do you experience auditory hallucinations during sleep?
17. Do you feel that someone is holding your body tightly during sleep or in between sleep?
18. Do you experience speech loss during sleep?
19. Do you feel like you are floating during sleep?
20. Do you experience anxiety during sleep?
21. Do you feel anxious during daytime?
22. Do you prefer light/dim light in your room during night or sleep?
23. Are you a daydreamer?
24. Are you prompt to follow your sleep routine?
25. Whether you feel any mental stress?
26. Which position do you prefer for sleep?
27. Are you a night watcher?
28. Are you taking any anti-depressant medicines?

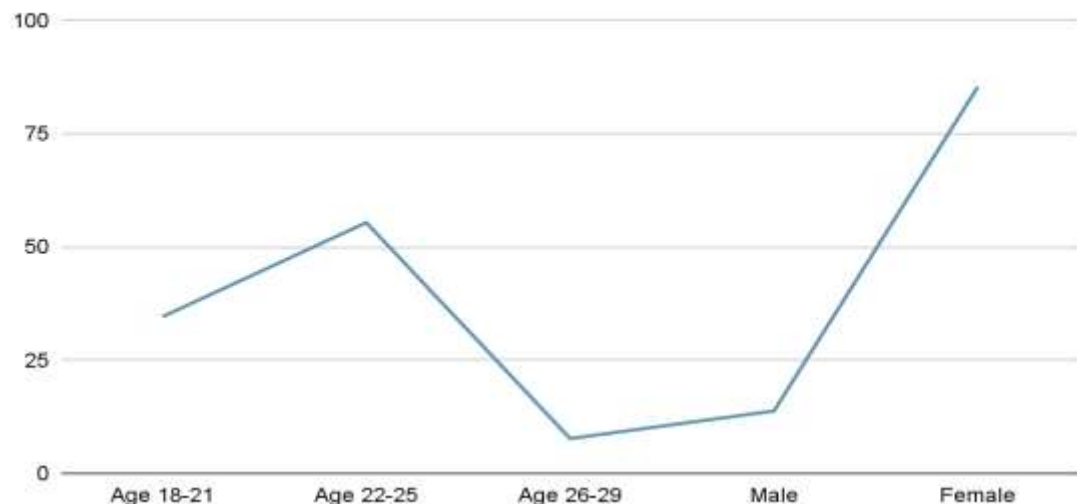


OBSERVATION	Category	Frequency	Percent	Valid Percent	Cumulative Percent
Age Group					
	18-21	45	34.6	34.6	34.6
	22-25	72	55.4	55.4	90.0
	26-29	10	7.7	7.7	97.7
	30-32	3	2.3	2.3	100.0
Gender					
	Male	18	13.8	13.8	13.8
	Female	111	85.4	85.4	99.2
	Others	1	0.8	0.8	100.0
Body Mass Index (BMI)					
	Below 18.5	13	10.0	10.0	10.0
	18.5 - 24.9	95	73.1	73.1	83.1
	25 - 29.9	17	13.1	13.1	96.2
	30 and above	5	3.8	3.8	100.0
Hours of Sleep					
	0	1	0.8	0.8	0.8
	7-9 Hours	3	2.3	2.3	3.1
	6 - 7 Hours	33	25.4	25.4	28.5
	5 - 6 Hours	61	46.9	46.9	75.4
	Below 5 Hours	32	24.6	24.6	100.0
Abuse Experienced					
	Yes	14	10.8	10.8	10.8
	No	116	89.2	89.2	100.0
Preferred Hobbies					
	Arts	19	14.6	14.6	14.6
	Arts, sports	5	3.8	3.8	18.5
	Arts, sports, watching TV, Using Phone or internet	1	0.8	0.8	19.2
	Arts, Using Phone or internet	12	9.2	9.2	28.5

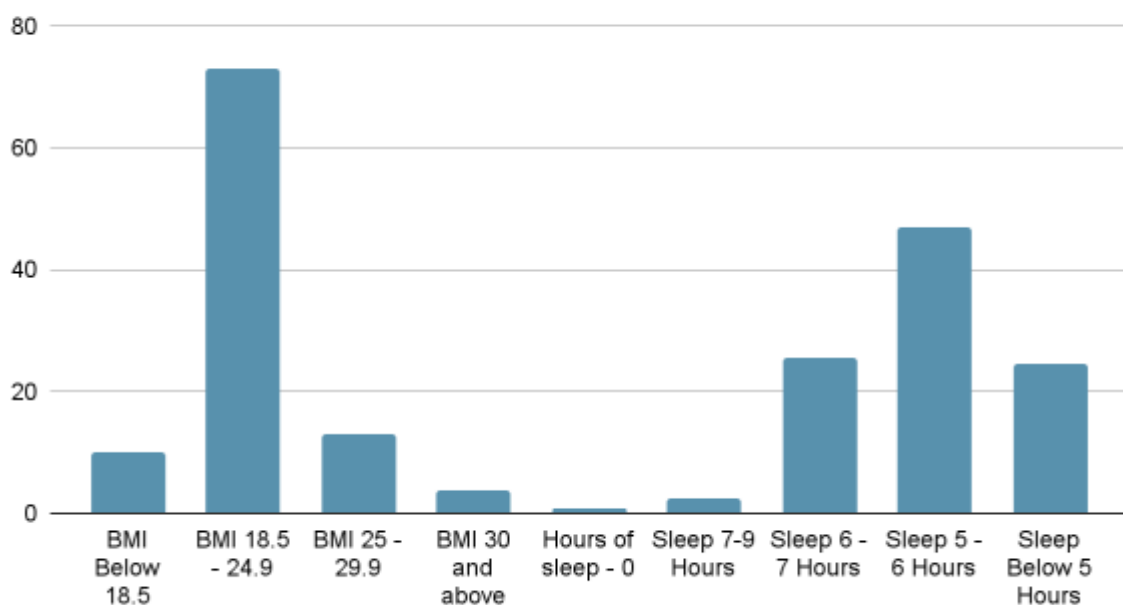
Arts, watching TV	1	0.8	0.8	29.2
Arts, watching TV, Using Phone or internet	4	3.1	3.1	32.3
Sports	8	6.2	6.2	38.5
Sports, Using Phone or internet	3	2.3	2.3	40.8
Sports, watching TV, Using Phone or internet	4	3.1	3.1	43.8
Using Phone or internet	61	46.9	46.9	90.8
Watching TV	9	6.9	6.9	97.7
Watching TV, Using Phone or internet	3	2.3	2.3	100.0
Residential Status				
Day Scholar	39	30.0	30.0	30.0
Hostler	91	70.0	70.0	100.0
Home Sickness				
0	1	0.8	0.8	0.8
Never	18	13.8	13.8	14.6
Seldom	19	14.6	14.6	29.2
Occasionally	77	59.2	59.2	88.5
Always	15	11.5	11.5	100.0
Diet Preference				
0	2	1.5	1.5	1.5
Vegetarian	17	13.1	13.1	14.6
Non Vegetarian	23	17.7	17.7	32.3
Mixed Diet	88	67.7	67.7	100.0
Consciousness During Sleep				
0	2	1.5	1.5	1.5
When Feeling Asleep	50	38.5	38.5	40.0
In Between Sleep	49	37.7	37.7	77.7
None of the Above	29	22.3	22.3	100.0
Unable to Move During Sleep				
Yes	33	25.4	25.4	25.4

No	69	53.1	53.1	78.5
Sometimes	28	21.5	21.5	100.0
Night Fear During Sleep				
Yes	28	21.5	21.5	21.5
No	62	47.7	47.7	69.2
Sometimes	40	30.8	30.8	100.0
Evil Presence During Sleep				
Yes	31	23.8	23.8	23.8
No	76	58.5	58.5	82.3
Sometimes	23	17.7	17.7	100.0
Pressure on Chest During Sleep				
Yes	25	19.2	19.2	19.2
No	84	64.6	64.6	83.8
Sometimes	21	16.2	16.2	100.0
Auditory Hallucinations During Sleep				
Yes	27	20.8	20.8	20.8
No	93	71.5	71.5	92.3
Sometimes	10	7.7	7.7	100.0
Feeling Held Down During Sleep				
Yes	32	24.6	24.6	24.6
No	87	66.9	66.9	91.5
Sometimes	11	8		

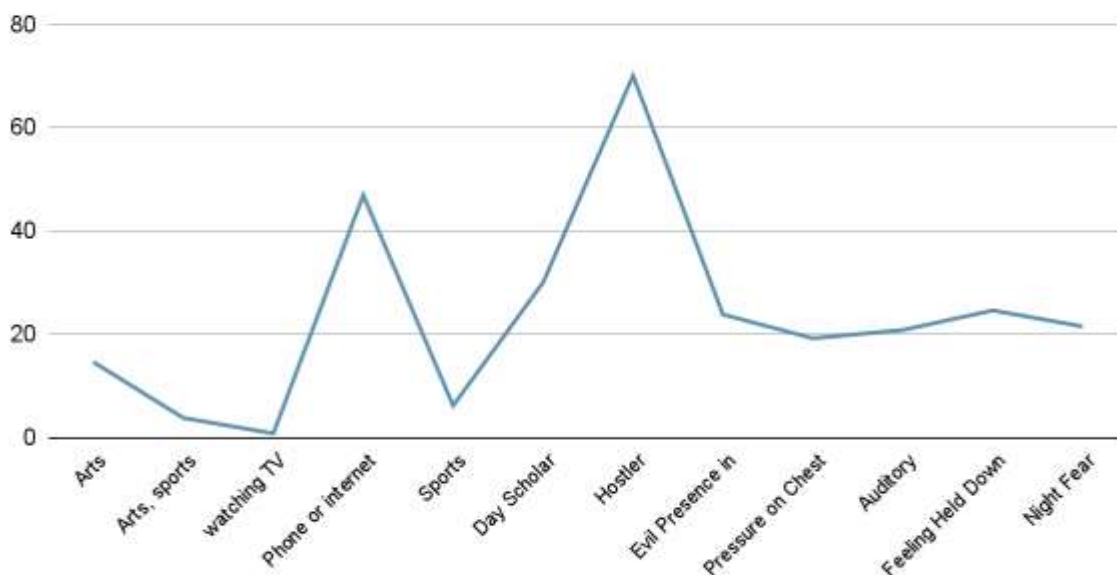
Age and Gender



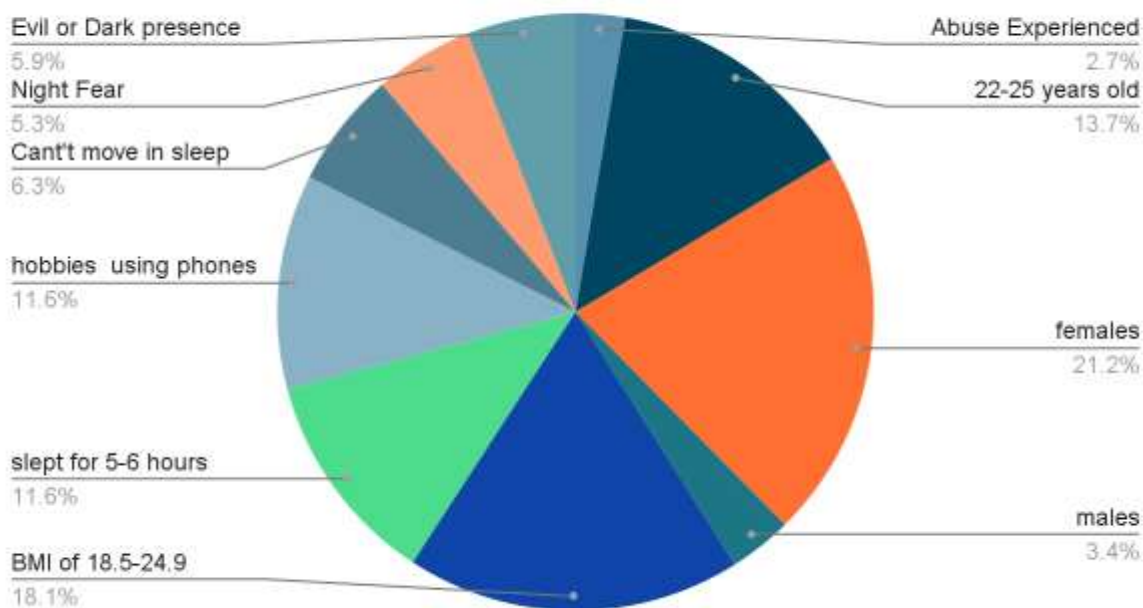
BMI & SLEEP PATTERN



Hobbies & Other Factors



Total Analysis



Research Through Innovation

Survey of 130 individuals revealed a diverse demographic profile. The majority were aged between 22-25 years (55.4%), with significant representation from 18-21 years (34.6%). Females constituted 85.4% of the respondents, while males accounted for 13.8%. In terms of body mass index (BMI), most fell within the range of 18.5 - 24.9 (73.1%). Sleep patterns varied, with 46.9% reporting 5-6 hours of sleep, and 25.4% experiencing less than 5 hours. Abuse was reported by 10.8%, while the majority (89.2%) had not experienced abuse. Preferred hobbies included using phones/internet (46.9%) and arts (14.6%). The majority were hostlers (70.0%), experiencing occasional (59.2%) or frequent (11.5%) homesickness. Diet preferences were mixed (67.7%), with vegetarian (13.1%) and non-vegetarian (17.7%) choices also noted. Sleep experiences varied widely, including auditory hallucinations (20.8%) and feeling held down during sleep (24.6%). Many reported feeling anxious during sleep (22.3%) and daydreaming (33.8%), while 43.8% were conscious of their sleep routines.

RESULTS

Most respondents were 22-25 years old (55.4%), with females (85.4%) being more affected than males (13.8%). The majority had a BMI of 18.5-24.9 (73.1%). Regarding sleep patterns and habits, most students slept for 5-6 hours (46.9%), and a significant number experienced abuse (10.8%). Common hobbies included using phones or the internet (46.9%). In terms of symptoms and experiences, 25.4% felt unable to move during sleep, 21.5% experienced night fear, and 23.8% reported feeling an evil or dark presence.

DISCUSSION

The findings from this study shed light on the prevalence and associated factors of sleep paralysis among undergraduate and postgraduate students at Sarada Krishna Homoeopathic Medical College. The observed high prevalence of sleep paralysis, particularly among young adults, aligns with existing literature highlighting its occurrence predominantly in this demographic. The predominance of females experiencing sleep paralysis more than males reflects a consistent trend seen in various studies globally.

The study also identified several associated factors such as sleep patterns, BMI, and experiences of abuse, which are known contributors to sleep disorders. The finding that a significant proportion of students reported night fears and sensations of an evil presence during sleep paralysis episodes underscores the psychological impact of this phenomenon.

Methodologically, the use of a Google Forms questionnaire facilitated efficient data collection among a large sample size using purposive sampling. However, the study's reliance on self-reporting may introduce biases such as recall bias and social desirability bias, which could influence the accuracy of reported symptoms and experiences.

Implications for clinical practice and medical education are substantial. Given the prevalence and potential psychological distress associated with sleep paralysis, integrating education about sleep disorders and their management into medical curricula, particularly within homoeopathic medicine, could enhance future healthcare practitioners' ability to recognize and address these issues effectively. Moreover, identifying and addressing underlying factors such as poor sleep hygiene and psychological stress could contribute to preventive strategies and improve overall well-being among students.

Further research avenues could explore the neurobiological mechanisms underlying sleep paralysis in this specific demographic, as well as culturally specific perceptions and beliefs about sleep disorders among homoeopathic medical students in India. Longitudinal studies could also track the persistence and impact of sleep paralysis over time, offering insights into its natural history and potential for intervention.

Overall, this study underscores the importance of understanding and addressing sleep paralysis among medical students, emphasizing the need for comprehensive education, clinical awareness, and further research to enhance both preventive measures and therapeutic interventions in the field of homoeopathic medicine.

CONCLUSION

This study provides a comprehensive examination of sleep paralysis among undergraduate and postgraduate students at Sarada Krishna Homoeopathic Medical College. Our findings reveal a significant prevalence of sleep paralysis, with notable experiences of associated symptoms such as an inability to move during sleep, night fears, and sensations of an evil or dark presence. The data suggest that sleep paralysis is not only a common phenomenon among this demographic but also interlinked with various factors including sleep patterns, BMI, and experiences of abuse. The high incidence of sleep paralysis and its associated distress underline the need for increased awareness and education about this condition within medical curricula, particularly in homoeopathic medicine, to better equip future practitioners in addressing and managing sleep-related disorders.

Further research is warranted to explore underlying mechanisms and effective interventions for mitigating the impact of sleep paralysis on student populations.

ACKNOWLEDGEMENTS

First and foremost, I thank God Almighty. I would like to express my deep and sincere gratitude to the students of Sarada Krishna Homoeopathic Medical College for their participation in this study. Next, I would like to thank the management of Sarada Krishna Homoeopathic Medical College for their timely support throughout the work and also the Tamil Nadu Dr M.G.R. Medical University for their timely support.

REFERENCES

1. Sharpless BA, Barber JP. Lifetime prevalence rates of sleep paralysis: A systematic review. *Sleep Med Rev.* 2011;15:311-5. [CrossRef]
2. Brooks PL, Peever JH. Identification of the transmitter and receptor mechanisms responsible for REM sleep paralysis. *J Neurosci.* 2012;32:9785-95. [CrossRef] [PubMed]
3. Ropper AH, Samuels MA, Klein JP. Adams and Victor's Principles of Neurology. 10th ed. New York, NY: McGraw-Hill Education; 2014. Chapter 19, Sleep and Its Abnormalities.
4. Walther BW, Schulz H. Recurrent Isolated Sleep Paralysis: Polysomnographic and Clinical Findings. *Somnologie.* 2004;8:53-60. [CrossRef]
5. Takeuchi T, Miyasita A, Sasaki Y, Inugami M, Fukuda K. Isolated sleep paralysis elicited by sleep interruption. *Sleep.* 1992;15:217-25. [CrossRef]
6. Hinton DE, Pich V, Chhean D, Pollack MH. 'The Ghost Pushes You Down': Sleep Paralysis-Type Panic Attacks in a Khmer Refugee Population. *Transcult Psychiatry.* 2005;42:46-77. [CrossRef] [PubMed]
7. Jalal B. How to make the ghosts in my bedroom disappear? Focused-attention meditation combined with muscle relaxation (MR therapy)—A direct treatment intervention for Sleep Paralysis. *Front Psychol.* 2016;7:28. [CrossRef] [PubMed]
8. Molendijk ML, Montagne H, Bouachmir O, Alper Z, Bervoets JP, Blom JD. Prevalence rates of the incubus phenomenon: A systematic review and meta-analysis. *Front Psychiatry.* 2017;8:253. [CrossRef]
9. Cheyne JA, Newby-Clark IR, Rueffer SD. Relations among hypnagogic and hypnopompic experiences associated with sleep paralysis. *J Sleep Res.* 1999;8:313-7. [CrossRef]
10. American Academy of Sleep Medicine. International Classification of Sleep Disorders ICSD. Darien, IL: American Academy of Sleep Medicine; 2001. ISBN 0965722015.
11. Wing YK, Lee ST, Chen CN. Sleep paralysis in Chinese: Ghost oppression phenomenon in Hong Kong. *Sleep.* 1994;17:609-13. [CrossRef]
12. Fukuda K, Miyasita A, Inugami M, Ishihara K. High prevalence of isolated sleep paralysis: Kanashibari phenomenon in Japan. *Sleep.* 1987;10:279-86. [CrossRef]
13. McNally RJ, Clancy SA. Sleep Paralysis, Sexual Abuse, and Space Alien Abduction. *Transcult Psychiatry.* 2005;42:113-22. [CrossRef] [PubMed]

14. Jalal B, Simons-Rudolph J, Hinton DE. Explanations of sleep paralysis among Egyptian college students and the general population in Egypt and Denmark. *Transcult Psychiatry*. 2014;51:158-75. [CrossRef] [PubMed]
15. Jalal B, Eskici HS, Acarturk C, Hinton DE. Beliefs about sleep paralysis in Turkey: Karabasan attack. *Transcult Psychiatry*. 2020. [CrossRef] [PubMed]
16. Ward D, Hufford DJ. The Terror That Comes in the Night. *West Folk*. 1984;43:274-6. [CrossRef]
17. Jalal B, Romanelli A, Hinton DE. Cultural Explanations of Sleep Paralysis in Italy: The Pandafeche Attack and Associated Supernatural Beliefs. *Cult Med Psychiatry*. 2015;39:651-64. [CrossRef] [PubMed]
18. Jalal B, Kruger Q, Hinton DE. Adaptation of CBT for Traumatized South African Indigenous Groups: Examples from Multiplex CBT for PTSD. *Cogn Behav Pract*. 2018;25:335-49. [CrossRef]
19. de Sá JFR, Mota-Rolim SA. Sleep paralysis in Brazilian folklore and other cultures: A Brief Review. *Front Psychol*. 2016;7:1294. [CrossRef]
20. Sharpless BA, Grom JL. Isolated Sleep Paralysis: Fear, Prevention, and Disruption. *Behav Sleep Med*. 2016;14:134-9. [CrossRef]
21. Cheyne JA, Rueffer SD, Newby-Clark IR. Hypnagogic and Hypnopompic Hallucinations during Sleep Paralysis: Neurological and Cultural Construction of the Night-Mare. *Conscious Cogn*. 1999;8:319-37. [CrossRef]
22. Sharpless BA, Kliková M. Clinical features of isolated sleep paralysis. *Sleep Med*. 2019;58:102-6. [CrossRef]
23. Jalal B, Hinton DE. Rates and Characteristics of Sleep Paralysis in the General Population of Denmark and Egypt. *Cult Med Psychiatry*. 2013;37:534-48. [CrossRef]
24. Otto MW, Simon NM, Powers M, Hinton D, Zalta AK, Pollack MH. Rates of isolated sleep paralysis in outpatients with anxiety disorders. *J Anxiety Disord*. 2006;20:687-93. [CrossRef] [PubMed]
25. Jalal B, Hinton DE. Sleep paralysis among Egyptian college students: Association with anxiety symptoms (PTSD, trait anxiety, pathological worry). *J Nerv Ment Dis*. 2015;203:871-5. [CrossRef]
26. Szklo-Coxe M, Young T, Finn L, Mignot E. Depression: Relationships to sleep paralysis and other sleep disturbances in a community sample. *J Sleep Res*. 2007;16:297-312. [CrossRef]
27. McNally RJ, Clancy SA. Sleep paralysis in adults reporting repressed, recovered, or continuous memories of childhood sexual abuse. *J Anxiety Disord*. 2005;19:595-602. [CrossRef]
28. Mellman TA, Aigbogun N, Graves RE, Lawson WB, Alim TN. Sleep paralysis and trauma, psychiatric symptoms and disorders in an adult African American population attending primary medical care. *Depress Anxiety*. 2008;25:435-40. [CrossRef]
29. Sharpless BA, McCarthy KS, Chambless DL, Milrod BL, Khalsa SR, Barber JP. Isolated sleep paralysis and fearful isolated sleep paralysis in outpatients with panic attacks. *J Clin Psychol*. 2010;66:1292-306. [CrossRef]
30. Terrillon JC, Marques-Bonham S. Does recurrent isolated sleep paralysis involve more than cognitive neurosciences? *J Sci Explor*. 2001;15:97-123.
31. American Academy of Sleep Medicine (AASM). International Classification of Sleep Disorders—Third Edition ICSID-3. Available from:

32. ArrayExpress—A Database of Functional Genomics Experiments. Available from: <http://www.ebi.ac.uk/arrayexpress/>.

