



Awareness on Sleep Paralysis and Impact of Lifestyle Change on Sleep Paralysis: An Online Survey

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Abstract

Aim: The survey aim is to perceive awareness and impact of lifestyle change on sleep paralysis among people. **Methods and Material:** This study was designed as a cross-sectional survey. Questionnaires were sent by google form. **Results:** There were a total of 21 questionnaires examined. Male and female respondents gave a combined response rate of 38% and 62%, respectively. The percentage of male and female respondents who experienced sleep paralysis was almost the same i.e. male 29%, female 30.7%. There was no significant difference observed in the respondents in terms of the episodes of sleep paralysis and quality of sleep. The frequency of nightmares, the timings, and irregularity in sleep, and especially the degree of insomnia, all showed a link that leads to sleep paralysis. Although, there was a significant difference in lifestyle data between genders that includes cigarette smoking, the average for sleep and nap time. **Conclusion:** Awareness of Sleep Paralysis and its impact on lifestyle was found to be affirmative in this survey. Furthermore, the findings of this study imply that maintaining regular sleep habits is a crucial step to avoid such symptoms. We propose that adults and the elderly be educated on the importance of good sleep habits.

Key words: Sleep paralysis, Nightmare, Hallucination.

INTRODUCTION

Sleep paralysis (SP) is a type of paralysis that happens during sleep and may occur because of narcolepsy, cataplexy, hallucinations in healthy people. (Honda, Y. 1988) In SP patients often suffer from such episodes as if they are threatened by someone or something evil. During SP a person is unable to move or speak for a short period of time. (Ganesh, B. *et al.*, 2012) The common causes of SP are migraine, anxiety, and obstructive sleep apnea. Although SP is common but people with narcolepsy or sleep apnea are more likely to experience it. People of all ages can be affected by sleep paralysis, though it is more common in young adults and teenagers (Siddiqui, J. A. *et al.*, 2019) Thoughts of emotional stress during the day, fatigue, or an unusual schedule can trigger episodes. It is shown that SP decreases with age. (Johnson, E. O. *et al.*, 2001) Rapid eye movement (REM) is a specific type of sleep in humans that is characterised by spontaneous fast eye movement and low muscular tone throughout the body. (Brown, R. E. *et al.*, 2008) During abnormal REM people

often experience SP like symptoms such as an intruder is in the room or seeing animals on the ceiling and people outside the window, panic attacks with racing heart and heavy breathing, extreme fear, terror, and feelings of being touched or grabbed, intense feelings of dread, pressure on one's chest, shortness of breath, sense of being paralyzed and trapped in one's body. (Williams, J. *et al.*, 1992) Extreme fear and a temporary failure to regain full awareness are hallmarks of SP episodes. Fear, panic, perplexity, or an apparent wish to escape may appear suddenly in the person. During active episodes of SP, they may feel gasping, moaning, or shouting. However, the individual is not totally awake, and when the incident has passed, they frequently return to regular sleep without ever fully awakening. (Cheyne, J. A. *et al.*, 1999) Isolated sleep paralysis (ISP) and recurrent isolated sleep paralysis (RISP) are the two types of sleep paralysis. In ISP a condition which leads to infrequent episodes that can last from a few seconds to several minutes after that person can move and speak normally Whereas in

RISP people experience back to back episodes which can last for a few hours or even longer and may lead to panic attacks. The upper body is being swept by a strong current. (Takeuchi, T. *et al.*, 1992) Sleep paralysis is more prevalent in people who don't get enough sleep. It's also more likely if a person's sleep routine varies often. Mental stress might also be a factor. Few preventive measures are to be taken care of such as rollovers and sleeping on the back, it has been proven that sleeping on the back can cause pressure on the lungs due to which one feels some kind of burden on the chest. Hence during SP episodes patients often hallucinate like some demon is sitting on their chest. It might also be linked to bipolar disorder, the use of certain drugs or sleep-related leg cramps. (Rosenberg, R. S. *et al.*, 2014)

A regular sleep schedule can help as well as maintaining good sleep hygiene can decrease the episodes. Cognitive behavioral therapy to address anxiety and stress may be helpful to control SP. Adopting good sleeping habits is the safest method to avoid sleep paralysis. The tricyclic antidepressants or selective serotonin reuptake inhibitors (SSRIs) may be utilised in more serious situations. Despite the fact that these therapies are provided, no medicine has yet been discovered that can aid with the total evacuation of episodes resulting from sleep paralysis. Awareness on SP is not so prevalently observed. (Vignau, J. *et al.*, 1997) Hence this survey aims to make people more aware about sleep paralysis.

MATERIALS AND METHODS

Participants

The study was set up as an online cross-sectional questionnaire survey. The survey was distributed through Facebook and WhatsApp groups. All data were collected between March and August 2020. The survey was completed by 361 people of which 224 were females and 137 were males aged between 15 to 60 years.

MATERIALS

Demographic Questionnaire

For the current study, a demographic questionnaire was created to capture relevant personal data. The survey looked at two types of information i.e. personal and lifestyle data.

Personal Data included parameters like gender & age; while lifestyle data included parameters like cigarette smoking, alcohol consumption, the number of hours of sleep during 24 h period.

Sleep Paralysis Experiences Questionnaire

The sleep paralysis experience questionnaire was designed to assess various factors such as frequency of SP, it's episode, time period, religious belief, sleeping pattern, lifestyle. A self-designed questionnaire was used to evaluate the awareness about sleep paralysis.

Statistical Analysis

The statistical calculations were performed using the chi-square test in SPSS (IBM SPSS Statistics for Windows, Version 26.0 Armonk, NY: IBM Corp., 2019) and the descriptive analysis in the form of frequency and percentages was calculated. We applied a chi-squared test (χ^2) to compare gender with each question where $P < 0.05$ was considered statistically significant.

RESULT

During this survey period from March 14 to August 6, 2020, a total of 370 respondents participated. Responses that were incomplete were not considered for the final analysis. Finally, 361 responses were found to be complete in all aspects and were analysed [Table 1]. The pattern of response observed was 38% male and 62% female respondents. The overall awareness of sleep paralysis was found to be 71.4% females and 67.2% males. So no significant difference was observed between genders on awareness of Sleep Paralysis. Experience of SP was observed in 102 respondents out of 361 that is 29% females and 31% males.

Table 1: Demographic Data

Variables	Frequency, n (%)
Gender	
Male	137 (38)
Female	224 (62)
Age	
15-17	3 (0.8)
18-25	305 (84.5)
26-40	36 (10)
40 & above	17 (4.7)

Further few questions based on SP are limited to those who have experienced it. Such as the

frequency to experience it, episode time period, what all do they experience during its episodes. The result on the frequency of episodes was found to be highest once in a lifetime of which 47% males and 45% females and lowest was observed daily in which 2% males and 1% females were involved. Another factor was the time period as to how long does the episode last. The observation indicated that the highest time period observed was for a few minutes which was found to be statistically significant ($P=0.012^*$). People who have experienced SP was queried based on what all do they experience during SP episodes. It was found that they often experience nightmare followed by paralysis.

People who are prevalent of SP are more likely to experience nightmare. It was observed that 74% of males and 67% of females experienced nightmare. Also, its frequency to experience was assessed. The obtained results depict that, respondents are more likely to experience nightmares in a month than in a week, results were statistically significant ($P=0.019^*$).

People often misinterpret SP with religious belief, hence one of the factors was based on spiritual belief. Over 65% of males and 61% of females do not consider SP as a spiritual aspect.

Questions based on one's lifestyle were even considered such as smoking and consumption of alcohol. It was observed that in both genders

over 90% of respondents do not smoke. The result showed statistically significant ($P=0.02^*$). Whereas, in consumption of alcohol both genders over 90% of respondents do not drink alcohol.

Sleeping pattern is one of the important factors which can even help in the prevention of SP. Hence few questions were based on it such as average hours of sleep, bedtime, and their opinion based on analysis of sleep. Over half the population responded their average sleeping hours were more than 6 hours. During the evaluation of bedtime, it was found that 42% of males and 40% of females sleep after midnight but before 2 a.m. Over 60% of respondents consider their quality of sleep as well based on the sleeping hours. Though bedtime should even be taken into consideration in their evaluation. The result showed statistical significance

Excessive daytime sleepiness was also estimated. The result shows that 43% of males and 41% of females are more likely to sleep during day time. People who face such issues are even questioned as to when do they suffer and the result reported that it often happens while sitting, reading and during the resting period in the afternoon. According to literature, it was reported that SP decreases with age and also our result shows that 26% of males and 24% females in their opinion think that it decreases with age [Table 2].

Table 2: Survey questionnaire and observations

Questionnaire	Male (n=224), n (%)	Female (n=137), n (%)	Chi square test (P)
Are you aware of sleep paralysis?			
Yes	92 (67.2)	160 (71.4)	1.468 (0.480)
No	45 (32.8)	63 (67)	
Have you experienced sleep paralysis?			
Yes	42 (30.7)	65 (29.0)	0.110 (0.741)
No	95 (69.3)	159 (71.0)	
If yes; how frequently do you experience sleep paralysis?			
Daily	2 (1.5)	1 (0.4)	6.499 (0.261)
Monthly	9 (6.6)	19 (8.5)	
Once or twice in your life	23 (16.8)	35 (15.6)	
Weekly	3 (2.2)	0 (0.0)	
Weekly	15 (10.9)	25 (11.2)	

Yearly			
If yes, what do these episodes involve?			
Paralysis	14 (10.2)	20 (8.9)	1.462 (0.984)
Nightmare	19 (13.9)	25 (11.2)	
Difficulty in breathing	10 (7.3)	18 (8.0)	
Visual Hallucinations	12 (8.8)	4 (1.8)	
Auditory Hallucinations	6 (4.4)	8 (3.6)	
Floating sensation	5 (3.6)	7 (3.1)	
Have you experienced nightmares?			
Yes	102 (74.5)	150 (67)	2.262 (0.133)
No	35 (25.5)	74 (33)	
How frequently do you experience nightmares?			
Daily	3 (2.2)	6 (2.7)	11.260 (0.024*)
Monthly	28 (20.4)	61 (27.2)	
Weekly	10 (7.3)	28 (12.5)	
Yearly	57 (41.6)	57 (25.4)	
How long do these episodes last?			
A few seconds	38 (27.7)	41 (18.3)	10.908 (0.012*)
A few minutes	55 (40.1)	83 (37.1)	
Up to an hour	5 (3.6)	27 (12.1)	
Are you religious/spiritual?			
Yes	22 (16.1)	27 (12.1)	3.914 (0.141)
No	90 (65.7)	137 (61.2)	
Are you under certain medications?			
CNS drugs	8 (5.8)	6 (2.7)	4.456 (0.216)
Anti-histamines	3 (2.2)	2 (0.9)	
Antihypertensives	1 (0.7)	5 (2.2)	
Miscellaneous	125 (91.2)	211 (94.2)	
Do you smoke?			
Yes	13 (9.5)	8 (3.6)	5.433 (0.020*)
No	124 (90.5)	216 (96.4)	
If yes; how frequently?			
Neutral	22 (16.1)	24 (10.7)	6.416 (0.093)
Once in a week	4 (2.9)	1 (0.4)	
Twice in a week	3 (2.2)	4 (1.8)	
Do you consume alcohol?			
Yes	14 (10.2)	22 (9.8)	0.015 (0.903)
No	123 (89.8)	202 (90.2)	
If yes; how frequently?			
Neutral	21 (15.3)	31 (13.8)	4.059 (0.255)
Once a week	5 (3.6)	8 (3.6)	
Twice a week	4 (2.9)	1 (0.4)	
How many hours on an average do you sleep at night?			
Less than 5hr	1 (0.7%)	11 (4.9)	17.573 (0.001***)
More than 5hr but less than 6hr	38 (27.7)	27 (12.1)	
More than 6hr but less than 7hr	50 (36.5)	92 (41.1)	
More than 7hr but less than 8hr	48 (35.0)	94 (42)	
What time do you go to bed on an average basis?			
Before 10 p.m.	6 (4.4)	10 (4.5)	2.388 (0.793)
Before 12 a.m.	16 (11.7)	28 (12.5)	

After 11 p.m. but before midnight	50 (36.5)	86 (38.4)	
After midnight but before 2 a.m.	58 (42.3)	85 (37.9)	
After 2 a.m.	7 (5.1)	12 (5.4)	
How long does your nap time exist?			16.729 (0.001***)
Less than 15mins	27 (19.7)	22 (9.8)	
More than 15mins but less than 30min	33 (24.1)	40 (17.9)	
More than 30mins but less than 1hr	37 (27)	105 (46.9)	
None	40 (29.2)	57 (25.4)	
How do you analyze the quality of your sleep when you awake?			5.742 (0.125)
Bad	24 (17.5)	21 (9.4)	
Good	90 (65.7)	158 (70.5)	
Very bad	1 (0.7)	4 (1.8)	
Very good	22 (16.1)	41 (18.3)	
Do you face difficulty in commencing sleep at night?			1.760 (0.624)
Always			
Never	11 (8.0)	27 (12.1)	
Rarely	27 (19.7)	47 (21)	
Sometimes	41 (29.9)	64 (28.6)	
	58 (42.3)	86 (38.4)	
Do you experience excessive daytime sleepiness?			0.259 (0.611)
Yes	60 (43.8)	92 (41.1)	
No	77 (56.2)	132 (58.9)	
If yes; please tick the below options or mention if others.			17.642 (0.014*)
Sitting and reading	19 (13.9)	29 (12.9)	
Seeing TV	9 (4.0)	14 (6.3)	
As a passenger in a car for an hour without a break	12 (8.0)	9 (6.6)	
Sitting, inactive in a public place			
Sitting and talking to someone	5 (3.6)	13 (5.8)	
Lying down to rest in the afternoon when circumstances permit	5 (3.6)	2 (0.9)	
	15 (10.9)	33 (14.7)	
In a car, while stopped for a few minutes in the traffic	7 (5.1)	1 (0.4)	
Have your experiences of sleep Paralysis increased or decreased with age?			2.557 (0.278)
Increased	35 (25.5)	44 (19.6)	
Decreased	36 (26.3)	54 (24.1)	

*P<0.05; **P<0.01; ***P<0.001

DISCUSSION

This online survey evaluated awareness on SP and impact on lifestyle change on SP, using a self-designed questionnaire. Based on these findings, gender can be considered a significant determinant in the occurrence of sleep paralysis. Our findings in the present study suggest that SP is experienced similarly in males and females. As explained by Fukunda, among Canadian and Japanese students 45 out of 86 Canadian

(52.3%) and 66 out of 149 Japanese (44.3%) reported experiencing SP. Therefore, in both the cases, no significant difference was observed in experiencing SP. (Fukuda, K. *et al.*, 1998) Further, the present study also discussed on symptoms during SP episodes. People often experience paralysis, nightmare, difficulty in breathing, visual and auditory hallucination and floating sensation. Sleep Paralysis was also associated with naptime, the majority of

participants took for was less than 60 min. According to Munezawa, it's unclear if those who suffer from sleep paralysis have longer naps as a result of their lack of night time sleep. Excessive daytime sleepiness (EDS) is highly experienced in half of the participants. There were several reasons when people often experienced it such as while watching TV, sitting and talking to someone, while resting in the afternoon, etc. (Munezawa, T. et al., 2011) According to Joo et al., the frequency of EDS tended to rise in conjunction with the frequency of nightmares; the authors ascribed this link to a reduction in sleep quality. (Joo, S. et al., 2005) Our study also had a look towards people who face difficulty in initiation of sleep and 50% sometimes do experience it. Difficulty in the initiation of sleep is often related to insomnia, its chief complaint is they are prone to anxiety and depression, and their muscles are stiff when they begin to sleep. Nightmares and sleep paralysis may be influenced by such circumstances at the start of sleep. (Kaneita, Y. et al., 2006) Alcohol causes sleep to be shallow and disturbed because it promotes sleep onset. In our study, alcohol consumption might not affect the onset of SP due to low rates of consumption. According to Munezawa, the sleeping pattern showed low subjective assessment, in our study it is observed that the majority of respondents sleep after midnight which can be compared with the average sleep at night which showed that the majority of respondents sleep for more than 6 hrs. (Munezawa, T. et al., 2011) According to literature, it has been reported that REM sleep is highly active during the time period of 12 a.m. to 2 a.m, but sleeping on time should even be considered because it can lead to an effect on a person's health. (Penn, N. E. et al., 1981) The only limitation involved in the survey was conducted using google forms and hence had a low response rate. It might be that some of the participants provided socially acceptable responses. This survey was only open to people who have a smartphone or a valid email account.

CONCLUSION

This survey research was conducted to create awareness among people on Sleep Paralysis. The findings of this study should be taken into consideration which shall help people as a

preventive measure on sleep paralysis. Our study conveyed a strong link between nightmares and sleep paralysis. Its preventive measure is to have stable REM sleep. Regular sleep patterns have been linked to REM sleep stability. As a result, it is a critical step to keep regular sleeping patterns to avoid such symptoms. Hence, we propose that people should follow maintain normal sleeping patterns.

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