ORIGINAL ARTICLE

Association between sleep quality and sleep paralysis in medical students from a private university in Paraguay

CORONEL-OCAMPOS JOHANNA MAGALÍ[1], GÓMEZ-SERVÍN JONATHAN ULISES[1], TELMO RAÚL AVEIRO-RÓBALO[1], GARLISI-TORALES LUCIANA DANIELA[1], MARIO J. VALLADARES-GARRIDO[2]
[1]Universidad del Pacífico, Asunción, Paraguay
[2]Universidad Continental, Lima, Peru
Correspondence to Mario J. Valladares-Garrido, M.D, MSc(C), E-mail: mvalladares@continental.edu.pe , Mobile: + 51 944655-396

ABSTRACT

Background: The influence of sleep quality in sleep paralysis has not been widely documented in medical students, although they are exposed to high academic loads in undergraduate studies.
Aim: To determine the association between sleep quality and paralysis in medical students from Paraguay.
Methods: Analytical cross-sectional study in first- and second-year medical students at Universidad del Pacífico, Paraguay in 2018. The questionnaire was self-administered and consisted of socio-educational data (age and sex), index of Pitsburgh sleep quality and self-reported sleep paralysis. Simple and multiple regression models were built, estimating prevalence ratios.
Results: Of 329 medical students, the majority were male (34.7%) and the median age was 19 years. 48.3% and 47.1% presented poor quality of sleep and sleep paralysis; respectively. Poor sleepers had a 40% higher frequency of reporting sleep paralysis (PR = 1.40). Men had a 28% lower frequency of reporting sleep paralysis (PR = 0.72). For each additional year of age, the frequency of sleep paralysis decreased 14% (PR = 0.86).
Conclusion: Almost half were poor sleepers and suffered from sleep paralysis. Our findings suggest that there is a positive association between quality and sleep paralysis. Additionally, sex and age were also factors associated with a higher frequency of sleep paralysis in medical students.
Keywords: Sleep quality, paralysis, medical student, Sleep Onset and Maintenance Disorders

INTRODUCTION

Sleep is defined as a state of unconsciousness, from which it is possible to get out by sensory stimulation[1]. Sleep is classified into two phases: slow wave sleep and rapid movement sleep[2–5]. The quality of sleep influences aging[6–8] therefore, enjoying a good quality of sleep is essential to lead an optimal quality of life[9]. However, multiple reports show a poor quality of sleep in students[10] which may be due to high academic demands[11], anxiety, depression and stress[12]. Sleep paralysis is a neurological disorder characterized by transient limitation to move limbs, speak, and open the eyes upon waking[13,14]. This pathology affects between 5 to 62% of the general population[15], in medical and nursing students, according to a report carried out in Paraguay, they refer that it affected 5%[16].

Studies affirm that having poor sleep quality negatively influences the presence of sleep paralysis[17] even in health science students[18]. This relationship is explained by the high demands regarding time in these students.

Despite the fact that medical students do not have adequate quality of sleep, due to the consumption of coffee, tobacco or alcohol[19,20], there is not enough conclusive evidence on the relationship between enjoying adequate sleep and the presence of sleep paralysis as it is reported in an investigation carried out in medical students from a Peruvian university, no association was found between sleep quality and paralysis[21]. Likewise, previous reports have not carried out sufficient statistical analyzes, such as estimating association measures[22] and have not considered other variables that could influence the relationship[23]

This research aims to show preliminary findings that allow the future evaluation of said relationship in the medical population -student. The objective of this research was to determine the association between sleep quality and sleep paralysis in medical students from a private university in Paraguay.

MATERIALS AND METHODS

Study design: Analytical cross-sectional study in medical students from the Universidad del Pacífico de Paraguay, whose purpose was to determine the association between sleep quality and sleep paralysis.
Population and Sample: 329 first and second year medical students from the Universidad del Pacífico, Paraguay during the months of March to July 2018.
Medical students duly enrolled in the 2018 academic semester and who verbally agreed to participate in the research were included. Those whose questionnaires were incomplete were excluded.
A sample size of 329 students was estimated, based on 31% of bad sleepers with sleep paralysis in a previous investigation, with a 95% confidence level and 5% precision. A non-probability sampling was carried out
Study Procedures: Authorization was requested from the medical school to apply the questionnaires in the first and second year medical students. Then, the researchers in charge of data collection, applied the self-administered questionnaire in each classroom to the students who met the selection criteria. Previously, the purpose of the research was explained and verbal consent was requested to be part of the study. Subsequently, each questionnaire was entered into a database designed in the Microsoft Excel 2016 program to perform the statistical analysis.

Instrument and variables: The questionnaire was self-administered and consisted of three sections: 1) socio-educational data to investigate the sex (male or female) and age in years of the students, 2) Pitsburgh Sleep Quality Index, which has been validated previously in medical students[24], where adequate psychometric properties were obtained (Cronbach's alpha = 0.78). It has 19 questions to measure sleep quality in the last month based on seven components (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of hypnotic medication, and daytime dysfunction). Each component presents a score between 0 points (no difficulty) to 3 points (very difficult). Then, a total sum of the components was obtained, in a range from 0 to 21 points, whose cut-off point was 5 points to differentiate the group of good and bad quality of sleep. Finally, 3) data on sleep paralysis: measured by the question Have you suffered from sleep paralysis in the last month? whose answer option was no and yes, Additionally, the frequency of sleep paralysis was investigated, with the categories never, sometimes, regularly and always.

Sleep quality was the outcome variable, defined as the absence or presence of a good night's sleep, whose categories were poor and good sleep quality. Sleep paralysis was the main independent variable, defined as the presence or absence of this disorder, whose categories were no and yes. Age in years and sex were the co-variables of interest, which were taken as confounders to adjust in the multiple regression model.

Statistic analysis: The statistical program Stata v.15.0 was used. (Stata Corp LP, College Station, TX, USA).

In the descriptive statistics, frequencies and percentages were shown for the categorical variables and measures of central tendency and dispersion after evaluating normality for the numerical variables.

In inferential statistics, bivariate analysis was initially performed to identify the association between sleep quality and sleep paralysis, using the chi-square test of independence after evaluating the assumption of expected frequencies. To compare the numerical variable of age, the nonparametric Mann Whitney U test was used. We worked with a significance level of 5%.

Simple and multiple regression models were constructed, estimating prevalence ratios (PR) and 95% confidence intervals. Generalized linear models (GLM), Binomial distribution family and log link function were used. In the multiple regression, age and sex were adjusted to the association of interest.

RESULTS

Characteristics of medical students: Of 329 medical students, the majority were male (34.7%) and the median age was 19 years. 48.3% presented poor sleep quality. 47.1% presented sleep paralysis (Table 1).

Factors associated with sleep paralysis: It was observed that the frequency of sleep paralysis in medical students was higher in women compared to men (53% vs. 36%, p = 0.003). There was a higher frequency of sleep paralysis in students with poor sleep quality compared to those with good sleep quality (56.6% vs. 38.2%, p = 0.001). Additionally, an association was found between age in years and the presence of sleep paralysis (p <0.001) (Table 2).

In the simple regression analysis, a positive association was evidenced between sleep quality and sleep paralysis, since the frequency of sleep paralysis was 48% higher in students with poor sleep quality, adjusted for age and sex (PR = 1.48, 95% CI: 1.17-1.87, p = 0.001) (Table 3).

The association of interest found in the simple regression analysis was maintained in the multiple regression in terms of direction and magnitude. In students whose sleep quality was poor, the frequency of sleep paralysis is 40% higher than in those with good sleep quality, adjusted for sex and age (PR = 1.40, 95% CI: 1.11-1.75, p = 0.004) (Table 3).

Additionally, it was found that male students had a 28% lower frequency of sleep paralysis compared to female students (PR = 0.72, 95% CI: 0.55-0.93, p = 0.014). For each additional year of age, the frequency of sleep paralysis decreased 14% (PR = 0.86, 95% CI: 0.79-0.92, p <0.001) (Table 3).

Table 1: Characteristics of medical students from a private university in Paraguay.

Characteristics	**N (%)**
Gender	
Female	215 (65.4)
Male	114 (34.7)
Age (years)*	19 (17-28)
Sleep quality	
Good	170 (51.7)
Bad	159 (48.3)
Sleep paralysis	
No	174 (52.9)
Yes	155 (47.1)

*Median (minimum value-maximum value)

Table 2: Factors associated with sleep paralysis in bivariate analysis.

Variables	**Sleep paralysis?**		***p*****
	No (n=174)	**Yes (n=155)**	
Gender			
Female	101 (47.0)	114 (53.0)	
Male	73 (64.0)	41 (36.0)	0.003
Age (years)*†	19 (17 - 25)	19 (17 - 28)	<0.001
Sleep quality			
Good	105 (61.8)	65 (38.2)	
Bad	69 (43.4)	90 (56.6)	0.001

*****Median (minimum-maximum value)

**p-values calculated with the Chi Square test of independence

†p-value calculated with the Mann Whitney U test

Table 3: Factors independently associated with sleep paralysis in multiple regression analysis.

Variables	Simple regression			Multiple regression		
	PR	IC 95%	p*	PR	IC 95%	p**
Gender						
Female	Ref.			Ref.		
Male	0.68	0.52 - 0.89	0.006	0.72	0.55 - 0.93	0.014
Age (years)*†	0.84	0.78 - 0.92	<0.001	0.86	0.79 - 0.92	<0.001
Sleep quality						
Good	Ref.			Ref.		
Bad	1.48	1.17 - 1.87	0.001	1.40	1.11 - 1.75	0.004

*P-values obtained with generalized linear models (GLM), Binomial family, log link function, ** Adjusted for age and sex

DISCUSSION

Main findings: Based on our general objective, which was to correlate sleep quality and sleep paralysis, a positive association was found which differs from the findings of Huamaní et al. in a population of Peruvian students[21]. Although both studies were carried out in similar populations, ours only included students from the first two years of medical studies, while the report from Peru does not specify whether students from specific courses were surveyed, it only mentions students enrolled in the year the study was conducted.

Sleep quality prevalence: Almost half of the medical students tested were poor sleepers, which is similar to what was previously reported in the literature[25–28]. In a Peruvian university, it was estimated that the prevalence of poor sleep quality in students was 48.5%[21]. The differences found could be explained by the presence of heterogeneity in academic hours[29] and lifestyles[30].

Prevalence of sleep paralysis: Nearly 5 out of 10 medical students were found to have sleep paralysis. This is consistent with similar studies, where the frequency of paralysis ranged from 63-89%[31-34]. However, it differs from a study carried out in students from Ecuador, where the prevalence of sleep paralysis was 30.9%[35]. The difference found could be explained because the latter only took a population of students made up of specific semesters and not all of the academic years or semesters.

Sleep quality and paralysis: It was observed that bad sleepers had a higher frequency of presenting sleep paralysis. This coincides with what has been reported in similar studies[36–40]. This finding is similar to that described in similar studies carried out in adolescents in China[41], Japan[42], Mexico[43] and England[44], where it is stated that sleep quality is negatively associated with the outcome of paralysis of the dream. However, it contrasts with other research conducted in Peru where no positive association was found[21]. The positive association between quality and sleep paralysis was an expected result, since the alteration of periods of sleepiness can generate episodes of this condition during rapid eye movement (REM) sleep is where the most vivid dreams are experienced and we consider as the deep sleep[45]. During sleep paralysis the person is awake, but with the neurological pattern of REM sleep, so that all his voluntary muscles are paralyzed, except for the respiratory and ocular muscles[46] This muscle paralysis normally occurs during sleep REM by the action of neurotransmitters such as GABA and glycine[47,48]. Other factors potentially associated with sleep paralysis are nightmares[42] and depression[49], irregular waking-sleep cycle times and constant stress[50]; however, they have not been evaluated in this research.

Other associated factors: It was found that being a woman was positively associated with a higher frequency of sleep paralysis, which is similar to that described in previous findings[41,42]. Additionally, it coincides with that described in China, where it was found that the risk factors for sleep paralysis included female sex, alcohol consumption, low subjective quality of sleep and living in a rural area when evaluating a population of adolescents[41]. However, our finding is contrary to that reported by Huamaní et al[21], where the prevalence of sleep paralysis was higher in men than in women; however, this did not result in a statistical difference. This association could be due to the fact that women tend to have more episodes of REM sleep than men[51]

Additionally, we found that the older the age, the lower the frequency of suffering from sleep paralysis. Previous studies have documented this potential relationship[45,52,53]. This agrees with what was described in Spain, where age increased the chance of paralysis in the adult population by 4.7%[54]. However, it differs from what was found by Pin-Arboleda et al. where he refers that the diagnosis in children is more and more frequent[55]. The probable explanation for this association is probably the low frequency in terms of diagnosis or lack of knowledge of the pathology[56].

Limitations and strengths: Our research has limitations. First, selection bias given that the sample obtained has not been representative due to non-probability sampling, therefore, we cannot extrapolate our findings to the entire medical-student population. Second, this research lacks temporality as it is a cross-sectional design, and we cannot assure a causal relationship between paralysis and quality of sleep. Third, measurement bias, since other variables such as years of study[22], mental health disorders[12], drug use[57], other sleep disorders[58], which influence paralysis, have not been explored sleep of students and / or the general population. Neither has a real measurement of sleep paralysis been obtained, since this has been obtained by self-report by the students, which could lead to a differential or non-differential misclassification bias, biasing our estimated findings. However, to our knowledge this is the first evaluation that attempts to provide evidence about this potential association between quality and sleep paralysis. Which, serves as a baseline for future studies, not only in medical students but also in health personnel that is a population potentially affected in the quality of sleep, due to the high academic and / or work load that it constantly presents.

Implications and relevance in public health / medical education: This research is relevant since academic performance can be affected in university populations (59) and high school students[60] when suffering from sleep disorders. This, later, could cause emotional consequences, eventually trigger mental health disorders, such as depression, as well as problems in the family environment and other consequences that should be the object of careful study for this particular condition[12].

CONCLUSIONS

In the population evaluated, almost half were poor sleepers and suffered from sleep paralysis. Our findings suggest that there is a positive association between quality and sleep paralysis. Additionally, sex and age were also factors associated with a higher frequency of sleep paralysis in medical students.

Conflicts of interest: The authors declare no conflicts of interest.

Ethical Considerations: The study was approved by the Department of Human Medicine of the Universidad del Pacífico in Paraguay. The questionnaire was anonymous and voluntary; therefore, the privacy of the respondents was respected.

REFERENCES

1. Hall JE. Guyton and Hall textbook of medical physiology e-Book. Elsevier Health Sciences; 2010.
2. Tyson PD, Ogilvie RD, Hunt HT. Lucid, prelucid, and nonlucid dreams related to the amount of EEG alpha activity during REM sleep. Psychophysiology. 1984;21(4):442–51.
3. McNamara P, McLaren D, Kowalczyk S, Pace-Schott EF. " Theory of Mind" in REM and NREM dreams. 2007;
4. Foulkes D. Data constraints on theorizing about dream function. 1993;
5. D'Agostino A, Manni R, Limosani I, Terzaghi M, Cavallotti S, Scarone S. Challenging the myth of REM sleep behavior disorder: no evidence of heightened aggressiveness in dreams. Sleep Med. 2012;13(6):714–9.
6. Karacan I, Thornby JI, Anch M, Holzer CE, Warheit GJ, Schwab JJ, et al. Prevalence of sleep disturbance in a primarily urban Florida county. Soc Sci Med 1967. 1976;10(5):239–44.
7. McGhie A, Russell S. The subjective assessment of normal sleep patterns. J Ment Sci. 1962;108(456):642–54.
8. WELSTEN L. Insomnia in the San Francisco Bay Area: a telephone survey. Sleepwake Disord Nat Hist Epidemiol Long-Term Evoluation. 1983;73–85.
9. Miró E, Lozano M del CC, Casal GB. Sueño y calidad de vida. Rev Colomb Psicol. 2005;(14):11–27.
10. Sierra JC, Jiménez-Navarro C, Martín-Ortiz JD. Calidad del sueño en estudiantes universitarios: importancia de la higiene del sueño. Salud Ment. 2002;25(6):35–43.
11. Niño García JA, Barragán Vergel MF, Ortiz Labrador JA, Ochoa Vera ME, González Olaya HL. Factores asociados con somnolencia diurna excesiva en estudiantes de Medicina de una institución de educación superior de Bucaramanga. Rev Colomb Psiquiatr. 2019;48(4).
12. Vilchez-Cornejo J, Quiñones-Laveriano D, Failoc-Rojas V, Acevedo-Villar T, Larico-Calla G, Mucching-Toscano S, et al. Salud mental y calidad de sueño en estudiantes de ocho facultades de medicina humana del Perú. Rev Chil Neuro-Psiquiatr. 2016;54(4):272–81.
13. Ethelberg S. SLEEP- PARALYSIS OR POSTDORMITIAL CHALASTIC FITS IN CORTICAL LESION OF THE FRONTAL POLE. Acta Psychiatr Scand. 1957;31(S108):121–30.
14. American Academy of Sleep Medicine. International classification of sleep disorders. Diagn Coding Man. 2005;51–5.
15. Ness RC. The old hag phenomenon as sleep paralysis: A biocultural interpretation. Cult Med Psychiatry. 1978;2(1):15–39.
16. Giménez Maciel CF, Almada González SM. Calidad del sueño de estudiantes de Medicina y Enfermería de la FACISA–UNE. 2016;
17. Sharpless BA. A clinician's guide to recurrent isolated sleep paralysis. Neuropsychiatr Dis Treat. 2016;12:1761.
18. Lišková M, Janečková D, Krátčmarová LK, Mladá K, Bušková J. The occurrence and predictive factors of sleep paralysis in university students. Neuropsychiatr Dis Treat. 2016;12:2957.
19. Carone C, Silva B, Rodrigues L, Tavares P, Carpena M, Santos I. Factors associated with sleep disorders in university students. Cad Saude Publica. 2020;36(3):e00074919.
20. Navarro-Martínez R, Chover-Sierra E, Colomer-Pérez N, Vlachou E, Andriuseviciene V, Cauli O. Sleep quality and its association with substance abuse among university students. Clin Neurol Neurosurg. 2020;188:105591.
21. Huamaní C, Reyes A, Mayta-Tristán P, Timana R, Salazar A, Sánchez D, et al. Calidad y parálisis del sueño en estudiantes de medicina. En UNMSM. Facultad de Medicina; 2006. p. 339–44.
22. Loo MBB, Zeballos CG, Peña AJH, Loayza IP, Gonzales MA, de Castro Mujica JR. Calidad de sueño y excesiva somnolencia diurna en estudiantes del tercer y cuarto año de Medicina. CIMEL Cienc E Investig Médica Estud Latinoam. 2010;15(2):54–8.
23. Lazarte C, Murillo C, Padilla M, Schult S, Sunción V. Calidad de sueño en internos de Medicina de la Universidad Nacional Mayor de San Marcos, Agosto 2005. En 2005.
24. Lezcano H, Vieto Y, Morán J, Donadío F, Carbono A. Características del Sueño y su Calidad en Estudiantes de Medicina de la Universidad de Panamá. Rev Méd Científica. 2014;27(1).
25. Correa MSA. Asociación entre conocimiento y uso de métodos anticonceptivos en estudiantes de enfermería y medicina de la Universidad El Bosque. Rev Colomb Enfermeria. 2006;1:65–73.
26. Almojali AI, Almalki SA, Alothman AS, Masuadi EM, Alaqeel MK. The prevalence and association of stress with sleep quality among medical students. J Epidemiol Glob Health. 2017;7(3):169–74.
27. Rao W-W, Li W, Qi H, Hong L, Chen C, Li C-Y, et al. Sleep quality in medical students: a comprehensive meta-analysis of observational studies. Sleep Breath. 2020;1–15.
28. Safhi MA, Alafif RA, Alamoudi NM, Alamoudi MM, Alghamdi WA, Albishri SF, et al. The association of stress with sleep quality among medical students at King Abdulaziz University. J Fam Med Prim Care. 2020;9(3):1662.
29. Castro AM, Caamaño LU, Julio SC. Calidad del dormir, insomnio y rendimiento académico en Estudiantes de Medicina. Duazary Rev Int Cienc Salud. 2014;11(2):2.
30. Paquiyauri Dios MÁD. Estilos de vida de los estudiantes de la escuela de Obstetricia de la Universidad Nacional de Tumbes, 2018. 2018;
31. Obaid B, Nathaniel E, Shams L, Ibrahim S. Types of sleep disorders among medical students of Rehman Medical College: a cross-sectional study. J Med Stud. 2019;3(1–2).
32. Belingheri M, Pellegrini A, Facchetti R, De Vito G, Cesana G, Riva M. Self-reported prevalence of sleep disorders among medical and nursing students. Occup Med. 2020;
33. Piro RS, Alhakem SSM, Azzez SS, Abdulah DM. Prevalence of sleep disorders and their impact on academic performance in medical students/University of Duhok. Sleep Biol Rhythms. 2018;16(1):125–32.

34. Nasiri K, Shekarchi A, Roshangar A, Nasiri A, Jafari M. Sleep Quality of Students during Final Exams in Ardabil and Khalkhal University of Medical Sciences. Int Electron J Med. 2019;8(1):66–72.
35. Muñoz Naranjo JD, Rizzo Vinueza VA. Parálisis y alucinaciones del sueño en estudiantes de la Facultad de Medicina de la Pontificia Universidad Católica del Ecuador y su asociación con la privación de sueño en los meses de septiembre a noviembre del 2015. 2016;
36. Everett HC. Sleep paralysis in medical students. J Nerv Ment Dis. 1963;136(3):283–7.
37. Penn NE, Kripke DF, Scharff J. Sleep paralysis among medical students. J Psychol. 1981;107(2):247–52.
38. Ohaeri JU, Odejide A, Ikuesan B, Adeyemi J. The pattern of isolated sleep paralysis among Nigerian medical students. J Natl Med Assoc. 1989;81(7):805.
39. 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. el 1 de mayo de 2008;25(5):435–40.
40. Schadow C, Schredl M, Rieger J, Göritz AS. The relationship between lucid dream frequency and sleep quality: Two cross-sectional studies. Int J Dream Res. 2018;11(2):154–9.
41. Ma S, Wu T, Pi G. Sleep paralysis in Chinese adolescents: a representative survey. Sleep Biol Rhythms. 2014;12(1):46–52.
42. Munezawa T, Kaneita Y, Osaki Y, Kanda H, Ohtsu T, Suzuki H, et al. Nightmare and sleep paralysis among Japanese adolescents: a nationwide representative survey. Sleep Med. 2011;12(1):56–64.
43. Jiménez Genchi A, Ávila Rodríguez VM, Sánchez Rojas F, Vargas Terrez BE, Nenclares Portocarrero A. Sleep paralysis in adolescents: the 'a dead body climbed on top of me'phenomenon in Mexico. Psychiatry Clin Neurosci. 2009;63(4):546–9.
44. Denis D, French CC, Schneider MN, Gregory AM. Subjective sleep- related variables in those who have and have not experienced sleep paralysis. J Sleep Res. 2018;27(5):e12650.
45. Hsieh S-W, Lai C-L, Liu C-K, Lan S-H, Hsu C-Y. Isolated sleep paralysis linked to impaired nocturnal sleep quality and health-related quality of life in Chinese-Taiwanese patients with obstructive sleep apnea. Qual Life Res. 2010;19(9):1265–72.
46. American Academy of Sleep Medicine. International classification of sleep disorders. Diagn Coding Man. 2014;
47. Denis D. Relationships between sleep paralysis and sleep quality: current insights. Nat Sci Sleep. 2018;10:355.
48. Solomonova E. 31 Sleep Paralysis: Phenomenology, Neurophysiology, and Treatment. Oxf Handb Spontaneous Thought Mind-Wander Creat Dreaming. 2018;435.
49. 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(3):297–312.
50. Carrillo-Mora P, Barajas-Martínez KG, Sánchez-Vázquez I, Rangel-Caballero MF. Trastornos del sueño:¿ qué son y cuáles son sus consecuencias? Rev Fac Med México. 2018;61(1):6–20.
51. Campos-Rodríguez F, Fernández-Palacín A, Reyes-Núñez N, Reina-González Á. Características clínicas y polisomnográficas del síndrome de apneas durante el sueño localizado en la fase REM. Arch Bronconeumol. 2009;45(7):330–4.
52. Ohayon MM, Zulley J, Guilleminault C, Smirne S. Prevalence and pathologic associations of sleep paralysis in the general population. Neurology. 1999;52(6):1194–1194.
53. Ramsawh HJ, Raffa SD, White KS, Barlow DH. Risk factors for isolated sleep paralysis in an African American sample: a preliminary study. Behav Ther. 2008;39(4):386–97.
54. Vela-Bueno A, De Iceta M, Fernández C. Prevalencia de los trastornos del sueño en la ciudad de Madrid. Gac Sanit. 1999;13(6):441–8.
55. Pin-Arboleda G, Cubel M, Morell M. Particularidades de los trastornos del sueño en la edad pediátrica. Recuperado En Httpwww Aepap Orggtsiaepapgtsuenoevolparas Pdf. 2017;15(05).
56. Peterson MJ. Sleep Paralysis: Historical, Psychological, and Medical Perspectives. 2016;
57. Rosales E, Egoavil M, La Cruz C, Rey de Castro J. Somnolencia y calidad del sueño en estudiantes de medicina de una universidad peruana. En UNMSM. Facultad de Medicina; 2007. p. 150–8.
58. García Gascón Á, Querts Méndez O, Hernández González RC, Agüero Martén R, Cascaret Soto X. Algunas variables biológicas relacionadas con trastornos del sueño en estudiantes de primer año de medicina. Medisan. 2015;19(8):978–83.
59. Bugueño M, Curihual C, Olivares P, Wallace J, López-AlegrÍa F, Rivera-López G, et al. Calidad de sueño y rendimiento académico en alumnos de educación secundaria. Rev Médica Chile. 2017;145(9):1106–14.
60. Roa B, Constanza M, Parada D, Vargas D, López B. Calidad del sueño y consumo de inhibidores del sueño en estudiantes de medicina. Rev ANACEM. 2016;10(1)