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Restless Leg Syndrome in Dormitory and Its Relationship with Sleep Quality

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Restless legs syndrome, is a widespread, chronic, multifactorial movement condition of the limbs in which patients have an insatiable need to move their legs.
It was linked to poor quality sleep among students.
Objective: This study aim to explore The Relationship between them among health sciences students who live in dormitory.
Methods: We conducted a Quantitative cross-sectional observation study by using a validated questionnaire targeting Health sciences students and compare to those who live in dormitory Summary statistics for the data are presented in the form of numbers and percentages for categorical variables. A mean score for restless leg symptoms and quality of sleep was calculated. A higher score reflects severe symptoms or poor sleep quality.
IBM SPSS 26 for windows software was used for the analysis, and a P-value < 0.05 is considered statistically significant.
Results: A total of 148 students participated in this study. The highest percentage of participants are from the faculty of medicine (58.1%), while participants from other health sciences faculties ranged from 5.4% to 14.2%. 58.1% of the participants are living in the dorms.
The relationships between dormitory and restless leg syndrome average score and with sleep quality average score were studied using independent sample t test. The results showed no

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statistically significant difference between those living in the dorms and those outside the dorms in any of the scores. Even though the results showed no statistically significant difference between students of different faculties in the sleep quality score.
Conclusion: There was no statistically significant difference regarding living in dorms, but there was a statistically significant difference regarding the faculties.

Keywords: Restless leg syndrome; sleep quality; dormitory; health sciences students.

1. INTRODUCTION

Willis-Ekbom illness, often known as restless legs syndrome, is a widespread, chronic, multifactorial movement condition of the limbs in which patients have an insatiable need to move their legs. This is frequently linked to unusual, non-painful feelings that begin at rest and improve with movement. The symptoms get worse at night in a diurnal rhythm [1]. The symptoms get worse at night in a diurnal rhythm [2]. Sleep disruption is linked to periodic leg movements of sleep, which are involuntary jerking movements of the legs that occur while sleeping [2].

Restless legs syndrome can affect anywhere from 5% to 15% of the population. Restless legs syndrome is more common in those under the age of 45 [3]. Age ranges from infancy to more than 90 years. Women are more impacted than males [4]. When compared to whites, African Americans are less likely to be harmed. Pregnant women in the range of 11% to 29% are impacted. It's three times more prevalent in pregnant women than it is in non-pregnant women, and it's more common in the third trimester [5]. According to recent epidemiologic investigations of different nations, the incidence rate ranged from 3.9 to 15% of the general population [6]. Asians have a substantially lower incidence, ranging from 0.1 to 12 percent [7]. The overall prevalence of RLS was 50.22% including 53.7% males and 46.3% females in King Abdulaziz Medical City-King Fahad National Guard Hospital (KAMC-KFNGH), Riyadh and King Faisal Specialist Hospital and Research Centre (KFHRC), Jeddah, Saudi Arabia [8].

In idiopathic restless legs syndrome, the dopaminergic system is disrupted, and iron reserves in certain brain areas are depleted [1]. There may be an autosomal dominant inheritance; restless legs syndrome has been reported in multiple big families with various susceptibility loci. This shows that the illness has a hereditary foundation [4]. The pathogenesis of uremic restless legs syndrome may include calcium/phosphate imbalance, anemia, functional iron insufficiency, and subclinical peripheral nerve problems. Pre-eclampsia, a strong family history, low serum iron and ferritin levels, and high estrogen levels may all play a role in pregnancy [9].

The disease's complications are confined to a reduction in quality of life owing to sleep disturbances and exhaustion. In most patients, the symptoms worsen over time and have a major impact on their quality of life. Patients with RLS may develop additional sleep problems, such as insomnia and excessive daytime drowsiness, as a result of their restlessness. In its most severe forms, it develops into a chronic and debilitating illness that needs long-term therapy. Despite the fact that there is no cure for this illness, clinical therapy aims to treat the underlying causes and investigate various medications for symptomatic alleviation. Symptoms can be treated with a range of medications, including dopaminergic medicines, opioids, anticonvulsants, and sedative hypnotics [10]. In general, the symptoms are milder in the mornings and worsen in the evenings and at night [11]. The symptoms in some people are so severe that they are incapacitating, disrupting sleep, and causing daytime weariness [4]. Restless leg syndrome individuals have been linked to hypertension, headaches, and sleep problems in studies [12]. The majority of patients have a low quality of life [13].

2. METHODOLOGY

It is a cross-sectional observational study using a validated questionnaire. The study population is the health sciences students at King Saud University, Saudi Arabia. All students who are living in the dorms or outside the dorms from the college of Medicine, college of dentistry, college of pharmacy, college of applied medical sciences, and college of nursing are included. Students with history of psychiatric problems were also included in the study. Assessment of the presence of restless leg symptom and assessment of sleep quality were done using structured questionnaires. International Restless Legs Syndrome Rating Scale was used to

assess the severity of restless leg symptom, and The Insomnia Severity Index (ISI) was used for sleep quality. A validated Arabic version of both scales was used.

The questionnaire was distributed to the students using an electronic form. Convenience sampling was used till reaching a sufficient sample size of 148 students.

2.1 Statistical Analysis

Summary statistics for the data are presented in the form of numbers and percentages for categorical variables. A mean score for restless leg symptoms and quality of sleep was calculated. A higher score reflects severe symptoms or poor sleep quality. Comparison of the scores between different participants' groups was done using independent samples t test or one-way ANOVA. Chi square test was used to compare the percentage of having restless leg symptoms. The correlation between restless leg syndrome average score and sleep average score was studied using Pearson's correlation.

IBM SPSS 26 for windows software was used for the analysis, and a P-value < 0.05 is considered statistically significant.

3. RESULTS

A total of 148 students participated in this study. The highest percentage of participants are from the faculty of medicine (58.1%), while participants from other faculties ranged from 5.4% to 14.2%. 58.1% of the participants are living in the dorms as presented in Table 1.

The answers of the participants regarding the severity, characteristics and effects of restless leg syndrome are presented in Table 2 and Fig 1.

The answers of the participants regarding the severity, characteristics of sleep disorders are presented in Table 3 and Fig. 2.

For the sake of comparison, an average score for the severity of restless leg syndrome was calculated based on the individual questions regarding this phenomenon. A higher score indicates more severe symptoms. The same was done for the quality of sleep, an average score was calculated. A higher score indicates poorer quality of sleep.

The relationships between dormitory and restless leg syndrome average score and with sleep quality average score were studied using independent sample t test. the results showed no statistically significant difference between those living in the dorms and those outside the dorms in any of the scores as presented in Table 4.

The relationship between faculties and sleep quality average score was studied using One-way ANOVA. The results showed no statistically significant difference between students of different faculties in the sleep quality score as presented in Table 5.

The relationship between faculties and restless leg syndrome average score was studied using Kruskal Wallis test. The results showed no statistically significant difference between students of different faculties in the restless leg syndrome average score as presented in Table 6.

The correlation between restless leg syndrome average score and sleep average score was studied using Pearson's correlation. The Pearson's correlation coefficient is 0.46 indicating a moderate positive relationship between them. This relationship is also illustrated in the scatterplot in Fig. 3.

The association between having any symptoms of restless leg syndrome and the faculty or living in dorms was done using Chi-Square test. There was no statistically significant difference regarding living in dorms, but there was a statistically significant difference regarding the faculties. The percentage of having restless leg symptoms in the faculty of applied sciences was 71.4% and 50% in the faculty of pharmacy. Other faculties have lower percentages as presented in Table 8.

4. DISCUSSION

We went through many various articles, and to the best of our knowledge, this is the first study of RLS among health science faculties students who live in dormitory, and their relationship to sleep disorder. Since the dormitory students have different situations than those who live in their home and family, the studies about this group still limited and needs to be covered by researchers.

Global RLS prevalence rate of RLS is 0.7% to 12.5% in Asia. RLS was perfectly studied in females which found to be higher in incidence, it may relate to the highest levels of estrogen, or psychological changes [1]. However the prevalence of RLS is about e 5.2%–8.4% 8.4% Which increases with age, peaks at 45– 55 years

of age and even a decline of RLS frequency in the older elderly [14,2]. These findings made us focus on male gender groups as major inclusion factor.

It has been concluded that the prevalence of RLS among health sciences students was not affected by dormitory living, on the other hand it showed that there are some discrepancies in the presence of RLS and the association with sleep disorder. The percentage of having restless leg symptoms in the faculty of applied sciences was the highest among the faculties 71.4%, followed by the faculty of pharmacy 50%. The correlation between restless leg syndrome average score and sleep average score was indicating a moderate positive relationship between them.

The relationship between aging and RLS depends on whether the RLS is idiopathic or secondary [4]. The RLS can develop at any age, although the majority of people who suffer from it are over the age of 40. This data was gathered as part of a few epidemiological research. Two studies looked at the relationship between the age of onset and the cause. Idiopathic RLS has a similar age of onset in both studies. The age of onset for idiopathic RLS was 33.7 years in one research [11] and 35.4 years in the other study [15]; the age of onset for secondary RLS was 47.4 (5.3) years [15]. Another study found that 70.2% of RLS patients started before the age of 45, but did not specify whether the condition was idiopathic or secondary [3].

Table 1. Descriptive statistics of the participants

		Frequency	Percentage
Faculty	Medicine	86	58.1
	Pharmacy	8	5.4
	Nursing	16	10.8
	Dental	17	11.5
	Applied sciences	21	14.2
Living in Dorms	No	62	41.9
	yes	86	58.1

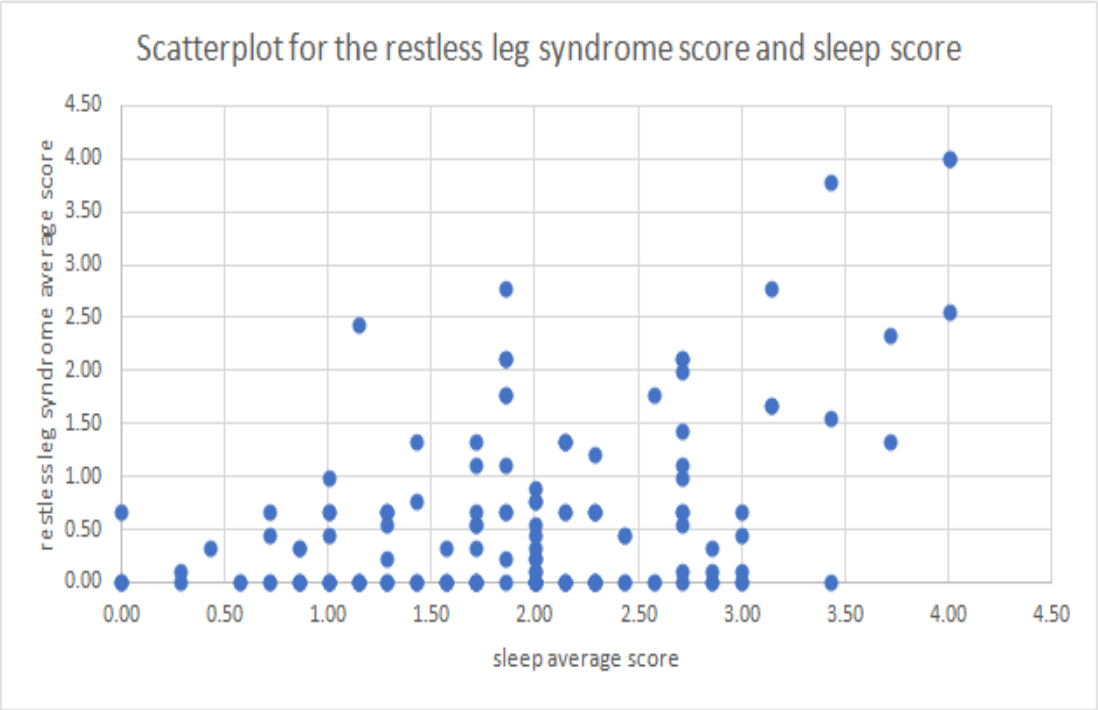

Fig. 1. Scatterplot for the restless leg syndrome score and sleep score

Table 2. Severity, characteristics and effects of restless leg syndrome on the participants

				Severity of symptoms			
		None	Having symptoms	Mild	Moderate	Severe	Very severe
Over the past 7 days in general, how much discomfort does restless legs syndrome caused to your legs or arms?	%	54.7	45.3	26.4	8.8	6.8	3.4
Over the past 7 days in general, how often do you need to move because of your restless leg syndrome symptoms?	%	58.1	41.9	18.9	12.2	6.1	4.7
Over the past 7 days, how severe has your sleep been due to your restless legs syndrome symptoms?	%	83.1	16.9	8.1	4.1	3.4	1.4
During the past 7 days, how tired or sleepy have you been during the day due to your restless leg syndrome symptoms?	%	77.7	22.3	10.1	7.4	3.4	1.4
Over the past 7 days, how severe was your restless legs syndrome as a whole?	%	62.2	37.8	20.9	10.8	4.1	2.0
During the past 7 days, how frequently have you had restless legs syndrome symptoms?	%	50.0	50.0	31.8	9.5	3.4	5.4
During the past 7 days when I had restless legs symptoms, how severe were they on average?	%	54.1	45.9	31.8	4.7	7.4	2.0
During the past 7 days in general, how severe the impact of your restless legs syndrome symptoms on your ability has been to carry out your daily affairs, for example, to practice your family, home, social, academic, or professional life satisfactorily?	%	81.1	18.9	14.9	0.7	0.7	2.7
Over the past 7 days, how severe was your mood disturbance due to your restless leg syndrome symptoms - e.g., you were angry, depressed, sad, anxious, or irritable?	%	72.3	27.7	18.9	2.7	2.7	3.4

Table 3. Severity and characteristics of sleeping disorders among participants

				Severity of symptoms			
		None	Yes	Mild	Moderate	Severe	Very severe
Do you have difficulty falling asleep?	%	20.3	79.7	26.4	30.4	14.9	8.1
Do you have trouble staying asleep?	%	28.4	71.6	27.7	29.1	8.1	6.8
Do you have problems waking up too early?	%	13.5	86.5	23.0	25.0	19.6	18.9
To what extent do you think your sleep problem is affecting your daily functions (eg fatigue during the day, ability to work at your job/daily chores, concentration, memory, mood, etc.)	%	12.2	87.8	14.9	35.1	20.3	17.6
How noticeable is your sleep problem to others in terms of affecting your quality of life?	%	10.1	89.9	16.2	30.4	18.9	24.3
How concerned are you with your current sleep problem?	%	29.1	70.9	24.3	23.6	12.2	10.8

Table 4. The Relationships between dormitory and restless leg syndrome average score with sleep quality average score

	Living in Dorms	N	Mean	SD	P-value
Restless Leg Syndrome Average score	No	62	0.55	0.78	0.745
	Yes	86	0.60	0.88	
sleep Average score	No	62	1.74	0.98	0.058
	Yes	86	2.02	0.72	

Table 5. The Relationship between faculty and sleep quality average score

	N	Mean	SD	P-value
Medicine	86	1.78	0.90	0.271
Pharmacy	8	2.05	0.98	
Nursing	16	2.07	0.54	
Dental	17	1.92	0.81	
Applied sciences	21	2.19	0.74	

Table 6. The Relationship between restless leg syndrome average score and Faculty

	N	Median	IQR	P-value
Medicine	86	0.06	0.67	0.070
Pharmacy	8	0.50	0.58	
Nursing	16	0.22	1.69	
Dental	17	0.00	0.67	
Applied sciences	21	0.67	1.28	

Table 7. Correlation between restless leg syndrome average score and sleep average score

		Restless Leg Syndrome Average score
Sleep Average score	Pearson Correlation coefficient	0.461
	P-value	<0.001

Table 8. The association of having symptoms of restless leg syndrome and living in dorms and the faculty

			Restless leg syndrome symptoms		P-value
			No	Yes	
Living in Dorms	No	N	39	23	0.875
		%	62.9%	37.1%	
	Yes	N	53	33	
		%	61.6%	38.4%	
Faculty	Medicine	N	61	25	0.009
		%	70.9%	29.1%	
	Pharmacy	N	4	4	
		%	50.0%	50.0%	
	Nursing	N	10	6	
		%	62.5%	37.5%	
	Dental	N	11	6	
		%	64.7%	35.3%	
	Applied Sciences	N	6	15	
		%	28.6%	71.4%	

The incidence of symptoms consistent with RLS among this cohort of adolescents and young adults is comparable to RLS prevalence rates previously reported in adults, according to the findings of this study [16,17]. The current study showed that the symptoms are milder in the

mornings and worsen in the evenings and at night. The symptoms in some people are so severe that they are incapacitating, disrupting sleep, and causing daytime weariness. Restless leg syndrome individuals have been linked to hypertension, headaches, and sleep problems in studies. The majority of patients have a low quality of life. This was consistent with RLS symptoms were significantly with greater odds of having trouble falling asleep, and trouble falling asleep was associated with lower health-related quality of life [13].

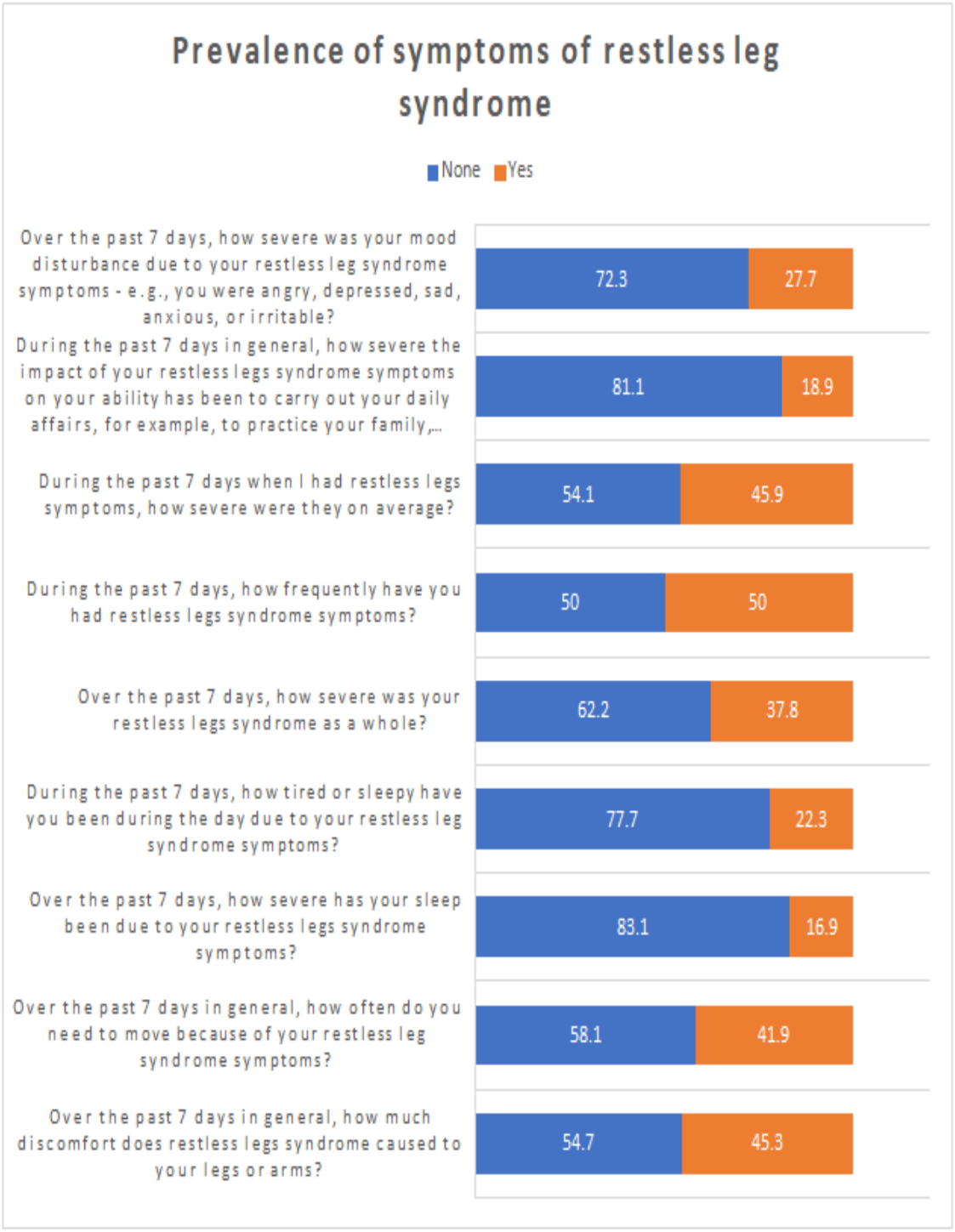

Fig. 2. Prevalence of symptoms of restless leg syndrome

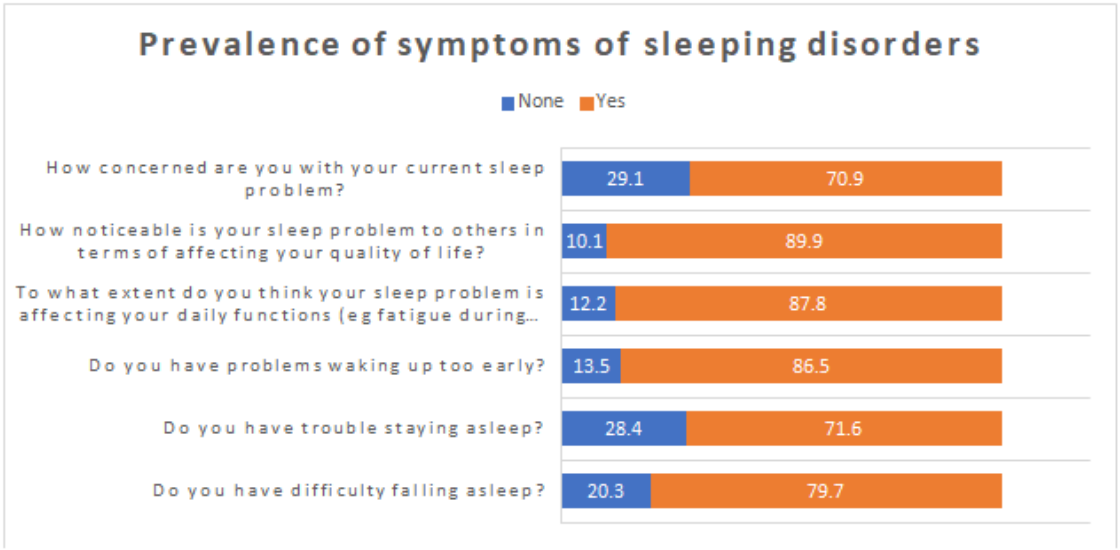

Fig. 3. Prevalence of symptoms of sleeping disorders

Identifying the factors that influence the prevalence of RLS among the students is a crucial step, like being a female, which found to be higher in incidence, it may relate to the highest levels of estrogen, or psychological changes [1]. In addition, it is has been noted that smoking was associated with RLS, whereas consumption of coffee and tea had a negative effect on RLS [18]. Further studies are needed to establish the relationship between RLS, background factors, and age.

Other factor to consider which P Medcalf et al. reported that about 40% of patients with restless legs syndrome have a family history. In these patients it is inherited as an autosomal dominant disorder with variable penetrance and clinical expressivity [19]. In current study 54.1% of participant had severe restless leg symptom.

With regard to the relationship between RLS and sleep hours the Sleep quality disorder was the most common problem among these patients compared to the normal healthy population. RLS could be an etiological factor, or just attendant with other sleep disorders; insomnia, sleep fragmentation and reduction of sleep quality could lead to daytime sleepiness and mood disorders which directly affect their quality of life and mortality rate [20].

5. CONCLUSION

In Conclusion, RLS is extremely momentous and frequently underestimated disease which can affect any individual in the population, some factors have been studied and documented. Even though, the researchers need to give more efforts to find further about this disease and its relationships.

6. LIMITATIONS

One lack of our study was that the sample was only including male students. In addition to small sample size that we could not expand it due to poor response from students. However, we have used RLS international scale as an online questionnaire, the student answers ware based on self judgement instead of clinical psychiatric evaluation.

7. RECOMMENDATIONS

Students who are suspected to have RLS or sleep quality disorder should be encouraged to a Physician for early recognition and intervention. Further studies are needed about this topic to recognize the affection on students' performance and raise the awareness among our population. Therefore, its affection on sleep quality needs to be investigated more. We suggest to study the relationship between RLS and mental health disorder, to address the problem properly.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not

intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Lisa Klingelhoefer, Kalyan Bhattacharya, Heinz Reichmann Restless legs syndrome Clinical Medicine. 2016;16 (4):379382. DOI: 10.7861/clinmedicine.16-4-379
2. Venkateshiah SB, Ioachimescu OC. Restless legs syndrome. Crit Care Clin. 2015;31(3):459-472. DOI:10.1016/j.ccc.2015.03.003
3. Curcio G, Ferrara M, De Gennaro L. Sleep loss, learning capacity and academic performance. Sleep Med Rev. 2006;10(5):323-37. DOI: 10.1016/j.smrv.2005.11.001. Epub 2006 Mar 24. PMID: 16564189.
4. Trenkwalder C, Allen R, Högl B, et al. Comorbidities, treatment, and pathophysiology in restless legs syndrome. Lancet Neurol. 2018;17(11):994-1005. DOI:10.1016/S1474-4422(18)30311-9
5. Prosperetti C, Manconi M. Restless Legs Syndrome/Willis-Ekbom Disease and Pregnancy. Sleep Med Clin. 2015;10(3): 323-9, xiv. DOI: 10.1016/j.jsmc.2015.05.016. Epub 2015 Jun 22. PMID: 26329442.
6. Ohayon MM, O'Hara R, Vitiello MV. Epidemiology of restless legs syndrome: a synthesis of the literature. Sleep Med Rev. 2012;16(4):283-95. DOI: 10.1016/j.smrv.2011.05.002. Epub 2011 Jul 26. PMID: 21795081; PMCID: PMC3204316.
7. Cho SJ, Hong JP, Hahm BJ, Jeon HJ, Chang SM, Cho MJ, Lee HB. Restless legs syndrome in a community sample of Korean adults: prevalence, impact on quality of life, and association with DSM-IV psychiatric disorders. Sleep. 2009;32(8): 1069-76. PMID: 19725258; PMCID: PMC2717197.
8. Kavanagh D, Siddiqui S, Geddes CC. Restless legs syndrome in patients on dialysis. Am J Kidney Dis. 2004;43(5):763-71. DOI: 10.1053/j.ajkd.2004.01.007. PMID: 15112166.
9. Gade K, Blaschke S, Rodenbeck A, Becker A, Anderson-Schmidt H, Cohrs S. Uremic restless legs syndrome (RLS) and sleep quality in patients with end-stage renal disease on hemodialysis: potential role of homocysteine and parathyroid hormone. Kidney Blood Press Res. 2013;37(4-5):458-63. DOI: 10.1159/000355727. Epub 2013 Oct 25. PMID: 24247595.
10. Allen RP, Walters AS, Montplaisir J, Hening W, Myers A, Bell TJ, Ferini-Strambi L. Restless legs syndrome prevalence and impact: REST general population study. Arch Intern Med. 2005;165(11):1286-92. DOI: 10.1001/archinte.165.11.1286. PMID: 15956009.
11. Japaridze G, Kasradze S, Maisuradze L, Popp R, Wetter T. The restless legs syndrome (review). Georgian Med News. 2018;(285):74-81.
12. Becker SP, Jarrett MA, Luebbe AM, Garner AA, Burns GL, Kofler MJ. Sleep in a large, multi-university sample of college students: sleep problem prevalence, sex differences, and mental health correlates. Sleep Health. 2018;4(2):174-181. DOI: 10.1016/j.sleh.2018.01.001. Epub 2018 Feb 21. PMID: 29555131; PMCID: PMC5863586.
13. Silva GE, Goodwin JL, Vana KD, Vasquez MM, Wilcox PG, Quan SF. Restless legs syndrome, sleep, and quality of life among adolescents and young adults. J Clin Sleep Med. 2014;10(7):779-86. DOI: 10.5664/jcsm.3872. PMID: 25024656; PMCID: PMC4067442.
14. Gonzalez-Latapi P, Malkani R. Update on Restless Legs Syndrome: from Mechanisms to Treatment. Curr Neurol Neurosci Rep. 2019;19(8):54. Published 2019 Jun 27.

DOI:10.1007/s11910-019-0965-4
15. Zheng B, Wang K, Pan Z, et al. Zhonghua Liu Xing Bing Xue Za Zhi. 2016;37(3):348-352.
DOI:10.3760/cma.j.issn.0254-6450.2016.03.011
16. BaHammam AS, Alaseem AM, Alzakri AA, et al. The relationship between sleep and wake habits and academic performance in medical students: A cross-sectional study. BMC Med Educ. 2012;12(61).
Available:https://doi.org/10.1186/1472-6920-12-61
17. Lund HG, Reider BD, Whiting AB, Prichard JR. Sleep patterns and predictors of disturbed sleep in a large population of college students. J Adolesc Health. 2010;46(2):124-32.
DOI: 10.1016/j.jadohealth.2009.06.016. Epub 2009 Aug 3.
PMID: 20113918
18. Demir G. Daytime sleepiness and related factors in nursing students. Nurse Educ Today. 2017;59:21-25.
DOI: 10.1016/j.nedt.2017.08.003. Epub 2017 Aug 26. PMID: 28918361.
19. Sarıaydın M, Günay E, Ünlü M. Tıp fakültesi öğrencileri arasında huzursuz bacak sendromu sıklığı, depresyon, anksiyete ve uyku kalitesi arasındaki ilişki [Frequency of restless legs syndrome and relationship between depression, anxiety and sleep quality among medical school students]. Tuberk Toraks. 2018;66(3):217-223. Turkish.
DOI: 10.5578/tt.29167. PMID: 30479229
20. Öcal, Ruhsen, Cagri, Aycan, Zeynep, Balaban, Seran, Senar, Sena, Yavuz, and Atgüden, Gizem. "Restless leg syndrome frequency in health workers." Ideggyógyászati Szemle. 2019;72(8): 236-240.

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