Original Article

Prevalence of Restless Leg Syndrome and Its Impact on the Quality of Life of Medical Students in Makkah, Saudi Arabia: A Cross-Sectional Study

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Abstract

Background and Aim: restless leg syndrome (RLS), also known as Willis-Ekbom disease (WED), is a movement and sleep disorder characterised by an uncontrollable desire to move the legs and is associated with uncomfortable and occasionally painful sensations in the legs. Unfortunately, there are limited data on the prevalence of this condition among medical students in Makkah. Therefore, we assessed the prevalence of RLS among Saudi medical students in Makkah, Saudi Arabia.

Methods: A cross-sectional study was conducted at Umm Al-Qura University College of Medicine in Makkah region between December 2022 till December 2023 utilising an online validated English language self-administered questionnaire targeting undergraduates medical student.

Results: A total of 366 medical students from Umm Al-Qura University were enrolled in our study, with a nearly equal number of both genders. Respondents were second- to sixth-year students. More than half of the respondents (53%, n = 192) did not show symptoms of RLS. In contrast, up to 47% (n = 174) of respondents experienced variations in the severity of RLS symptoms.

Conclusion: The current study found that nearly half of the medical students at Umm Al-Qura University reported symptoms related to or mimicking RLS. Moreover, the study showed personal history, family history, and marital status were significantly associated with RLS. However, GPA and academic year were not significantly associated with RLS. These findings suggest that more studies should be conducted to understand the effect of RLS on academic performance and health outcomes of medical students.

Keywords: Restless leg syndrome, medical students, prevalence, Makkah, Umm Al-Qura University

Introduction

Restless leg syndrome (RLS), also known as Willis-Ekbom disease (WED), is a movement and sleep disorder characterised by an urge to move the legs and is associated with uncomfortable and occasionally painful sensations in the legs, dlie symptoms are often present or made worse by inactivity, constantly forcing the affected individual to move their legs to get partial or complete relief. Other features of the symptoms are their gradual worsening or their occurring exclusively at night, making it difficult for patients to fall asleep or go back to sleep[1,2].

RLS can contribute to insomnia, sleep deprivation, anxiety, depression, decreased cognition and even cardiovascular disorders. If the disease progresses, symptoms may occur at the beginning of the day and worsen at night, possibly extending to the arms or even the trunk[3].

Most diagnoses of RLS are primary (idiopathic), often affecting middle-aged individuals; it has been suggested that RLS is a genetically inherited disease, and multiple different genes have been identified to play a role, along with dopaminergic and brain iron dysregulation[4,5]. Secondary RLS can accompany iron deficiency anaemia, pregnancy and end-stage renal disease, among many other causes, including depression and anxiety[6,7]. Medical students experience much stress throughout their academic journeys, which challenges their mental health and sleep quality[8].

A previous study done in Pakistan on the general population showed that out of 390 individuals, 92 (23.6%) were classified as positive for RLS. The prevalence of RLS in females was higher than in males. The study found that the 31-40-year-old age group was associated with an increase in RLS prevalence, indicating that increases in age increased the likelihood of RLS[9].

Moreover, another study in Egypt investigated the prevalence of RLS among 389 Egyptian medical students and found that 11.8% of the participants (27 females and 19 males) met the criteria for an RLS diagnosis[10]. Another study conducted on the general population in Saudi Arabia showed that 5.2% of the sample of 1303 individuals had RLS, and the highest rate was among participants between 45 and 60 years of age. The overall prevalence between males and females was roughly equal[11].

Unfortunately, there are limited data on the prevalence of this condition among medical students in Makkah. Therefore, we evaluate the prevalence of RLS among Saudi medical students in Makkah.

Methods

Study design

A cross-sectional study was conducted at Umm Al-Qura University (UQU) College of Medicine in Makkah utilising an online English language self-administered validated questionnaire from a published study[12]. The study conducted on December 2022 till December 2023. Undergraduate medical students, male and female, across all years were included in the target group. Students in the preparatory year and students outside of UQU were not included. The sample size was calculated using Epi info software version 3.0 while keeping the confidence

interval (CI) level at 95% with a 5% margin of error. Considering that the number of students enrolled at the College of Medicine was 1300, the study required a minimum of 297 participants. The questionnaire was created using Google Forms and then shared across various social media channels. The informed consent agreement appeared on the first page of the questionnaire, which was split into two sections. Sociodemographic data questions in the first section asked about the participant's age, academic year, gender, nationality, marital status and academic accomplishments. The second section featured the RLS rating scale, which consists of 10 questions; the scale assigns a maximum of four points to each question according to severity: 0 = none, 1 = mild, 2 = moderate, 3 = severe and 4 = very severe. Total scores of 1-10 points indicate mild, 11-20 indicate moderate, 21-30 indicate severe and 31-40 indicate very severe symptoms. The scale was validated by the International Restless Legs Syndrome Study Group (IRLSSG)[12].

Ethical Considerations

The Committee of Biomedical Research Ethics at Umm Al-Qura University's College of Medicine reviewed and approved this study before the questionnaire was disseminated; all participants provided informed consent. No names or phone numbers were requested to ensure the participants' data anonymity.

Statistical Analysis

Data were recorded on Microsoft Excel spreadsheets, which were then subsequently entered into the Statistical Package for Social Studies (SPSS 26). Frequency analysis was conducted for categorical variables, and mean ± standard deviation were determined for continuous variables. To enable the comparison of categorical variables, the chi-squared test was used. Univariate analysis was done to determine the association between RLS symptoms'severity and gender, academic year, academic achievement and other factors.

Results

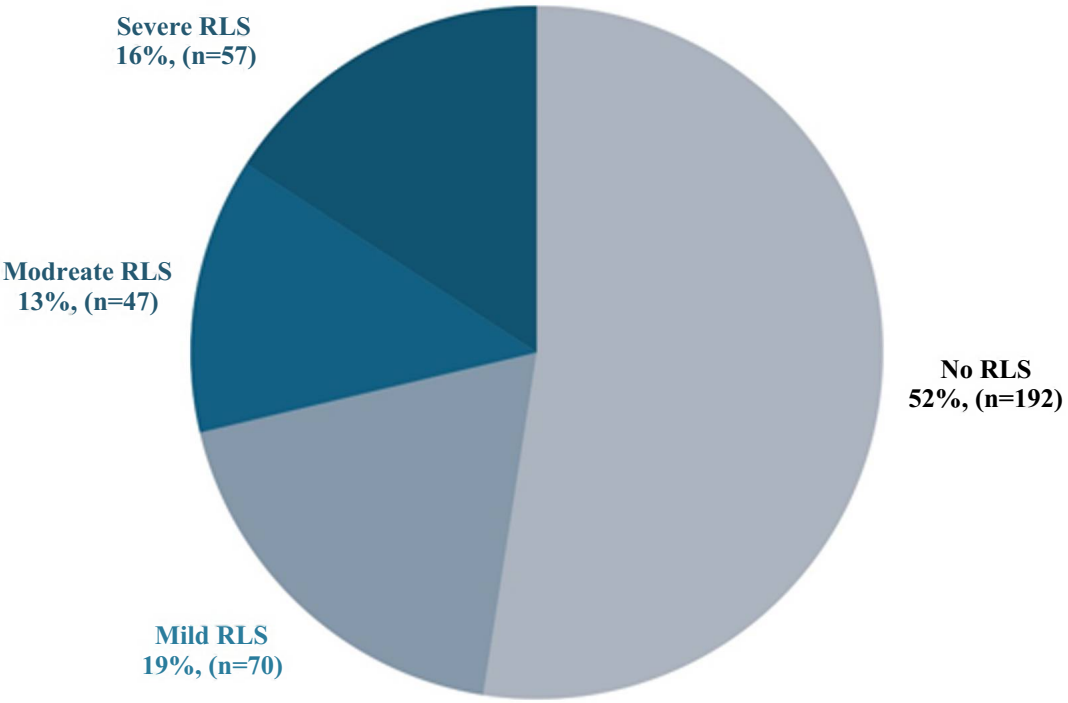
A total of 366 medical students were enrolled in our study. Male and female representation was almost equal, with 53.6% (n = 196) of respondents being female. Participants from the second to sixth years were involved in the study. Most of our population (73.2%, N = 268) was in good academic standing, as most reported a grade point average (GPA) of 3.5-4 out of 4. Most respondents (93.4%; n = 342) were single and unmarried. Only 8.5% (n = 31) and 7.1% (n = 26) reported personal and family histories of RLS, respectively. Sociodemographic data are displayed in **Table 1.**

Table 1. Socio-demographic characteristics of study participants

Characteristic		Frequency	Percentage
Gender	Male	170	46.4%
	Female	196	53.6%
Academic Year	2nd year	65	17.8%
	3rd year	101	27.6%
	4th year	80	21.9%
	5th year	60	16.4%
	6th year	60	16.4%
GPA	<2.75	7	1.9%
	2.75 - 3.49	91	24.9%
	3.5-4	268	73.2%
Marital status	Single	342	93.4%
	Engaged	12	3.3%
	Married	10	2.7%
	Divorced/widow	2	0.5%
Personal history with RLS	Positive	31	8.5%
	Negative	335	91.5%
Family history of RLS	Positive	26	7.1%
	Negative	340	92.9%

Figure 1 illustrates the number and percentages of participants displaying symptoms suggestive of or mimicking RLS. More than half of the respondents (53%, n = 192) did not show signs of the syndrome. In contrast, up to 47% (n = 174) of respondents had experienced symptoms of varying severity. Mild symptoms were reported by 19% (n = 70) of the respondents.

Figure 1. RLS status among the included participants



The presence of the features of RLS significantly correlated with several variables. Most of the respondents who had previously reported having a personal history of RLS had scores suggestive of moderate to severe RLS, and the same can be said about participants with a positive family history; P < 0.001 for both factors. Marital status was also significantly associated with RLS, with P = 0.003. Furthermore, engaged participants were more likely to show symptoms of RLS than single participants. A detailed breakdown of associations is shown in **Table 2.**

Table 2. RLS status in association with demographic characteristics of the participants

Demographic characteristics	*RLS status*				*P-value*
	No RLS	*Mild*	*Moderate*	*Severe*	
Gender					
Male	94 (49%)	31 (44.3%)	22 (46.8%)	23 (40.4%)	0.689
Female	98 (51%)	39 (55.7%)	25 (53.2%)	34 (59.6%)	
Academic year					
2nd year	28 (14.6%)	20 (28.6%)	7(14.9%)	10(17.5%)	
3rd year	56 (29.2%)	15 (21.4%)	16(34%)	14(24.6%)	
4th year	41 (21.4%)	10(14.3%)	14 (29.8%)	15 (26.3%)	0.216
5th year	32(16.7%)	13 (18.6%)	7(14.9%)	8 (14.0%)	
6th year	35 (18.2%)	12(17.1%)	3 (6.4%)	10(17.5%)	
GPA					
High GPA	139 (72.4%)	59 (84.3%)	31 (66.0%)	39 (68.4%)	0.095
Moderate to low GPA	53 (27.6%)	11 (15.7%)	16 (34.0%)	18(31.6%)	
Personal history of RLS					
Positive	1 (0.5)	4 (5.7%)	8 (17%)	18 (31.6%)	<0.001*
Negative	191 (99.5%)	66 (94.3)	39 (83%)	39 (68.4%)	
Family history of RLS					
Positive	2 (1%)	3 (4.3%)	10(21.3%)	11 (19.3%)	<0.001*
Negative	190 (99%)	67 (95.7%)	37 (78.7%)	46 (80.7%)	
Marital status					
Single	185 (96.4%)	68 (97.1%)	42 (89.4%)	47 (82.5%)	
Engaged	3 (1.6%)	2 (2.9%)	3 (6.4%)	4 (7.0%)	0.003*
Married	3 (1.6%)	0 (0%)	1 (2.1%)	6(10.5%)	
Divorced/widow	1 (50%)	0 (0%)	1 (50%)	0 (0.0%)	

* Crosstabs was used. The difference is considered significant at a p-value < 0.05.

Discussion

Medical students are exposed to many challenges and stressors throughout their academic journeys. These pressures have been linked to a variety of negative health outcomes, including sleep disturbance[13]. This study evaluated the prevalence of RLS among medical students.

Our study found that 47% of the surveyed medical students had RLS with symptoms of varying degrees of severity. The majority (19%) reported mild RLS, followed by moderate (13%), severe (16%).In contrast to our study, a study performed at the University of Tabuk showed a lower prevalence (39.7%)[14]. In addition, a study done among medical students in Turkey showed a 16.9% prevalence of RLS[15]. Moreover, studies conducted in Egypt and Karachi among medical students showed a lower prevalence (11.9%% and 8%, respectively)[10,16]. Additionally, a study among the middle-aged Saudi population showed a prevalence of 8.4%[17].These discrepancies maybe attributed to differences in sample size, methodology, and potentially, specific stressors associated with each region's medical education system.

In terms of the correlation between the prevalence of RLS and demographic characteristics, our study identified a statistically significant association between a personal history of RLS and the increased prevalence of the condition. This finding suggests the potential role of recurring episodes in individuals with a prior diagnosis. Students with a positive family history of RLS also showed a significantly higher prevalence, indicating a possible genetic component to the condition. Interestingly, engaged students exhibited a significantly greater prevalence than single students, suggesting a potential link between premarital stress and RLS. According to the Literature, a higher prevalence was found among females than males across all variables which support study result[16,18,19,20,21]. Students in their second, third and fourth years were associated with a higher prevalence of RLS compared to fifth- and sixth-year students. Similarly, a study in Turkey found that the prevalence of RLS was higher among second- and third-year medical students. These findings could be due to the increased academic challenges encountered in the earlier years of medical school. Surprisingly, students with higher GPAs were associated with the increased prevalence of RLS compared to those with lower GPAs. These findings contrast a study conducted in Turkey that showed a higher prevalence of RLS among students with lower GPAs[22]. This finding warrants further investigation in future studies.

This study highlighted the significant prevalence of RLS among medical students, which is potentially influenced by various factors, including personal history, family history and marital status. The observed inconsistencies in prevalence rates across different studies emphasise the need for further research to understand the specific stressors contributing to RLS in medical student populations, considering the potential impact on their wellbeing and academic performance.

This study has several limitations. First,

no clinical assessments were carried out to confirm the diagnosis of RLS and to distinguish between primary and secondary forms. Second, the study design was descriptive, cross-sectional and limited to medical students. Lastly, one notable limitation of our study was related to the sampling method used. Due to the nature of the online questionnaire, we were unable to randomize our sample. This means that participants were not selected in a way that would ensure every individual in the target population had an equal chance of being included in the study.

Conclusion

Umm Al-Qura University's medical students reported symptoms related to or mimicking RLS. This study found the significant prevalence of RLS among medical students, which is potentially influenced by various factors, including personal history, family history and marital status. The observed inconsistencies in prevalence across different studies highlight the need for additional research to understand the specific stressors contributing to RLS in medical student populations, considering the potential impact on their wellbeing and academic performance.

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The anonymized participant data is securely stored. If a reasonable request is made, data could be obtained from Mohammed H. Alharbi by contacting him at Mohammed.H.Alharbi2@gmail.com.

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Conflict of interest

The authors have no conflicts of interest.

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