Prevalence and Awareness of Restless Legs Syndrome and Associated Self Reported Sleep Problems in Medical Students

Tıp Öğrencilerinde Huzursuz Bacak Sendromu ve İlişkili Kendilerinin Bildirdiği Uyku Sorunlarının Prevalansı ve Farkındalığı

Tuğba Yıldız, Didem Kafadar, Ayşen Kutan Fenercioglu, Gülçin Benbir Şenel*, Nurver Turfaner Sipahioğlu

İstanbul University-Cerrahpasa, Cerrahpasa Faculty of Medicine, Department of Family Medicine, İstanbul, Turkey
*İstanbul University-Cerrahpasa, Cerrahpasa Faculty of Medicine, Department of Neurology, İstanbul, Turkey

Abstract

Objective: Restless Legs Syndrome (RLS) symptoms may cause stress and anxiety which lead to functional disturbances. In several studies, awareness about RLS was found to be low in physicians and medical students who live through a rigorous educational period. In this study, we aimed to investigate the frequency, risk factors, and awareness of RLS in medical students and associated sleep problems.

Materials and Methods: The study was planned as a cross-sectional, analytical study and included third and fourth year medical students. A questionnaire about sociodemographic characteristics, RLS parameters including risk factors, diagnostic criteria, awareness and sleep problems was applied to 354 students in a period of two months. Data were evaluated Chi-square, Fisher Exact Test, Kolmogorov Smirnoff Test, Student's t Test and Mann-Whitney U Test.

Results: In our study, 39 (11.1%) of the participants fullfilled the diagnostic Criteria A of RLS based on the ICSD-3. Female to male ratio was 1.6:1. RLS symptoms were associated with lower-income and family history (p=0.003, p=0.041). Self-reported symptoms of anxiety and stress as well as functional impairment were associated with RLS (p=0.003, p=0.004). Depression and sleep problems were more frequent in participants experiencing RLS symptoms (p=0.005, p=0,005). Awareness about RLS was observed in those with probable RLS (p=0.003), attending neurology rotation did not affect awareness, and the main source about RLS-related data was reported as web sources.

Conclusions: In this study, lower income, family history, depression as comorbidity, poor sleep quality, anxiety, stress and daytime dysfunctionality were associated with RLS symptoms. Awareness about RLS was quite low in the medical students. To enhance the diagnosis, treatment and appropriate referrals concerning RLS, awareness should be increased in medical students who are future physicians.

Keywords: Restless legs syndrome, awareness, sleep, medical students, questionnaire

Öz

Amaç: Huzursuz Bacak Sendromu (HBS) semptomları, stres ve anksiyeteye neden olarak fonksiyonel bozukluklara neden olabilir. Çeşitli çalışmalarda, yoğun bir eğitim süreci geçiren tıp öğrencilerinde ve hekimlerde HBS konusundaki farkındalığın düşük olduğu bulunmuştur. Bu çalışmada tıp öğrencilerinde HBS sıklığını, risk faktörlerini, farkındalığını ve buna bağlı uyku problemlerini araştırmayı amaçladık.

Gereç ve Yöntem: Çalışma kesitsel, analitik bir çalışma olarak planlanmış ve üçüncü ile dördüncü sınıf tıp öğrencilerini kapsamaktadır. Sosyodemografik özellikler, risk faktörlerini, tanı kriterlerini içeren HBS parametreleri, farkındalık ve uyku sorunlarını içeren anket 354 öğrenciye iki aylık sürede uygulanmıştır. Veriler Ki-kare, Fisher Exact Testi, Kolmogorov Smirnoff Testi, Students's t Testi ve Mann-Whitney U Testi ile değerlendirildi.

Bulgular: Çalışmamızda katılımcıların 39'u (%11,1) ICSD-3'e göre HBS Tanı Kriterleri A'yı karşılamıştı. Kadın-erkek oranı 1,6:1 idi. HBS belirtileri düşük gelir ve aile öyküsü ile ilişkiliydi (p=0,003, p=0,041). Katılımcının bildirdiği anksiyete ve stres semptomlarının yanı sıra fonksiyonel bozulma da HBS ile ilişkiliydi (p=0,003, p=0,004). HBS belirtileri yaşayan katılımcılarda depresyon ve uyku sorunları daha sıktı (p=0,005, p=0,005). Olası HBS olanlarda HBS farkındalığı gözlendi (p=0,003), nöroloji rotasyonuna katılmak farkındalığı etkilemedi ve HBS ile ilgili verilerle ilgili ana kaynağın web kaynakları olduğu belirtildi.

Sonuç: Bu çalışmada, düşük gelir, aile öyküsü, komorbidite olarak depresyon, düşük uyku kalitesi, anksiyete, stres ve gündüz işlev bozukluğu HBS semptomlarıyla ilişkilendirilmiştir. Tıp öğrencilerinde HBS konusundaki farkındalık oldukça düşüktü. HBS ile ilgili tanı, tedavi ve uygun yönlendirmelerin arttırılması için geleceğin hekimi olan tıp öğrencilerinde farkındalığın arttırılması gerekmektedir.

Anahtar Kelimeler: Huzursuz bacak sendromu, farkındalık, uyku, tıp öğrencisi, anket

Introduction

In restless legs syndrome (RLS), named recently as "*Willis Ekbom disease*" (WED) there is an urge to move the legs, which is usually accompanied by an uncomfortable or unpleasant sensation or the presence of this sensation is thought to be the result of this urge and these symptoms begin or worsen during the rest period, are relieved by movements such as walking, stretching and often occur in the evening and at night and these symptoms cannot be explained by another medical or behavioral condition.[1,2] The current criteria used for diagnosis of RLS is established by the *International Restless Legs Syndrome Study Group* (IRLSSG), and with some modifications by the *American Academy of Sleep Medicine in International Classification of Sleep Disorders (ICSD-3.).*[3-6]

Genetic predisposition and mechanisms related to iron metabolism, dopamine metabolism, circadian rhythm as well as melatonin and neurotransmitters such as glutamate and gabaaminobutyric acid (GABA) are present in the pathophysiology of RLS.[7-9]

RLS is analyzed in two groups as primary and secondary. For primary RLS diagnosis, there should not be any pathologies in physical, neurophysiological, neuroradiological examinations and laboratory findings of the individuals presenting with RLS symptoms.[6] In the secondary form, various clinical conditions may accompany the RLS symptoms. The most frequent among them are; iron deficiency, pregnancy, end-stage renal disease (uremia), thyroid dysfunction, parkinsonism, depression, rheumatoid arthritis, fibromyalgia, diabetes mellitus and multiple sclerosis.[3,6] The age of onset of the secondary form is late and its progression is rapid.[6,7]

RLS is more frequent in women and family history also is a risk factor.[3] In literature, many studies have investigated RLS in different populations and age groups.[6] In a review article, it has been mentioned that RLS diagnostic criteria was based on self-reported symptoms by the participants of the studies and this may be associated with various prevalance rates of RLS reported in literature.[10] In an earlier population-based study conducted by Sevim et al, the prevalence of RLS was reported as 3.19%.[11] In a large scale study conducted in primary care practices across Europe, the estimated prevalance of physician-diagnosed RLS was found as 3.5-4.4 % in adult patients.[12] The prevalence was found as 4.5% in a study in general population and the frequency increased in the fourth decade in women and in the sixth decade in men. [13]

Sleep disturbances are considered to support the diagnosis of RLS.[5,6] In a study, it was reported that difficulty in falling asleep which negatively affects quality of life were associated with RLS symptoms. [14]

RLS symptoms are associated with stress and anxiety which may lead to functional disturbances.[15] This condition negatively effects functionality in many areas such as school performance, social life and mental status.[14]

In patients whose RLS diagnosis is delayed due to late or misdiagnosis or inappropriate referrals and treatments, the sleep quality deteriorates which results in an increase in stress and anxiety levels.[4-6]

In some studies, the awareness of RLS was found quite low in university students.[16,17] In our study, the objective was to reveal the awareness and the frequency of Restless Legs Syndrome (RLS), the risk factors of the disease, sleep problems and co-existing conditions in a group of medical students who have attended and have not attended the sleep disorders course in neurology curriculum.

Materials and Methods

This cross-sectional, analytical study was conducted in XXXXX University, XXXXX Faculty of Medicine in two months, which were the end period of the academic year. "Sleep Disorders" course was in the neurology curriculum of the fourth grade. We planned to include students in the third grade and students in the fourth grade since the study plan was to differentiate between students who took the sleep disorders course and those who did not. The total number of third-grade students were 513, and fourth-grade students were 567.

After a literature search, a 31-item questionnaire was prepared by the researchers. There were questions about sociodemographic characteristics, presence of RLS risk factors (smoking, alcohol and exercise) and co-morbid chronic diseases (iron deficiency anemia, chronic renal failure, diabetes mellitus, rheumatological diseases, thyroid disorders, multiple sclerosis, depression and others). Rest of the questionnaire was about the RLS diagnostic criteria according to the ICSD3 (International classification of sleep disorders-3), awareness of RLS and presence of sleep disturbances. The answers to the questions are presented in Tables 1 through 5 in the results section.

Preceded by a brief explanation about the study, the questionnaires were distributed to students in lecture halls and after approximately 15 minutes they were collected.

Awareness was defined as both having had the clinical rotation in neurology department as an undergraduate and having prior knowledge about RLS disease.

Students who fullfilled the total Criteria A of ICSD3 considered as having RLS symptoms.[3] Fullfilment of RLS Criteria A was considered as probable RLS.

The participants have provided their written informed consent to participate and the study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical Analysis

Data were analyzed using SPSS 21.0 computer package program. Numerical data were expressed as mean±standard deviation and median (minimum-maximum), categorical data were expressed as frequencies (n) and percentages (%). Chi-square test and Fisher Exact test were used where necessary for categorical variables to evaluate the difference between the groups. Kolmogorov-Smirnoff test was used for testing normal distribution of numerical data, student-t test was used in normal distribution conditions for the comparison of continuous variables between two independent groups; when the data was not normally distributed, Mann –Whitney U test was used. A p value of <0.05 was accepted for statistical significance.

Results

A total of 354 students consisting of 206 third-grade and 148 fourth-grade students participated. Among participants, 166 were male (46,9%) and 188 were female (53,1%) and the median age was 21. The sociodemographic features of the participants are presented in Table-1.

RLS frequency was not different between third grade and fourth grade students. There were no differences between mean ages, marriage status, housing styles and frequencies of genders in RLS present and RLS absent groups. Students living with their friends in student houses were 34.5 %. Those coming from a high-income family reported less RLS symptoms (p=0,003). Participants with a family history of RLS were significantly more frequent in group with RLS (p=0.041). In this group, family members with RLS were mostly mother and mother's sister with frequencies 2.5% and 1.4%, respectively (Table-1).

In the present study, participants who reported to have Criteria A, were accepted to have RLS symptoms/sensations (Table-2). Risk factors such as smoking and absence of regular exercise was not significant between those having Criteria A symptoms and those who did not (Table-1). Those who had a medical condition

Table 1. Sociodemographic Features of Participants related with the probable presence of RLS				
VARIABLES	Study group; N (%) N=354 (100.0)	RLS absent; N (%) N=315 (89.0)	RLS present; N (%) N=39 (11.0)	P

Age
  Mean±SD
  Median(min-max.)
	20.86±1.63
	21 (19-39)
		20.86±1.67
		21 (19-39)
			20.87±1.23
			21 (19-26)
				0.838

Gender
  Male
  Female
	166 (46.9)
	188 (53.1)
		152(91.6)
		163(86.7)
			14(8.4)
			25(13.3)
				0.145

Third grade Fourth grade	206 (58.2) 148 (41.8)	181(87.9) 134(90.5)	25(12.1) 14(9.5)	0.428
Married	10 (2.8)	8(80.0)	2(20.0)	0.357

Family income
  Low
  Medium
  High
	21 (5.9)
	165 (46.6)
	168 (47.5)
		16(76.2)
		140(84.8)
		159(94.6)
			5(23.8)
			25(15.2)
			9(5.4)
				0.003

Housing style
  Dormitory and
Guest-house
  Shared with friends
  Shared with family
  Alone in house
  Other
	120 (33.0)
	122 (34.5)
	85 (24.0)
	25 (7.1)
	2 (0.6)
		104(86.7)
		113(92.6)
		75(88.2)
		22(88.0)
		1(50.0)
			16(13.3)
			9(7.4)
			10(11.8)
			3(12.0)
			1(50.0)
				0.208*

Family history of RLS	26(7.3)	20(76.9)	6(23.1)	0.041
Smoker	30 (8.5)	26(86.7)	4(13.3)	0.672
Alcoholic beverages consumer	78 (22)	72(92.3)	6(7.7)	0.288
Exercising regularly	87 (24.6)	80(92.0)	7(8.0)	0.308

Presence of co-morbid conditions
  Depression
  Rheumatologic disease
  Iron deficiency
  Thyroid disorders
  Diabetes mellitus
  Multiple Sclerosis
  Other *
	11 (3.1)
	2 (0.6)
	19 (5.4)
	12 (3.4)
	2 (0.6)
	1 (0.3)
	26 (7.3)
		7 (63.6)
		2 (100.0)
		17 (89.5)
		10 (83.3)
		2 (100)
		0
		22 (84.6)
			4 (36.4)
			0
			2 (10.5)
			2 (16.7)
			0
			1 (100.0)
			4 (15.4)
				0.005
				1
				0.944
				0.525
				1
				0.11
				0.46

Regular medication use**	45(12.7)	40(88.9)	5(11.1)	0.983
SD : Standart deviation; Min: Minimum, Max: Maximum; Chi-square test and *Fisher exact test were used.				
* : Gilbert Syndrome, lumbar disc herniation, migraine, polycystic ovary syndrome, acne, seasonal allergic rhinitis, supraventricular tachycardia				
**: Antidepressants, antihistamines, vitamins and iron supplements etc. for the co-morbid conditions				

which will explain RLS symptoms were 12 participants. Among them were diagnosed RLS 2(0.6%); habitual foot tapping 2(0.6%); lumbar disc herniation 1(0.3%); nocturnal leg cramps 2(0.6%); myalgia 2(0.6%); edema 1(0.3%) and venous stasis 2(0.6%).

Among those in whom RLS sensations were present, 20 (37%) students reported that RLS symptoms caused significant anxiety and stress (p=0.003). Functional interference in social, work, behavioral, and mental issues were reported significantly by 8(38.1%) students in the RLS sensations present group (p=0.004) (Table-3). Presence of sleep problems were significant in those with RLS symptoms (p=0.005).

Anxiety and stress were reported in 15.3% students. Among those who did not report to have anxiety and stress symptoms, 6.3 % were diagnosed with RLS (p=0.003). Among 11 students who reported to have depression, those who were diagnosed with RLS were four (p=0.005). Among participants who fullfilled the RLS criteria, two students reported to have DM, one student had MS, two had iron deficiency anemia and two had thyroid disorders.

Association of sleep problems and RLS were shown in Table-4. Presence of RLS was significantly more frequent in participants with sleep problems (p=0,005). Participants were asked to indicate if they had problems other than those mentioned regarding sleep associated with RLS criteria. A total of 13 (3.7%) people stated that they had other sleep problems apart from these. Among these people, only one (7.7%) person had RLS and no significant relationship was found (p=0.696).

Individuals were asked whether they have consulted a physician at any time about their sleep problems. There was no significant relationship between referral to a physician and the presence of RLS (p=0.357) (Table-4).

A total of 157 (44.4%) participants stated that they had knowledge about RLS, and among them 25(15.9%) participants were diagnosed with RLS. A statistically significant relationship was found between having knowledge about the disease and having RLS (p=0.008). Information sources of the participants about RLS were questioned. The internet (64 people-18.1%) was the most frequent information source (Table-5). No statistically significant relationship was found between the information source used and RLS presence (p=0.959).

As far as we know there is no scale to assess awareness about RLS. Both participating in neurology clerkship and having prior knowledge about RLS were considered as presence of awareness. There were no differences between third and fourth grade students in terms of presence of all criteria for RLS, presence of risk factors and awareness.

Among the 131 (37%) participants who had awareness, 23 (17.6%) had Criteria A of RLS. A statistically significant correlation was found between awareness and the presence of RLS sensations of Criteria A(p=0.003).

Discussion

In the present study, the presence of symptoms, risk factors and awareness related to RLS in medical students were investigated and RLS Criteria A were met in 11.1 % of the third and fourth grade medical students which is compatible with the literature. RLS is a chronic disease.[5] In studies conducted with medical students, RLS prevalance was found as 16.9 % in Turkey; 8 % in Pakistan and 10 % in Egypt.[17-19] In another recent study conducted with both medical students and residents in Turkey, RLS was present in 9% of the participants.[20]

Female gender has a greater risk concerning RLS.[3] In a population based study, Sevim et al have reported that the prevalence of RLS was 3.9% for females and 2.45% for males, and the female to male ratio was 1.6:1. [21](21). In another study in Turkey among medical faculty students, the frequency of RLS symptoms was found as 18.4% and they were more frequent in females than males as 23% vs 13% .[16] In the present study, the median age of the students was 21 and no differences were found between genders in terms of frequencies of RLS presence. The female to male ratio of RLS presence was 1.6:1 supporting the literature.

In a study conducted with young people, RLS affected 1% of participants and family history was found to be associated with RLS.[15] Family history of RLS was present in 23.1% of our participants diagnosed with RLS, which is significant and consistent with related literature. This may be associated with the involvement of genetic factors in RLS etiology.[5]

In our study, RLS symptoms were observed less frequently in medical students from high-income families. In other studies also, socioeconomic status was found to be associated with RLS.[10]

Some studies have revealed a significant association between RLS and smoking habit, alcohol and caffeine intake, pregnancy,

Table 2. Presence of RLS sensations (Criteria A*) in participants	
CRITERIA A	**Study group, N (%)**
	N=354 (100.0)
CRITERIA A **Do you feel an urge to move the legs usually because of an uncomfortable sensation?** Yes No	 160 (45.2) 194 (54.8)
CRITERION A1 **Does this urge to move begin or worsen during rest?** Yes No	 87 (24.6) 267 (75.4)
CRITERION A2 **Does this urge to move relieved by walking or stretching?** Yes No	 175 (49.4) 179 (50.6)
CRITERION A3 **Does this urge to move at rest occur or worsen in the evening or night?** Yes No	 70 (19.8) 284 (80.2)
* Criteria A (A1,A2,A3) is fullfilled in 39 (11%) participants.	

Table 3. Association of Criteria B and C with RLS Criteria A sensations

CRITERIA B AND C	Study group; N (%) N=354 (100.0)	RLS Criteria A sensations has not been fullfilled; N (%) N=315 (89.0)	RLS Criteria A sensations present; N (%) N=39 (11.0)	P
CRITERION B* **Do you have a medical condition which you think will explain RLS symptoms? ** Yes No	 12 (3.4) 342 (96.6)	 10 (83.3) 305 (89.2)	 2 (16.7) 37 (10.8)	 0.525
CRITERION C* **Does any of present RLS symptoms cause anxiety and stress?** Yes No **Does any of present RLS symptoms cause functional interference?** Yes No **Do you have sleep problems?** Yes No	54 (15.3) 300 (79.4) 21 (5.9) 333 (94.1) 102 (28.8) 252 (71.2)	34 (63.0) 281 (93.7) 13 (61.9) 302 (90.7) 80 (78.4) 235 (93.3)	20 (37.0) 19 (6.3) 8 (38.1) 31 (9.3) 22 (21.6) 17 (6.7)	**0.003** **0.004** **0.005**

*Criterion B: to differentiate RLS from other conditions mimicking RLS.

**Another medical condition (e.g., myalgia, venous stasis, leg edema, arthritis, leg cramps, positional discomfort, habitual foot tapping).

***Criterion C: Clinically significance of RLS : RLS symptoms causing concern, distress, sleep disturbance, or impairment in mental, physical, social, occupational, educational, behavioral, or other important areas of functioning.

Table 4: Association of presence of RLS symptoms and sleep problems

QUESTIONS	Study group; N (%) N=354 (100.0)	RLS(CriteriaA) absent; N (%) N=315 (89.0)	RLS(Criteria A) present; N (%) N=39 (11.0)	P *
Do you feel urge to move or an uncomfortable sensation in legs which prevents falling asleep? Yes No	 24 (6.8) 330 (93.2)	 13 (54.2) 302 (91.5)	 11 (45.8) 28 (8.5)	 0.001
Do you wake up at night with leg cramps? Yes No	 21 (5.9) 333 (94.1)	 16 (76.2) 299 (89.9)	 5 (23.8) 34 (10.2)	 **0.54**
Do you have leg pain in the morning? Yes No	 11 (3.1) 343 (96.9)	 7 (63.6) 308 (89.8)	 4 (36.4) 35 (10.2)	 0.006
Does your sleeping partner tell that you have many kicks at night? Yes No	 16 (4.5) 338 (95.5)	 9 (56.3) 306 (90.5)	 7 (43.7) 32 (9.5)	 0.001
Have you consulted a physician about your sleep problems? Yes No	 10 (2.8) 344 (97.2)	 8 (80) 307 (89.2)	 2 (20) 37 (10.8)	 **0.357**

*Chi-square test is used.

Table 5. RLS awareness				
PARTICIPANT ACTIVITIES	Study group; N (%) N=354	RLS (Criteria A) absent; N (%) N=315	RLS (Criteria A) present; N (%) N=39	P
Rotation in neurology department /Yes	268 (75.7)	235 (87.7)	33 (12.3)	0.169
Prior knowledge about RLS/Yes	157 (44.4)	132(84.1)	25 (15.9)	**0.008**
Neurology rotation and prior knowledge about RLS (both)	131 (37.0)	108 (82.4)	23 (17.6)	**0.003**

Sources of information about RLS
   School lectures
   Web sources
   Visual Media (Radio-TV)
   Books and Journals
   Health Professionals
	46 (13.0)
	64 (18.1)
	14 (4.0)
	10 (2.89)
	14 (4.0)
		37 (80.4)
		54 (84.4)
		12 (85.7)
		9 (90.0)
		12 (85.7)
			9 (16.9)
			10 (15.6)
			2 (2.2)
			1 (10.0)
			2 (14.3)
				0.959

diet and inadequate exercise.[10] In our study, there were no significant relationships between these risk factors and the presence of RLS symptoms.

Iron deficiency anemia also plays a role in pathophysiology.[3] RLS risk increases in patient groups who are at risk for insufficient iron levels.[22] In our study, two of 19 (5.4 %) students who reported to have iron deficiency anemia had probable RLS and only two out of 354 medical students had diabetes mellitus, and none of them had RLS. RLS is associated with type 2 diabetes mellitus and in diabetic patients polyneuropathy has been found to be a risk factor for RLS.[23] Studies have reported that the prevalence of RLS in diabetic patients was 17.7 % and 27%.[23,24]

In this current study, RLS sensations were more frequent in medical students with depression. The secondary causes of RLS involve a broad range of chronic conditions. Our study group consisted of young people with a median age of 21, so accompanying chronic conditions were not frequent and presence of RLS was not significant in those with chronic conditions except depression. Only presence of depression in our participants was found to be associated with RLS symptoms. However, according to some studies, this relationship could be due to the side effects of antidepressants resulting in secondary RLS, or depression itself could be a result of RLS. [25,26]

RLS is a serious reason of sleep disturbances and it causes a fall in total sleeptime. It has been reported that patients with RLS have increased symptoms of sleep deprivation and anxiety compared to individuals without RLS symptoms.[27] Sarıaydın et al have also found that the sleep quality of students who have RLS was worse than that of healthy students.[18] In our study group, presence of sleep disturbances, an urge to move or an uncomfortable sensation in legs which prevents falling asleep, leg pain in the morning, kicks at night were associated with low sleep quality and were significantly more frequent in those who had RLS.

Difficulties in falling asleep, waking up frequently at night and having difficulty in getting up in the morning were the most frequent problems mentioned by our participants. The sleep quality of people whose RLS diagnosis has delayed due to misdiagnosis and misreferrals deteriorates with time and results in increased anxiety and stress levels.[12] We found out that RLS symptoms were rare in students who did not experience anxiety or stress, or it could be possible that the presence of RLS symptoms was a reason for anxiety and stress. In a study conducted by Silva et al. in adolescents and young adults, they reported the frequency of RLS as 8.4% and displayed that this group had a worse quality of life.[14] Moreover, in advanced cases, depression may accompany RLS because of impaired sleep quality and quality of life.[5,26,28]

Sleep problems were reported by 102 of our participants and only 10 (10%) of them have consulted a physician which may be attributed to inadequate awareness. In literature, the awareness about RLS was found insufficient in both physicians and medical school students. In a former study, the rate of medical students who would consult a doctor for the RLS symptoms was 23.3%. [16]

In our study, participants with RLS reported symptoms that caused functional effects in many areas of life. With the appropriate diagnosis, treatment and guidance, the quality of life, sleep quality and functionality of RLS patients can be enhanced. Non-pharmacological interventions like pneumatic compression, enabling sleep hygiene besides mind and body exercises constitute an important part of the treatment to help relieve RLS symptoms.[28-30]

Awareness was not different between third and fourth grade medical students. In the group with awareness, RLS symptoms were more frequent either in themselves or in their relatives than those with less awareness. This may be interpreted as presence of RLS symptoms have alerted the students to seek for more information on RLS through information resources. Besides lectures attended at school, internet was the most frequent source of information which is a matter of fact in this group of young scholars.

Screening RLS symptoms may enhance the early diagnosis, treatment and referral of patients with RLS. Early management of patients with RLS may improve their quality of life and functionality in many areas according to the needs of the patients.[29] RLS has been defined for years and can only be diagnosed using the diagnostic criteria, therefore awareness should be increased in medical students, who will become future physicians.

Limitations and Strengths

There are not adequate studies about problems of medical students in literature, in this case symptoms related to RLS. The high number of medical students participating in the study group is another strength of this study. There are some limitations of this study. A scale evaluating the sleep problems was not used but the presence of any sleep problems was questioned. It is a single center cross-sectional study and results cannot be generalized. Screening RLS with questionnaires may lead to underdiagnosis or overdiagnosis so patients who have RLS symptoms should further be examined by neurologists.

Conclusion

Awareness and knowledge about RLS was quite low among our participants and this supports the results of the studies conducted with other medical students. In our study, depression, family history of RLS, lower familial income, sleep problems and awareness about RLS has been found to be associated with presence of RLS. By increasing the knowledge and awareness of medical students, delayed diagnosis and consequencies may be avoided and the patients may be timely referred to the neurologists. This study may lead to conduct new studies to manage differential diagnosis in patients. Consultations about non-pharmacological treatments in appropriate cases, primary care interventions related to comorbidities and risk factors such as iron replacement and referrals after screening are the main issues that family physicians can accomplish do in management of RLS in primary care.

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Ethics

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Authorship Contributions

Concept: T.Y., G.B.Ş., N.T.S., Design: T.Y., N.T.S., Data Collection or Processing: T.Y., N.T.S., Analysis or Interpretation: T.Y., D.K., A.K.F., N.T.S., Literature Search: T.Y., D.K., A.K.F., G.B.Ş., Writing: T.Y., D.K., A.K.F., N.T.S.

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