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Prevalence and Epidemiology of Restless Leg Syndrome (RLS) Among the Residents of Quetta Pakistan: A Cross-Sectional Study

Quetta Pakistan'da Yaşayanlar Arasında Huzursuz Bacaklar Sendromunun (RLS) Prevalansı ve Epidemiyolojisi: Kesitsel Bir Çalışma

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Abstract

Objective: Restless legs syndrome (RLS) is a prevalent neurological disorder characterized by an irresistible urge to move the legs. Mostly, the condition is associated with other health problems such as sleep disorders or any other health problems, thus making it an underdiagnosed condition among general population in a developing country like Pakistan including its local regions.

Materials and Methods: The study consisted of 350 participants from different regions of Quetta to evaluate the prevalence of RLS in the region. To achieve the desired aim, a well-designed questionnaire was made using Google Form which was distributed through different social media platforms from March 2023 to October 2023. The international diagnostic criteria for diagnosis of RLS was used.

Results: The prevalence of RLS among 350 individuals was calculated to be 43 (12.1%). According to the Epworth Sleepiness Scale, 20 (46.5%) of the 43 participants with an RLS diagnosis had severe sleepiness, followed by moderate (23.3%), very severe (20.9%), and mild (9.3%). Age, gender, sleeping difficulties, and other health conditions were not substantially correlated with RLS ($p > 0.05$), however smoking was ($p = 0.036$). Neither the severity of RLS nor the degree of sleepiness were significantly correlated with gender ($p = 0.683$ and $p = 0.858$, respectively).

Conclusion: The RLS prevalence found in our study was less than that of another prevalence study in Pakistan. To have a better understanding of the variables of RLS in distinct populations, it is imperative that additional prevalence studies be conducted in various regions of the country.

Keywords: Restless leg syndrome, prevalence, epidemiology, general population

Öz

Amaç: Huzursuz bacaklar sendromu (RLS), bacakları hareket ettirme konusunda karşı konulamaz bir istekle karakterize edilen yaygın bir nörolojik hastalıktır. Çoğunlukla, bu durum uyku bozuklukları veya diğer sağlık problemleriyle ilişkilendirmekte ve bu da onu Pakistan gibi gelişmekte olan bir ülkede ve yerel bölgelerinde genel popülasyonda tanı konulmamış bir durum haline getirmektedir.

Gereç ve Yöntem: Çalışma, Quetta'nın farklı bölgelerinden 350 katılımcıdan oluşmuş ve bölgedeki RLS prevalansını değerlendirmeyi amaçlamıştır. İstenilen amaca ulaşmak için iyi tasarlanmış sorulardan oluşan bir anket formu Google Form ile oluşturulmuş, formlar Mart 2023 ile Ekim 2023 arasında farklı sosyal medya platformları aracılığıyla dağıtılmıştır. RLS tanısı için uluslararası tanı kriterleri kullanılmıştır.

Bulgular: Yapılan çalışmada 350 birey arasında RLS prevalansı %12,1 (43 kişi) olarak belirlendi. Epworth Uykululuk Ölçeğine göre, RLS tanısı alan 43 katılımcıdan 20'si (%46,5) şiddetli uykululuk yaşarken, bunları orta derecede (%23,3), çok şiddetli (%20,9) ve hafif (%9,3) uykululuk takip etmiştir. Yaş, cinsiyet, uyku sorunları ve diğer sağlık sorunları RLS ile anlamlı ölçüde ilişkili değildi ($p>0,05$), ancak sigara içme ile ilişki bulunmuştur ($p = 0,036$). RLS şiddeti ve uykululuk derecesi cinsiyetle anlamlı bir şekilde ilişkili değildi (sırasıyla $p = 0,683$ ve $p = 0,858$).

Sonuç: Çalışmamızda bulunan RLS prevalansı, Pakistan'da başka bir prevalans çalışmasına göre daha düşüktür. RLS'nin farklı popülasyonlardaki değişkenlerini daha iyi anlayabilmek için ülkenin çeşitli bölgelerinde ek prevalans çalışmalarının yapılması gerekmektedir.

Anahtar Kelimeler: Huzursuz bacaklar sendromu, prevalans, epidemioloji, popülasyon tabanlı çalışma

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Introduction

Despite increased awareness of its detrimental effects on life quality, restless legs syndrome (RLS) is still not well understood and underdiagnosed condition, especially in developing countries. It's also known as Willis-Ekbom disease, a common and chronic movement disorder that significantly affects the limbs.[1,2] People suffering from this illness have an uncontrollable need to move their legs and often experience strange and painless feelings of tingling and cramping. These sensations occur when the person is at rest, particularly in the evening and during the night and can decrease with body movements or physical activities.[3,4] Symptoms tend to worsen at night, especially involuntary leg movements can disrupt the sleeping pattern, leading to periodic leg movement of sleep.[5] RLS is mostly diagnosed based on the following five factors: (1) an urge to move the legs, frequently accompanied by uncomfortable leg sensations; (2) initiation or worsening of symptoms by rest; (3) relief from symptoms upon activity; (4) regular changes of symptoms with worsening in the evening and at night; and (5) excluding additional medical and behavioral conditions that can mimic RLS.[6-9]

There are very limited studies that tend to assess the prevalence and epidemiology of RLS among the general population in recent years. A prevalence study was conducted in Saudi Arabia with almost 10,106 sample size, reported that a total of 11.9% of participants had persistent RLS. The study revealed associations between RLS with factors such as younger age, tobacco smoking, anxiety, and moderate to severe depressive symptoms.[10] Similarly, the epidemiology of RLS has been the subject of numerous descriptive studies, but in the past ten years, it has become more well-known. The fact that RLS prevalence varies greatly around the globe is among the most significant conclusions drawn from these epidemiological studies. Another discovery is that RLS, which was before thought to be a rare disease, is now acknowledged as a prevalent ailment with notable clinical diversity.

Several studies in Pakistan evaluated the prevalence of RLS among different populations, such as pregnant women, medical students, madrasa students, and IT students.[11-14] Other studies reported on its prevalence among patients with diabetes and obesity, spinal cord injuries, sleep disorders, and hemodialysis patients.[15-18] So, the gap was felt regarding its prevalence and epidemiology in non-clinical setting specially in underprivileged area like Quetta, Pakistan which has an estimated population of 1.57 million according to 2023 Census of Pakistan. While local statistics on literacy and internet penetration are not available, national data indicates that 78 percent of people subscribe to mobile broadband and 45.7% of people use the internet. This lends credence to the utilization of an online poll among urban dwellers who are interested in technology. Online surveys can be a useful instrument for collecting health-related data from a sizable portion of the population in cities like Quetta, where internet access is increasingly expanding. Such approaches can non-etheless give a fairly accurate prevalence estimate among the population that is digitally active, even though they might not include people who do not have internet access or digital literacy.

Materials and Methods

Study Design

The current research study aimed to investigate the prevalence and severity of RLS among the residents of Quetta, Pakistan. To achieve this objective, a cross-sectional study design was employed using an online questionnaire distribution method through Google Forms during March 2022 to December 2022. It was content validated, and pilot tested before its application in the present study. The data were collected by sharing the questionnaire link through WhatsApp and Email among the general population of different regions of Quetta.

Ethical Approval

Throughout the study, ethical considerations were meticulously observed, including informed consent, anonymity, and data confidentiality. Participants were assured that their responses would remain confidential and be used solely for research purposes.

Sample Size

The following presumptions guided the calculation of the study's sample size, which was determined using a standard formula for prevalence studies:

$n = (Z^2 \times P \times (1 \times P)) / d^2$

P is the expected prevalence or proportion (if the expected prevalence is 20%, then p=0:2), d is the precision (if the precision is 5%, then d=0:05), n is the sample size, and Z is the Z statistic for a level of confidence. The anticipated sample size, assuming a prevalence of 23.6% (16), maintaining a 95% confidence level, and allowing for a 5% margin of error, came to 278. We require 300 individuals, plus an additional 10% for non-response, missing values, and dropouts. According to a prior study carried out in Karachi, Pakistan, the predicted prevalence was 23.6%.[19] However, after careful consideration and to enhance the study's statistical power, the final selected sample size was increased to 350 participants.

Study Tool and Data Collection Method

The participants were thus recruited for this study through a non-random sampling method. Those participants aged 18 years and above were considered in this study. Participants below 18 years of age and those who did not give consent to participate were excluded from this study.

The questionnaire comprised four sections. The first section gathered demographic information, including age and gender, to provide a comprehensive characterization of the study population. The second section consisted of diagnostic criteria of the RLS set by:[9]

(1) A strong desire to move one's legs, usually accompanied by leg discomfort.

(2) Symptoms getting worse when at rest or inactivity.

(3) Symptoms getting better when moving around.
(4) Symptoms are more bothersome at night and in the evening than during the day.
(5) Unpleasant feelings and sensations get worse after certain activities, such as long periods of sitting or inactivity.
Subjects fulfilling a maximum of five criteria were considered positive for RLS.
The third section consisted of sleep patterns and sleep disturbances using Epworth Sleepiness Scale (ESS). For participant convenience, the ESS was converted to a binary response format and the responses to the seven ESS questions were scored, and the total scores were categorized as follows:
- 0–2: Mild sleepiness
- 3–4: Moderate sleepiness
- 5–6: Severe sleepiness
- 7: Very severe sleepiness

The fourth section contained eight items about the frequency, severity, and impact of RLS symptoms on sleep and everyday activities that were used to measure the severity of their conditions. Due to the high percentage of illiteracy in the area, all answers were entered in the form of binary "Yes" or "No" format. Severity was classified as mild (0–2), moderate (3–4), severe (5–6), or very severe (7–8) based on the sum of the responses. While capturing important elements of RLS, like its onset, duration, alleviation through activity, and related sleep problems, our method guaranteed ease of use and accessibility.

Data Analysis

Data analysis encompassed descriptive statistics, including frequencies and percentages, to summarize the prevalence and severity of RLS within the Quetta population. Chi-square tests were also used to find the association between the categorical data in the study.

Results

In the study cohort comprising 350 individuals, 275 (77.50%) were identified as females, while 80 (22.50%) were males. Most participants were below the age of 40, 326 (91.8%), while a smaller portion was above 40, 29 (8.2%). In terms of smoking status, only 13 (3.7%), were reported smoking, while the rest 342 (96.3%), were non-smokers.
Among the total subjects (n=355), 43 (12.10%) met all the diagnostic criteria and were RLS positive. The condition was observed to be more prevalent among females 32 (74.4%), than males 11 (25.6%). Within this subgroup of positive RLS cases (n=43), 32 (74.42%) were females, and 11 (25.58%) were males (Figure 1).
The participants diagnosed with RLS (n=43), had severe sleepiness among 20 (46.5%) followed by moderate 10 (23.3%), very severe 9 (20.9%), and mild 4 (9.3%) with minimal percentage on the ESS. As given by the RLS severity score, out of the 43 participants, there were 2 (4.6%) with mild, 9 (16.3%) moderate, 9 (20.9%) having a severe level of the condition, and the major number, 25 (58.1%), with very severe RLS.
Almost half of diagnosed participants, 48.8% were facing other health problems, and 39.5% had sleeping problems. In terms of treatment, more participants opted for homeopathy 25 (55.8%) than medical treatment 12 (27.9%), and a considerable number 31 (72.1%) did not seek medical treatment (Table 1).
The chi-square tests were applied to find out the association of RLS with gender, smoking, other health conditions and other sleeping disorders. The table indicates that smoking status is significantly associated with increased risk of RLS (p-value =0.036). However, the participants with other health problems and sleeping disorders are not significantly associated with RLS, as their (p-values =3.3395 and 9.0202), respectively, are greater than 0.05. The age and gender did not show significant associations with RLS, as p-values are greater than 0.05 (Table 2).
To find out the association between RLS severity scale and ESS with gender, the chi-square test was applied. The p-value for both the factors with gender were p=0.683 and 0.858 respectively. The reason could be the high differences in both the genders among our sample size (Table 3).

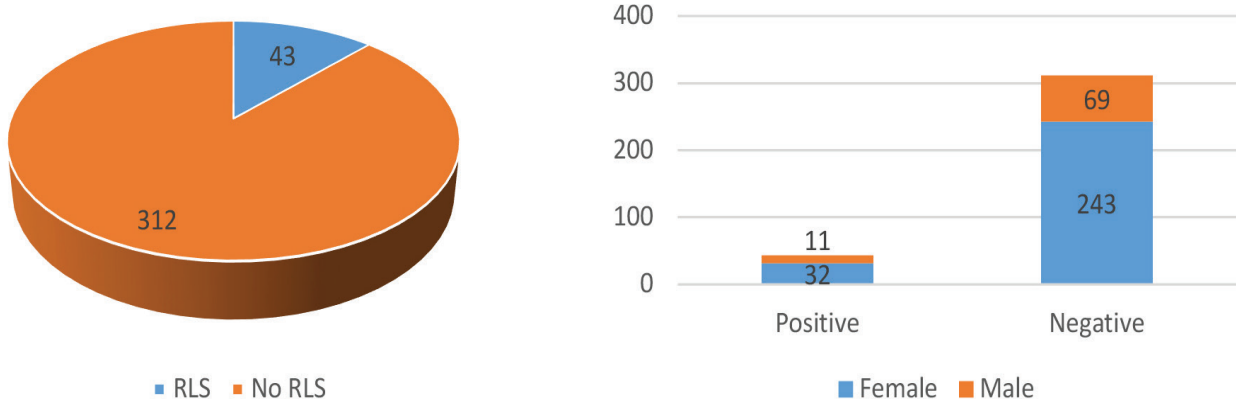

Figure 1. Prevalence of RLS among the residents of Quetta with distribution in gender with five diagnostic criteria (n=355)
RLS: Restless legs syndrome

Table 1. Characteristics of participants of the study		
Characteristics	**Numbers**	**Percentages**
Total	355	100.0
Female	275	77.5
Male	80	22.5
Age (n=355)		
Below 40	326	91.8
Above 40	29	8.2
Smoking status (n=355)		
Yes	13	3.7
No	342	96.3
IRLSS diagnostic criteria (n=355)		
Met all 5 diagnostic criteria	43	12.1
Female (n=43) Male	32 11	74.4 25.6
Epworth Sleepiness Scale (n=43)		
Mild	4	9.3
Moderate	10	23.3
Severe	20	46.5
Very severe	9	20.9
RLS severity scale (n=43)		
Mild	2	4.6
Moderate	7	16.3
Severe	9	20.9
Very severe	25	58.1
Diagnosed with other health conditions (n=43)		
Yes	21	48.8
No	22	51.2
Diagnosed with Sleeping problems (n=43)		
Yes	17	39.5
No	26	53.5
Type of treatment (n=43)		
Homeopathy		
Yes	24	55.8
No	19	44.2
Medical		
Yes	12	27.9
No	31	72.1

RLS: Restless legs syndrome, IRLSS: International Restless Legs Syndrome Study Group

Discussion

To the best of our knowledge, after going through number of studies, this was the second attempt to classify RLS among the general population of Pakistan and identify its effects and consequences on the sleeping patterns. The first study was conducted in Karachi in 2015 and reported a prevalence up to 23% among general Pakistani population.[20]

Other Asian countries came up with a prevalence of 32.9%[21] 16.2%,[22] 11.9%,[23] 8.36%.[24] 8.5–14.2% is the documented prevalence of RLS in Western countries, making it one of the most prevalent movement disorders.[25] In the current study, the prevalence of RLS among the general residents of Quetta city is (12.10%).The prevalence in the current study is almost similar to most of the other studies around the world. The consistency in prevalence can be due to the use of standardized diagnostic methods, similar lifestyles and genetic predispositions. The higher variation with the previous prevalence study in Pakistan is due the differences in participant selection and data collection methods. In the current study, the data were collected through online forms and covered a wider population compared to their study, whereas their participants were recruited from hospitals. This hospital-based recruitment probably included people with higher comorbidity rates, which could result in a higher prevalence being reported in their study.

Our study did not find any association between RLS and gender unlike other studies who reported higher prevalence in females as compared to males, similar results were found by.[20,21,23,26-29] Similar to our study, another study among medical students in Pakistan, also reported its high prevalence among females but could not find any significant association between both.[19] This is because our study had significant differences between the two genders.

RLS can appear at any age, the majority of individuals with RLS are older than 40, and prevalence of RLS rises with age.[30] Many research studies reported that prevalence of RLS increases with age and others reported similar results to our study that is maximum peak between 30 and 40 years of age.[31] Further, the association with advancing age is greater among North American and European compared with Asian countries. Smoking acts as an independent risk factor for RLS,[19,32,33] as observed in the current study.

A study with a larger sample size was carried out in Iran, looking into individuals with a variety of comorbid conditions. It found that smoking and any neurological comorbidity were major contributors to the incidence.[34] Further research can be done to examine this topic in the future. A study conducted in Türkiye revealed a generally low occurrence, although those who lived at high elevations were more likely to have this illness. Additionally, this study reaffirmed the link between smoking and developing RLS like another study in Pakistan.[19] One of the most significant strength of this study was that the diagnosis was made based on IRLSSG diagnostic criteria.

Study Limitations

There are various restrictions on this study. Initially, it employed non-probability convenience sampling via online mediums (E-mail and WhatsApp), which would have left out people who lacked digital literacy or internet access. As a result, the results could not accurately reflect Quetta's overall population, but rather the city's tech-savvy and urban-literate citizens.

Second, a customized sleep scale created to enhance local comprehension was used to measure sleep disruption, even

Table 2. Association of age, gender, smoking status and other health or sleeping problems with RLS				
Characteristics	**RLS positive (%)**	**RLS negative (%)**	**OR (95% CI)**	**p-value**
Age				
>40	37 (10.4%)	289 (81.4%)	0.491 (0.188-1.284)	0.1396
<40	6 (1.7%)	23 (6.5%)		
Gender				
Female	32 (9.0%)	243 (68.5%)	0.826 (0.396-1.723)	0.6101
Male	11 (3.1%)	69 (19.4%)		
Smoking status				
Smoker	4 (1.1%)	9 (2.5%)	3.453 (1.015-11.74)	0.0357
Non-smoker	39 (11.0%)	303 (85.4%)		
Diagnosed with other health problems				
Yes	21 (5.9%)	20 (5.6%)	13.936 (6.582-29.51)	3.3395
No	22 (6.2%)	292 (82.3%)		
Diagnosed with other sleeping disorder				
Yes	17 (4.8%)	15 (4.3%)	12.946 (5.807-28.86)	9.0202
No	26 (7.3%)	297 (83.7%)		
RLS: Restless legs syndrome, OR: Odds ratio, CI: Confidence interval				

Table 3. Association of RLS severity and Epworth Sleepiness Scale with gender			
Characters	**Female**	**Male**	**p-value**
Epworth Sleepiness Scale (n=43)			
Mild	3 (6.9%)	1 (2.3%)	0.858
Moderate	8 (18.6%)	2 (4.6%)	
Severe	9 (20.9%)	5 (11.6%)	
Very severe	11 (25.6%)	4 (9.3%)	
RLS severity scale (n=43)			
Mild	2 (4.6%)	0 (0.0%)	0.683
Moderate	4 (9.3%)	3 (11.6%)	
Severe	6 (13.9%	3 (11.6%)	
Very severe	18 (41.9%)	7 (16.3%)	
RLS: Restless legs syndrome			

though RLS was diagnosed using the established IRLSSG criteria. The reliability and comparability of sleep-related outcomes may be impacted by the fact that this modified tool was not fully validated in the research population.

Finally, using self-reported data raises the possibility of subjective misinterpretation and recall bias, particularly when done online and without supervision.

Conclusion

It has been established that the prevalence of RLS in the general population of Quetta cannot be underestimated. Moreover, our research indicates that this condition is often overlooked, as a significant number of individuals do not actively seek medical assistance or investigate the underlying factors due to their lack of awareness regarding the cause of their symptoms. By educating the public about RLS, the project aims to enhance people's understanding of this ailment and its potential ramifications.

Ethics

Ethics Committee Approval: Strict adherence to ethical principles, such as informed permission, anonymity, and data confidentiality, was maintained throughout the investigation.

Participants received assurances that their answers would be kept private and used only for study.
Informed Consent: Not availible.

Footnotes

Authorship Contributions

Concept: N.T., Design: N.E.A., N.T., Data Collection or Processing: N.E.A., N.T., Analysis or Interpretation: N.E.A., Literature Search: N.E.A., M.J.J., Writing: N.E.A., M.J.J.
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