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Original Article

Prevalence of and risk factors for poor sleep quality among residents in training in KSA

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الملخص

أهداف البحث: أجريت هذه الدراسة لتحديد معدل انتشار وعوامل الخطر لسوء جودة النوم لدى الأطباء المقيمين في المملكة العربية السعودية.

طرق البحث: تم عمل دراسة مقطعية على الأطباء المقيمين في برامج تشرف عليها الهيئة السعودية للتخصصات الصحية. بعمل مسح ذاتي مجهول على شبكة الإنترنت باستخدام مؤشر بيتسبرغ لجودة النوم. بعد الحصول على الموافقة الأخلاقية على البحث من قبل مجلس المراجعة المؤسسية بكلية الطب بجامعة الملك سعود، الرياض، المملكة العربية السعودية.

النتائج: شارك ١٢٠٥ طبيبا مقيما في الدراسة. كان معدل انتشار سوء جودة النوم عاليا ٨٦.٣٪. عندما جمعت حسب التخصص، أعلى معدل انتشار لسوء جودة النوم كان بين الأطباء المقيمين في تخصص التخدير (٩٦٪)، بينما كان أقل معدل انتشار بين الأطباء المقيمين في تخصص علم الأمراض (٦٨.٧٪). زيادة الوقت الكامن قبل النوم كان أكثر العوامل المساهمة شيوعا في سوء جودة النوم، ولوحظ لدى ٦٨.٤٪ من الأطباء المقيمين على الأقل مرة بالأسبوع. تم تقسيم سوء جودة النوم اعتمادا على متوسط درجة مؤشر بيتسبرغ لجودة النوم إلى المرحلة ١ (٤٦.٩٪) والمرحلة ٢ (٣٩.٤٪). باستخدام الانحدار اللوجستي المتعدد، وكانت العوامل التالية مرتبطة بشكل كبير مع المرحلة ٢ لسوء جودة النوم، العمر بين ٢٧ و٢٩ عاما، تغطية المناوبات أو نظام الورديات.

الاستنتاجات: سوء جودة النوم منتشر بشكل كبير بين الأطباء المقيمين في المملكة العربية السعودية. زيادة الوقت الكامن قبل النوم وقصر مدة النوم كانتا من أكثر اضطرابات النوم انتشارا. كما كانت المناوبات والورديات هي عوامل الخطر الرئيسة لسوء جودة النوم. يفضل أن تلتزم البرامج التدريبية باقتراح ٨٠ ساعة عمل في الأسبوع وأن تدمج برامج الصحة في المناهج الدراسية.

الكلمات المفتاحية: النوم؛ الصحة النفسية؛ التعليم الطبي؛ الإقامة؛ سلامة المريض

Abstract

Objectives: This study aimed to identify the prevalence of and risk factors for poor sleep quality among medical residents in KSA.

Methods: A cross-sectional study was conducted on residents in programmes supervised by the Saudi Commission for Health Specialties. An anonymous, self-administered, web-based survey using the Pittsburgh Sleep Quality Index (PSQI) was done. The study received ethical approval from the institutional review board of the King Saud University College of Medicine, Riyadh, KSA.

Results: A total of 1205 residents responded to the survey. A high prevalence of 86.3% of poor sleep quality was recorded. When grouped by specialty, anaesthesia residents had the highest prevalence of poor sleep quality (96%), whereas pathology residents had the lowest prevalence (68.7%). Increased sleep latency was the most common contributor to poor sleep quality, observed in 68.4% of residents at least once a week. Poor sleep quality was further stratified based on median PSQI scores into stages 1 (46.9%) and 2 (39.4%). Using multivariate logistic regression, the age group of those between 27 and 29 years ($p = 0.012$) covering on-call cases ($p \leq 0.01$) or working shifts ($p < 0.001$) was significantly associated with stage 2 poor sleep quality.

Conclusion: Poor sleep quality is highly prevalent among medical residents in KSA. Increased sleep latency and short sleep duration were the most reported sleep distractors. On-call scheduling and shift work were major risk factors for poor sleep quality. Training programmes should abide by the 80-hour weekly limit and integrate wellness programmes into the curriculum.

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Keywords: Medical education; Mental health; Patient safety; Residency; Sleep

Introduction

Residents in training are involved in most aspects of patient care and are required to have significant cognitive and psychomotor skills. However, cognition and clinical performance are negatively affected by poor sleep quality,[1] which is associated with an increase in technical errors while performing surgical procedures.[2] Fewer sleeping hours are associated with falling asleep unintentionally at work among residents.[3] Resident sleepiness is associated with increased self-reported medical errors.[4] Moreover, residents must acquire a large quantity of knowledge, participate in research, and sit for assessment exams. Improved sleep quality and quantity are closely associated with better learning capacity and academic performance.[5] For example, the amount of sleep during the two nights before the American Board of Surgery In-Training Examination was positively correlated with performance.[6] Lastly, sleep deprivation among residents is associated with burnout and depressive symptoms.[7,8]

Despite the importance of sleep quality in health and well-being, there is no widely accepted definition of this term. The National Sleep Foundation expert panel considers the following as indicators of good sleep quality: sleep efficiency, sleep latency, rapid eye movement (REM) and non-REM sleep ratios, naps, arousals, and awakenings.[9] Sleep quality can be objectively measured using polysomnography and actigraphy.[10,11] Furthermore, sleep quality can be measured using the Pittsburgh Sleep Quality Index (PSQI) questionnaire, which has been validated by polysomnography.[12]

Pulliam et al. reported that 17.4% of trainees begin residency with poor baseline sleep quality.[13] Studies conducted during residency from centres in India and Mexico have reported even higher rates of poor sleep quality (39.3% and 63.8%, respectively) among residents.[14,15] A possible explanation for this increase is the effect of residency; residents have demanding professional and academic obligations.[16] Stress is prevalent among residents, and it has been linked to sleep disturbances.[16,17] All the above-mentioned studies on poor sleep quality recruited a small sample of residents (range, 56–84 residents) and were limited to a single training centre. Therefore, it is difficult to ascertain whether or not centre characteristics (e.g. workload) affected the prevalence of poor sleep quality reported in these studies.

Previous studies on medical students in KSA have shown an alarmingly high prevalence of poor sleep quality (74.2% and 76%).[18,19] A study on Saudi adults reported almost a similar rate (78.3%).[20] No known study has explored sleep quality among residents; however, Al-Maddah et al. studied daytime sleepiness and observed that 52% of residents at an academic hospital experienced daytime sleepiness.[8] They inquired on the number of sleeping hours over the last week but did not investigate other domains of sleep quality.[8]

Given the various negative effects of poor sleep quality in residents on patient care and safety and on residents' learning capacity and mental health, residents' sleep quality should be assessed using a tool that includes various domains of sleep quality and covers an extended period of time. Doing so will help highlight the domains that contribute the most to poor sleep quality. Furthermore, multiple centres should be included to avoid the confounding effect of the centre on the results. Lastly, different specialties should be included to identify groups that are a priority for interventions. This study aimed to determine the prevalence of and risk factors for poor sleep quality among residents training in different specialties at multiple centres across KSA.

Materials and Methods

The Saudi Commission for Health Specialties (SCFHS) is responsible for the supervision and evaluation of postgraduate residency training programmes in KSA. The SCFHS offers 25 different programmes in diverse diagnostic, medical, and surgical specialties.[21] Training is provided by 249 accredited centres across KSA.[22] The study population consisted of 3823 postgraduate medical residents who were included in the SCFHS email list. Residents training in programmes not supervised by the SCFHS or in postgraduate dental or pharmacological programmes were excluded. The study was approved by the institutional review board of the College of Medicine, King Saud University, Riyadh, KSA (14/4491/IRB). Data collection was conducted from May to September 2015.

Data were collected using an anonymous, web-based questionnaire. Emails were sent to participants with a link to the webpage that contained the informed consent form, description of the objectives of the study, exclusion criteria, and questionnaire. The online questionnaire was created using the FormAssembly website (Veer West LLC, Bloomington IN, USA) and consisted of two parts: 1) demographic and training characteristics, and 2) the PSQI questionnaire.[23] As English is the official language of instruction and evaluation in residency programmes supervised by SCFHS, the English language version of PSQI was used, with the permission of Dr Buysse. The PSQI assesses sleep quality and disturbances over the past month[23] and measures seven domains of sleep: quality, latency, duration, habitual efficiency, disturbances, use of sleep medication, and daytime dysfunction. It has been validated concurrently and discriminatively with clinical evaluation, sleep questionnaires, other questionnaires, and polysomnography.[12,23–25] The PSQI has a good overall reliability coefficient (Cronbach's α of 0.83).[23] Each domain of the PSQI is scored out of a maximum of 3 points and added together, with a minimum total PSQI score of 0, and maximum of 21. A total score of 5 or less indicates good sleep quality, and scores above 5 indicate poor sleep quality.[23]

The questionnaire was pilot tested on a group of 30 participants. Pilot testing showed no problems in the wording of the questionnaire or access to the survey regardless of the device or operating system used. The only pitfall was that some medical specialties were missing from the list of choices and was remedied accordingly.

All analyses were performed using SPSS version 21.0 (IBM Corporation, Armonk, NY, USA). The minimum sample size required to detect a prevalence of 74.2% (prevalence reported among Saudi medical students[18]) with a 95% confidence interval (CI) and 2% margin of error was calculated to be 1514. The significance of associations between PSQI category scores and demographic variables were calculated using Pearson's chi-squared test of independence and odds ratios: age, sex, marital status, nationality, region, level of training, type of specialty, and number of on-call schedules (period of time outside regular working hours at which the resident cover duties) or shifts. Associations were considered significant based on two-tailed tests at an α level of 0.05.

Results

A total of 1433 residents responded to the survey (a response rate of 37.5%). Out of the 1433 responses, 1205 (84.1%) were complete and subsequently included in the analysis. This represents 79.6% of the proposed sample size of 1514 needed to detect a prevalence of 74.2%.[18] The average participant age was 27.9 years (standard deviation [SD] ± 2.8). The mean number of on-call schedules was 5.17 per month with 4 representing the 25th percentile and 6, the 75th. The demographic and training characteristics of the participants are shown in Table 1.

Table 1: Demographic and training characteristics of participants (n = 1205).

Characteristic	n (%)
Age (years)	
24–26	394 (32.7)
27–29	577 (47.9)
≥30	234 (19.4)
Sex	
Female	591 (49)
Male	614 (51)
Nationality	
Non-Saudi	86 (7.1)
Saudi	1119 (92.9)
Marital status	
Married	566 (47)
Separated/divorced/widow/widower	33 (2.7)
Single	606 (50.3)
Region	
Central	437 (36.3)
Eastern	245 (20.3)
Southern	87 (7.2)
Western	436 (36.2)
Level of training	
Junior	764 (63.4)
Senior	441 (36.6)
Number of on-call schedules (per month)	
None	150 (12.4)
1–4	210 (17.4)
5–6	505 (41.9)
≥7	278 (23.1)
Shift work	62 (5.1)
Specialty	
Anaesthesia	25 (2.1)
Dermatology	20 (1.7)
Emergency Medicine	36 (3)
Family Medicine	133 (11)
General Surgery	121 (10)
Internal Medicine	230 (19.1)
Neurology	25 (2.1)
Neurosurgery	19 (1.6)
Obstetrics and Gynaecology	65 (5.4)
Ophthalmology	29 (2.4)
Orthopaedics	58 (4.8)
Otolaryngology	53 (4.4)
Paediatrics	178 (14.8)
Pathology	16 (1.3)
Plastic Surgery	12 (1)
Psychiatry	31 (2.6)
Radiology	87 (7.2)
Urology	31 (2.6)
Other	36 (3)

The prevalence of poor sleep quality was high (86.3%). The mean PSQI score was 9.5 ± 3.6, and the median was 10. The mean for poor sleep quality scores was 10.4, and the median was 10. To provide more insight into poor sleep quality, responses were further stratified into stages 1 (a score of 6–10) and 2 (a score of 11–21), and they had a prevalence of 46.9% and 39.4%, respectively. Residents aged between 27 and 29 years had the highest prevalence of poor sleep quality (88.2%), whereas those ≥30 years old had the lowest prevalence of poor sleep quality (79.5%). There were no significant differences in prevalence of poor sleep quality according to sex, nationality, marital status, region, or level of training.

Residents who did not cover on-call schedules in the prior month had the lowest prevalence of poor sleep quality (70.7%). Those working shifts had the highest prevalence of poor sleep quality (93.5%), followed by those who had seven or more on-call schedules in the prior month (90.6%). Pathology residents had the lowest prevalence of poor sleep quality (68.7%). Conversely, anaesthesia residents had the highest prevalence of poor sleep quality (96%), followed by neurosurgery (94.7%) and paediatrics residents (92.7%).

The demographic and training characteristics stratified by PSQI score categories are shown in Table 2.

The mean bedtime was at 12:29 AM ± 88 min, whereas the mean rise time was 6:23 AM ± 69 min. Mean sleep latency was 44 ± 37.5 min, and the mean total sleep time was 5.2 ± 1.1 h. Increased sleep latency was a prominent contributor to poor sleep quality, with a mean score of 1.9 ± 0.96, occurring in 68.4% of residents at least once a week. Average sleep duration was 5.2 ± 1.1 h. The longest mean duration of sleep was among pathology residents (6.2 ± 0.9 h), followed by psychiatry residents (5.5 ± 1.1 h).

Conversely, the shortest mean duration of sleep was among neurosurgery residents (4.9 ± 1 h). The mean score of daytime dysfunction was 1.79 ± 0.92, and 58.2% of residents had a problem mustering enough enthusiasm to get things done. Sleep interruption was the most reported disturbance

Table 2: Demographic and training characteristics stratified by PSQI score categories.

	Optimal (0–5), no. (%)	Poor stage 1 (6–10), no. (%)	Poor stage 2 (11–21), no. (%)	
Characteristic	165 (13.7)	565 (46.9)	475 (39.4)	n = 1205
Age, years[a]				$p = 0.001$
24–26	49 (12.4)	206 (52.3)	139 (35.3)	
27–29	68 (11.8)	258 (44.7)	251 (43.5)	
≥30	48 (20.5)	101 (43.2)	85 (36.3)	
Sex:				$p = 0.70$
Female	80 (13.5)	271 (45.9)	240 (40.6)	
Male	85 (13.8)	294 (47.9)	235 (38.3)	
Nationality				$p = 0.25$
Non-Saudi	13 (15.1)	33 (38.4)	40 (46.5)	
Saudi	152 (13.6)	532 (47.5)	435 (38.9)	
Marital status				$p = 0.31$
Married	83 (14.7)	257 (45.4)	226 (39.9)	
Separated/Divorced/Widow/Widower	6 (18.2)	14 (42.4)	13 (39.4)	
Single	76 (12.5)	294 (48.5)	236 (38.9)	
Region				$p = 0.3$
Central	57 (13)	228 (52.2)	152 (34.8)	
Eastern	37 (15.1)	109 (44.5)	99 (40.4)	
Southern	10 (11.5)	37 (42.5)	40 (46)	
Western	61 (14)	191 (43.8)	184 (42.2)	
Level of training				$p = 0.77$
Junior	101 (13.2)	363 (47.5)	300 (39.3)	
Senior	64 (14.5)	202 (45.8)	175 (39.7)	
Number of on-call schedules (per month)				$p < 0.001$
None	44 (29.3)	75 (50)	31 (20.7)	
1–4	34 (16.2)	98 (46.7)	78 (37.1)	
5–6	57 (11.3)	241 (47.7)	207 (41)	
≥7	26 (9.4)	124 (44.6)	128 (46)	
Shift work	4 (6.5)	27 (43.5)	31 (50)	
Specialty				$p = 0.008$
Anaesthesia	1 (4)	15 (60)	9 (36)	
Dermatology	5 (25)	8 (40)	7 (35)	
Emergency Medicine	3 (8.3)	18 (50)	15 (41.7)	
Family Medicine	30 (22.6)	64 (48.1)	39 (29.3)	
General Surgery	15 (12.4)	61 (50.4)	45 (37.2)	
Internal Medicine	24 (10.4)	111 (48.3)	95 (41.3)	
Neurology	3 (12)	12 (48)	10 (40)	
Neurosurgery	1 (5.3)	8 (42.1)	10 (52.6)	
Obstetrics and Gynaecology	7 (10.8)	30 (46.2)	28 (43.1)	
Ophthalmology	5 (17.2)	14 (48.3)	10 (34.5)	
Orthopaedics	7 (12.1)	29 (50)	22 (37.9)	
Otolaryngology	10 (18.9)	26 (49.1)	17 (32.1)	
Paediatrics	13 (7.3)	84 (47.2)	81 (45.5)	
Pathology	5 (31.3)	11 (68.8)	0 (0)	
Psychiatry	6 (19.4)	11 (35.5)	14 (45.2)	
Radiology	14 (16.1)	28 (32.2)	45 (51.7)	
Urology	5 (16.1)	13 (41.9)	13 (41.9)	
Other	11 (22.9)	22 (45.8)	15 (31.3)	

[a] Pearson's chi-squared test of independence.

occurring in 58.1% of residents at least once a week. This was followed by pain during sleep in 39.1% of participants at least once a week.

Use of sleep medication during the prior month was reported by 26.2% of participants. Sleep medication use in the prior month was reported by 39.4% of residents working shifts in the emergency department. The odds ratio for use of sleep medication in the prior month for residents who rotated in emergency medicine was 1.89 (95% CI: 1.14–3.2), compared with residents who rotated in other departments. The mean score for use of sleep medication was 0.48. A high number of participants (48.6%) experienced daytime sleepiness at least once a week. In addition, 58.2% of participants reported difficulty with motivation for task completion at least once weekly. Lastly, 55.1% of residents reported subjective poor sleep quality. Descriptive statistics of PSQI responses are shown in Table 3, and mean scores of PSQI domains are shown in Table 4.

As shown in Table 2, age ($p = 0.001$), covering on-call schedules or shift work ($p < 0.001$), and training specialty

Table 3: Descriptive statistics of Pittsburgh Sleep Quality Index (PSQI) responses (n = 1205).

PSQI response	Not during the past month, %	Less than once a week, %	Once or twice a week, %	Three or more times a week, %
Cannot get to sleep within 30 min	16.4	15.1	28.6	39.8
Wake up in the middle of the night or early morning	22.8	19.1	26.9	31.2
Wake up to use the bathroom	44.4	26.2	18.4	11
Cannot breathe comfortably	66.3	16.2	12.3	5.2
Cough or snore loudly	60.7	13.9	11.7	13.7
Feel too cold	42.5	23.5	19.1	14.9
Feel too hot	45.6	25.4	18.2	10.9
Had bad dreams	29.5	35	24.1	11.5
Have pain	42.9	18	19.1	20
Had other reasons	89.4	0.7	3.4	6.5
How often have you taken medicine to aid in sleep?	73.7	11.5	8	6.7
How often have you had trouble staying awake while driving, eating, or engaging in social activity?	24.3	27.1	28.3	20.3
	No problem at all	Only a very slight problem	Somewhat of a problem	A very big problem
Had a problem getting the enthusiasm to get things done	16.3	25.6	31.3	26.9
	Very good	Fairly good	Fairly bad	Very bad
Rate overall sleep	11.6	33.2	42.7	12.4

Table 4: Pittsburgh Sleep Quality Index (PSQI) mean scores (n = 1205).[a]

Parameters	Sleep latency	Sleep disturbance	Sleep duration	Daytime dysfunction	Habitual sleep efficiency	Use of sleeping medication	Subjective sleep quality
Mean	1.90	1.41	1.84	1.79	0.57	0.48	1.56
SD	0.958	0.603	0.955	0.921	0.872	0.903	0.853

[a] Scored out of 3.

(p = 0.008) were significantly associated with sleep quality scores. These associations were analysed using multivariate logistic regression with adjustment for sex, nationality, marital status, and region. The following variables were significantly associated with stage 2 poor sleep quality: age 27–29 years and having on-call schedules or shifts. Odds ratios, CIs, and *p*-values are shown in Table 5.

Discussion

This study included a large sample of residents (n = 1205) from various medical specialties working in multiple healthcare centres across KSA. The prevalence of poor sleep quality (86.3%) was higher than that reported in other studies conducted in residents in India (39.3%) and Mexico (63.8%),[14,15] but both of these studies had significantly smaller sample sizes (n = 56 and n = 84, respectively). In the present study, pathology residents had the lowest prevalence of poor sleep quality (68.7%), compared with residents belonging to other specialties. This finding is consistent with the results in Murthy et al., in which non-clinical specialty (including pathology) residents reported significantly better sleep quality compared with residents in clinical specialties.[14] The prevalence of poor sleep quality among psychiatry residents in the present sample (80.6%) was higher than that among Brazilian psychiatry residents (59.6%).[27] Regarding studies conducted in KSA, the participants in the current work had higher rates of poor sleep quality (86.3%) compared with medical students (74.2% and 76%) and the general population of Saudi adults (78.3%).[18–20] The prevalence of poor sleep quality among Saudi adults and medical students (range of 74.2%–78.3%) is higher than that among residents in other countries (range of 39.3%–63.8%). Further research should explore whether cultural factors might play a role in the high prevalence of poor sleep quality in the Saudi population.

Alshahrani et al. reported that healthcare workers who perform shift work and on-call schedules had poorer sleep quality compared with those who did not.[28] This is consistent with the findings in the present study. Performing on-call schedules or shift work was significantly associated with

Table 5: Multivariate logistic regression for factors that potentially predict grade 2 poor sleep quality among residents in KSA (N = 1205).

Variable	Odds ratio	95% CI	*p*-value
Age 27–29 years (reference: age 24–26 years)	1.49	1.09–2.03	0.012
Number of on-call schedules per month (reference: no on-call schedules)			
1–4	2.21	1.20–4.09	0.011
5–6	2.82	1.57–5.06	0.001
≥7	3.59	1.93–6.67	<0.001
Shift work	4.27	1.97–9.25	<0.001

Note: These values are adjusted for sex, nationality, marital status, and region.

grade 2 poor sleep quality. The odds ratio increased as the number of on-call schedules increased and was the highest among those who performed shift work. The literature indicates that shift work and on-call schedules are risk factors for excessive sleepiness and insomnia.[29]

The average sleep duration of 5.2 h in the present study was lower than the average for Saudi medical students observed in two previous studies (5.8 and 6.07 h) and Saudi adults (6.4 h).[12–14] The difference between medical students and the general population and the current residents could be attributed to the negative effect of residency training on sleep duration. This was demonstrated by Kalmbach et al., who reported a 54-minute decrease in the baseline mean sleep duration after six months of residency training.[30] Additionally, the average sleep duration among Saudi residents was shorter than that among Mexican medical residents (5.5 h).[11] The average sleep duration among first-year residents (5.2 h) in the current study was shorter than that of their American counterparts (6.4 h).[30] Saudi anaesthesia residents (5.2 h) also had a shorter average sleep duration than Canadian anaesthesia residents (6.5 h).[31] Lastly, Saudi family medicine residents had a shorter sleep duration (5.3 h) compared with Korean family medicine residents (6 h).[32] These comparisons show that Saudi residents in different subspecialties and levels have an overall shorter average sleep duration compared with residents in other countries.

Increased sleep latency (>30 min) was experienced by 68.4% of the participants at least once a week. The mean sleep latency was 44 min, which is higher than that previously reported among Mexican residents (35 min).[11] Fuller et al. used polysomnography to observe higher sleep latency among subjects with high anxiety compared with subjects with low anxiety.[33] Saudi medical residents have high levels of perceived stress,[16] and it is likely that the increased sleep latency among Saudi residents is related to increased levels of stress and anxiety.

Two previous studies on emergency medicine residents showed that 38% and 46.2% of participants used sleep medication.[34,35] Overall, in the current study, 26.7% of residents took medication to help them sleep in the past month. In the subgroup analysis, residents who rotated in the emergency medicine department had the highest prevalence of sleep medication use (39.4%). This rate is comparable to those reported in other studies. The increased use of sleep medication might reflect the need to mitigate the effects of shift work and changing sleep times. In the present study, residents had a higher mean sleep medication score (0.48) compared with a sample of healthcare workers (composed of doctors, nurses, and technicians) from two Saudi tertiary care hospitals (mean score 0.29).[28] These data suggest that more residents use sleep medication compared with other healthcare workers in KSA.

The results of the current study should be interpreted with caution, given the response rate of 37.5%. However, this rate is comparable to the average response rate of web-based surveys (39.6%) and higher than that in another study that used a web-based survey targeting residents in KSA (25.9%).[16,26] Given that participation was anonymous, it was not possible to identify residents in the email list who responded and those who did not. Moreover, cooperation with the SCFHS included only help in contacting the 3823 residents in their database. The cooperation did not extend to the inclusion of the total population baseline characteristics. As such, the study could not conduct a comparison of the baseline characteristics between the sample and the total population.

Other limitations for the current study were that it measured sleep quality at a single point in time. Future work should collect longitudinal data on sleep quality before and after residency, which will better reflect how residency itself affects sleep quality. Moreover, this work did not collect data on comorbidities of the participants, which might confound the effect of residency on sleep quality. Lastly, the participants provided a self-report of their sleep quality; collecting objective measurements of sleep quality, such as sleep logs, actigraphy, and polysomnography, would provide a more valid measurement of sleep quality.

Conclusion

The prevalence of poor sleep quality among Saudi medical residents is high. On-call schedules and shift work represent major risk factors for poor sleep quality. Short sleep duration and increased sleep latency were among the most common reported disturbances. In addition, the increased use of sleep medication was common in residents rotating through the emergency department. Training programmes should aim to abide by the 80-hour work week recommendation set forth by the Accreditation Council for Graduate Medical Education.[36] There is a need to integrate wellness programmes into the curriculum and increase residents' awareness of poor sleep quality and the available resources for help.

Conflict of interest

The author has no conflict of interest to declare.

Ethical approval

The study was approved by the Institutional review board of the College of Medicine, King Saud University, Riyadh, KSA (14/4491/IRB).

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