Research Article

Sleep quality among residents of Saudi Board of Family Medicine compared to service physicians in primary care centers

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Abstract

Background: Medical specialties residents are exposed to several factors that can affect their sleep. On-call duties, exam stress, and qualification issues are the main factors.

Objectives: To assess sleep quality among residents of Saudi Board of Family Medicine and compare it with that of service doctors of primary care.

Methods: This was a cross-sectional study that included all residents of Saudi Joint Program of Family Medicine ($n = 71$). There were four levels of training for residents: R1, R2, R3, and R4. An equal number of service doctors were included in this study by a convenience sampling technique to compare their sleep with residents' sleep. Sleep quality was assessed using Pittsburgh Sleep Quality Index. This tool can define sleep quality as poor or good according to the score result.

Results: Only 59 responses (83.1%) were obtained from residents group, compared to 71 responses (100%) from service group. More than 90% of R1 and R2 had poor sleep, compared to 67% in R3 and 77% in R4. However, among all residents levels, 48 (81.3%) had poor sleep, compared to 34 (47.8%) from service doctors (OR = 1.99, $\chi^2 = 15.5$, $P < 0.001$). Regression analysis was carried out for different variables, which showed that marital status was the only variable that significantly affected sleep quality, with married doctors having worse sleep than unmarried ones.

Conclusion: R1 and R2 residents had poorer sleep than R3 and R4. However, all residents in general had worse sleep compared to service doctors.

KEY WORDS: Sleep quality, resident physicians, primary health care, Pittsburgh Sleep Quality Index, Saudi Arabia

Introduction

It has been reported that bad sleep and long work hours affect both physical and mental functions, causing decreased cognitive function and increased daytime sleepiness,[1–6] which results in increased medical incidents. So, it is important to prevent stress and sleep deprivation to ensure comfortable environment to doctors and a safe health service for patients.

Until now, there is no fixed number of hours that can be considered normal duration of sleep. However, a 2005 Gallup poll in the USA found that among 1500 adults (age ≥18 years; mean = 49 years), the average self-reported sleep duration was 6.8 h on weekdays and 7.4 h on weekends.[7]

Sleep deprivation can be acute or chronic. Acute sleep deprivation can cause different changes in various body functions; however, experts conclude that these changes might not be a clinically significant.[8] However, chronic sleep deprivation is found to exert adverse effect on cognitive function, mood, and driving safety.[3,9] Moreover, some

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evidences suggest that chronic sleep deprivation can increase the incidence of obesity and diabetes mellitus.[7]

Medical specialties residents are exposed to several factors that can affect their sleep. On-call duties, exam stress, and qualification issues are the main factors. Some epidemiological studies have investigated the work and sleep situations of residents. A study conducted on 2737 medical residents in the USA reported that as extended-duration work shifts of the medical residents increased, there was a reduction in the duration of sleep available to them, leading to an increase in the number of medical errors.[10] Another study of 3604 medical residents in the USA showed that long work hours and short sleep duration were associated with medical errors and trouble with colleagues.[11] Interestingly, the reduction in the number of working hours of medical interns led to a decrease in the number of serious medical errors and attentional failures in intensive care units.[12,13]

The aim of this study was to evaluate the sleep quality of residents of Saudi Board of Family Medicine Join Program (SBFMP) and to compare it with that of service doctors running primary care clinics, who are not subjected to stress of exams or graduation.

Materials and Methods

This was a cross-sectional study. A sleep quality assessment tool was distributed among two groups: residents group and service group, comparing sleep quality between these two groups. The study was conducted in primary care clinics of Riyadh Military Hospital. They consisted of several centers scattered in Riyadh city.

Residents of SBFMP are doing rotations in several specialties including family medicine, internal medicine, pediatrics, obstetrics and gynecology, surgery, ENT, ophthalmology, emergency medicine, psychiatry, and radiology. They have half-day academic activity weekly. Service primary care doctors are running the primary care clinics. However, some of them are running Chronic Disease Clinics that usually manage diseases such as diabetes mellitus, hypertension, and bronchial asthma.

There are about 71residents in SBFMP. They fell into four levels: R1, R2, R3, and R4. All residents were surveyed and comprised the residents group. A similar number of service primary care doctors were surveyed and comprised the service group. Service doctors were included in the group by a convenience sampling technique.

Questionnaire consisted of the Pittsburgh Sleep Quality Index (PSQI).[14] It is a scale to assess quality and pattern of the sleep. It was developed by the Hartford Institute for Geriatric Nursing, New York University, College of Nursing. The PSQI has internal consistency and a reliability coefficient (Cronbach's α) of 0.83. It differentiates "poor" from "good" sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the past month. The subject self-rates each of these seven areas of sleep. Scoring of answers is based on a 0–3 scale, whereby 3 reflects the negative extreme on the Likert scale. A global sum of "5" or greater indicates a "poor" sleep.

Table 1: Groups characteristics

Characteristics	Residents		Service	
	No (59)	%	No (71)	%
Gender				
Male	35	59.3	42	59.1
Female	24	40.6	29	40.8
Marital status				
Married	37	62.7	64	90.1
Unmarried	22	37.2	7	9.8
Smoking status				
Yes	7	11.8	5	7.04
No	52	88.2	66	92.9
Age group				
<35	58	98.3	17	23.9
35–44	1	1.6	34	47.8
45–54	0	0	20	28.1

Table 2: Sleep quality of the groups

Characteristics	Residents		Service	
	No. (59)	%	No. (71)	%
PSQI				
Good	11	18.6	37	52.1
Poor	48	81.3	34	47.9

OR = 1.99, χ^2 = 15.5 ($P < 0.001$).

PSQI was distributed among residents during their weekly academic activity and had been continued for 3 weeks to include residents who were absent or on leave. Service group was surveyed mainly when they were in their clinics or during break time. Distribution was performed by the author or his colleague doctors who received a brief explanation about the study and the data collection tool.

The main ethical encounter that was raised by this study is that there was no preserved time for answering the survey. This was solved by distributing the survey during break time or giving it to the responder to take it home and give it back after finishing it.

Statistical Package for the Social Sciences (SPSS) software, version 15, was used for data entry and analysis. χ^2-Test and regression analysis were used to analyze relation between PSQI score and age, marital status, job status, and smoking status.

Results

Only 59 responses were obtained from the residents group (83.1%) compared to 71 responses from the service group (100%). Characteristics of both groups are shown in Table]. Approximately 90% of participants in the service group were married, whereas approximately 60% of those in the

Table 3: Factors that can affect sleep quality

Characteristics	No.	PSQI			
		Poor sleep (82)		Good sleep (48)	
		No.	%	No.	%
Age group					
<35	75	58	77.3	17	22.7
35–44	35	17	48.6	18	51.4
>44	20	7	35	13	65
Gender					
Female	53	36	67.9	17	32.1
Male	77	46	59.7	31	40.3
Marital status					
Married	101	56	55.4	45	44.6
Unmarried	29	26	89.7	3	10.3
Smoking status					
Nonsmoker	118	72	61.0	46	39.0
Smoker	12	10	83.3	2	16.7

resident group were married. The percentage of non-smokers in both groups was approximately 90. The percentage of residents who were below 35 years of age was approximately 98, whereas the majority of those in the service group were between 35 and 44 years (approximately 50%). Among the resident group, 48(81.3%) had poor sleep, compared to 34 (47.8%) from the service group (OR = 1.99, χ^2 = 15.5, $P < 0.001$) [Table 2]. However, other variables such as age, gender, marital status, and smoking status [Table 3] need to be considered in the analysis. So, regression analysis was carried out to assess the relation between sleep quality and other variables. The results of regression analysis showed

Table 5: Sleep quality among different levels of residents

	Sleep quality			
	Poor		Good	
	No.	%	No.	%
R1	12	92	1	8
R2	17	89.5	2	10.5
R3	9	64	5	36
R4	10	77	3	23

that marital status has a significant effect on PSQI score, with married individuals having poorer sleep than unmarried ones [Table 4a,b]. Job status (resident or service), smoking status, age, and gender were not found to be statistically significant in relation to sleep quality. The number of all levels of residents (R1, R2, R3, and R4) who had poor sleep was more than that with good sleep, as shown in Table 5. However, about 90% of R1 and R2 had poor sleep whereas approximately 65% R3 had a poor sleep. About 77% of R4 residents had a poor sleep. Among different sleep components of PSQI, subjective sleep quality, sleep latency, and sleep duration were the most components affected in the residents group as well as in the service group (Figures 1 and 2). Use of sleep medication was the least component affected in the residents group and also in the service group.

Discussion

Response rate among the residents group was 83.1%; this was mainly because some residents were not attending

Table 4a: Regression analysis results

Model		Unstandardized coefficients		Standardized coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.051	0.167		0.308	0.759
	Gender	0.099	0.080	0.100	1.232	0.220
	Marital status in two groups	0.225	0.101	0.194	2.222	0.028
	Age group	0.099	0.064	0.169	1.547	0.124
	Job in two groups	–0.166	0.105	–0.171	–1.571	0.119

[a]Dependent variable: PSQI in group.
Married=1, Un married = 0

Table 4b: ANOVA[a]

Model		Sum of squares	df	Mean square	F	Significance
1	Regression	5.546	4	1.386	7.008	0.000[b]
	Residual	24.731	125	0.198		
	Total	30.277	129			

[a]Dependent variable: PSQI in groups.
[b]Predictors: (constant) job in two groups, gender, marital status in two groups, age group.

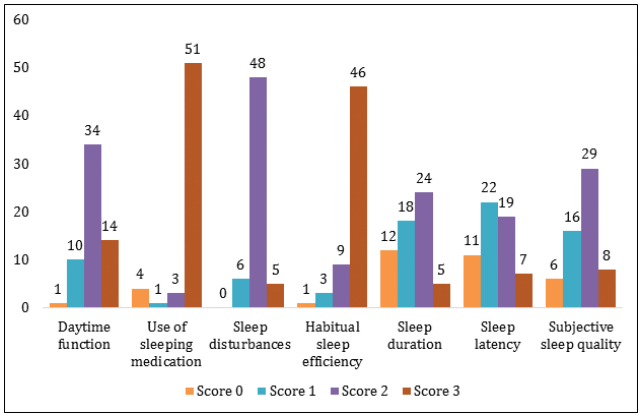

Figure 1: Components of sleep quality in PSQI of residents group.

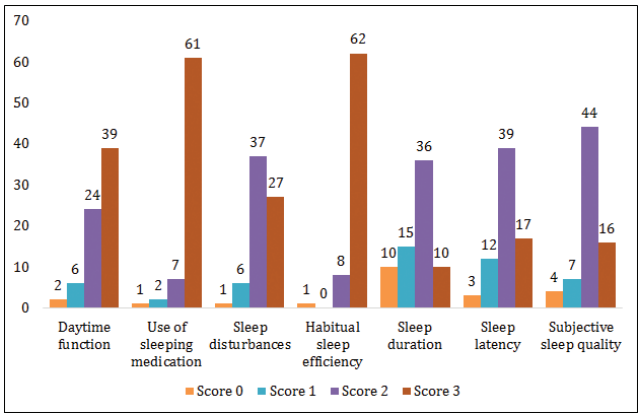

Figure 2: Components of sleep quality in PSQI of service group.

the academic activity or refused to participate. Moreover, some responses were not valid for analysis because some questions were left unanswered.

Sleep quality among residents of SBFM was poorer than that of service doctors of primary care, and this difference was statistically significant. However, being a resident does not affect sleep quality. This is according to the regression analysis results. The only variable that significantly affected sleep quality was the marital status, with married individuals having a poorer sleep. This result is not in line with literature, because many studies have shown that married people had better sleep quality than single people.[7,9,10] This contradicting result could be because of different target population. Moreover, the relatively small number size of this study (n = 130) could affect the results. Among different levels of residents, R1 and R2 had worse sleep than R3 and R4. This can be explained by the fact that both R1 and R2 have rotations with on-call duties throughout their first and second years of training. On the other hand, R3 had one rotation with on-calls duties, whereas R4 had no on-call duties during their year of training. Among different sleep components of PSQI, subjective sleep quality, sleep latency, and sleep duration were the most components affected in both residents and service groups. This actually goes with the study by Asghari et al.,[15] who studied the sleep of more than 3000 individuals by a cross-sectional survey and found that sleep latency is the most affected area their sleep.

Conclusion

In conclusion, it was found that R1 and R2 had poorer sleep quality than R3 and R4. Compared to service doctors, residents in general had worse sleep. For both residents and service doctors, marital status was the only factor that affected the sleep quality, with unmarried doctors having better sleep quality. Among different sleep components of PSQI, subjective sleep quality, sleep latency, and sleep duration were the most components affected in both groups. Decreasing on-calls duties for residents is recommended to help improve their sleep quality.

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