SHORT REPORT

Association of cognitive impairment with sleeping difficulties, anxiety and depression among Pakistani physicians

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Abstract

Previous literature has highlighted a high burden of a variety of psychopathologies such as anxiety, depression, and poor sleep quality among Pakistani physicians. These psychopathologies are associated with a poor quality of life and cognitive difficulties, affecting empathy levels, doctor patient relationship, and work performance. It is a cross sectional study in which 300 Pakistani physicians aged 45 and above, were interviewed using a questionnaire comprising hospital anxiety and depression scale, cognitive difficulties scale, and Pittsburgh Sleep Quality Index. All data were analyzed in SPSS v.21. A total of 268 doctors responded (268/300). A total of 72 (26.9%) participants were severely anxious, 31 (11.6%) were severely depressed and 129 (48.1%) respondents were poor sleepers.

Hierarchal regression analysis revealed that female gender, increasing age, high PSQI and anxiety scores were significant predictors of cognitive difficulties among the respondents.

Keywords: Anxiety, Depression, Cognitive impairment, Sleep quality, PSQI, Physicians.

Introduction

A career in medicine is among the noblest professions which demands higher expectations from physicians than their counterparts in other fields. Excellent academic records, professional efficiency, and intense training are the fundamental requirements of this field. Most of the physicians are competitive, perfectionists, and work under significant psychological, academic, and social stressors.[1,2] Similar to other parts of the world, doctors in Pakistan have a tough professional life; coping with, a rigorous undergraduate training entailing 5 years; extensive curricula, frequent examinations, postgraduate training period, and peer pressure, resulting in a constant stress and anxiety for medical students and physicians.[1]

The professional life of a Pakistani physician is worsened by a plethora of problems related to poor healthcare infrastructure, high patient load, growing poverty, a staggering burden of diseases, and one of the highest mortality rates in the world.[1] Despite their competence, Pakistani physicians' work on low salaries, poor job structure, and insecurity due to rising religious intolerance and sectarian killings in the last decade.[3] Due to these stressors, Pakistani physicians are at a high risk of developing psychological distress and common mental disorders such as anxiety and depression.[1-3]

Our recent studies in the province of Punjab, Pakistan, demonstrated a very high prevalence of different psychopathologies among Pakistani medical students as well as practicing physicians. Pakistani physicians report lower mental well-being as compared to their Western counterparts, poor dietary habits, high prevalence of anxiety, depression, medication abuse, and poor sleep quality.[1-4]

Prior studies in Western countries have suggested that up to 50% of older adults endorse symptoms of poor or insufficient sleep, such as difficulty in falling asleep, fragmented sleep, early morning awakening, and daytime sleepiness.[5] However, there are no studies that report the prevalence of sleep disorders among senior physicians in Pakistan. Waqas et al, reported that around 77% of medical students suffer from poor sleep quality in a medical school in Lahore, Punjab.[2] This poor sleep quality disturbs physicians' interpersonal relationship.[6] In addition, physician's vigilance and decision making, procedural skills, and professionalism also gets affected.[7] Grave medical errors tend to occur in association with both sleep deprivation and physician shift work.[2] This not only influences patients' lives,

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compromises on the health care delivery with increasing medical errors but also puts a burden on their personal life.[6,7] There is also a growing evidence that poor sleep quality and disturbed circadian rhythm may lead to cognitive decline and dementia which leads to numerous adverse consequences including cognitive impairment, deterioration of motor skills,and depressed mood.[6,7]

Over the past 3 decades, various surveys have documented unequivocal evidence that psychomotor performance is impaired in physicians who are sleep deprived and suffer from mood disorders.[8,9] This higher cognitive impairment in the Pakistani sleep deprived physicians, with a high frequency of anxiety and depression, impacts their professional attitudes, personal lives, and patient care. These psychopathologies lead to decreased physicians' competency by impacting their cognitive judgment and learned reflexes, resulting in a poor performance, poor empathy levels and doctor-patient relationship, and increased chances of human errors in the patient care.[6-9]

Despite the harms associated with these psychopathologies, there is a paucity of studies reporting sleep disorders and cognitive deficits contributed by common mental disorders among senior Pakistani physicians thus, warranting this study.

Methods and Results

This study was designed as a cross-sectional study, where 300 senior doctors aged 45 and above were approached conveniently from January to February, 2017, at teaching hospitals in cities of Lahore and Faisalabad, Pakistan. Minimum sample size required for this survey was 266 based on a hypothetical population size of 20,000, 90% confidence level and a 5% margin of error. Moreover, this study required a minimum sample size of 138, to test a regression model with 5 predictors, alpha error probability of 0.05, an anticipated medium effect size yielding a 95% statistical power.

A pretested questionnaire comprising informed consent form, characteristics of respondents, Hospital Anxiety and Depression Scale (HADS), Pittsburgh sleep quality scale (PSQI) and cognitive difficulties scale (CDS) was employed. Participation in this study was voluntary and written informed consent was obtained from all participants. They were informed about aims of this study and ensured anonymity. Institutional review board approval was sought and obtained from the ethical review board of University College of Medicine and Dentistry, Lahore, Pakistan.

Table-1: PSQI symptoms endorsed by physicians (n=268).

Subscale	Subcategories	Frequency (n)	Percentage (%)
PSQI duration	Better	93	34.7
	Good	79	29.5
	Bad	66	24.6
	Worse	30	11.2
PSQI disturbance	Better	29	10.8
	Good	179	66.8
	Bad	57	21.3
	Worse	3	1.1
PSQI day dysfunction	Better	70	26.1
	Good	110	41.0
	Bad	70	26.1
	Worse	18	6.7
PSQI latency	Better	61	22.8
	Good	134	50.0
	Bad	51	19.0
	Worse	22	8.2
PSQI efficiency	Better	244	91.0
	Good	19	7.1
	Bad	4	1.5
	Worse	1	.4
PSQI sleep quality	Better	66	24.6
	Good	155	57.8
	Bad	39	14.6
	Worse	8	3.0
PSQI medication	Not during the past month	240	89.6
	Once or twice a week	11	4.1
	Once or twice a week	13	4.9
	three or more times a week	3	1.1

PSQI: Pittsburgh Sleep Quality Index.

Hospital anxiety and depression scale (HADS) is an important assessment tool for symptoms of anxiety and depression.[1] According to it, a score ranging from 0 to 7 on the anxiety and depression subscales is considered as normal, 8 to 10 borderline and 11-21 as severe.

Cognitive difficulties scale (CDS) is a valid and reliable scale for evaluating cognitive difficulties. It evaluates several domains of cognitive difficulties such as attention-concentration, praxis, delayed recall, difficulties in orientation for persons, difficulties in temporal orientation, and difficulties in prospective memory.[10] Higher scores on this scale correspond to more cognitive difficulties.[10]

The Pittsburgh sleep quality index (PSQI) questionnaire measures subjective sleep quality, sleep habits, and sleep disturbances over the previous month and discriminate between normal and poor sleepers. It consists of 19 questions which produce a summated global PSQI score, which if greater than 5 is consistent with clinically disturbed or poor sleep.[2]

Table-2: Hierarchal regression analysis identifying predictors of cognitive difficulties among Pakistani physicians (n=268).

Model	Predictors	B	Std. Error	Beta	t-statistic	P-value
1	(Constant)	16.541	4.645		3.561	<0.001
	Gender	4.755	1.787	0.160	2.661	0.008
	Age	-4.009	2.774	-0.084	-1.445	0.150
	PSQI scores	1.571	0.324	0.286	4.842	<0.001
2	(Constant)	14.187	4.633		3.062	0.002
	Gender	5.036	1.761	0.169	2.860	0.005
	Age	-4.825	2.742	-0.101	-1.759	0.080
	PSQI scores	1.257	0.335	0.229	3.755	<0.001
	Depression	0.752	0.242	0.183	3.110	0.002
3	(Constant)	14.977	4.610		3.249	0.001
	Gender	4.006	1.806	0.135	2.219	0.027
	Age	-5.780	2.754	-0.121	-2.099	0.037
	PSQI scores	1.111	0.338	0.202	3.281	0.001
	Depression	0.317	0.307	0.077	1.032	0.303
	Anxiety	0.677	0.299	0.177	2.264	0.024

PSQI: Pittsburgh Sleep Quality Index.

All data were analyzed in SPSS v. 21. Frequencies were calculated for demographics and mean scores (SD) were reported for PSQI subscales, CDS subscales, and HADS. Then, hierarchal regression analysis was run to analyze predictors of cognitive difficulties. Three models were created to analyze significant predictors of cognitive difficulties and controlling effects of anxiety on depression and PSQI scores. Covariates entered for cognitive difficulties were gender, age, income, anxiety, depression and PSQI scores.

There were a total of 268 (89.3%) respondents. Twenty physicians (6.67%) did not return and twelve respondents (4%) had incomplete questionnaires, and therefore, excluded from the analysis. Most of the respondents were males 142 (53%) and 126 (47%) females, 239 (89.2%) of the respondents were aged 45-50 years and rest were 50-60 years age. Only 48 (17.9%) earned less than Rs.50,000 as compared with 220 (82.1%) earning >Rs.50, 000.Mean scores (SD) on cognitive difficulties scale were 28.15±14.87, anxiety subscale 7.86±3.89, depression subscale 6.19±3.61 and PSQI scale 5.77±2.71.

PSQI scale identified that 129 (48.1%) respondents were poor sleepers. According to HADS, 124 (46.27%) were normal, 72 (26.9%) borderline anxious, and 72 (26.9%) were severely anxious, and 162 (60.4%) were normal, 75 (28.0%) borderline depressed, and 31 (11.6%) were severely depressed.

A high percentage of physicians reported poor sleep duration, sleep disturbance, day dysfunction, sleep latency, sleep efficiency, subjective sleep quality and frequent use of sleeping medications. Detailed results have been presented in Table-1. Anxiety scores were strongly associated with depression scores (r=0.65, P <0.001). Hierarchical regression analysis was conducted to analyze significant predictors of cognitive difficulties and controlling effects of anxiety in their relationship. The first model, explained 14.1% variation in scores on CDS scale (ANOVA F= 15.6, P <0.001, dftotal= 267). According to it, high CDS scores were associated with female gender and PSQI scores. In second model (adjusted R^2= 0.17, ANOVA F= 14.48, df total= 267, P<0.001), depression was entered along with the previously entered predictors. It also yielded a significant association with cognitive difficulties.

However, when anxiety scores yielded strong controlling effects on depression scores and rendered it insignificant. Anxiety itself remained as a significant predictor of cognitive difficulties. The third model could explain 18.1% variation in scores of CDS scale (ANOVA F= 12.79, P <0.001, dftotal= 267). Detailed results are presented in Table-2.

Conclusion

Our study has demonstrated a high prevalence of anxiety, depression and sleeping difficulties among the Pakistani physicians. These psychopathologies were further associated with cognitive deficits that affect their physician-patient relationships and clinical practice.

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