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The impact of anxiety on sleep quality

Azizeh Afkham-Ebrahimi, MSc[1], Maryam Rasoulian, MD.[2], ZahraTaherifar[3], Maryam Zare[4]

Tehran Psychiatric Institute, Rasoul Akram Hospital, Iran University of Medical Science, Tehran, Iran.

Abstract

Background: A significant relationship between psychiatric disorders principally depression and anxiety and insomnia is well-known in general population. A high percent of insomnia sufferers report anxiety symptoms. Anxiety is also frequently seen in medical patients whom complaints of sleep problems are often prominent.

Method: 250 outpatients with various medical complaints participated in the study and completed Pittsburgh Sleep Quality Index(PSQI) and Beck Anxiety inventory (BAI).

Results: The patients reported moderate anxiety on BAI. Significant correlations were found between anxiety and four components of sleep; sleep quality, sleep latency, sleep duration and habitual sleep efficiency.

Conclusion: The correlation of sleep complaints with anxiety symptoms indicated a high interrelatedness between anxiety and sleep complaints. Insomnia is a disorder of hyperarousal. Nonetheless inqury into mechanisms of arousal regulation could further explain the anxiety and sleep disorders as well.

Keywords: Anxiety, sleep quality, Beck Anxiety Inventory, Pittsburgh Sleep Quality Index

Introduction

Sleep is an active state, critical for our physical, mental and emotional well-being and important for optimal cognitive and overall functioning. However sleep problems are very common in the general population, affecting 10-20% of adults [1]. Sleep disorders coexist with a number of physical and psychiatric conditions, including psychoses, anxiety and mood disorders [2-4]. In general population studies, a significant relationship between psychiatric disorders principally depression and anxiety and insomnia is well-known. An analysis of data from the large-scale Epidemiologic Catchment Area (ECA) project demonstrates the relatively high percentage of individuals in the general population who suffer from significant insomnia symptoms and meet the criteria for mood and anxiety disorders. 40% of these insomnia sufferers met the criteria for at least 1 psychiatric disorder. Anxiety disorder was diagnosed in 24% of insomniacs [5-7]. There is a high interrelatedness between sleep and anxiety . Anxiety complaint such as worrying and rumination are named to be important in sleep problems [8,9] . Sleep disorders are also a common but under-recognized problem in general hospi-

1. **Corresponding author**, MSc in Clinical Psychology. Academic Member of Department of Clinical Psychology, Tehran. Psychiatric Institute. Satarkhan, Niayesh, Next to Shahid Mansouri St. Tel: +989121597189. Email: afkhami@iums.ac.ir
2. Psychiatrist. Assistant Professor of Psychiatry Department. Rasoul Akram hospital .Tehran-Iran
3&4 . MSc in Clinical Psychology. Tehran Psychiatric Institute. Tehran, Iran

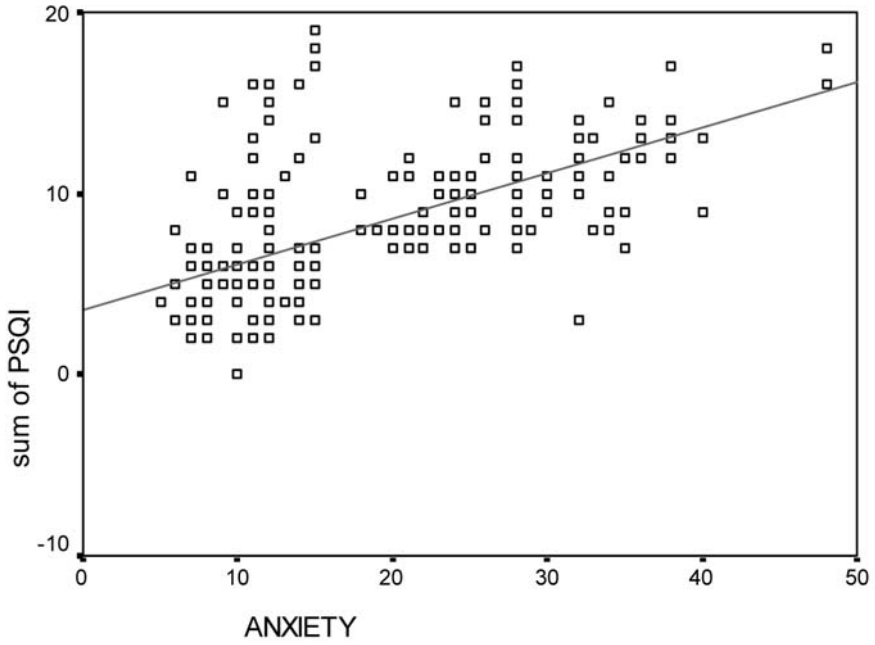

Fig. 1. The correlation between the PSQI and anxiety

tals and approximately 35% of the patients complain of insomnia [10]. From an epidemiologic perspective anxiety symptoms often herald the onset of sleep problems. Anxiety is also frequently seen in medical patient whom complaints of sleep problems are often prominent [11]. The aim of this study was to investigate the impact of anxiety on components of sleep quality (e.g sleep duration, sleep latency, sleep efficiency, sleep disturbances and daytime dysfunction) in a sample of medical outpatients.

Method

Participants and procedure

A total of 250 (138 women and 112 men) outpatients with various medical complaints attending different internal/surgical clinics (expect for psychiatry clinic) of a training general hospital and agreed to participate in the study, were selected . The age range of the participants was between 18-74 (Mean= 42.56; SD=17.18). The inclusion criteria were 18 years and older, high school education , intact cognition being communicative and cooperative and no regular sedative-hypnotics consumer, over the past month . The exclusion criteria was current or a history of psychiatric disorders All of these informations were obtained through a brief interview with the patients.

The assessment was conducted in two stages. In the first stage, participants completed the PSQI and then those who reported frequent anxiety on 5th component (sleep disturbances) of the PSQI, were entered the second stage and the BAI was administered. 96 (55 women and 41 men) out of 234 patients qualified for entry to the second stage and the remaining 138 patients were excluded.

Measures

1- The PSQI is a self-rated questionnaire that provides an index of sleep quality for a 1 month interval and comprises 19 questions and considered to be an instrument with established reliability and validity [12]. These 19 questions were grouped into 7 component scores, each weighted equally on a 0-3 scale. The 7 component were subjective sleep quality (C1), sleep latency (C2), sleep duration(C3), habitual sleep efficiency (C4), sleep disturbances (C5), use of

Components of PSQI	*Correlation*	*P- value*
C1	0.366**	0.001
C2	0.328**	0.001
C3	0.240*	0.01
C4	0.395**	0.001

C1= Sleep quality C3= Sleep duration
C2= sleep latency C4= Sleep efficiency

Table 1. The relationship of sleep quality components and anxiety.

sleep medication (C6) and daytime dysfunction (C7). The sum of scores for these seven components yielded a global score between 0 and 21 with higher scores indicating worse sleep quality. The PSQI has been shown to be valid and reliable in Iranian population [Ebrahimi et al in press]. We used the scores >6 on PSQI as an indicator of poor sleep quality.

2- The BAI is a 21 items, self-reporting questionnaire that measures the severity of anxiety in adults and adolescents [13]. The anxiety symptoms were rated on a 4-point scale from " not at all" (0 points) to "severe" (3 points). The total score had ranges from 0 to 63. Scores from 0-7 points reflected a minimal level of anxiety, 8-15 mild anxiety, 16-25 moderate anxiety and 26-63 severe anxiety. The scale had good psychometric properties and was shown to be valid and reliable in Iranian subjects (unpublished dissertations).

Data analysis

Statistical analysis was performed using SPSS 15 for windows. Descriptive statistics and scatter-plot graph were used for demonstrating the distribution and correlation of anxiety and PSQI scores. The bivariate relations between continuous variables (anxiety , and components of PSQI) were calculated with Pearson product-moment correlations.

Results

41% of the patients were reported to have anxiety on PSQI-C5 in the initial screening and the mean for PSQI in the screened patients was 7.67(SD= 3.86) and higher than the anchor point. The mean of anxiety score was 18.11 (SD= 9.75) on BAI which indicated moderate anxiety in our medical patients.

The associations of PSQI and anxiety scores are shown in Fig. 1. The scatter of anxiety and global sleep scores showed a significant linear relationship between the two variables. Table 1 shows the correlations of anxiety scores with sleep components. There were significant relationships between anxiety , sleep quality, sleep latency, sleep duration and habitual sleep efficiency.

Discussion

There is now compelling evidence for linkages between the regulation of sleep, and emotions. Spielman and colleagues (1996) proposed a behavioral model of insomnia that incorporates predisposing or constitutional factors, precipitating factors that serve as "triggers" and perpetuating factors that sustain the sleep disruption [14]. Anxiety (which is often brought on by a stressful event) is probably the most common cause of difficulty in falling asleep. This is called " stress related insomnia". Clinicians have long noted associations between sleep disruption and anxiety symptoms. Our patients with sleep difficulties reported to have moderate anxiety on BAI. The severity of reported anxiety was correlated with poorer sleep quality, longer sleep latency, shorter sleep duration and poor perceived sleep efficiency which comprised the criteria of insomnia. The study of lamberg [15] show that bedtime state anxiety has been positively related to perceived sleep latency and negative emotions were found to influence particular types of insomnia; sleep onset versus maintenance which is consistent with our results. We electronically searched MEDLINE and PSYCHLINC database for further relevant references on anxiety and components of insomnia. . The majority of the articles were focused on relationship of insomnia with an anxiety disorder or the impact

of anxiety on a certain sleep disorder. Although we did ruled out the recent or history of any psychiatric disorder in our patients, but the severity of anxiety symptoms in some of our patients suggested unaddressed anxiety symptoms and disorder in this population. The high correlation of anxiety and four components of insomnia in our patients also showed the comorbidity of these two clinical entities.

In fact, there are theoretical links between anxiety and insomnia. Sleep is a necessary and restorative state of diminished cortical arousal. A global reduction in metabolism as well as relative deactivation of a broad range of other physiologic processes are hallmarks of the transition of sleep. Anxiety and fear states manifest with heightened cortical and peripheral arousal. The studies had shown that insomnia is a disorder of hyperarousal [16]. The hyperarousal has been evidenced among insomniacs with increased brain metabolism, increases in autonomic nervous system activity, EEG spectral analysis, and norepinephrine levels. It is therefore not surprising that heightened physiologic arousal, indexed by such changes as increased body temperature, heart rate and muscle tension induced by anxiety is incompatible with sleep [17]. These measures of increased arousal are not only present when patients are lying in their beds awake trying to sleep, but also when subjects are asleep and more importantly during the day when subjects are not even trying to sleep. [1] Presleep cognitive arousal is also reported to be the primary predictor of sleep quality in medical patients [18]. This was reported also by our patients in the related subscale of PSQI.

Because increases in nocturnal secretion of cortisol also has been found among adults with insomnia, alterations in the hypothalamic-pituitary-adrenal axis seem to have implication both for the development of psychopathology as well as the sleep-wake cycle [19]. Patients may be unaware of their hyperarousal, however which poses a problem for the diagnostician. Furthermore, systematic work has not yielded a practical, valid, and objective method of assessing a person's arousal level although brain imaging along with elevations in cortisol and changes in circadian rhythms of cortisol secretion shows evidence of hyperarousal in insomniacs. Insights into mechanisms of arousal regulation would have been applicable to both anxiety and sleep disorders. It is also important to note that the association between cognitive errors and sleep problems was mediated by the presence of both anxiety and depressive symptoms [20]. Thus cognitive biases seemed to be one of several potential mechanisms involved in the co-occurrence of these problems in our studied population.

Conclusion

We found a high interrelatedness between anxiety and sleep components in our study. Although the nature of these association does not allow us to make directionality, the relationships between sleep and affective functioning seemed to be bidirectional and remains a challenge for the clinical evaluation.

Whereas sleep has been extensively studied in depressive disorders but the PSG study of anxiety disorders was less developed. The PSG studies of anxiety disorders provide information regarding measurable objective disturbances in sleep initiation, maintenance and other components of sleep quality as well as the presence of a primary sleep pathologic process.

This study had the following Limitations: The same interviewers assessed the insomnia complaints and psychiatric diagnosis and lack of blinding can lead to experimenter bias. The absence of information related to medical conditions and drugs the patients were taking precluded a deep analysis of the relationship between these conditions and insomnia. Our data were self-reported, whereas sleep disturbances are measured most accurately with the use of polysomnography. Nonetheless subjective and objective measures of sleep quality did not cor-

relate well with each other. Finally, our findings were cross-sectional in nature, and the direction of causality was not determined definitively.

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