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Role of big five personality traits in obsessive-compulsive disorder and sleep quality among students

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Abstract

Obsessive-compulsive and sleep disorders are among the most common disorders in general population and therefore aim of present study was to determine role of personality traits in predicting obsessive-compulsive disorder and sleep quality among dormitory students. The participants included 277 university students that were selected randomly. Goldberg big five personality inventory-short form, maudsley obsessive-compulsive inventory, and pittsburgh sleep quality index were used to collect data. The results indicated positive relationship between neuroticism and high obsessive-compulsive disorder among university students and openness, agreeableness, and conscientiousness were correlated with low obsessive-compulsive disorder. Additionally, neuroticism was related to low sleep quality and conscientiousness, openness, agreeableness and extraversion were correlated with high sleep quality among university students. In continue, results of stepwise regression analysis revealed that neuroticism, openness, extraversions and agreeableness altogether predicted 0.53 of the variance in obsessive-compulsive disorder and conscientiousness, openness, and extraversion altogether predicted 0.54 of the variance in sleep quality among university students living in dormitories. The results obtained from the present study demonstrated that personality traits play a significant role in determining obsessive-compulsive disorder and sleep quality among university students.

Keywords: Obsessive-Compulsive Disorder, Personality, Students

Introduction

Personality is a characteristic that affects human behavior and lifestyle and sleep quality is part of healthy life [1]. Sleep is very important to humans, as biological process, by influencing the behavior and mental health. Research has shown that poor sleep and poor quality sleep has great impact on mental health and performance [2]. Sleep is dynamic and very organized biological process, which is considered as an important part of life and sleep quantity is associated with quality of social interaction. The importance of sleep in health and disease has been concerned since Hippocrates and disturbed sleep is an important cause of suffering and sickness of people of any age [3]. Today, clinical observations have shown that sleep problems and insomnia are reason for many aggressive and violent behaviors,

because lack of sleep and sleep disorders impair function of the prefrontal cortex, leading to aggressive and violent behaviors [4]. Also, sleep disorder has negative effects on people's mood [5]. However, about 20 percent of the adult populations suffer from insomnia [6] and people who have sleep disorders, not only suffer from fatigue, but also from the defects in cellular repair, defects in learning memory, increasing anxiety and reducing quality of life. There is significant relationship between sleep duration and professional operation as well as mental awareness of people, also in students; sleep deprivation can affect their academic status [7]. Contrary, obsession is among the very complex and interesting mental disorders that has attracted psychiatrists' view since early nineteenth century [8]. It is more than a hundred years that the obsessive-compulsive disorder has been described and for the first time in 1952, the disorder was published in the Diagnostic and Statistical Manual for Mental Disorders. Obsessive-compulsive disorder is personality disorder, which spread in the general population is between 3 and 8 percent and it is more common in elderly and less educated. The disorder is considered one of the most common disorders in public [9]. Obsessive-compulsive disorder has symptoms including thoughts that are repeated regularly (obsessive) and repetition of behaviors that the person feels is forced to do them (compulsive). Obsessive-compulsive personality disorder is defined as chronic disease with maladaptive patterns of perfectionism and the need to have excessive control over environment [10]. Given that need to sleep is different in people and since the main cause of obsessive-compulsive disorder is not fully discovered, so character and personality traits can play an important role in sleep quality and people's obsession. In this regard, Freud believed that everything ever got and all the things you would expect to gain, even your general health state can be influenced by your personality. Personality is considered often as an organizing force for human behavior [11] Therefore, one of the most recognized models of personality traits is Goldberg five-factor personality model 1993 which includes five traits: neuroticism, extroversion, openness, agreeableness and conscientiousness. Neuroticism can be described with features such as insecurity and tendency to anxiety, extraversion reflects a desire to establish social relationships, being friendly and happy and openness includes features such as originality, creativity and intellectualism, agreeableness is aligned with features such as flexibility and conscientiousness with features such as hard work and reliability. In this regard, and given the five big personality factors, research was done by Hintsanen, Puttonen, Smith [6] that examines personality traits of people and their sleep quality in the two countries: Australia with 1104 participants and Finland with 1623 participant. The results showed that from among big five personality factors, extraversion, agreeableness and conscientiousness are associated with high quality of sleep while the neuroticism is associated with low quality of sleep and openness is not related to sleep quality [6]. In a study carried out by Park, An, Jang, and Chung [12], examining the influence of personality on the severity of insomnia, the results indicated that five of the seven personality dimensions were significantly associated with the severity of insomnia. Novelty seeking, reward dependence and cooperativeness were negatively correlated, and harm avoidance and self-transcendence were positively correlated with insomnia severity. Sleep-related cognitions were also associated with the severity of insomnia [12] In another study investigating the association between personality traits and insomnia in postmenopausal women, the obtained results revealed that women with insomnia suffered more from neuroticism and had lower agreeableness and conscientiousness, compared to women in the control group [13] In addition, relationship between personality traits and obsessive-compulsive disorder is for long time the main subject of physicians, psychologists and researchers [14] and the latest studies have shown that a general etiologic

agent plays a significant role in psychopathology including symptoms of obsessive-compulsive disorder [15]. However, due to the fact that sleep is one of basic needs of the body and any disruption in the normal flow, in addition to psychological problems, can also reduce person's performance [16] as well as having excessive obsession, reduces the quality of life [9] This study sought to answer the following questions: Is there any relationship between the big five personality factors (neuroticism, extraversion, openness, agreeableness and conscientiousness) with obsessive compulsive and sleep quality of students?

Method

This study is a correlational research. The statistical population included 543 female university students and 450 male university students (N=993) in Zahedan city, the east of Iran, 2015. Multi-stage cluster sampling was used, such that among eleven boys' and girls' dormitories, seven dormitories (four girls' dormitories and three boys' dormitories) were randomly selected. Afterwards, from each dorm, 10 rooms were randomly selected and questionnaires were distributed among all students living in those rooms. Since the statistical population of this study included 993 university students, using Cochran's formula with the margin of error (d=0.05) to determine the sample size, 277 questionnaires were collected.

In this study, in addition to demographic questions, three questionnaires were used as follows to collect data: Goldberg big five personality factors–short form, Maudsley Obsessive–Compulsive Inventory (MOCI) and Pittsburgh Sleep Quality Index (PSQI). To answer the main research question, Pearson correlation coefficient and stepwise regression analysis were applied.

In this research tools included:

Goldberg big five personality factors questionnaire–short form: Goldberg big five personality factors questionnaire–short form (short form), according to the results by Khormaei [17], is a shorter form of this questionnaire by selecting the items of Goldberg big five personality questionnaire [18,19] which contains 25 items and 5 subscales of neuroticism (4 questions), agreeableness (4 questions), conscientiousness (4 questions), extraversion [5] and openness to experience [4] which are used to assess big five personality factors. Scoring questionnaire is as a 5-point Likert scale, which points 1, 2, 3, 4 and 5 are considered for options "completely wrong", "wrong", "between right and wrong", "right" and "absolutely right" and some questions are inversely scored. The maximum score achieved in each factor will be 25 and least acquiring score will be 10. The reliability of the questionnaire through Cronbach's alpha coefficient is reported about 0.88, for neuroticism up to 77 for extraversion. Also, in study by Khormaei [17], to determine the validity of Big Five personality Questionnaire (short form), main component factor analysis with varimax rotation was used. In questionnaire data analysis, index value of sampling adequacy and Bartlett's test of sphericity (adequacy index of correlation matrix) indicates that there are sufficient evidences to carry out factor analysis. Sampling adequacy index value was 0.79 and Bartlett's test chi-square was 3.532 which were significant at $p<0.0001$ [20].

Maudsley Obsessive–Compulsive Inventory (MOCI): This questionnaire is prepared by Hodgson and Rachman [21] to study the type and scope of obsessive problems. The questionnaire consists of 30 items, half with correct key and half with wrong key and in initial validation in Maudsley Hospital, 50 obsessive patients are well separated from 50 neurotic patients. Implementation of this questionnaire is very quick and easy. 30 items are formed that their answer is as right or wrong. The questionnaire, in addition to total score of obsessive-orientation, gives four sub-scores for review, washing and cleaning, slowness - repetition, hesitation - precision. Maudsley obsessive test reliability and validity are confirmed in studies conducted

on clinical participants in different countries [21]. The test has a relatively good reliability and its retest reliability is (r = 0.98) [22, 23].

Pittsburgh Sleep Quality Index (PSQI): The questionnaire consists of 19 items and is based on self-reporting technique which is used to measure subjects' quality of sleep in the past month. In scoring PSQI, 7 components should be examined (1) General description of person's sleep quality; 2) Sleep latency, 3) Useful sleep duration; 4) Sleep efficiency, 5) Sleep disorders, 6) Used hypnotic drug, 7) Daily performance). The minimum and maximum score considered for each component is from 0 (lack of problem) to 3 (very serious problems). To obtain an overall score, the score of all components should be summed up together and converted to a total score (0 to 21), top score in each component or in the overall score is indicative of poor sleep quality. 0-1-2-3 scores on each scale represent the natural situation, mild, moderate and severe problems, respectively. Total scores of 7 scales form the overall score which ranges from zero to 21. Total score of 6 or more means poor quality of sleep. Pittsburgh index validity and reliability and its sensitivity to study sleep quality is examined in in several internal and external studies (α=89.6 and R=0.88). The reliability of the questionnaire was reported 83% using Cronbach's alpha coefficient and content validity of the sleep quality questionnaire has been confirmed [24,25].

Results

The demographic information and descriptive findings about the campus students would be showed in Table 1. Among 277 participants were 110 boy and 167 girl students.

Table 1 *Demographic information of participants*

		n	%
Gender	Boy	110	39.7
	Girl	167	60.3
	19-17 years	18	6.5
Age	22-20 years	225	81.2
	23 years and above	34	12.3
	Medical	24	8.7
	Pharmacy	31	11.2
	Anesthesiology	32	11.6
	Operating room	27	9.7
Field of Study	Professional Health	51	18.4
	Environmental Health	61	0.22
	Nutrition	19	9.6
	Health information technology	32	11.6

n=277

The main research question: Is there any relationship between big five personality factors (neuroticism, extraversion, openness, agreeableness and conscientiousness) with obsessive compulsive disorder and sleep quality of on-campus students?

As can be seen in Table 2, significant positive relationship exists between neuroticism and OCD (r=0.69) and significant negative relationship between openness (r=0.35), agreeableness (r=-0.34) and conscientiousness (r=-0.28) with obsessive compulsive disorder at ($p<0.01$), but there is no significant relationship between extroversion and obsessive compulsive disorder. Also, significant positive correlation exists between the neuroticism and sleep quality (r=-0.21) and significant negative relationship between extroversion (r=-0.44), openness (r=-0.47), agreeableness (r=-0.56) and conscientiousness (r=-0.63) with the quality of sleep at $p<0.01$.

Table 2 *Results of correlation matrix of with big five personality traits with obsessive compulsive disorder and sleep quality of on-campus students*

Variables	1	2	3	4	5	6	7
1. Neurosis	1						
2. Extroversion	-0.14*	1					
3. Openness	-0.25**	0.29**	1				
4. Agreeableness	-0.40**	0.54**	0.30**	1			
5. Conscientiousness	-0.31**	0.30**	0.24**	0.63**	1		
6. OCD	0.69**	-0.05	-0.35**	-0.34**	-0.28**	1	
7. Sleep Quality	0.21**	-0.44**	-0.47**	-0.56**	-0.63**	-0.28**	1

*Correlation is significant at the level of p<0.05
**Correlation is significant at p<0.01

Table 3 *Results of stepwise regression to predict OCD in students By Big Five personality factors*

Step	Personality	R	R^2	Adjusted R^2	F	Sig	B	β	t	Sig
First step	Neuroticism	69.0	48.0	48.0	52.260	0.00	94.0	69.0	14.16	0.001
Second step	Neuroticism	72.0	52.0	51.0	32.149	0.00	87.0	64.0	2.15	0.001
	Openness						-0.57	-0.19	47.4	0.001
Third step	Neuroticism	72.0	53.0	52.0	51.103	0.00	88.0	65.0	31.15	0.001
	Openness						-0.66	-0.22	02.5	0.001
	Extroversion						23.0	10.0	49.2	0.01
Fourth step	Neuroticism	73.0	54.0	53.0	49.80	0.00	83.0	6.10	-13.52	0.001
	Openness						-0.63	-0.21	79.4	0.001
	Extroversion						37.0	16.0	39.3	0.001
	Agreeableness						-0.24	-0.12	42.2	0.01

As can be seen in Table 3, results of stepwise regression to predict OCD by the big five personality factors in students on campus, show that in first step, neuroticism 0.48, in second step, neuroticism and openness 0.52, in third step, neuroticism, openness and extroversion 0.53 and finally, in the fourth step, neuroticism, openness, extraversion and agreeableness predicted 0.54 of variance of OCD in students on campus.

As can be seen in Table 4, results of stepwiseregression to predict sleep quality of students' on-campus by the big five personality factors show that in the first step, conscientiousness 0.40, in second step, conscientiousness and openness 0.5 and finally in the third step, conscientiousness, openness and extroversion altogether predict 0.54 of sleep quality variance in student on campus.

Table 4 *Results of stepwise regression to predict the sleep quality of students by big five personality factors*

Step	Personality	R	R^2	Adjusted R^2	F	Sig	B	β	t	Sig
First step	Conscientiousness	63.0	40.0	40.0	58.185	0.00	-0.62	-0.63	-13.62	0.001
Second step	Conscientiousness	71.0	51.0	51.0	37.143	0.00	-0.54	-0.55	-12.71	0.001
	Openness						-0.57	-0.33	79.7	0.001
Third step	Conscientiousness	74.0	54.0	54.0	17.110	0.00	-0.49	-0.50	-11.58	0.001
	Openness						-0.49	-0.29	73.6	0.001
	Extroversion						-0.26	-0.20	68.4	0.001

Discussion

Sleep is one of factors that plays important role in human health. World Health Organization put quality of sleep as one of the principles of primary health care on the agenda of the member states and defined it as follows: Sleep is body physiological mechanisms in recovering lost power and fatigue from physical activity during daily life and is important criterion to maintain physical and mental health [26]. Sleep and rest is one of basic human needs and in Maslow's needs hierarchy is placed in line with physiological needs. When sleep-wake cycle is disrupted, it may change other physiological functions, and experience decreased appetite and weight loss [27]. Also, obsessive-compulsive disorder is a prevalent psychiatric disorder and epidemiological studies reported the prevalence of OCD high in adolescents that the symptoms of the disorder start from childhood and adolescence [28]. In this regard, according to Hampson, Edmonds et al, [29], many self-regulation processes affecting health outcomes and personal health are rooted in personality traits and childhood. Big five personality factors model, including (neuroticism, extraversion, openness, agreeableness and conscientiousness) is a wide classification of characters that can be used in psychological research [30]. However, due to differences in characteristics of each individual and importance of quality of sleep and prevalence of Obsessive-Compulsive Disorder among students which are repeated with signs like regularly repeated thoughts (obsessive) and repeating behaviors that the person feels he has to do them (compulsive) and due to the fact that obsessive-compulsive disorder, as a chronic disease, is associated with maladaptive perfectionism patterns [10] The results of this study in response to question whether a relationship exists between the big five personality factors (neuroticism, extraversion, openness, agreeableness and conscientiousness) and obsessive-compulsive disorder and sleep quality of on-campus students? The results showed that a positive relationship exists between the neuroticism and obsessive compulsive disorder, so that the higher the students' neuroticism rates, their obsessive-compulsive disorder will be higher. A significant negative relationship exists between openness, agreeableness and conscientiousness with obsessive compulsive disorder, in the sense that lower student character in terms of the components of openness, agreeableness and conscientiousness, he will more suffer from obsessive-compulsive disorder. But no significant relationship exists between extroversion and obsessive compulsive disorder. Also, positive significant relationship exists between neuroticism and sleep quality, which means that higher levels of neuroticism, student will have lower sleeping quality and significant negative relationship exists between extroversion, openness, agreeableness and conscientiousness with sleep quality. This means that conscientiousness, agreeableness, openness and extroversion are associated with high sleep quality. In study conducted by Cheng, Shin, Lee & Yang [31] in Taiwan, results showed that among students, significant relationship exists between high neuroticism and low sleep quality. Also, in research by Kim, Cho, Chang & Ryu, Shin & Kim [1] entitled "relationship between personality traits and sleep quality in Korean women", results showed that from big five personality factors, only neuroticism and conscientiousness predict the sleep quality in women, so that significant relationship exists between poor sleep quality and the two sub-scales. Allen and Kiburz [32] in study found that significant relationship exists between quality of sleep and concentration and better the sleep quality, it is predictor of students' happiness and mindfulness. Also results of research by Sassoon, Zambotti, Colrain and Baker [13] showed that subjects that suffer from insomnia and low sleep quality have higher neuroticism and lower agreeableness and conscientiousness than the control group [13]. In study conducted to examine the relationship between personality dimensions and sleep length, the obtained results demonstrated a positive and significant relationship of short sleep with self-criticism and neuroticism [33]

and in another study carried out to investigate relationship between personality traits and sleep quality of professional over the road drivers, the findings revealed that neuroticism, openness and agreeableness are significant predictors of drivers' sleep quality [34]. In addition, findings suggest that neuroticism may confer a nonspecific vulnerability to development of obsessive-compulsive disorder [35]. Therefore, the results of this study are consistent with the results of previously conducted studies which examined the relationship of personality traits with sleep quality and obsessive-compulsive disorder [6,12,13,33-35] In fact, it can be concluded that personality traits could offer marker for individual differences in sleep. Personality traits reflect comparatively stable individual differences in emotional and cognitive processes and behavioral tendencies [6]. Moreover, personality traits may represent risk and resiliency factors for the development of mental disorders and their comorbidities [36]. Since a paper-and-pencil questionnaire was used to collect data, current study faced all restrictions related to measuring tools

Conclusion

The results derived from this study and previous studies showed that personality traits played a significant role in the obsessive-compulsive disorder and sleep quality of students. Since the character is formed in the earliest period of human development, so personality traits can explain the obsessive-compulsive disorder and sleep quality in adulthood.

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Study design: MAF, MS,AF,RN
Data collection and analysis: AF, AA
Manuscript preparation: RN, MAF

Conflicts of Interest

"The authors declare that they have no competing interests."

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