doi:10.22100/ijhs.v9i3.1039
Original Article

SJMS 2023;9(3):17-21
sjms.shmu.ac.ir

SJMS
Shahroud Journal of Medical Sciences

# The Association between Personality Traits and OSCE-related Test Anxiety among Medical Science Students

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Received: 6 April 2023
Accepted: 21 May 2023

## Abstract

***Background:*** *Personality traits are effective factors in controlling feelings and emotions, including psychological distress. The present study was conducted with the aim of determining the relationship between personality traits and test anxiety in medical students under Objective Structured Clinical Examination (OSCE).*

***Methods:*** *This cross-sectional study was conducted with the participation of 176 medical science students by census sampling method in Iran. The inclusion criteria included studying in the first semester, having no history of addiction and suffering from psychological disorders, and the exclusion criterion was a previous history of participating in OSCE. Data collection tools included the demographic profile form, Sarason test anxiety questionnaires, and the short version of Neo Personality Inventory (NEO-PI). Data were collected by self-report and analyzed using descriptive and inferential statistics.*

***Results:*** *According to the results of the present study, most of the participants (64.8%) were female and (87.5%) were single. Out of all participants, about half of them (45.5%) reported moderate test anxiety. As among the five dominant personality profiles; Conscientiousness (40.9%) and neuroticism (8%) had the highest and lowest frequency, respectively. In addition, a significant relationship between personality traits and OSCE related test anxiety was observed (P-value=0.03).*

***Conclusions:*** *The findings of the present study indicated that a significant number of students face OSCE-related test anxiety, which is related to their personality traits (conscientiousness and agreeableness). It is recommended to carry out psychological interventions according to each of the mentioned personality types in order to reduce the anxiety related to OSCE.*

**Keywords:** Anxiety, Medical education, Personality.
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**Please cite this paper as:** Mirhosseini S, Ghasempour S, Bazghaleh M, Abbasi A, Basirinezhad MH, Rezvani F, Gholami T, Ebrahimi H. The Association between Personality Traits and OSCE-related Test Anxiety among Medical Science Students. Shahroud Journal of Medical Sciences 2023;9(3):17-21.

## Introduction

Objective structured clinical evaluation is the most well-known method for testing clinical skills, which has been studied more than any other test, and it can be used to evaluate the degree of achievement of educational goals in cognitive, emotional, and psychomotor systems in nursing students. In the evaluation of clinical skills, three criteria are necessary: validity, reliability and practicality. Today, medical education specialists believe that this method has a very strong validity and reliability to check the level of clinical skills compared to oral and written exams, and it has been proposed as a golden method in the clinical evaluation of nursing students.[1, 2] There are three types of stations in OSCE, which include method (procedure/practical skill), question (mental information) and rest stations. In method stations, the student must perform a practice/procedure and an observer evaluates the student's performance from a pre-prepared checklist. In the question stations based on the activities of other stations, questions with a high level of objectivity are used in the form of multiple options, short answers or true and false. Due to the practicality of the test, a rest station is also considered for a short break.[3] The main strengths of this method are its high reliability and objectivity, the same assessment for all students, the absence of luck and the assessment of psycho-motor learning. The need for a lot of personnel, providing a lot of supplies, preparing checklists, and being time-consuming are also among the disadvantages of this method.[4] The results of studies conducted in many countries on paramedical students show that most students were more satisfied with objective structured clinical evaluation than other evaluation methods[5] But it seems that in Iran, the issue of clinical evaluation is still one of the unsolvable problems. The lack of specific evaluation standards, such as specificity, attainability, measurability, and scheduling, has affected the process of student evaluation. This is clearly present in a number of studies that have stated that the main reason for students' dissatisfaction with the OSCE evaluation method is the presence of high anxiety due to facing the evaluators, time constraints, etc.[6, 7] In one study, several reports of hand tremors and changes in voice tone in students during the OSCE exam due to anxiety have been presented, and even in some cases, the students were unable to continue the exam.[8] In various studies, students have mentioned several reasons for this anxiety, which include the presence of professors at the exam session, the way they give feedback, and incomprehensible questions.[9] Test anxiety refers to a type of specific social phobia that makes a person doubt about his abilities and leads to a decrease in the ability to deal with situations that expose a person to evaluation and require problem-solving skills, such as an exam. Therefore, a student who suffers from test anxiety is a person who knows the course

material, but the severity of his anxiety prevents him from using his knowledge during the exam.[10, 11]

This anxiety is a response to stress[12] which consists of three main components: cognitive, emotional and behavioral. Students who experience test anxiety from a cognitive aspect complain of lack of self-confidence. They may have negative thoughts and doubt about their ability and scientific competence[13] Additionally, when they are in a test situation, they are more likely to overemphasize potential negative outcomes and feel frustrated. Some students may feel that the exam requires them to answer every question correctly, so when this does not happen, they may think of their own incompetence, so they reinforce negative thoughts such as "I knew I would pass this exam." I don't.", "I know I'm in a bad grade.", or "Everyone knows I'm not smart." Negative thoughts should be reduced and controlled so that students have the best chance for academic success, when students are not able to control their emotions, they may experience higher levels of distress and thus find more difficulty in concentration.[14, 15] One of the factors that can be effective in causing test anxiety is personality traits.[10] Personality traits are relatively stable traits that do not change much in different situations. They are stable and durable tendencies to respond in the same way to different stimuli and can be a predictor of a person's behavior in different situations. These characteristics can make a person vulnerable to some disorders.

Personality traits such as neuroticism, extroversion, experientially, agreeableness, and conscientiousness can affect test anxiety and compromise mechanisms in the face of stressful and anxiety-provoking sources as components of personality.[10] In general, the results of the studies indicate that there is a relationship between personality traits and test anxiety. For example, neuroticism indicates a tendency to experience high levels of negative and anxiety-provoking emotions, and responsibility indicates a tendency to self-control and self-regulation.[16] The results of Khosravi et al.'s study (2008) showed that test anxiety has a significant positive correlation with neuroticism in such a way that the high level of neurotic traits was related to increased test anxiety.[10] Also, the results of Hamidi et al.'s study (2015) stated that neuroticism has a positive and significant relationship with test anxiety, while there was a negative correlation between being responsible and test anxiety.[17] Since medical science deals with the life and health of human beings, then the way of practical teaching of these sciences to students is very important. Therefore, in medical sciences, not only special attention should be paid to education, but also their evaluation should be done with accuracy and credibility.[18] On the other hand, the studies conducted in this field indicate that there is a relationship between test anxiety and students' performance in it, but how this relationship is, needs more study, and this study tries to examine one of the factors affecting this category. Therefore, this study was conducted with the aim of determining the relationship between personality traits and test anxiety related to objective structured clinical evaluation in students of medical sciences.

## Materials and Methods

This cross-sectional study was conducted with the participation of 190 students of Shahroud University of Medical Sciences, including all first semester students of nursing, midwifery, surgical technician, anesthesiology and emergency medical services. 18 respondents were excluded from the study due to repeated and unauthorized entry. The inclusion criteria of the participants in this research were studying in the first semester, not having a history of addiction and suffering from psychiatric disorders, and the exclusion criterion was the previous a history of participating in OSCE. The sampling method in this study was a census.

The information of the participants in the study was collected using the demographic profile form, the Sarason test anxiety questionnaire, and the Neo Personality Inventory (NEO-PI) questionnaire. Individual profile information including field of study, gender, age, marital status, residence status, parents' education level, diploma grade point average, hours of exercise per week and hours of weekly study, student's employment status, level of interest in their field of study and number of the practical training sessions were before OSCE.

The test anxiety questionnaire was created by Sarason in 1957 and has 37 items in the form of "yes and no". This questionnaire reports mental states and physiological experiences related to the exam based on a self-report method. A higher score obtained in this questionnaire indicates greater test anxiety. In the scoring of the Sarason test anxiety questionnaire, a score of one is given for a no answer to questions 3-15-26-27-29-33 and a yes answer to other questions. By adding up the scores, the level of test anxiety is obtained: 12 and below Expressing mild anxiety, 13 to 20 indicates moderate anxiety and 21 and above indicates severe anxiety.[19] In the study of Farnia et al. (2017), the reliability of the Persian version of this questionnaire was obtained by determining the internal consistency using Cronbach's alpha estimation method at the rate of 0.84, which is generally acceptable.[20]

The NEO-PI personality traits questionnaire has five scales (neuroticism, extroversion, openness, agreeableness and conscientiousness) and has a total of 60 items. For each statement of the questionnaire, there is a five-point rating scale (completely agree to completely disagree) that has a value of 0 to 4. Based on the scores that can be obtained from 5 personality traits, a higher score in each subscale indicates a person's personality profile. The score that can be obtained for each personality type is between 0 and 48.[21] The reliability of the present questionnaire in Iran in the study of Mirzabeigi et al. (2018) using internal consistency by determining Cronbach's alpha coefficient was 0.68, 0.46, 0.68, 0.64, 0.84 and 0.72. The order was obtained for the personality types of neuroticism, extroversion, openness, agreeableness and responsibility and the whole questionnaire.[22]

The data were analyzed using descriptive and inferential statistics (chi-square). A significance level of 0.05 was considered for all tests.

The researchers are committed to the principles of the Declaration of Helsinki (maintaining the right to withdraw from the study, no harm or loss to participants, the right to enter the research freely, and confidentiality of the information) during conducting the research and also the principles of the Committee on Publication Ethics (COPE) in publishing the findings of the present study. The present study was approved

by the Ethics Council of Shahroud University of Medical Sciences (IR.SHMU.REC.1396.122).

## Results

According to the results of Table 1, the majority (64.8%) of the participants in the study were female, and 78 (44.3%) studied in nursing and 154 (87.5%) were single. Additional information was described in Table 1. About half of students reported the moderate levels of test anxiety (Table2). Conscientiousness (40.9%) and neuroticism (8.0%) had the highest and lowest frequency of personality profiles in students, respectively (Table3). The relationship between personality traits and test anxiety was investigated using a chi-square test and it was found that there is a significant relationship (P-value=0.03). This relationship is due to the difference between extroversion and agreeableness with other personality traits (Table 4).

**Table 1. The demographic characteristics of participants**

| Variables | | N | % |
|---|---|---|---|
| **Gender** | Female | 114 | 64.8 |
| | Male | 62 | 35.2 |
| **Marital status** | Single | 154 | 87.5 |
| | Married | 19 | 10.8 |
| **Occupational status** | Unemployed | 153 | 86.9 |
| | Student part-time employment | 5 | 2.8 |
| | Practical nurse | 5 | 2.8 |
| | Self employed | 6 | 3.5 |
| | EMS | 7 | 4.0 |
| **Field of study** | Nursing | 78 | 44.3 |
| | Midwifery | 40 | 22.7 |
| | Anesthesia | 26 | 14.8 |
| | Surgical technology | 20 | 11.4 |
| | EMS | 12 | 6.8 |
| **Residence status** | With family | 57 | 32.4 |
| | Dormitory | 118 | 67.0 |
| | Rental | 1 | 0.6 |

N: frequency; %: percent; EMS: Emergency Medical Services.

**Table 2. Levels of test anxiety in students**

| Test anxiety | N | % |
|---|---|---|
| **Mild** | 43 | 24.4 |
| **Moderate** | 80 | 45.5 |
| **Severe** | 53 | 30.1 |

N: frequency; %: percent.

**Table 3. Distribution of personality traits based on NEO-PI among medical science students**

| Personality traits | N | % |
|---|---|---|
| **Neuroticism** | 14 | 8.0 |
| **Extraversion** | 38 | 21.6 |
| **Openness** | 23 | 13.1 |
| **Agreeableness** | 29 | 16.5 |
| **Conscientiousness** | 72 | 40.9 |

N: frequency; %: percent; NEO-PI: The NEO Personality Inventory.

**Table 4. The association between test anxiety and personality traits in participants**

| Test anxiety | | Mild N (%) | Moderate N (%) | Severe N (%) | P-value |
|---|---|---|---|---|---|
| **Personality traits** | Neuroticism | 1 (7.1)[a] | 8 (57.1)[a] | 5 (35.7)[a] | 0.03 |
| | Extraversion | 16 (42.1)[a] | 15 (39.5)[a,b] | 17 (18.4)[b] | |
| | Openness | 6 (26.1)[a] | 12 (52.2)[a] | 5 (21.7)[a] | |
| | Agreeableness | 3 (10.3)[a] | 11 (37.9)[a,b] | 15 (51.7)[b] | |
| | Conscientiousness | 17 (23.6)[a] | 34 (47.2)[a] | 21 (29.2)[a] | |

N: frequency; %: percent.

## Discussion

The aim of the present study was to determine the relationship between personality traits and test anxiety in students of Shahroud University of Medical Sciences. Students in this study mostly reported mild to moderate levels of test anxiety during the OSCE. Conscientiousness was also the dominant personality trait of the participants. Also, a significant negative relationship was observed between test anxiety and the "extroversion" personality trait. Test anxiety also had a significant positive relationship with the "agreeable" personality trait. In this study, 69.9% of students experienced mild and moderate levels of test anxiety during this evaluation. In this study, the majority of students (69.9%) experienced mild to moderate levels of test anxiety related to OSCE. In this regard, the results of a previous study by Darabi et al. (2013) showed that 34.1 and 51.8 percent of students suffer from mild and moderate text anxiety, respectively.[23] In the study of Pourghane (2016), which was conducted in order to determine the anxiety caused by final exams in nursing students of Guilan University of Medical Sciences, 79.7% of the students reported mild and moderate levels of test anxiety.[24] In this study, the personality profile of most of the students is "conscientiousness" and they are placed in the C area (40.2%). Conscientious people are very interested in progress and usually achieve significant success in the field of education and career. They are also responsible and conscientious people. Because of this, others consider them to be reliable people. They also try not to offend others with their behavior and speech. On the other hand, they cannot bear to accept failure and feel worthless and depressed if they fail. They are usually perfectionist people who have set specific plans for themselves and if they don't follow them, they are restless. People are addicted to work and this causes them to be tired and worn out.[25] The results of this study showed that test anxiety has a significant negative relationship with extroversion so only 18.4% of extroverted students experienced severe test anxiety during the OSCE exam. In explaining this finding, the personality trait of extroversion plays a key role in adapting and coping with the tensions in life. Extroverted people are more inclined to new experiences than others, which protects them from the stress of facing difficult and unknown situations.[26] A neurotic person experiences many negative feelings and emotions such as fear, excitability, guilt, and constant and pervasive boredom, and shows less compromise and flexibility in the face of environmental changes. A neurotic person experiences many negative feelings and emotions such as fear, excitability, guilt, and generalized boredom, and shows less compromise and flexibility in the face of environmental changes.[16] Anxiety is the main characteristic of this personality trait.[27] In various studies, neuroticism was one of the influencing factors in tests such as students, so these students experience more test anxiety and often consider the cause of their failures to be internal factors and lack of talent.[10, 17] Despite this, in the current study, a significant positive relationship was observed between test anxiety and agreeableness, so 51.7% of agreeable students had severe anxiety during the OSCE evaluation. This contradiction can be caused by the small number of neurotic students (0.8%) in this study.

The present study had some limitations such as the small sample size. In order to increase the response rate, it was not possible to measure other variables related to mental health. Due to the assessment of test anxiety and personality traits in the form of self-reports, the data of the present study are subject to response bias. Despite these limitations, the present study provides novel results in relation to mental health and nursing education.

The present study shows the presence of significant levels of test anxiety, which may be caused by students' personality types. In order to control and guide this level of anxiety in an optimal way, the cooperation of a multidisciplinary team is recommended in the implementation of appropriate interventions.

## Acknowledgment

This article was extracted from the approved project at the Shahroud University of Medical Sciences (Code=96138). We would like to express our gratitude to the deputy of research and technology of this university and the study participants for their contributions to this research.

## Conflict of Interest

The authors declare that they have no conflict of interest.

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