ARAŞTIRMA YAZISI / RESEARCH ARTICLE

TIP VE DİŞ HEKİMLİĞİ ÖĞRENCİLERİNİN KAYGI DURUMLARI İLE ANATOMİ BAŞARILARI ARASINDAKİ İLİŞKİDE KİŞİLİK ÖZELLİKLERİNİN ARACI ROLÜ - GENİTAL MODÜL ÖRNEĞİ

THE MEDIATOR ROLE OF PERSONALITY TRAITS IN THE RELATIONSHIP BETWEEN MEDICAL AND DENTISTRY STUDENTS' ANXIETY AND ANATOMY ACHIEVEMENT - GENITAL MODULE EXAMPLE

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ÖZET

AMAÇ: Tıp eğitiminde, genital sistem anatomisini öğrenirken öğrenciler, bu sistemin anatomik özelliklerinden dolayı mahcubiyet göstererek kaygılanabilirler. Bu kaygı duygusu öğrencilerin kişilik özellikleri ile birleşince akademik başarılarını olumsuz yönde etkileyebilir. Bu doğrultuda, bu araştırmanın amacı, kaygının anatomik başarıya etkisinde kişilik özelliklerinin aracı rol oynayıp oynamadığını araştırmaktır.

GEREÇ VE YÖNTEM: : Araştırmanın örneklemini Ankara Medipol Üniversitesi Tıp ve Diş Hekimliği 2. sınıf öğrencileri oluşturmaktadır. Araştırmada, öğrencilerin genital sistem anatomisi öğrenimindeki akademik başarıları ile kaygı ve kişilik özellikleri arasındaki ilişki incelenmiştir.

BULGULAR: Katılımcıların %64,5'i kadın ve %58,1'i Tıp Fakültesi öğrencisi iken, %91,1'i Türkiye Cumhuriyeti vatandaşıydı. Kaygının anatomi başarısını tahmin etme gücünü gösteren c´ katsayısında (B=-.197, p=0.28) anlamlı bir artış olduğu tespit edildi. Ayrıca kişilik faktörünün kaygı ile anatomi başarısı arasında aracı bir rol oynamadığı ortaya kondu.

SONUÇ: Analiz sonucunda sürekli kaygının anatomi başarısını doğrudan etkilediği belirlendi. Kişilik özelliği aracı olarak sisteme eklendiğinde herhangi bir aracı rolü oluşturmadığı belirlenmiştir. Bu doğrultuda Tıp Fakültesi öğrencilerine fakülteye başladıklarında kendilerini daha iyi tanımlayabilmeleri için kısa eğitimler verilebilir ve kişisel farkındalıkları arttırılabilir.

ANAHTAR KELİMELER: Anatomi başarısı, Kaygı, Kişilik özelliği.

ABSTRACT

OBJECTIVE: While studying the anatomy of the genital system in medical education, students may feel embarrassed and anxious due to the anatomical features of this system. This feeling of anxiety, combined with students' personality characteristics, can negatively affect their academic success. In light of this, the purpose of this study is to investigate whether personality traits play a mediating role in the effect of anxiety on anatomical success.

MATERIAL AND METHODS: The sample of the study consists of Ankara Medipol University Medicine and Dentistry 2nd year students. In the study, the relationship between students' academic achievement in genital system anatomy learning and their anxiety and personality traits was investigated.

RESULTS: While 64.5% of the participants were female and 58.1% were medical students, 91.1% were Turkish citizens. There was a significant increase in the c´ coefficient (B=-.197, p=0.28) indicating the predictive power of anxiety on anatomy success. It was also found that personality factor did not play a mediating role between anxiety and anatomy achievement.

CONCLUSIONS: As a result of the analysis, it was determined that trait anxiety directly affected anatomy success. When the personality trait was added to the system as a mediator, it was determined that it did not create any mediation role. In this direction, short trainings can be given to the students of the Faculty of Medicine so that they can better define themselves when they start the faculty, and their personal awareness can be increased.

KEYWORDS: Anatomy success, Anxiety, Personality trait.

INTRODUCTION

During basic medical education, the most difficult course for students is Anatomy due to its terminology, high content and easy loss of motivation, and students may experience deep anxiety due to the medical language they encounter (1). Although students think that Anatomy is difficult in general, there are various studies that show that they find it particularly difficult to learn certain subjects for various reasons. For example, the nervous system is emphasized as a difficult lesson for students to understand and learn, due to the complexity of structure-function relationships, difficulty in visualization, and the abundance of structures that need to be learned (2, 3). In addition, there may be subjects with medium difficulty such as genital system anatomy that students hesitate to learn and have difficulty in learning due to the natural anatomical features of the genital organs. Therefore, while the genital system is being studied, students both experience the anxiety of the difficulty of the Anatomy course and their academic success decreases because they participate less in the lessons that include these subjects (4).

One of the most important issues of educational research is to reveal the factors affecting academic achievement (3, 5). Miller et al. report that it is not correct to assume all effects on students' academic success are direct, and there are variables which directly affect academic achievements of students as well as variables which indirectly affect them (1). While anxiety directly affects the student achievement, personality traits have the feature of indirectly affecting academic achievement. In addition, it has been reported in many studies that anxiety has a significant effect on academic achievement and anxiety factors affect individuals by showing a close relationship with personality (6, 7). The Five Factor Model (FFM), which is a reliable model for evaluating personality and consists of five main characteristics such as extraversion, conscientiousness, agreeableness, openness to experience and neuroticism, is one of the most common measurement tools used in this field. There are many studies stating that these personality traits are correlated with anxiety (8 – 10). Vreeke and Muris (2012); stated that neuroticism and compatibility are the most important personality traits that affect anxiety and that there is a negative correlation between these personality traits and anxiety (11). Studies have emphasized that conscientiousness, extraversion, responsibility and neuroticism play a determining role on anxiety (12 - 14). However, it has been determined that there are very limited data on how the personality traits of the students in the Faculty of Medicine affect their academic achievement. In fact, in the literature review, no data were found regarding whether the personality factor plays a mediating role in the effect of anxiety on academic success of medical school students.

While the mediation methodology is widely used in psychological, educational and sociological research, it is less used in health studies. The terms mediation and indirect effect are very important in health science research. Although the two terms seem to mean basically the same thing, the term mediation is used to denote a more rigorous process of statistical proof.

The main objective of mediation tests is to reveal the connection between the two variables with the presence of another variable (15). When learning the anatomy course, which is one of the most difficult basic science courses of medical school, the difficulties may cause loss of motivation and anxiety among students, but there is no study investigating that this situation may be related to personality traits (13, 16, 17). Therefore, this study aimed to reveal, using mediation tests, whether students' personality traits play a mediating role in the relationship between students' anxiety levels and academic achievements based on the grades they received in the genital system anatomy course.

MATERIALS AND METHODS

In this study, the relationship model, one of the research methods, was used. In the study, the relationship between students' anatomy education and anxiety and personality traits were investigated.

Study Design

The population of the study consisted of 136 students from Ankara Medipol University Faculty of Medicine and Faculty of Dentistry. In the study,

it is aimed to reach the whole universe. The number of students in the Faculty of Medicine was 79 and the number of dentistry students was 57 . The students answered questions under the supervision of responsible researchers. 44 students refused to participate in the study. As a result, the results of the 124 participants were analyzed. The participation rate was 91 %.

We aimed to investigate whether personality traits play a mediating role in the relationship between academic achievement and anxiety. To achieve this objective, we devised five hypotheses to examine the mediating effect of individual personality traits on the association between anxiety and academic achievement.

Hypothesis 1 (H1): In the relationship between anatomy success and anxiety level, the external personality feature has a serial vehicle effect (Model 1).
Hypothesis 2 (H2): In the relationship between anatomy success and anxiety, the responsible personality feature has a serial vehicle effect (Model 2).
Hypothesis 3 (H3): In the relationship between anatomy success and anxiety, the compatible personality feature has a serial vehicle effect (Model 3).
Hypothesis 4 (H4): In the relationship between anatomy success and anxiety, the personality feature which is open to experience has a serial vehicle effect (Model 4).
Hypothesis 5 (H5): In the relationship between anatomy success and anxiety the neurotic personality feature has a serial vehicle effect (Model 5).

Collection of Data

Data were collected between the dates of 10.09.2022 - 10.10.2022. Within the scope of the research 124 students were reached. Classes visited by the researchers and data collection tools were given to the students, the researchers were found in the classroom during the completion of data collection tools, completed data collection tools were taken back from the students. In this respect, on the last lesson day of the genital module, the status / continuity anxiety inventory with five - factor personality inventory were applied to the students. Finally, the relationship between the achievements of the students from anatomy questions and the scales applied were analyzed. The course success of the students was evaluated according to the scores they received from the anatomy course in the module exam. Surveys were answered within 10-15 minutes.

Ethical Committee

Approval (115/2022) was taken from Ankara Medipol University Ethics Committee (115/2022) in order to conduct the research. During the process of gathering the data face to face, the relevant approvals were obtained from the unit managers of the university in order to conduct the research in appropriate time periods. The students were informed about the purpose of the research, that participation in the research was based on a voluntary basis and informed consent was taken.

Statistical Analysis

IBM SPSS (Statistical Package for the Social Sciences) Statistics and SPSS Process 4.2 macro plug in was used to perform statistical analyzes using the data obtained. Normality analysis was performed to determine whether the data was distributed normally. It has been seen that the distortion values of the variables vary between 0.49-1.78 and the switch values (-0.605-1.139). These values are considered among the criteria of the assumption of normality. The relationships between variables were examined by the Pearson correlation coefficient. Before determining the intermediary effects of the research model, descriptive statistics of the variables were determined. It was measured using the series of multi -mediators (Process Model 4) whether the identified intermediary variable (personality traits) detects the relationship between dependent (anatomy success) and independent (anxiety) variables (18). According to the most widely used intermediary definition of Baron and Kenny (1986), the coefficient of regression obtained in case of adding the intermediary variable should be lower than the coefficient C before the addition of the intermediary variable (19, 20).

RESULTS

In Table 1, the demographic information of the participants included in the research is given.

While 64.5 % of the participants were women and 58.1 % of them were students of the Faculty of Medicine, 91.1 % were citizens of the Republic of Turkey. It was determined that 50.00 % of the participants were studying for 1-2 hours a day and 75.8 % were studying anatomy for 1-2 hours. The correlation between the anatomy achievements of the students and the scales is given in **Table 2**. According to the table, it was found that emotional imbalance did not show significant correlation between the success of anatomy and continuity anxiety. It was determined that continuity anxiety was correlated by other sub - dimensions (external, responsibility, compliance and clarity) except for emotional imbalance at a five -factor personality scale.

Tablo 1: Descriptive Information of the Participants

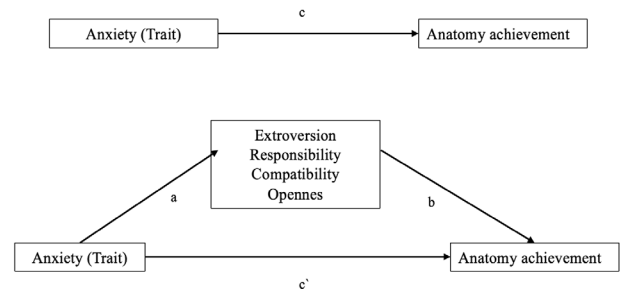|		N(%)
Gender	Female	80(64.5)
	Male	44(35.5)
Faculty	Faculty of Medicine	72(58.1)
	Dentistry	52(41.9)
Education language	Turkish	104(83.9)
	English	20(16.1)
Nationality	TC citizen	113(91.1)
	Not a TC citizen	11(8.9)
How many hours a day do you study anatomy course?	1-2 hours	94(75.8)
	3-4 hours	30(24.2)
How many hours a day do you study?	1-2 hours	62(50.0)
	3-5 hours	58 (46.8)
	6 and above	4 (3.2)
Are the anxiety levels of individuals in your family high?	Yes	43(34.7)
	No	32(25.8)
	Partially	49(39.5)
Do you have a psychiatric disease?	Yes	22(17.7)
	No	102(82.3)
What is your socioeconomic status?	Good	46(37.1)
	Middle	73(58.9)
	Bad	5(4.0)
Preferred main expertise	Medical sciences	38(30.6)
	Surgical sciences	58(46.8)
	Basic sciences	28(22.6)

Tablo 2: Correlation analysis between students' anatomy achievements and scales

	Anatomy	Outwardness	Responsibility	Compatibility	Clarity to experience	Neuroticism	Situationness	Continuity
Anatomy	1							
Outwardness	.047*	1						
Responsibility	.004*	-.047	1					
Compatibility	.023**	.006	-.184*	1				
Clarity to experience	.074*	.433**	-.045	-.010	1			
Neuroticism	-.039	.078	.090	-.140	.115	1		
Situationness	.031	.150	-.068	.194	.187	.044	1	
Continuity	-.197*	-.483*	-.03*	-.323*	.444**	.112	.199*	1

Serial Mediation Analyses

Since the situation does not have a correlational effect, the serial vehicle effects are not considered. As a result of the analysis, a meaningful model was not created, the analysis results of the personality characteristics and the analysis results of neuroticism could not be included in this research. (Model 5/Hypothesis 5 (H5) was

not able to established). Regression analysis using Process Macro was performed separately for each independent variable **(Figure 1)**.

Figure 1: The mediator effect of personality on the relationship between anatomy success and anxiety
a; The direct effect of anxiety on personality traits, **b;** The direct effect of personality traits on anatomy achievement, **c;** The direct effect of anxiety on anatomy achievement, **c';** The mediating role of personality traits in the effect of anxiety on anatomy achievement

In these analysis, the average values of the answers given to the relevant scales of independent and dependent variables were used. The results of the analysis are given in the following **Table 3** and each line in the table shows the results of the analysis to test the hypotheses. In addition, all roads (A, B and C) specified in the model must be significant for the formation of the serial vehicle effect. As a result of the analysis, none of the personality traits such as extroversion (Model1), responsibility (Model 2), compatibility (Model 3) and openness to experience (Model 4) have built a serial vehicle model; however, it was found that extroversion (Model 1), compatibility (Model 3) and openness to experience (Model 4) personality traits could be used as partial tools. When the table is examined, it is seen that the anxiety (continuity) variable in the first step analyses significantly anatomy success (C) (B = 1.668, R2 = .142, p <0.05).

In the second step, it was found that the personality variable (path A) in H1, H3 and H4 hypotheses significantly predicted anxiety. In the third step, it was found that the variable of personality traits (extroversion, responsibility, compliance and openness) did not predict the anatomy success (B). Since two of the coefficient values in the first three steps are significant, the intermediary model was partially established. In addition, Bootstrap confidence intervals of the estimated roads (A-B-C roads) should not contain "0" value. In the results of the table, it is seen that bootstrap values show the total indirect effect (A-B-C paths) have negative values and do not have

any "0" value between among? these values. Therefore, it can be said that the model 1-3 and 4 can be accepted as partially (Table 3).

Tablo 3: Bootstrap Results belonging to Serial-Multi-Intermediary Effect

	a wave (x→M₁)		b wave (M₁→y)		c wave (Total effect)		c`wave (x→y, Direct effect)		Indirect effect	
	B	LLCI-ULCI	B	LLCI-ULCI	B	LLCI-ULCI	B	LLCI-ULCI	B	LLCI-ULCI
H1	.217	-.284 -.161 **p=.010**	.897	-.761 2.554 p=.281	- 1.668	-3.150 .182 **p=.023**	- 1.857	-3.386 -.334 **p=.012**	.180	-.161 -.170
H2	-.385	-.287 -.165 P=.702	-.016	-1.359 1.312 p=.971	- 1.668	-3.150 .182 **p=.023**	- 1.667	-3.167 .179 **p=.028**	.007	-.145 -.117
H3	.290	.056 -.053 **p=.016**	.430	-.690 -1.56 p=.444	- 1.668	-3.150 .182 **p=.023**	- 1.790	-3.321 .279 **p=.021**	.120	-.150 -.453
H4	.164	.410 -.870 **P=.000**	.096	-1.053 1.246 P=.860	- 1.668	-3.150 .182 **p=.023**	- 1.729	-3.397 -.064 **p=.041**	.065	-.661 -.750

x: Anxiety; y: Anatomy Achievement
H: Hypothesis

DISCUSSION

This text is a research article that aims to investigate the relationship between anxiety and anatomy course success among medical and dental students, as well as whether personality traits play a mediating role in this relationship. The study employs the genital module to investigate the relationship between students' anxiety levels, personality traits, and anatomy course success, with a particular emphasis on whether personality traits mediate anatomy success. The study's mediation effects were analyzed using Andrew F. Hayes' macro PROCESS, and the study is thought as a guide in medical education. The study discovered a moderate negative correlation between continuous anxiety and anatomy success, which is consistent with the literature.

According to Ayyıldız et al. (2014), there is a negative relationship between academic achievement and anxiety (21), whereas another study found that students with high academic achievement had lower anxiety scores than students with low academic achievement (22). According to Bozkurt (2004), students who perceived themselves to be unsuccessful had higher levels of depression than those who perceived themselves to be successful (23). It is believed that students with low academic achievement have high levels of anxiety because they are afraid of not meeting their goals and not meeting the expectations of their families. Students were generally anxious in our study (state anxiety 16.02 2.79, trait anxiety 17.37 2.44) and consistent anxiety showed a moderately negative

correlation with anatomy achievement, which was consistent with the literature (21 - 23). As anxiety levels rise, so does students' fear of failure, which may result in lower anatomy and other module and final exam scores. Medical education is widely regarded as a highly stressful experience that can have a negative impact not only on medical students' academic performance, but also on their physical health and psychosocial well-being (24). There is growing global concern about medical students' psychological health, with a focus on their vulnerability to depression and anxiety (13, 14).

In order to evaluate mediating effects, the levels of effect between the independent variable, the mediating variable, and the dependent variable must be measured (25). In our study, we discovered that the trait anxiety variable significantly predicted anatomy achievement by 14%, while the state anxiety variable did not show Students' anxiety during their education may be caused by the academic burden, highly competent peers, obstacles to achieving the desired specialization, and the transition from student to physician. These elements can have an impact on students' psychological well-being as well as their academic performance (26). All these factors are exacerbated by the fact that students are unable to participate in extracurricular activities such as hobbies due to the additional time required to complete academic work (26). Increased stress levels among medical students can have a variety of negative long-term consequences, including poor academic performance and a low quality of life (27). All these factors may be the reason why medical students have higher levels of depression and anxiety compared to the general population in the same age group (28).

It is well understood that depressive and anxiety symptoms are linked to a variety of personality traits, particularly neuroticism (29). In our study, we discovered that anxiety was an effective predictor of the results of the five-factor personality analysis (p<0.05). According to our findings, the relationship between the five-factor personality inventory and anxiety is consistent with the literature. Although it has been observed in the literature that people with high

neuroticism respond negatively to daily stressful events, including internal cognitive stressors such as anxiety (30, 31) we found no relationship between neuroticism and either anxiety or academic performance in our findings. We believe this is because our sample was not mixed but only consisted of medical students, and these students used their feelings of neuroticism positively. It has been reported in the literature that neuroticism, when combined with personal strengths or other aspects of personality, can be beneficial rather than harmful for some people (32). Tamir et al. (2006), for example, stated that individuals with high neuroticism scores detected dangers faster and showed less negative emotion in the face of danger (33).

The relationship between the sub-dimensions of the five-factor personality traits and stress yields a variety of results. Some researchers contend that responsibility, agreeableness, and openness to experience predict lower perceived stress, whereas others contend that these personality traits are unrelated to stress (10, 34, 35). In our study, we discovered a link between openness to new experiences and trait anxiety. We believe this is due to the long hours and intense nature of medical school classes, as well as the high level of difficulty of the courses, which leads to the suppression of the curious, creative, and intellectual qualities of individuals with an open personality trait, which can result in the emergence of anxiety symptoms.

Some studies suggest that responsibility, agreeableness, and openness to experience predict lower perceived stress (29, 36), whereas others have found no relationship between these personality traits and stress. In our study, we discovered that agreeableness and responsibility have a negative relationship with trait anxiety. According to Wayne et al., being conscientious and organized, as well as effectively using time, can eliminate time pressure, reduce stress, and tension, and prevent stress-related problems (37). As a result, individuals who have a strong sense of responsibility are more likely to succeed in school and at work (38). We discovered that the responsibility dimension of the five-factor personality scale did not mediate anxiety or anatomy achievement in our study. Although

the literature suggests that responsible people are more successful and less anxious, we found that in our model, responsibility had no direct or indirect effect on anxiety or anatomy achievement. There were no studies in the literature that specifically looked at the role of personality traits in the relationship between academic achievement and stress in medical students. This is the first study to look into this topic. Extraversion, agreeableness, and openness to experience were found to be related to trait anxiety, and these personality traits mediated the relationship between anatomy achievement and anxiety. Schneiderjans (2005) and Uysal (2021) discovered a positive relationship between academic achievement and self-discipline, openness to experience, and agreeableness, and a negative relationship between academic achievement and neuroticism (39, 40). Maki et al. (2003) discovered a negative relationship between academic achievement and extraversion and a positive relationship between openness to experience and academic achievement (41). Vedel (2014) discovered that self-discipline, openness to experience, and agreeableness were significantly and positively related to overall academic performance in a meta-analysis of 20 studies (42). Propat et al. (2015) discovered that self-discipline, openness to experience, and agreeableness were significantly and positively related to academic achievement in a meta-analysis of 70.000 samples (43). Trapmann et al. (2007) have reported that self-discipline as a personality trait has a positive and significant correlation with academic achievement, while other personality traits do not have a significant effect on academic achievement (44). Our study found that although the five-factor personality inventory did not have a direct mediating role, personality traits such as extraversion, agreeableness, and openness to experience could play a partial mediating role in anatomy achievement. Therefore, we believe that our partial mediating model in this study provides a clearer explanation than the correlation results commonly reported in the literature.

As a result, in line with the literature, it was found that anxiety affects academic success. In addition, the mediating role of personality traits, which is the main research subject of

this study, in affecting anxiety and academic success, was revealed using mediation methodology. When assessing students' psychological states for academic success, issues such as the degree of overlap between their personality traits and their education or how much they can struggle can be predicted in advance, and solutions can be developed accordingly. In our study, we discovered a link between openness to new experiences and trait anxiety. We believe this is due to the long hours and intense nature of medical school classes, as well as the high level of difficulty of the courses, which leads to the suppression of the curious, creative, and intellectual qualities of individuals with an open personality trait, which can result in the emergence of anxiety symptoms.

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