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What Kind of Dr. Turkish Medical Students Want to be Depends on Their Personality and Sex

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Abstract

Students have important, life altering decisions to make. One of those is what specialty they will go into. In this study ($N = 376$), we examined the future vocational interests (i.e., basic medicine, surgery, psychiatry) of Turkish medical students to see whether their personality (i.e., the Dark Triad, competitiveness, empathy, gender role identity) and medical specialty preferences were related. We found that in women, preference for psychiatry was the highest while surgery was the lowest among all three specialties. In men, preference for basic medicine was the highest; however, preferences for surgery and psychiatry did not differ. Narcissism was more strongly correlated to the preference for basic medicine in women compared to men, and it was positively correlated with the preference for basic medicine more, compared to the preference for psychiatry in women. Psychopathy was positively associated with the preference for surgery more than the preference for basic medicine in women. The enjoyment of competition was positively correlated with the preference for basic medicine and surgery more in women compared to men while it was negatively associated with the preference for psychiatry more compared to the preference for surgery in men. The avoidance of contention was negatively correlated with the preference for basic medicine compared to the preference for surgery in women while it was positively correlated with the preference for psychiatry compared to the preference for surgery in men. Compassionate care negatively correlated with the preference for basic medicine more in men, compared to women.

Keywords: Medicine; Personality; Dark Triad; Gender Roles; Sex Differences; Empathy; Competitiveness

List of Abbreviations

A. Content.: Avoidance of Contention

Comp. Care: Compassionate Care

JSPE-S: Jefferson Scale of Physician Empathy Student Version

Pers. Taking: Perspective Taking

Standing in P. S.: Standing in Patients Shoes

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1. INTRODUCTION

Choosing their specialty is a rite of passage in medical students' personal and professional lives. Apart from the external reasons of the medical field selection like working conditions, and monetary gain; students also choose their specialties based on their interests (Cansever et al., 2020); that can be influenced by their personality and related to their sex and their gender role. There are several reasons (i.e., evolutionary and social theories) why men and women may differ in terms of their personality traits and therefore, their medical specialty preferences.

1.1 Literature Review

According to the evolutionary point of view, it was suggested in the sexual strategies theory (Puts, 2010) that men and women may be characterized by different traits because some traits may influence their reproductive success differently. For instance, men might have evolved to take more risks, be more competitive, assertive, and aggressive because doing so lead to more reproductive success than it did in women. Women, on the other hand, may have been evolved to be more agreeable, nurturing, submissive, and warmer to better protect their offspring but also to signal maternal abilities to potential mates (Buss, 1999). According to life history theory (Hill & Kaplan, 1999), individuals tend to distribute limited resources and energy for reproduction and survival in terms of the environmental state. When the environment is unpredictable, harsh and stressful with limited resources, they spend more energy on immediate benefits without calculating future consequences by giving more impulsive, risky and survival-focus decisions, that is to say, they adopt fast life history strategies because of the uncertainty of survival. For example, they reproduce faster and earlier in the age without calculating the sufficiency of the available resources so that they can maintain their generational persistence (Griskevicius et al., 2011). On the other hand, when the environment is safe and stable, they focus more on the

quality of survival by "investing more on the quality of the present offspring" by being more responsive, emotionally sensitive, and cautious (Figueredo et al., 2004). Concordantly, prior studies suggested that the fast life history strategies were associated to the Dark Triad traits (Paulhus & Williams, 2002) of Machiavellianism (i.e., manipulation, cynicism, pragmatic morality; Jones & Paulhus, 2009), psychopathy (i.e., lack of remorse, recklessness, antisocial attitude, irresponsible behavior; Boddy et al., 2010), and narcissism (i.e., exaggerated self-involvement, grandiosity, constant need for attention and admiration from others; Morf & Rhodewalt, 2001), risk taking, and aggressiveness (Jonason et al., 2019; Lu & Chang, 2019). Slow life history strategies, on the other hand, were related to responsivity, emotional sensitivity and cautiousness (Figueredo et al., 2004). In terms of sex differences, it may be because men have not had to rear offspring to the same extent that women leading men to optimize their approaches to life towards fast life history strategies where they choose quantity over quality of the offspring by reproducing faster and with multiple partners while women should calculate the future consequences of the pregnancy and raising their offspring (Hurst & Kavanagh, 2017). In the light of these, it can be said that evolutionarily, men are more prone to competitiveness, risk taking, impulsivity, dominance, and aggression while women are more caring, nourishing, sensitive and emotional for adaptive reasons.

Apart from the evolutionary theories, several social theories are used to explain the differences of personality traits in each sex, or as these researchers would say, gender. In social role theory (Eagly et al., 2000), gender roles are attributed by the society based on the basic physical differences between men and women. For example, men are accepted as the "breadwinners" of the family because of their physical strength, durability, and toughness while women expected to be housekeepers and caregivers for their nurturing, sensitive and fragile nature. As the working labor has started to become male-dominant, men have more economic

freedom and therefore, more power; forming a patriarchal social structure by defining the social gender roles and stereotypes more strictly (e.g., men are more assertive while women are more agreeable). Additionally, in societies where gender roles are more strictly determined, the differences of personality traits in each sex can be observed more clearly. Besides the social role theory, parental and societal inducements are also suggested to create differences in gender roles. In socialization theories, it was claimed that children are raised and guided by gender-typical practices and expectancies by their parents and other adults that leads to some distinctions between boys and girls. For example, boys are encouraged to play games requiring more physical effort and competition, raised to be more independent, and physical punishment is used more to boys (Lytton & Romney, 1991) while girls are heartened to play with dolls, do chores, and take care of the younger children. Because they are raised by the expectancies of sex-appropriate behavior, their personalities may be partially shaped accordingly by enlarging the differences among the sexes, especially in societies where gender-typical behavior is accepted to be appropriate (Lippa, 2010).

Consequently, sex differences in particular traits (i.e., empathy, competitiveness, the Dark Triad traits) were observed in several studies, which could be attributed to both of the aforementioned approaches. In one research, it was shown that men are more willing to compete and take risks, compared to women (Buser et al., 2021) and are eager to choose more competitive and prestigious occupations (Buser et al., 2014). Similarly, they have higher levels of Machiavellianism, psychopathy, and narcissism (Chiorri et al., 2019; Vedel & Thomsen, 2017). Empathy, on the other hand, is found to be higher on women (Chen et al., 2012; Hojat et al., 2002; Santos et al., 2016) and the difference between men and women seems to increase by age (Mestre et al., 2009).

In the light of these, we can say that both evolutionary background and social expectations may shape sex-typical personality traits which will lead medical students to choose more sex-appropriate medical specialties. For example, in Turkey, the most competitive specialties such as orthopedic and trauma surgery, plastic surgery, and neurosurgery (Murphy, 2018) are preferred mostly by men, according to the results of the Medical Specialty Examination (MSE) of 2020 (Öğrenci Seçme ve Yerleştirme Merkezi, 2020). Moreover, surgeons were also found to be more narcissistic, compared to other specialties (Bucknall et al., 2015), and more prone to psychopathy (Pegrum & Pearce, 2015), Machiavellianism, and impulsivity (Muscatello et al., 2017). On the other hand, person-oriented specialties requiring more person-physician contact and empathy are primarily preferred by women (Chen et al., 2012; Hojat et al., 2002).

However, recently, with the increasing number of women participating in work life, female students have started to have more same-sex role models in sex-atypical occupations, encouraging them to choose sex-atypical careers as well (Makarova & Herzog, 2014). Moreover, the shift from traditional to nontraditional occupations occurred as a results of the awareness of the importance of status among women as well, in other words, women think that male-typical jobs are more prestigious so they tend to choose them as a career (Sax & Bryant, 2006). Medicine, which was identified as a male-typical field, has had its share of this change as well as other male-typical occupations such as law, and engineering (Ward, 2008). Indeed, over the past years, the percentage of women in medicine and surgical fields has started to increase gradually (Linscheid et al., 2020). Additionally, in one research conducted with Turkish medical students, it was found that more than half of the students who were planning to continue on their residencies were women (Yapalak et al., 2021). Furthermore, male university students with less materialistic values, status concerns, and the ones who receive more faculty support, encouragement, and respect tend to select male-atypical fields, as the research suggests (Sax & Bryant, 2006).

Nonetheless, this does not necessarily mean that gender roles and stereotypes are not an issue in societies any longer. In fact, according to one study comparing 1983 and 2014, gender stereotypes prevail despite the changes in the preferences for sex-typical and sex-atypical occupations (Haines et al., 2016). For this reason, people in sex-atypical occupations might face with several challenges. For instance, according to lack of fit model (Heilman, 1983, p. 726), women might be judged because of "a mismatch between the attributes that women are thought to possess and the attributes seen as necessary for success in male-typed positions and fields". In other words, because of the gender stereotypes, women are considered to be warm, sensitive, fragile and submissive; they are thought that they are not a good fit for male-typical jobs which may lead to gender bias and discrimination in the workplace.

Given that the personality traits might have an impact on choosing a career, the increase in the number of people choosing sex-atypical occupations may be explained by the idea that those people might have gender-atypical traits. For example, one research revealed that women choosing male-typical occupations might be more "assertive and tough-minded", compared to other women in female-typical jobs (Lemkau, 1983). Furthermore, in another research, it was stated that men preferring female-typical jobs were found to be more emotionally sensitive and showed less conformity for "traditional sex-role expectations", compared to other men preferring male-typical occupations (Lemkau, 1984, p. 110).

Lastly, apart from gender roles, medical specialty preferences and personality traits of the students may also be affected by the medical training itself. For example, in one study conducted to determine the factors affecting the medical specialty preferences among students and residents, it was suggested that medical students preferred specialties based on their interest, abilities, and gender roles and stereotypes. After residency, on the other hand, their preferences were mostly based on the payment and working conditions of the field (Cansever et al., 2020). In other words,

as they involve in the clinical practice, their preferences change based on the working conditions. Moreover, it was found in several studies that empathy levels of the students, which may have an influential factor on medical specialty preferences (Chen et al., 2012; Hojat et al., 2002), seemed to decrease in the higher grades as they start clinical practice and internship and this might be considered as a result of the fact that they start experiencing challenges in the clinical practice that may lead them to be less empathetic as a defense mechanism to deal with those emotionally challenging situations (Chen et al., 2007; Chen et al., 2012; Hojat et al., 2002).

1.2 Current Study

Considering these issues, in the current study, we attempt to understand the future vocational interests (i.e., basic medicine, survey, psychiatry) of Turkish medical students to provide information whether their particular personality traits (i.e., the Dark Triad, competitiveness, empathy, gender role identity) and medical specialty preferences are related. We replicate sex differences in the aforementioned traits, test for sex differences in preferences, and examine whether their personality traits and medical specialty preferences are moderated by their sex and personality traits. We also run exploratory tests to understand whether the medical specialty preferences and personality traits are moderated by the students' grades. We hypothesized that students with higher levels of sex-typical traits would prefer sex-typical specialties while students with sex-atypical traits would be more prone to choose sex-atypical specialties.

2. METHOD

2.1 Participants and Procedure

In this study, 416 students were recruited as participants from the medical schools in Turkey, 376 of them (*Men* = 145, *Women* = 231) completed the survey. To reach various medical students, the snowball technique was used by sending the survey link via e-mail and posting it on Facebook, Twitter, and WhatsApp. As an incentive, all participants were given the option to participate in a book draw and the ones who wanted to participate were asked to share their e-mail addresses. After receiving and accepting the tick-box consent form, the participants were asked whether they are medical students or not, and the survey was terminated if they choose "No" as an answer to prevent any complications. Thereafter, they chose their grade for more detailed classification. Then, they completed four questionnaires, which were Medical Specialty Preferences, Revised Competitiveness Index, Jefferson Scale of Physician Empathy Student Version (JSPE-S), and The Dark Triad Dirty Dozen. Lastly, they stated their gender role identity in the way given below. The total survey lasted 10 minutes to take for each participant. This study was approved by the ethics committee at Istanbul University Cerrahpaşa Medical Faculty (E-83045809-604.01.02-155396)

2.2 Measures

The Dark Triad traits were measured using the Turkish translation (Özsoy et al., 2017) of the Dark Triad Dirty Dozen scale (Jonason & Webster, 2010). The scale is composed of four items measuring Machiavellianism (e.g., "I tend to exploit others towards my own end."), psychopathy (e.g., "I tend to not be too concerned with morality or the morality of my actions."), and narcissism (e.g., "I tend to feel that I am better than others."). Participants were asked how much they agreed (1 = *Strongly Disagree*; 5 = *Strongly Agree*) with the statements and their scores were averaged to create indexes of each trait.

Competitiveness was measured with the Turkish translation (Günay & Çelik, 2020) of Revised Competitiveness Index (Houston et al., 2002). The translated and adapted version of the scale is made of 11 items; eight for measuring the enjoyment of competition (e.g., "I enjoy competing against an opponent.") and three for avoiding of contention (e.g., "I often remain quiet rather than risk hurting another person."). Participants were asked how much they agreed (1 = *Strongly Disagree;* 5 = *Strongly Agree*) with the statements and their scores were averaged to create indexes of each subscales.

Empathy was measured with the Turkish translation (Gönüllü & Öztuna, 2012) of the Jefferson Scale of Physician Empathy Student Version (Hojat et al., 2002), which was designed for measuring empathy in patient care among medical students. The scale is composed of 20 items, measuring perspective taking (e.g., "I believe that empathy is an important therapeutic factor in medical treatment."), compassionate care (e.g., "I believe that emotion has no place in the treatment of medical illness."), and standing in patients' shoes (e.g., "Because people are different, it is difficult to see things from patients' perspectives."). Participants were asked how much they agreed (1 = *Strongly Disagree;* 7 = *Strongly Agree*) with the statements and their scores were averaged to create indexes for each trait.

Gender Role Identity was measured with an *ad hoc*, single question. Participants were asked to report how masculine or feminine they were on a single continuum (1 = *Very Masculine;* 3 = *Androgynous;* 5 = *Very Feminine*). Participant's responses were used to determine their gender role identity.

To measure medical specialty preferences, a scale with 20 items were designed for this study. Participants were asked to state how much they would prefer to choose each specialty as a career in the future (1 = *Not Preferable;* 5 = *Very Preferable*). The specialties were selected from the most preferred fields according to the Medical Proficiency Exam results in 2020. In hopes of

reducing these specialities into larger-yet-fewer groups, we ran exploratory factorial analysis but we were unable to find a sensible solution. Therefore, we relied prior categorizations (Grasreiner et al, 2018) and manually created groupings of interest in *basic medicine* (i.e., dermatology, radiology, physiotherapy, ophthalmology, otolaryngology, clinical microbiology and infectious diseases, cardiology, neurology, chest diseases, internal medicine, and anaesthesiology and reanimation), *surgery* (i.e., general surgery, plastic surgery, neurosurgery, cardiovascular surgery, urology, orthopaedic and trauma surgery, and obstructive and gynaecology), and *psychiatry* (i.e., psychiatry, child psychiatry).

3. RESULTS

In a 2 (sex) × 3 (specialty) mixed model ANOVA, we found a main effect of medical specialties on preference ($F[2, 748] = 22.46$, $p < .01$, $\eta_p^2 = .06$), suggesting that in general, basic medicine and psychiatry were preferred more than surgery ($p < .01$). Moreover, an interaction ($F[2, 748] = 17.93$, $p < .01$, $\eta_p^2 = .05$; see Figure 1) was found between sex and the specialties showing psychiatry ($p < .05$) was preferred more by women than men. Although surgery was preferred more by men than women, the difference was not significant ($p > .05$). Moreover, women preferred psychiatry more ($p < .01$) than basic medicine and surgery, and preferred basic medicine more ($p = .01$) than surgery. In contrast, men preferred basic medicine more than surgery ($p < .01$) and psychiatry ($p < .05$). There was no main effect of sex on medical specialty preferences ($F [1, 374] = 0.74$, $p = .391$, $\eta_p^2 = .002$) overall.

Correlations are reported in Table 1. Machiavellianism, psychopathy and narcissism were correlated with the enjoyment of competition while higher psychopathy levels were positively correlated to the avoidance of contention. Machiavellianism negatively correlated with perspective taking and compassionate care. Similarly, psychopathy had a negative relationship with compassionate care and perspective taking. When the medical specialties and their correlations with personality traits were investigated, people preferring basic medicine did not show any significant correlations with the personality traits. Preference for surgery positively correlated with psychopathy, competitiveness and masculinity. Students that were interested in psychiatry had lower levels of the enjoyment of competition and higher levels of femininity.

When the relationship between medical specialties and the grades of the students were investigated, we found that students in higher grades preferred surgery ($r = -.29$, $p < .01$) and psychiatry ($r = -.14$, $p < .01$) less than the ones in lower grades in general. Also, by grade, all of the students' perspective taking ($r = -.16$, $p < .01$), compassionate care ($r = -.11$, $p < .05$), and the

enjoyment of competition (r = -.17, p < .01) levels seemed to decrease. When we further investigated the students' preferences for the medical fields and their personality traits based on their grades, we found that women in the higher grades preferred surgery (r = -.38, p < .01) less, compared to the women in the lower grades. This decrease in the preference for surgery was more in women than men (z = -2.09, p < .05), although men in higher grades also preferred surgery (r = -.17, p < .05) less than the ones in the lower grades. Women in the higher grades also preferred psychiatry less than the ones in the lower grades (r = -.20, p < .01). Moreover, they also had higher levels of narcissism (r = .17, p < .05) and the difference was more, compared to the men in higher versus lower grades (z = 2.03, p < .05). Moreover, the women in higher grades enjoyed competition less (r = -.22, p < .01), and had lower levels of perspective taking. The men in the higher grades also had lower levels of perspective taking (r = -.17, p < .05).

We examined whether the effects were moderated by the sex of the students using Fisher's z-tests. Preference for basic medicine positively correlated (z = 1.92. p < .05) with narcissism (r = .12. p < .05) in women more than men, where they was not correlated (r = .08. p > .05). Preference for basic medicine also positively correlated with the enjoyment of competition (z = 2.28. p < .05) more in women (r = .14. p <.05) while there was no correlation in men (r = -.10. p > .05). Moreover, it was also negatively correlated with the avoiding of contention in women (r = -.15. p < .05). Nonetheless, they were more strongly correlated (z = .13, p < .05) in men (r = -.04. p >.05), compared to women (r = -.04. p < .05). Preference for surgery positively correlated with the enjoyment of competition (z = 1.61. p < .05) in women (r = .19. p < .01), compared to men (r = .02. p > .05). It also positively correlated with psychopathy (r =.14. p < .05) in women. Psychiatry only negatively correlated with the enjoyment of competition in men (r = -.20. p < .05).

Additionally, we investigated whether the effects were moderated based on participants' preferences for three groups of medical fields with a Steiger's *z*-test. In women, psychopathy was positively correlated ($z = -1.74$. $p < .05$) with surgery ($r = -.15$. $p < .05$) more than basic medicine, which was not correlated to basic medicine ($r = -.03$, $p > .05$). The avoiding of contention was negatively correlated ($z = -3.05$. $p < .01$) with basic medicine ($r = -.15$, $p < .05$) more than surgery, which was not correlated ($r = .13$. $p > .05$). The enjoyment of competition was more strongly correlated ($z = 2.18$. $p < .01$) with basic medicine ($r = .14$, $p < .05$) than psychiatry, which was not correlated ($r = .07$. $p > .05$). In men, the enjoyment of competition was negatively correlated ($z = 2.76$, $p < .01$) with psychiatry ($r = -.20$, $p < .05$) more than surgery ($r = .02$, $p > .05$), which was not correlated. The avoiding of contention was not correlated with neither of the specialties in men. However, it was more strongly correlated ($z = 1.62$, $p < .05$) with surgery ($r = .13$, $p < .05$) compared to psychiatry ($r = -.06$, $p > .05$).

4. DISCUSSION

4.1 Significance of the Current Study

In a cross-sectional dataset from medical universities in Turkey, we attempted to understand how some of their personality traits (i.e., competitiveness, empathy, the Dark Triad traits) might have an impact on their decisions on pursuing a career in basic medicine, surgery, and psychiatry; and we replicated sex differences in those traits according to their specialty preferences. Our results were mainly congruent with the previous literature. To begin with, we found that psychiatry; which was positively correlated with perspective taking and femininity while negatively correlated with the enjoyment of competition; preferred mostly by women while surgery; correlated with masculinity, psychopathy, the enjoyment of competition and the avoidance of contention, was preferred mostly by men. On the other hand, we did not find sex differences in the preference for basic medicine. As it was suggested in the sexual strategies theory (Puts, 2010), men might have been evolved in a more assertive, dominant, practical and status-seeker way while women may be more nurturing, caring, vulnerable and more submissive by nature. Moreover, as it was claimed in social role theory (Eagly et al., 2000), and socialization theories (Lytton & Romney, 1991); men might be attributed to be more assertive, competitive and dominant while women may be expected to be more caring, submissive, and sensitive and this could affect the social structure of the society by forming the working labor. Hence, they may be more prone to choose specialties that are more compatible with their sex-typical traits, for surgery is stereotypically associated to dominance, competitiveness, and prestige (Thomas, 1997) while psychiatrists are expected to be caring, communicative, intuitive, and agreeable (Srinivasan, 2005). Moreover, because psychiatry requires fewer work demands compared to other specialties (Deary et al., 1996), it could be considered as a more suitable occupation for women so that they can have time for their domestic responsibilities, as the theories suggested.

Additionally, our results were supported by the life history theory framework. Surgery, which is a competitive, challenging and risky medical specialty for several reasons (i.e., violence against surgeons is higher than other medical personnel; Akça et al., 2014, complications in the operating room; Pinto et al., 2013), fast life history strategies might be required for adaptation, which are associated more with men compared to women (Hurst & Kavanagh, 2017). Therefore, men might be more prone to choose surgery, a male-typical specialty, compared to women.

When we further investigated the specialty preferences of both men and women in terms of their personality traits, we found that psychopathy and avoiding of contention was associated more with the preference for surgery compared to the preference for basic medicine in women. Furthermore, narcissism was correlated more with the preference for surgery compared to the preference for psychiatry in women. The enjoyment of competition was correlated with the preferences for surgery and basic medicine more than the preference for psychiatry in women. As prior work indicated, there is a possibility that women preferring male-typical specialties would have more male-typical personality traits (Lemkau, 1983); hence, it is logical that women preferring surgery might have more male-typical tendencies compared to women preferring a female-typical specialty, that is, psychiatry. Moreover, the preference for psychiatry negatively correlated with the enjoyment of competition, compared to the preference for surgery in men, which also supports our predictions and the prior work indicating men who do not conform to "traditional sex-role expectations" could be more prone to choose a female-typical occupation (Lemkau, 1984, p. 110).

When the sex differences in each trait was examined according to the medical specialty preferences, we found that narcissism and the enjoyment of competition were correlated with the preference for basic medicine more in women compared to men. Additionally, the enjoyment of competition was correlated with the preference for surgery more in women than men; suggesting

that male-typical traits were more strongly correlated with the preferences for the specialties that are female-atypical while we did not find the same correlation for preference for psychiatry and female-typical traits (i.e., empathy) in men. However, compassionate care was negatively correlated with the preference for basic medicine in men compared to women, meaning that a female-typical trait and the preference for a female-atypical specialty were negatively correlated more in men compared to women. Given that medicine is still generally considered as a male-typical occupation (Ward, 2008), it is concordant with the literature and our predictions that most women pursuing a career in majority of the fields of medicine might have particular male-typical traits. The reason why the correlations were stronger in women compared to men might be explained by the idea that having a male-typical trait may be more influential on women's decisions on choosing a career as a strategy to overcome the lack of fit model (Heilman, 1983). As mentioned earlier, it was suggested in the model that women are expected to behave in a female-typical way which is stereotypically considered as being incompetent in male-typical occupations. Therefore, women might think they would be a better fit if their traits match with their jobs. However, men in male-typical jobs do not have this obligation. Considering the tough, unpredicted, competitive and challenging working environment of medicine, women adopting fast life history strategies could be a better with for the female-atypical specialties such as basic medicine and surgery. This might also be another reason why being more narcissistic, psychopath and competitive can be a stronger determinant for women to prefer medicine compared to men. Nonetheless, because this study is exploratory, future research on views of women in male-typical specialties about gender bias may be needed to explain this issue.

Lastly, when we evaluated the students' personality traits and specialty preferences based on their grades, we found a decrease in the preferences for psychiatry and surgery for both men and women in higher grades, and this decline was stronger in women compared to men. This may

be because as they are more involved in the clinical practice, their preferences might start to change in terms of the working conditions of the specialties, as previous work suggested (Cansever et al., 2020). Given that surgery is a challenging specialty, especially for women (i.e., violence against women surgeons is higher than other medical personnel; Akça et al., 2014, complications in the operating room; Pinto et al., 2013), their preferences for surgery might decline with the involvement in clinical practice. Moreover, concordant with the previous research (Chen et al., 2007; Chen et al., 2012; Hojat et al., 2002), we found that by grade, all of the students' perspective taking, compassionate care levels seemed to decrease, which may also be caused by the challenges faced in clinical practice. We also found a decline in the enjoyment of competition in higher grades. This might be because of the increasing emotional exhaustion and burnout due to the test anxiety (Aysan et al., 2001) caused by the upcoming Medical Proficiency Exam for competition is known to cause more exhaustion and stress (Zhong et al., 2018) so they might aim to avoid it when possible. Finally, we found that women in higher grades had higher narcissism levels compared to the ones in lower grades , which can also be explained by the increase in the stress and the burnout rates because it was found in a study that "narcissism was positively correlated with job burnout, depersonalization, and emotional exhaustion" (Schwarzkopf et al., 2016). The reason why only women were affected by this can be explained by another research suggesting female gender and higher stress levels were linked to the higher levels of burnout (Von Känel et al., 2017). However, because our tests were exploratory, further research is needed to be conducted to examine these changes in these personality traits by grade.

4. 2 Limitations and Conclusion

In spite of the adequate sample size, overall and in each sex, from various prestigious medical schools around Turkey and mainly convenient psychometric properties, our study still

has some issues. First, we failed to find a sensible solution from exploratory factorial analysis to categorize the medical specialties. Thus, we adopted the method used in a previous study which was also conducted with the attempt to understand the influencing factors of specialty preferences among medical students (Grasreiner et al, 2018). Although it was a credible study and the results of our correlation analyses were compatible with the previous finding, we had to ignore the fact that there are some surgical specialties requiring clinical practice (i.e., urology, obstructive and gynaecology) while there are some basic medicine specialties that occasionally require surgical interventions (i.e., otolaryngology, anaesthesiology and reanimation, ophthalmology). Considering our results, we can assume that the way of categorization we used was applicable for determining the relationship between specialty selection and most of the personality traits. However, we did not find significant correlational differences between the specialties in terms of the empathy levels of the students because we fail to categorize the specialties based on the amount of patient-physician contact they require, although it is an essential factor due to its effects on the burnout rates that are related to the changes on the personality (Figley, 2002; Schwarzkopf et al., 2016; Zhong et al., 2018). For future research, this should be taken into consideration while categorizing the medical specialties. By this way, the differences between the medical specialties can be observed in a more detailed manner based on the empathy levels of the students who prefer them. Additionally, these findings can be beneficial for the preparation of more balanced curriculums for each grade to prevent emotional and mental exhaustion faced in the higher grades. Second, to measure personality traits, we relied on self-report questionnaires in which people answer the questions that were asked directly (i.e., “I enjoy competing against an opponent” to measure the enjoyment of competition) or indirectly (i.e., “I tend to feel that I am better than others” to measure grandiosity in narcissism), which is one of the most common methods used in the personality assessments (Paulhus & Vazire, 2007). It is known as an

effective method because it is simple to administer and provides good amount of information about individuals. Nonetheless, it may cause socially desirable responding, in other words, participants may tend to figure out what the question is intended to measure and answer it in a socially acceptable way. Considering that narcissism (Carroll, 1987) and self-reported empathy (Kämpfe et al., 2009) are positively associated with socially desirable responding, our findings might be affected by this. Third, while we obtained the results substantially congruent with the literature, the *ad hoc* we used to measure gender role identity was weak. Gender roles may be multidimensional, including personality, behaviors, gender roles attributed by the society, expression of emotions, and interpersonal relationships (Williemsen & Fischer, 1999). For example, Bem Sex Role Inventory (Bem, 1981) was designed to measure masculine, feminine and androgynous personality styles by referencing masculine-perceived traits (i.e., assertiveness, dominance, leadership), feminine-perceived traits (i.e., compassion, affection, sympathy), and gender neutral traits (i.e., helpfulness, jealousy, unpredictability). The Gender Identity Questionnaire (Williemsen & Fischer, 1999), on the other hand, measures feminine and masculine behaviors, in addition to the masculine and feminine traits. The downside of these questionnaires was that BSRI contains 60 items and Gender Identity Questionnaire is composed of 58 items, which opposes our aim of minimizing participants' fatigue and the dropout rate as possible, and the fact that our results mainly line up well with the predictions, the unidimensionality of the method we used did not weaken our results in our opinion. For future work, to investigate the relationship between the gender role identity, the Dark Triad, and medical specialty preferences among students, aforementioned questionnaires could be used to understand if our method caused methodological artifacts.

In conclusion, we examined the associations between particular personality traits (i.e., competitiveness, empathy, the Dark Triad traits, gender role identity) and medical specialty

preferences of Turkish medical students. We found that narcissism was strongly correlated with the preference for basic medicine in women compared to men and the preference for psychiatry in women. The enjoyment of competition was more strongly correlated with the preferences for basic medicine and surgery in women compared to men and the preference for psychiatry in women. Compassionate care negatively correlated with the preference for basic medicine in men compared to women. Psychopathy and the enjoyment of competition were positively correlated with the preference of surgery in women; the enjoyment of competition was more strongly correlated with the preference for surgery in women compared to men. The avoidance of contention negatively correlated with the preference for basic medicine and positively correlated with the preference for surgery in women. The enjoyment of competition negatively correlated with the preference for psychiatry in men. Moreover, preferences for surgery and psychiatry was negatively associated with the grade, meaning that students in higher grades preferred them less, compared to the ones in lower grades. The enjoyment of competition, compassionate care and perspective taking levels of the students dropped in the higher grades, and narcissism levels increased in women in higher grades. Our results were mainly concordant with the evolutionary, social role and socialization theories given that men would prefer male-typical medical specialties more than women and women would prefer female-typical fields. Additionally, congruent with the literature and our predictions, people with sex-atypical traits preferred sex-atypical medical specialties compared to others.

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APPENDIX

FIGURES

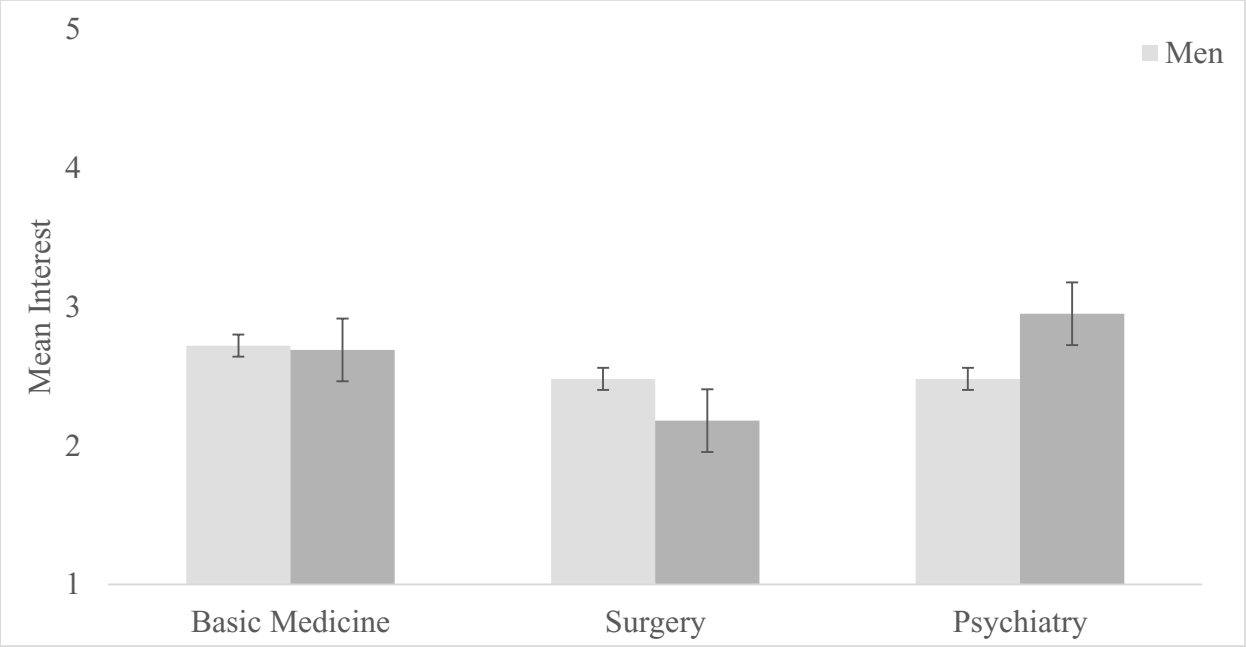

Figure 1.

TABLES

Table 1: Descriptive statistics, sex differences, and correlations for the medical specialties, the Dark Triad traits, competitiveness, empathy, and gender role identity.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Basic Medicine												
2. Surgery	.19**											
3. Psychiatry	.20**	-.06										
4. Machiavellianism	.02	.06	.09									
5. Psychopathy	-.02	.17**	.02	.54**								
6. Narcissism	.04	.04	-.05	.33**	.24**							
7. A. Content.	-.08	.14**	-.04	.06	.15**	-.03						
8. E. Compet.	.04	.16**	-.15**	.26**	.24**	.27**	.27**					
9. Standing in P. S.	-.06	< .01	.07	-.04	< .01	-.07	.14**	-.05				
10 Comp. Care	-.04	-.08	.08	-.21**	-.25**	-.03	-.06	-.09	.11*			
11. Pers.Taking	.02	< .01	.11*	-.13*	-.14**	-.03	-.05	< .01	< .01	.55**		
12. Gender Role	< .01	-.20**	.17**	-.11*	-.28**	.02	-.16**	-.19**	.06	.13*	.07	
Cronbach's α	.69	.68	.70	.78	.63	.75	.79	.92	.48	.67	.80	--
Overall: *M* (SD)	2.70 (0.60)	2.30 (0.77)	2.77 (1.27)	2.16 (0.98)	2.02 (0.84)	3.42 (0.89)	3.12 (1.02)	3.08 (1.01	4.22 (1.30)	5.83 (0.77)	5.39 (0.85)	3.16 (1.20)
Men: *M* (SD)	2.72 (0.63)	2.48 (0.74)	2.48 (1.17)	2.31 (1.06)	2.29 (0.93)	3.44 (0.90)	3.24 (1.06)	3.36 (1.06	4.03 (1.30)	5.69 (0.87)	5.30 (0.94)	1.80 (0.63)
Women: *M* (SD)	2.69 (0.59)	2.18 (0.77)	2.95 (1.30)	2.07 (0.92)	1.84 (0.73)	3.41 (0.88)	3.04 (0.99)	2.90 (0.94	4.33 (1.29)	5.92 (0.69)	5.44 (0.79)	4.02 (0.46)
t test	0.43	3.66**	-3.60**	2.36*	4.90**	0.40	1.90	4.21**	-2.19*	-2.67**	-1.42	36.72**
Cohen's *d*	0.05	0.39	-0.39	0.24	0.54	0.03	0.29	0.45	-0.23	-0.29	-0.15	4.02

Note. Cohen's *d* was calculated online (https://www.socscistatistics.com/effectsize/default3.aspx). For psychiatry and standing in the patients' shoes, Pearson's *r* was calculated instead of Cronbach's α because they have less than three variables. Gender role identity was measured with a single item (--) and this no index of internal consistency can be provided.

* $p < .05$, ** $p < .01$