TRAIT MINDFULNESS AND SMOKING IN TURKISH UNIVERSITY STUDENTS: THE MEDIATING EFFECTS OF DEPRESSION, ANXIETY AND STRESS

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The purpose of this study is to investigate the relationship between trait mindfulness and smoking among Turkish university students, as well as the role of depression, stress and anxiety as mediators in this relationship. The study sample was composed of 171 students, 75 % female and 25 % male. The data were collected using Mindful Attention Awareness Scale (MAAS) and Depression, Anxiety, and Stress Scale (DASS). Data analysis was based on a path analysis with a dichotomous outcome. It was found that mindfulness had a direct effect on smoking and anxiety partially mediated this effect. It was also found that high levels of mindfulness were negatively associated with low levels of depression, stress, and anxiety. Findings suggest that heightening the level of mindfulness among university students may indirectly reduce cigarette smoking through lowering their level of anxiety.

Keywords: Trait mindfulness; smoking; mediation; depression; anxiety; stress; path analysis; dichotomous outcome

Introduction

Originating in Buddhist philosophy (Gunaratana, 2002) and adapted and popularized with the efforts of Mark Williams and Jon Kabatt-Zin, among

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others, mindfulness practices are so widespread in the west that big corporations such as Google (with Search Inside Yourself) promote mindfulness practices for their employees, that universities in the UK (Oxford and Exeter Universities) have research centers and programs for mindfulness, and that there are online programs like www.bemindfulonline.com, teaching general public mindfulness practices. Moreover, there has been a growing research interest in mindfulness in the past few decades both as a psychological construct and as a form of a clinical intervention (Keng et al., 2011; Chiesa, 2013) because mindfulness has been shown to be positively associated with mental health (Mandal et al., 2012), higher levels of life satisfaction, vitality, self-esteem, optimism (Brown and Ryan, 2003), and positive emotion (Miners, 2008) and to be negatively associated with depression (Brown and Ryan, 2003; Williams et al., 2007; Cash and Whittingham, 2010), social anxiety (Brown and Ryan, 2003; Rasmussen and Pidgeon, 2011), stress (Palmer and Rodger, 2009; Chiesa, and Serretti, 2009; Williams and Penman, 2011; Greeson, Toohey, and Pearce, 2015), negative emotion (Miners, 2008), and less nicotine dependency (Vidrine et al., 2009). Contributing to the literature, this study focuses on the relationship between trait mindfulness and smoking, as well as depression, anxiety, and stress as mediators in this relationship in a sample of Turkish university students. It is believed that shedding light on this relationship would help design and delivery of the psychological counselling and cessation programs targeting university student populations.

**Mindfulness**

Mindfulness can be defined as “an awareness that merges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p.145). It involves directing attention through self-regulation and adopting a specific orientation toward one’s experiences (Bishop, et al., 2004). Trait mindfulness,
also referred to as dispositional mindfulness, refers to the level of mindfulness a person has during daily activities and is different from state mindfulness which can be acquired through mindfulness meditation practices (Cahn and Polich, 2006). It can be conceived “as a trait-like variable, reflecting the extent to which people naturally orient their attention and awareness towards ongoing, moment to moment experiences and bring attitudes of acceptance, self-compassion and non-judgment to these” (Crane, et al., 2010. p, 206). Therefore, the present study considers mindfulness as a trait.

There is a large body of interventional research examining levels of mindfulness; however, there are not many studies into “dispositional mindfulness in non–treatment seeking samples” (Murphy et al., 2012). Further, there is “a main gap in mindfulness research, which is a lack of understanding of the mechanisms linking trait mindfulness to health behavior in naturalistic contexts” (Black et al., 2012). Specifically, there are only a few studies into trait or dispositional mindfulness and its relationship with such variables as smoking in (undergraduate) samples in Turkey. Given the increasing importance of mindfulness-based practices in education and for educators (see for detailed events and practices: http://www.mindfuled.org and http://www.mindfulschools.org), the current study contributes to understanding trait mindfulness in a different cultural context from western countries and seeing whether it could be associated with the psychological states of undergraduate students in Turkey.

**Mindfulness Research in Turkey**

Although contemporary interest in mindfulness is on the increase in Turkey (Catak and Ogel, 2010; Ozyesil and Ogel, 2014; Ogel et al., 2014; Celik and Cetin, 2014; Demir, 2015; Korukcu and Kukulu, 2015), it has been quite a new area of research interest in Turkey, so the number of studies is limited with these recent studies, conducted directly on mindfulness and its relationship with
other variables. Some of these studies give the theoretical background of the concept of mindfulness and describe mindfulness-based practices (Catak and Ögel, 2010; Körükçü and Kukulu, 2015), while the others are correlation and intervention studies. Conducted with non-clinical samples of undergraduate students, one correlational study aimed to determine if the university students’ mindfulness and five factor personality traits scores predict their self-compassion levels with the result that mindfulness significantly predicts self-compassion (Ozyesil, 2011); another study investigated the role of mindfulness and self-consciousness on interpersonal conflict resolution approaches (Celik and Cetin, 2014) and found that mindfulness and sub-dimensions of the self-consciousness as internal state awareness, style consciousness, appearance consciousness and social anxiety have significant roles in the positive and constructive conflict resolution processes. Performed with a clinical sample, another study investigated the factors affecting mindfulness and the role of mindfulness on addiction with the conclusion that despite the significant differences between the levels of factors known to have an effect on mindfulness, including metacognition, repression, impulsivity and physical problems, between groups, there was no significant difference of mindfulness level observed in both the addicted and non-addicted groups (Ogel et al., 2014). The other study set out to see if there was a relationship between mindfulness and coping styles (self-confident approach, optimist approach, self-blame approach, submissive approach and social help searching approach) with depression, anxiety and stress symptoms and found that mindfulness predicted depression, anxiety, and stress (Ulev, 2014). The rest two studies are intervention studies using mindfulness-based therapies. One of them aimed to assess the effectiveness of a mindfulness and acceptance based program for reducing the perceived stress and test anxiety of the university students and the program was found to be effective on reducing the perceived stress and test anxiety (Ozyesil and Ogel, 2014). The other study aimed to assess the
effectiveness of a mindfulness-based cognitive therapy program considering depression level of individuals and found that depressive symptoms of participants’ significantly decreased regarding depression scores (Demir, 2015). Consequently, the present study aimed to look at the relationship between trait mindfulness and smoking as well as the possible mediating roles of depression, anxiety and stress in Turkish undergraduate students using path analysis with a dichotomous outcome. This aim helps to bridge the main gap in mindfulness research, concerning how trait mindfulness is associated with psychological disorders as such and smoking in a non-clinical and non-mediating sample.

**Smoking, University Students and Mindfulness**

Smoking is one of the leading causes of health problems and deaths in the world. It was estimated that 1.3 billion people in the world smoked cigarettes or tobacco-related products (Guindon and Boisclair, 2003). According to World Health Organization’s updated fact sheet (July 2015), tobacco kills up to half of its users; it kills around 6 million people each year; more than 5 million of those deaths are the result of direct tobacco use while more than 600 000 are the result of non-smokers being exposed to second-hand smoke; and nearly 80% of the world's 1 billion smokers live in low- and middle-income countries (WHO, 2015). It is also indicated in the report that smokers are in need of help to quit. On the other hand, the great majority of smokers (88%) start smoking before the age of 18, and 99% of them before the age of 26 (US Department of Health and Human Services, 2012). Finally, many of the chronic diseases linked with smoking are more widespread among the people who begin smoking early in life (Peto, 1986).

Current smoking rates in Turkey are appalling. Research has shown that 62.8% of the males over 15 and 24.3% of the females over 15 smoke. 43.6% of the general Turkish population smoke. Moreover, it is interesting to note that the more education people receive, the more likely they are to smoke in Turkey.
26% of those who do not go to school smoke, while 47% of the primary school graduates, 52% of the secondary school graduates, 45% of the high school graduates, and 59% of the university graduates smoke. Categories by profession are: 44% of the medical doctors, 51% of the teachers and 64% of the journalists smoke. A final concern is about the starting age for smoking. 10% of the smokers start after they are 19 and 5% of them start after the age of 24, which implies that the children and young adults are the groups at risk (SSV, 2015). Global Adult Tobacco Survey (GATS) Turkey in 2012 also shows that approximately 11.1 million men and 3.6 million women are smokers in the country. Among all adults, 23.8% are daily smokers and 3.3% are occasional smokers. The daily smoking prevalence rate among men is higher than women (37.3% vs. 10.7%) (GATS, 2014).

Smoking is one of the usual health problems of university students (Basen-Engquist, Edmundson, and Parcel, 1996). University students relate smoking with their psycho-social life experiences (Yazici, 2002). Smoking is common among university students in Turkey and the smoking rate among university students is reported to range from 22.5% to 81.8% (Boyacı et al., 2003; Ceylan, Yanik, and Gencer, 2005; Ozcan, Durukan, and Gulmez, 2012).

Living in a biological and social period of transition, university students are susceptible to smoking due to a number of reasons. Studies have shown that university students smoke because of stress, boredom, loneliness, social influence, curiosity, pretension, problems encountered, sadness, efforts to deal with responsibilities, living away from family, and with the aim of increasing self-esteem and self-confidence, to get rid of boredom, and harm themselves after a traumatic experience (Boyacı et al., 2003; Ceylan, Yanik, and Gencer, 2005; Talay, Kurt, Tug, 2008; Vatan, Ocakoglu, and Irgil, 2009; Ulukoca, Gokgoz, and Karakoc, 2013; Kop, Culduz, Kaspar, and Sencan, 2015).

A study asked university students how they felt after smoking and found that they felt relaxed at varying degrees (Kop, Culduz, Kaspar, and Sencan,
2015), which shows that they use smoking as a way to cope with difficult situations as a coping or avoidance strategy. In the short run, smoking seems to help diminish the level of stress or other psychological problems, but when employed as a coping strategy, addiction may develop and thus detrimental effects on physical and psychological health. Further, research has shown that nicotine dependency is more common among those with depressive or anxiety disorders (Cilli and Kaya, 2003).

Defined as an enhanced attention to and awareness of present moment experience (Brown and Ryan, 2003), mindfulness “is one protective characteristic that may play a role in cigarette smoking behaviour as it appears to be positively associated with affect regulation competencies” (Black et al., 2012, p.418). In addition, social cognitive theory emphasizes that thoughts, feelings and actions are all associated with smoking (Yazici, 2002). Consequently, if a smoker is in the habit of identifying themselves with their thoughts and they believe that smoking helps them to cope in some way, they probably continue to smoke. At this point, mindfulness as a strategy to separate the perceived self and the emerging thoughts may help such regulation. There has been recent research into the roles of mindfulness in the context of nicotine addiction and smoking cessation with preliminary success (Rogojanski, Vettese, and Antony, 2011). They emphasize the role and effectiveness of mindfulness in coping with smoking cravings (Bowen and Marlatt, 2009).

**Depression, Anxiety, and Stress among Undergraduate Students in Turkey**
The youth of university mean future for a country as they will be the decision-makers of the [social and political] affairs in the country (Yazıcı, 2003). University life is a period of transition (Arthur and Hiebert, 1996), usually coincides with late adolescence and early adulthood, in which the young are still searching for values and trying to build their philosophies of life with
severe psychological problems encountered during this phase of life (Gectan, 1997). Mental difficulties start to emerge in this period (Lynch et al., 2011). Specifically, Turkish university students are reported to have such psychological problems during their university education as boredom, pessimism, aversion, speaking anxiety, problems in relationships tension, high level of anxiety, sleeping disorders, emotional indecisiveness, maladaptation, sadness, obsessive and addictive behaviors, and feeling of guilt (Yesilyaprak, 1986; Ozguven, 1990; Guler, 1996).

Depression refers to is an affective disorder which manifests itself as high level of emotional, cognitive and physical difficulties (Blackburn, 1992) and is seen as an affective or anxiety disorder that necessitates psychiatric hospital admission (Hjerl, Karen et al, 2004). It is a state that triggers the sense of losing balance. Further, depression is a neurotic disorder, a pathological situation that includes emotional imbalance (Saricaoglu and Arslan, 2013) caused by such psycho-social factors as financial problems, family and work related problems, losing job or status, losing a loved one, serious physical problems, and humiliation (Tuzcuoglu and Korkmaz, 2001). The typical symptoms of depression are pessimism, despair and hopelessness, feelings of guilt, difficulties in social skills and relationships, and cognitive disorders (Koknel, 1989).

Defined as the indistinctive physical or psychological response to stimuli perceived as a threat commonly as a result of misinterpretation (Simsek, 1999; Akgemci, 2001), stress is one of the major problems of today’s life. It may be caused by a large number of factors which depend on the social, physical and psychological conditions of the person suffering from stress. Further, it brings about such health problems as hearty disease, migraine, ulcers, depression, abstinence, and workplace accidents, burnout, anxiety and sleeping disorders, alcohol and substance use and abuse, smoking, and aggressiveness (Doğan and Eser, 2013).
Depression, stress and anxiety are facts of university life and have negative effects on university students. First of all, depression is one of the major problems of Turkish university students (17-23% of the general university student population experience depression, Ozbek, 1997). It has a significant negative effect on learning, study habits, and attitudes toward studying (Aydın, 1989), decreasing cognitive performance (Yuksel, 1984). Secondly, stress, caused by such sources as academic, social and those concerning adaptation in university settings in Turkey, is another psychological discomfort. Stressed university students may not want to attend classes, form healthy relationships with lecturers, have enough time for hobbies and interests, have helpful guidance on education at university, and have low life satisfaction, may have difficulty in studying, fail the tests, feel uneasy at university, have problems in making friends, feel lonely, experience problems with family, have financial problems, and face the obligation to obey too many rules (Kocacik, 1988; Çağlar, 1990; Bayhan, 2003; Doğan and Eser, 2013). University students refer to such negative feelings as long duration of boredom, anxiety, sadness and tension, feeling depressed and tense and define it as a combined result of the factors in social life which place a lot of pressure on themselves (Deniz and Yılmaz, 2005). Finally, because university students experience physical and psychological changes in their personal developmental processes, they exhibit symptoms of anxiety during their university education (Bozkurt, 2004). Due to uncertainty brought about by the new conditions for the freshmen and uncertainty about the prospective work and life conditions for the seniors, anxiety emerges along with adaptation problems (Deniz and Sümer, 2010). In addition, anxiety might be about something specific like test anxiety, speaking anxiety, social anxiety, or types of phobias. University students level of anxiety is affected by gender, the monthly income of their parents and the levels of their satisfaction with the education they receive (Yılmaz et al., 2014), a grave concern about unemployment after university (unemployment anxiety) (Dursun
It is important to learn how to cope with such negative feelings, emotions, thoughts and behaviors at this stage in life because, with graduation, most of the students start professions, in which they, with more responsibilities of adult life, are likely to face more stressful situations, and they may not be able to spend enough time and effort to learn to deal with such psychological problems as depression, stress and anxiety. However, university students rarely receive preventive psychological health care and are among groups at risk in terms of psychological health (Ozkurkcugil, 1999). As a result, they are vulnerable to such addictions as smoking, drinking and substance use.

**Methodology**

**Participants**
Participants were 171 undergraduate university students, 42 males (25 %) and 129 females (75 %) randomly selected from the student population at the Faculty of Sciences at a big university in Ankara in Spring semester, 2015. They participated in the study by completing the scales online. Informed consent was obtained from all participants prior to completing the scales. The data about gender and smoking behavior were collected with closed-ended questions (gender: 1-female; 2-male; smoking: 0-non-smoker; 1-smoker), and the data for mindfulness and depression, stress and anxiety levels were collected through the following scales.

**Scales**

*Mindful Attention Awareness Scale (MAAS)*
One of the most widely used questionnaires in mindfulness studies is The Mindful Attention Awareness Scale (MAAS) (Chiesa, 2013), developed by Brown and Ryan (2003). It is a 15-item, 6-point Likert scale (1 = almost always to 6 = almost never) designed to assess participants’ frequency of mindfulness over time, specifically the presence or absence of attention to and awareness of
what is happening in the present moment (Brown and Ryan, 2003). The MAAS assesses how mindful individuals are in their everyday lives. Thus, it is a scale for the general adult population that does not require a specialized meditation- or mindfulness-specific vocabulary (Brown and Ryan, 2003). The MAAS can be used in studies with non-meditators (Palmer and Rodger, 2009). Participants’ responses on each item are summed to create a total score. Sample items include “I rush through activities without being really attentive to them” and “I find myself doing things without paying much attention.” A high score indicates a high degree of trait mindfulness. Cronbach alphas for the MAAS range from .80 to .87 across samples (Brown & Ryan, 2003). In the present study, the Turkish version of MASS, translated and adapted by Ozyeşil, Arslan, Kesici and Deniz (2011), was used to collect data for the identification of the mindfulness levels of the participants. They found the Cronbach alpha was .80 in their study. In the present study, the Cronbach alpha was .89.

**Depression Anxiety Stress Scales (DASS)**

Developed by Lovibond and Lovibond (1995), the DASS is a set of three self-report scales, each subscale having 14 items. The 42-item questionnaire is designed to measure three negative emotional states - stress (DASS-S), anxiety (DASS-A) and depression (DASS-D). The Likert scale ranges from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Scores for Depression, Anxiety and Stress are calculated by summing the scores for the relevant items. High score shows that the participant has problems in the area measured. The Depression scale measures dysphoria, hopelessness, devaluation of life, self-deprecation, and lack of interest/involvement, anhedonia, and inertia. The Anxiety scale measures autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress scale is about the levels of chronic non-specific arousal. It measures difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient. As the essential development of the DASS was carried
out with non-clinical samples, it is suitable for screening normal adolescents and adults (Lovibond, 2014). The translation and adaptation of the DASS into Turkish was carried out by Akin and Cetin (2007). Recommended cut-off scores for conventional severity labels are as follows (Lovibond & Lovibond, 1995):

**Table 1. Cut-off Scores for DASS**

<table>
<thead>
<tr>
<th>Labels</th>
<th>Depression</th>
<th>Anxiety</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>0-9</td>
<td>0-7</td>
<td>0-14</td>
</tr>
<tr>
<td>Mild</td>
<td>10-13</td>
<td>8-9</td>
<td>15-18</td>
</tr>
<tr>
<td>Moderate</td>
<td>14-20</td>
<td>10-14</td>
<td>19-25</td>
</tr>
<tr>
<td>Severe</td>
<td>21-27</td>
<td>15-19</td>
<td>26-33</td>
</tr>
<tr>
<td>Extremely Severe</td>
<td>28+</td>
<td>20+</td>
<td>34+</td>
</tr>
</tbody>
</table>

The Cronbach alpha for the whole scale was calculated as .89, and .90, .92, and .92 for depression, anxiety, and stress, respectively. In our study, the Cronbach alpha for the whole scale was calculated as .96, and .93, .89, and .91 for depression, anxiety, and stress, respectively.

**Data Analysis Strategy**

Data analysis was based on a path analysis with a dichotomous outcome to test the mediating effects of depression, stress, and anxiety on smoking. Logistic regression and linear regression analyses were used to obtain path coefficients. The path analysis did not contain gender because t-test results suggested that the measurements did not vary according to gender. The assumptions of normality, linearity, homogeneity of variance required for all the analyses above were statistically tested and it was concluded that all the assumptions were met.

As the outcome (smoking) was binary, STATA for binary mediation was used for mediation analysis. The steps suggested by Baron and Kenny (1986) were used in testing the mediator variables. Mediation is said to exist if the
following criteria are met: (a) the predictor (mindfulness) has a significant direct effect on the outcome (smoking); (b) the predictor (mindfulness) has a significant effect on the mediators (anxiety, depression, stress); (c) the mediator (anxiety) predicts unique variance in the outcome (smoking); and (d) the direct effect from the predictor (mindfulness) to the outcome (smoking) is significantly reduced after controlling for the indirect effect produced by the mediator (anxiety).

Data analysis was carried out using STATA/SE 12.0, and the results were considered to be significant at .05 level.

Results
The present study examined the relationship between trait mindfulness and smoking as well as the mediating roles of depression, anxiety, and stress in this relationship in a sample of undergraduate students in Turkey. It was found that high level of mindfulness was negatively associated with smoking and anxiety partially mediated this effect. It was also found, as predicted, that mindfulness was negatively associated with depression, anxiety, and stress. A 1-point increase in the total mindfulness score would bring about .19-point decrease in depression score, .23-point decrease in stress score, and .23-point decrease in anxiety score.

Table 2. Comparison of the scale scores in terms of gender

<table>
<thead>
<tr>
<th>Variables</th>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>KS</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindfulness</td>
<td>Male</td>
<td>42</td>
<td>67.14</td>
<td>14.73</td>
<td>.10</td>
<td>-.95</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>129</td>
<td>69.00</td>
<td>9.58</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>Male</td>
<td>42</td>
<td>12.95</td>
<td>8.24</td>
<td>.14</td>
<td>1.11</td>
<td>.27</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>129</td>
<td>11.43</td>
<td>7.53</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>Male</td>
<td>42</td>
<td>13.88</td>
<td>8.81</td>
<td>.14</td>
<td>.77</td>
<td>.44</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>129</td>
<td>12.64</td>
<td>9.09</td>
<td>.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>Male</td>
<td>42</td>
<td>17.43</td>
<td>7.92</td>
<td>.14</td>
<td>.33</td>
<td>.74</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>129</td>
<td>16.95</td>
<td>8.35</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

KS: Kolmogorov-Smirnov Test Statistic
Kolmogorov-Smirnov Test results show that the scores in gender groups were normally distributed (p>.05). Mindfulness score for males was 67.14 and 69.00 for females. Though females had a slightly higher score than males, it was not a statistically significant difference (p>.05). Anxiety, depression, and stress scores were not statistically significant according to gender (p>.05). Considering the levels of anxiety, depression and stress, both female and male students had anxiety at a moderate level, depression and stress at mild levels.

Linear and logistic regression procedures were employed to examine the mediating effects of anxiety, depression, and stress between mindfulness and smoking. The steps for mediation with the results of the analysis are illustrated in Table 3.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Outcomes</th>
<th>Predictors</th>
<th>B</th>
<th>Standard B</th>
<th>SE</th>
<th>Test Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Smoking</td>
<td>Mindfulness</td>
<td>-.09</td>
<td>-.50</td>
<td>.21</td>
<td>-4.42a</td>
<td>.00</td>
</tr>
<tr>
<td>2</td>
<td>Anxiety</td>
<td>Mindfulness</td>
<td>-.23</td>
<td>-.37</td>
<td>.04</td>
<td>-5.21b</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Depression</td>
<td>Mindfulness</td>
<td>-.19</td>
<td>-.23</td>
<td>.06</td>
<td>-3.07b</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Stress</td>
<td>Mindfulness</td>
<td>-.23</td>
<td>-.33</td>
<td>.05</td>
<td>-4.64b</td>
<td>.00</td>
</tr>
<tr>
<td>3</td>
<td>Smoking</td>
<td>Mindfulness</td>
<td>-.08</td>
<td>-.37</td>
<td>.02</td>
<td>-3.24a</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Smoking</td>
<td>Anxiety</td>
<td>.20</td>
<td>.57</td>
<td>.06</td>
<td>3.48a</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Smoking</td>
<td>Depression</td>
<td>-.06</td>
<td>-.25</td>
<td>.04</td>
<td>-1.54a</td>
<td>.12</td>
</tr>
<tr>
<td></td>
<td>Smoking</td>
<td>Stress</td>
<td>-.01</td>
<td>-.03</td>
<td>.05</td>
<td>-.20a</td>
<td>.84</td>
</tr>
</tbody>
</table>

* Wald test  ^ t test

It was found that depression and stress had no significant effect on smoking (p>.05). On the other hand, other effects were statistically significant. Firstly, mindfulness was found to be negatively associated with smoking. In other words, there was a negative correlation between mindfulness level and smoking, which shows that any increase in mindfulness level would bring about a decrease in the rate of smoking. Secondly, anxiety was found to be positively
associated with smoking. With increased anxiety, students were likely to smoke more. Thirdly, mindfulness was found to be negatively correlated with depression, anxiety, and stress. Any increase in the level of mindfulness would bring about decreases in the levels of depression, anxiety, and stress. To analyze the mediating effects of anxiety, depression, and stress, path coefficients were calculated and the path coefficients are given in the Standard B column in Table 1. They are illustrated in Figure 1.

![Figure 1. Path coefficients for the effects of mindfulness on anxiety, depression, and stress](image)

The path coefficient between the independent variable (mindfulness) and dichotomous outcome (smoking) was found to be -.50 (p<.01); however, it was reduced to -.37 (p<.01) by the mediating effect of the mediator variable (anxiety). Still, this correlation coefficient (-.37) was statistically significant, suggesting that anxiety was a partial mediator in the correlational relationship between mindfulness and smoking.

**Discussion**

The study aimed to assess the relationship between trait mindfulness and smoking, investigating the mediating effects of depression, anxiety and stress in Turkish undergraduate students, using a path analysis with a dichotomous outcome. It was found that mindfulness had a direct effect on smoking and
anxiety partially mediated this effect. However, depression and stress were found not to have a mediating role between mindfulness and smoking. It was also found that high levels of mindfulness were negatively associated with low levels of depression, stress, and anxiety, as predicted.

Contrary to the literature which suggests depressive symptoms are predictive of heavy smoking (Escobedo et al., 1998), this study found that depression and stress had no significant effect on smoking (p>.05), probably because of the (mild) level of the depression felt by the participants. On the other hand, depression may cause addictions other than smoking as well, which was beyond the scope of this study.

Mindfulness was found to be negatively associated with smoking. In other words, there was a negative correlation between mindfulness level and smoking, which shows that any increase in mindfulness level would bring about a decrease in the rate of smoking. This adds to the current literature on the relationship between trait mindfulness and smoking. Investigating in what way trait mindfulness might influence adolescent cigarette smoking frequency through its effect on depressive affect, anger affect and perceived stress mediators, Black et al. (2012) found that there was a negative correlation between mindfulness and adolescent smoking behaviour and negative affect and perceived stress were the mediators. That is, “trait mindfulness might indirectly reduce smoking frequency by its attenuating effect on negative affect and perceived stress indicators.” In the present study, the mediator was anxiety. Anxiety was found to be positively associated with smoking. With increased anxiety, students were likely to smoke more. Thus, it can be concluded that trait mindfulness could indirectly diminish smoking frequency among university students by its attenuating effect on anxiety.

Mindfulness was found to be negatively correlated with depression, anxiety, and stress, as predicted, because it is theoretically and clinically shown to work to reduce depression (Brown and Ryan, 2003; Williams et al., 2007;
Cash and Whittingham, 2010), social anxiety (Brown & Ryan, 2003; Rasmussen and Pidgeon, 2011), stress (Palmer and Rodger, 2009; Chiesa, and Serretti, 2009; Williams and Penman, 2011; Greeson, Toohey, and Pearce, 2015), negative emotion (Miners, 2008), and nicotine dependency (Vidrine et al., 2009). In this respect, the present study confirms the negative correlational relationship between mindfulness and depression, anxiety, and stress. What is new about this result is that this is the case for a sample of non-treatment seeking Turkish university students. This is of great significance for the prospective mindfulness practices, both formal and informal, in Turkey as it emphasizes the role of mindfulness and anxiety in relation to smoking in this type of samples.

This study is the first to suggest anxiety was a partial mediator in the correlational relationship between trait mindfulness and smoking. Considering the transitional nature of the period the university students go through, their level of anxiety (moderate) was understandably higher than their levels of depression (mild) and stress (mild). University students may not have enough experience to deal with the responsibilities and situations they newly encounter and thus may not have developed effective psychological strategies to manage difficult situations, all of which bring about uncertainty that triggers anxiety. Through pretension and due to the effects of the social atmosphere (e.g., friends smoking and looking relaxed), they find smoking as a way to deal with the tension they psychologically feel. In other words, assuming that they have not been able to develop effective coping strategies to deal with the uncertainty and other factors causing them to feel anxious, they resort to smoking, which might be giving them a sense of relaxation. In addition, it is known that “individuals who are characteristically more anxiety sensitive may tend toward more suppression and avoidance-oriented coping strategies when dealing with emotional or physical distress” (Carmody et al., 2007). Therefore, findings of the current study imply that heightening the level of mindfulness among
university students may indirectly reduce cigarette smoking through lowering the level of anxiety. Moreover, smokers may be smoking due to positive or negative affective states. Thus, learning to cope with thoughts in such states may better influence the control over smoking, especially when they feel anxious. As in mindfulness “not to change the content of thoughts … but to develop a different, nonjudgmental attitude or relationship to thoughts, feelings, and sensations as they occur” (Teasdale, Segal, and Williams, 1995) is encouraged, heightening the level of mindfulness seem to offer a powerful tool for managing the thoughts and smoking desire when anxious. A watch-the-thoughts-and-let-the-desire-to-smoke-go-away approach could be adopted through practices that enhance mindfulness. It was suggested that among undergraduate students mindfulness was associated with a lower frequency of negative automatic thoughts and to an enhanced ability to let go of those thoughts (Frewen et al. 2008). As a result, the thoughts that lead to a state of anxiety may not result in the same effect when the mindfulness level is high as when it is low and the rate of smoking could be reduced accordingly.

This study has demonstrated the link between mindfulness and smoking, emphasizing the role of anxiety. “Participation in mindfulness training can aid in reducing students’ state and trait anxiety and reducing overall symptoms of psychological distress, including depression, while increasing empathy and experiences of spirituality” (Shapiro et al., 1998). It is suggested, therefore, that cessation programs designed for university students in Turkey should consider the positive effects of increasing mindfulness and the negative effect of anxiety on smoking.

Students with lower levels of mindfulness may be more likely to experience problems that can harm their psychological well-being. Further research is needed to firmly establish such a relationship in Turkish university students. This study is among the first attempts in Turkey to identify the relationship. In addition, interventional studies may contribute to the
exploration of the nature of the relationship. However, the design and the nature of the mindfulness practices need to be well-adapted to the Turkish cultural content and religion, and context for the effectiveness of the programs. The individual should be helped to develop the effective ways in their own context because there seems to be no prescription that could fit everybody in coping with stress. (Doğan and Eser, 2013). This is the same for anxiety and smoking. Furthermore, “little is yet known regarding for whom and under what conditions mindfulness training is most effective, but there is some preliminary evidence to suggest that its effectiveness may vary as a function of individual differences” (Keng et al., 2011, p. 1051). Findings of this study suggest that incorporating mindfulness training into programs for university students may be beneficial, as results indicate that trait mindfulness is related to lower levels of depression, anxiety and stress among Turkish university students. Practices shown to cause substantial increase in mindfulness level could be promoted, so that university students could choose among them the most appropriate for their convenience. If students’ ability to deal with the day-to-day stressful situations improves, their level of mindfulness may go up, which may lead to more skillful attitudes toward anxiety in return.

Several limitations should be noted. The homogeneity of the sample limits the generalizability of these results to diverse university populations. The distinctiveness of the sample in the current study results in an inability to generalize the findings outside of a university student population.

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