

**THE MEDIATING ROLE OF METACOGNITION ON THE RELATIONSHIP
AMONG DEPRESSION/ANXIETY/ NEGATIVE IMPACT OF LIFE
EXPERIENCES AND SMOKING DEPENDENCE**

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ABSTRACT

THE MEDIATING ROLE OF METACOGNITION ON THE RELATIONSHIP AMONG DEPRESSION/ANXIETY/NEGATIVE IMPACT OF LIFE EXPERIENCES AND SMOKING DEPENDENCE

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The aim of the present study was to investigate the role of metacognition as a mediator of the relationship between smoking dependence and depression/anxiety/negative impact of life experiences. A sample of 202 adult smokers completed the following questionnaires: Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Life Experiences Survey (LES), Meta-Cognitions Questionnaire-30 (MCQ-30), and Fagerström Test of Nicotine Dependence (FTND). The path analyses were used to test a mediation model in which depression, anxiety, or negative impact of life experiences was the predictor of metacognition, which in turn was a predictor of smoking dependence. Twelve mediation models were tested using total scores of metacognition, and its factors including positive beliefs about

worry, negative beliefs about worry, lack of cognitive confidence, beliefs about need to control thoughts, and cognitive self-consciousness as mediator variables. The models included depression, anxiety, or negative impact of life experiences as independent variables; and smoking dependence as dependent variable. The results suggested that neither total metacognition score nor the individual metacognitive dimensions did mediate the relationship between smoking dependence and depression/anxiety/negative impact of life experiences. The results and limitations, as well as the implications of these findings, were discussed by referring to the relevant literature.

Keywords: Smoking Dependence, Depression, Anxiety, Negative Impact of Life Experiences, Metacognition

ÖZ

DEPRESYON/ KAYGI/YAŞAM DENEYİMLERİNİN OLUMSUZ ETKİSİ İLE
SİGARA BAĞIMLILIĞI ARASINDAKİ İLİŞKİDE
ÜSTBİLİŞLERİN ARACI ROLÜ

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Bu araştırmanın temel amacı depresyon, kaygı veya yaşam deneyimlerinin olumsuz etkisi ile sigara bağımlılığı arasındaki ilişkiyi ve bu ilişkide üstbilişlerin oynadığı aracı rolü incelemektir. Çalışmaya katılan 202 yetişkin sigara içen birey, Beck Depresyon Envanteri, Beck Anksiyete Envanteri, Yaşam Deneyimleri Anketi, Üstbilişler Ölçeği-30 ve Fagerström Nikotin Bağımlılığı Ölçeğini doldurmuştur. Depresyon, kaygı veya yaşam deneyimlerinin olumsuz etkilerinin üstbilişleri, üstbilişlerin ise sigara bağımlılığını yordadığı düşünülen aracılık modelini test etmek için path analizi kullanılmıştır. Üstbilişler ölçeğinin toplam puanı ile endişe hakkındaki olumlu inançlar, endişe hakkındaki olumsuz inançlar, bilişsel güvensizlik, düşünceleri kontrol ihtiyacı ve bilişsel farkındalık alt faktörleri aracı değişkenler olmak üzere toplam on iki model test edilmiştir. Modeller, bağımsız

değişkenler olarak depresyon, kaygı veya yaşam deneyimlerinin olumsuz etkisini; bağımlı değişken olarak da sigara bağımlılığını içermektedir. Sonuçlara göre ne toplam üstbiliş puanları ne de üstbiliş boyutları depresyon, kaygı veya yaşam deneyimlerinin olumsuz etkisi ile sigara bağımlılığı arasındaki ilişkiye aracılık etmektedir. Araştırma sonuçları, sınırlılıkları ve doğurguları yönünden ilgili literatür bilgisi ışığında tartışılmıştır.

Anahtar Kelimeler: Sigara Bağımlılığı, Depresyon, Kaygı, Yaşam Deneyimlerinin Olumsuz Etkisi, Üstbiliş

To my family

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CHAPTER 1

INTRODUCTION

1.1. Smoking behavior

1.1.1. Smoking prevalence and its negative consequences

Smoking is one of the most important and preventable public health issues due to the negative impact of various substances in tobacco and of tobacco smoke on human health. Smoking is a proven risk for lung and other cancers, coronary heart disease, stroke, chronic respiratory disease, and other diseases (USDHHS, 2000). Moreover, smoking is the primary causal factor for at least 30% of all cancer deaths, for nearly 80% of deaths from chronic obstructive pulmonary disease, and for early cardiovascular disease and deaths. Furthermore, smoking is associated with premature death from chronic diseases, economic losses for society, and a substantial burden on the United States health-care system (CDC, 2004). Currently, smoking continues to kill 5 million of people worldwide in each year and it is estimated that this number will be rising (WHO, 2009)

The prevalence of smoking is much higher in low- and middle-income countries, and will go on to increase rapidly in these countries in the next decades (WHO, 2009). The Center for Disease Control and Prevention (CDC, 2008) reported that 19.8% (33.8 million) of all adults were current smokers in 2007, while 77.8% smoked every day, and 22.2% smoked some days. Smoking rate was 22.3% for males and 17.4% for females.

Almost 110.000 people die due to smoking-related diseases each year in Turkey and it is expected to rise to 240.000 per year by 2030 (Bilir, Çakır, Dağlı, Ergüder, & Önder, 2009). The current literature shows that smoking is the most important health problem and preventable cause of death in Turkey with 25% of deaths in each year. It was reported that Turkey was in the top10 tobacco-consuming countries in the world in 2001 with consuming 2% of tobacco reserves all over the world and 14% in Europe (WHO, 2008).

According to one of the first nationwide figures(1988, cited in Aşut, 1993, p.48) that was the most representative nationwide study conducted on adults aged 15 years and over in 1988, adult smoking prevalence was 62.8% for male, 24.3% for female, and 43.6% for both genders. Additionally, 64% of smokers reported smoking 20 cigarettes or more per day and 59% claimed to have at least one quit attempt in the past. The National Household Survey of 2003 (cited in Bilir et al., 2009, p.19) indicated that 33.8% of adults aged 18 years and over smoked daily. In addition, smoking rate was 52.9% for male and 19.5% for female. The study carried out by General Directorate of Family Research Organization and the Turkish Statistical Institution in 2006 (cited in Bilir et al., 2009, p.19) revealed that 33.4% of adults aged 18 years and over smoked daily, and males smoke significantly more (50.6%) than females (33.4%). Global Adult Tobacco Survey (GATS) is a standardized adult tobacco survey that collects data from people aged 15 years and over in order to determine smoking prevalence and patterns (WHO, 2009; TÜİK, 2009). According to GATS, 31.3% of adults aged 15 years and older (47.9% of males and 15.2% of females) are current smokers in Turkey. Smoking is more common among people aged between 25-44 years and 40% of this age group reported current smoking. Smoking rate was 33% among people living in urban areas

and 27.2% among those living in rural areas. Smoking prevalence rate in Turkey is decreasing in general, although it is growing particularly among females (Bilir et al., 2009).

Due to the high prevalence rate of smoking and the potential health-related and other risks based on smoking, it is important to develop a more sufficient understanding of smoking behaviour, including the factors playing a role on the mechanisms of onset, development, maintenance, and cessation of smoking. Current literature suggests that smoking is a complex behavior influenced by many factors and with many aspects. Although much research attention has been given to understand factors that influence smoking, the reasons why people smoke are still not known properly (Kassel, Stroud, & Paranis, 2003).

1.1.2. Theories of smoking

Self-medication model of substance use (Khantzian, 1997) deals with emotional and psychological dimensions of addiction. This model emphasizes that drug abuse may help user to reduce painful feelings and to escape or avoid emotional stress or negative feelings. Khantzian (1997) indicated that nicotine was used to alleviate or remedy subjective states of distress. In other words, people smoke so as to assuage their negative feelings. Through cigarette use, smokers try to change their negative moods into positive ones. In the literature, there is empirical evidence supporting this hypothesis (e.g. Dierker, Avenevoli, Stolar, & Merikangas, 2002).

Likewise, stress-coping model (Wills & Shiffman, 1985) highlights that substance abuse may act as a coping response to stress. According to these authors, coping mechanisms employed by individuals under stress, in fact, are used in order to

regulate the independent dimensions of negative and positive affect. Wills and Shiffman (1985) emphasized that substance use, particularly tobacco and alcohol use, appears to not only increase positive affect but also reduce negative affect. A number of implications emerge from this stress-coping model: a) in the absence of effective coping repertoire, people are believed to be at heightened risk to engage in substance use behavior; b) affective distress should represent a risk factor in the development of substance use; c) individual's motives for using substance should be maintained by the reinforcing consequences related with substance use behavior.

If we evaluate these two perspectives together, both self-medication (Khantzian, 1997) and stress-coping (Wills & Shiffman, 1985) models of substance abuse propose that substance use is developed and maintained, at least in some degree, by escape or avoidance mechanisms from negative emotional state. That is, according to these models, substance use is believed to function as a coping mechanism, thereby, it facilitates general mood regulation.

1.1.3. Risk factors for smoking

Given the high prevalence of smoking and its negative consequences, numerous studies have sought to clarify the risk factors that are related to smoking. In the relevant literature, a variety of predictors including gender, age, race, and SES have been determined as crucial factors for the development and maintenance of smoking and nicotine dependence.

Gender is a variable that has been frequently studied as a risk factor for smoking. A review of the literature revealed that the effect of gender on smoking is controversial. In some studies, smoking dependence was reported as frequent in women

as in men (e.g., Breslau, 1995). On the other hand, some other studies revealed that the prevalence of regular smoking was higher in men than women (e.g., Covey & Tam, 1990; Park, 2009; Brook et al., 2005; Murphy, Horton, Monson, Laird, Sobol, and Leighton, 2003). In Park's study (2009), being male was found to be a risk factor for smoking in Korea, and this gender difference was attributed to Korean people's more accepting attitudes toward male smoking.

Age has also been indicated as among the important risk factors associated with smoking. In Lekka, Lee, Argyriou, Beratis, and Park's study (2007), younger age was found to be a significant predictor of smoking in a forensic population. Similarly, Murphy et al. (2003) showed that younger people smoke more than older people. On the contrary, Brook, Morojele, Brook, and Rosen (2005) reported that older adolescents smoked more frequently than younger adolescents. Therefore, young adult individuals smoke more than older individuals and adolescent.

In the literature, the effect of race in combination with age was also reported as a risk factor for smoking (e.g. Breslau, 1995; Breslau, Kilbey, & Andreski, 1994; Brook et al., 2005; Grunau, Ratner, Hossain, & Johnson, in press). Breslau (1995) found that smoking daily for a month or more was more frequent in white young adults than in blacks, while the life time prevalence of smoking dependence in White young adult smokers was higher than in black smokers. In the same study, it was also demonstrated that smoking is more common among blacks than whites in older adults. Central for Disease Control (CDC; 1990, 1992) reported that US black adults have a higher smoking prevalence and a lower quit rate than US white adults. However, the typology of smoking differs according to race and age: US black adults smoke significantly fewer cigarettes and are more likely to smoke high-nicotine mentholated cigarettes than US

white adults, while the first initiation age for smoking among black adolescents is later than that of among white adolescents. To summarize, US blacks have the lowest smoking prevalence among the youth of all ethnic groups, but one of the highest smoking prevalence rates among the adults of all ethnic groups (CDC, 1992). Goodman and Capitman (2000) conducted a prospective study with adolescent blacks and white Hispanics. Results from this study indicated that being black is a protective factor from becoming a heavy smoker. On the other hand, CDC (2008) reported that smoking prevalence among whites and blacks was significantly higher than among Hispanics. In addition, Mackey, McKinney, and Tavakoli (2008) found a significant association between being white and smoking in college women.

In the relevant literature, it was also underlined that low income increases the risk of smoking. It was reported that perceived income inequality is associated with smoking (Siahpush et al., 2006). Jun and Acevedo-Garcia (2007) did also find that parenting increases the risk of smoking among single women in the lowest income quartile.

A longitudinal study focusing on race, pubertal stage, and SES in a single design revealed that these factors were important predictors of initiation of smoking (Harrell et al., 1998). Specifically, it was found that white children with low SES started smoking earlier than African-American children and than children with high SES. Furthermore, results from this study pointed that boys have higher prevalence of experimental smoking than girls, and children who are at a higher pubertal stage than their peers are more likely to experience smoking.

Education level has also been reported as one of the associates of smoking and nicotine dependence. In Breslau's study (1995), it was found that smoking and smoking

dependence rates in individuals who graduated from college were about 50 percent lower than individuals with less than college education. Supporting the finding of Breslau's study, Klonoff and Landrine (2001) did also report that individuals who dropped-out from high school were four times more likely to be a smoker than individuals completed the college education in a Black adult population. In addition, Cho, Khang, Jun, and Kawchi (2008) revealed that smoking is negatively associated with the education level and it is higher in manual or blue-collar workers for both genders. In contrast to other countries, smoking is more common among educated people in Turkey (Bilir et al., 2009).

Marital status has also been identified as a factor associated with smoking in the literature. Breslau, Kilbey, and Andreski (1994) showed that the rate of smoking is the highest in people who were separated or divorced. Cho et al. (2008) found that the smoking rate is higher in unmarried compared to married people while the effect of marital status on the smoking rate was superior for women than men. In addition, it was demonstrated that smoking rate in divorced people is greater than that of reported in widowed people. Another similar finding revealed that single women have greater risk of smoking than married women (Jun & Acevedo-Garcia, 2007).

Apart from these demographic risk factors, some other context variables such as parent, sibling, and peer smoking, family and school problems have also been determined as contributory to the development of smoking and nicotine dependence. In the relevant literature, parent smoking (Grunau et al., in press; Patton et al., 1996; Vogel, Hurford, Smith, & Cole, 2003; Koval et al., 2000), sibling smoking (Grunau et al., in press; Koval et al., 2000), peer smoking (Covey & Tam, 1990; Goodman & Capitman, 2000; Grunau et al., in press; Patton et al., 1998, Brook et al., 2005; Koval,

Pederson, Mills, McGrady, & Carvajal, 2000), parental separation or living in a single-parent home (Covey & Tam, 1990; Botvin, Epstein, Schinke, & Diaz, 1994), poor academic performance (Goodman & Capitman, 2000), and less physical activity (Tomori, Zalar, Plesnicar, Zihlerl, & Stergar, 2001) have been reported as factors associated with smoking.

The risk factors of smoking in adolescence may be different from the risk factors in young adulthood. A longitudinal study suggested that smoking is related with depression, dysthymia, bipolar disorder, parental smoking, extraverted personality, discipline problems, and rebelliousness in adolescence. However, smoking was linked with only depression and dysthymia in adulthood (Ajdacic-Gross et al.,2009).

To summarize, a pileup of variables including demographic characteristics (e.g., gender, age, race, SES, marital status, etc.) and some other relevant factors (e.g., parent, sibling, and peer smoking, family and school problems, etc.) have been repeatedly suggested as among the important risk factors for smoking and nicotine dependence. On the other hand, a review of the relevant literature as presented above indicates that studies with regard to most of these factors have yielded an equivocal set of findings. For this reason, variables examined in the literature can only be viewed as potential risk factors for the development and maintenance of smoking behavior, and more research is required to attain more conclusive results.

1.2. The relationship between psychological disorders and smoking

Remarkable associations between smoking dependence and many psychological disorders have been reported in the literature. In recent years, smoking and nicotine dependence have been found as associated with problems as diverse as panic attacks

(Amering et al., 1999; Goodwin & Hamilton, 2002), depression (Breslau, 1995; Breslau, Kilbey, Andreski, 1991; Breslau, Kilbey, Andreski, 1994; Breslau, Novak, & Kessler, 2003; Dierker & Donny, 2008; Rohde, Kahler, Lewinsohn, & Brown, 2004b), anxiety (Breslau, 1995; Breslau et al., 1991, 1994; Breslau et al., 2004), alcohol use and alcohol use disorders (Breslau, 1995; Goodman & Capitman, 2000; Dierker et al., 2002; Dierker & Donny, 2008; Mackey et al., 2008; Patton et al., 1998; Reed et al., 2007; Rohde et al., 2004b), other substance use disorders (Breslau, 1995; Breslau et al., 1991, 1994; Breslau et al., 2004; Rohde et al., 2004b), early conduct problems (Breslau, 1995), specific phobia (Dierker & Donny, 2008), schizophrenia (McEvoy & Lindgren, 1996; Üçok, Polat, Bozkurt & Meteris, 2004), and bipolar disorder (Üçok, Polat, Bozkurt & Meteris, 2004).

Bush et al. (2007) was conducted a study to evaluate the association between mental health indicators, and vulnerability to smoking or current smoking among youth with asthma. It was reported that smoking was more widespread among youths with mental disorder, and anxiety/mood disorders were present in 37.8% of smokers, 19.8% of susceptible nonsmokers and 14.5% of nonsmokers.

1.2.1. Casual and noncasual models

Approaches focusing on the direction of the relationship between smoking and psychological disorders are known as casual models. A casual model might suggest that a) psychological disorders are the risk factors for the development of smoking and decrease the potential for quitting, and b) smoking raises the risk for the subsequent onset of psychological disorders (Breslau, 1995). Although there are numerous studies focusing on the association between smoking and psychological disorders, these studies

have produced inconsistent results in terms of the causal direction of this relationship. While some of these studies have found that smoking leads to psychological disorders (e.g. Breslau, Schultz, Johnson, Peterson, & Davis, 2005), some others have reported that presence of a psychological disorder functions as a vulnerability factor to smoking (e.g. Dierker & Donny, 2008; Lenz, 2004; Kendler et al., 1993; Rohde et al., 2004b). To illustrate, Cuijpers, Smit, ten Have, and de Graaf (2007) revealed that smoking is related to an increased risk of the first incidence of several psychological disorders such as generalized anxiety disorder, dysthymia, and alcohol use. Besides, they found evidence that having a psychological disorder augmented the risk of smoking onset, at least for generalized anxiety disorder (GAD) or drug abuse. Taking into account these studies supporting one of these viewpoints, it might be stated that the nature of causality and direction of the relationship between smoking and psychological disorders is still unclear.

As a solution to this problem, some studies among adolescents suggest an alternative perspective indicating a bidirectional association between smoking and depression (Audrain-McGovern, Rodriguez, & Kassel, 2009; Windle & Windle, 2001). Bidirectional model proposes that there is a reciprocal relationship between smoking and psychological disorders.

On the other hand, approaches emphasizing shared environmental or genetic components as predisposing factors to both smoking and psychological disorders are called noncasual models. Within the framework of noncasual models, genetic factors, social difficulties, stressful life events, and several personality characteristics such as neuroticism are examined as common factors contributing to the development of both

smoking and psychological disorders (Dierker et al., 2002; Kendler et al., 1993; Jorm, 1999; Koval et al., 2000).

1.2.2. Negative Affect and Smoking

1.2.2.1. Depression

A number of cross-sectional and longitudinal studies have demonstrated a strong association between smoking and depression. Smokers reported greater depressed mood and more depressive symptoms than nonsmokers on different depression inventories (Anda et al., 1990; Covey & Tam, 1990; Frerichs, Aneshensel, Clark, & Yokopenic, 1981; Haukkala, Uutela, Vartiainen, Mcalister, & Knekt, 2000; Jorm et al., 1999; Lam et al., 2005; Martini, Wagner, & Anthony, 2002; Perez-Stable, Marin, Marin, & Katz, 1990; Pederson & von Soest, 2009; Ridner, Staten, & Danner, 2005; Vogel et al., 2003). Likewise, smokers have been identified as having higher rates of clinical depression than nonsmokers (Breslau, 1995; Breslau et al., 1991, 1994; Breslau et al. 2003; Dierker & Donny, 2008; Grunau et al., in press; Khaled, Bulloch, Exner, & Patten, 2009; Rohde et.al., 2004b; Wiesbeck, Kuhl, Yaldizli, & Wurst, 2008). Along with unemployment and having a medical condition, smoking was determined as one of the strongest factors that correlated with clinical depression (Wilhelm, Mitchell, Slade, Brownhill, & Andrews, 2003). Moreover, depressed mood was found to be a fence for quitting smoking and depressed smokers were less likely to quit smoking than non-depressed smokers (Anda et al., 1990; Burgess et al., 2002; Hall, Munoz, Reus, & Sees, 1993; McClave, Dube, Strine, Kroenke, Caraballo, & Mokdad, 2009). Furthermore, it was reported that when depressed smokers try to quit smoking, they had a greater possibility of experiencing difficulties in smoking cessation as compared to non-depressed smokers

and depression was found to be a significant variable in smoking relapse (Hall et al., 1993; Murphy et al., 2003; Zvolensky, Stewart, Vujanovic, Gavric, & Steeves, 2009; Wilhelm, Arnold, Niven, & Richmond, 2004). Supportingly, depression was reported as associated with lower smoking cessation self-efficacy (Haukkala et al., 2000). After smoking cessation, an increase in both incidence of clinical depression and the level of depressive mood was also reported (Tsoh et al., 2000).

Several studies have concluded that depressive symptoms tend to be observed before the onset of smoking initiation and experience (e.g. Prinstein & La Greca, 2009), while some other studies have demonstrated that it is smoking that leads to an escalation in depressive symptomatology (Breslau et al., 1994).

A longitudinal study, which was conducted on South Korean adolescents, revealed that after controlling for the other factors (characteristics related to demographics, family, school, friends, and individuals), depression is a significant predictor of smoking, however irregular or continued smoking did not predict depression one year later (Park, 2009). Prinstein and La Greca (2009) found that childhood depressive symptoms predicted adolescent smoking even after controlling for the stability of depressive symptoms over development and the concurrent association between adolescent depressive symptoms and cigarette use. Repetto, Caldwell, and Zimmerman (2005) have also argued that depressive symptoms predicted later smoking. Their longitudinal study revealed that depressive symptoms tended to diminish over time, while smoking tended to rise. Similarly, Sihlova et al. (2008) performed a prospective longitudinal study on twins. Their results indicated that early-onset depressive disorders predict smoking and substance use, and this association seemed to be independent of shared family influences. It can be concluded from these findings that

depression is an antecedent of smoking but not vice versa. Such research findings did also support the idea that smoking may be used as a tactic for self-medication of negative affect and distress.

Pesa, Cowdery, Wang, and Fu (1997) focused on gender differences on the relationship between smoking and depression among adolescents. In their study, smokers of both gender had feelings of depression more commonly than nonsmokers. On the other hand, they proposed that the relationship between depression and smoking may be more evident for females, since smoker females were more likely to have all feelings of depression (unhappy, sad, depressed, worried, nervous, or tense) than nonsmoker females, while there was a significant difference between smoker and nonsmoker males on only one feeling related to depression (having trouble sleeping). Jarvelaid (2004) did also report that female smokers possess higher risk of having suicidal thoughts than nonsmokers, while smoking is a sign of risk for depression, distress, and risk-taking health-damaging behavior for both females and males.

A prospective study on adolescents clarified that current cigarette smoking is a predictor of developing depressive symptoms for the nondepressed population, while baseline depressive symptoms are not predictive of heavy smoking when controlling for the other determinant factors related to smoking such as self esteem, peer smoking, delinquency, alcohol and other drug use, reported self-rated health, and grade point average (Goodman & Capitman, 2000). This study suggested that depression is not an antecedent of heavy smoking among teens. Nonetheless, current smoking was a strong determinant of the increase in depressive symptomatology. It was also found that parent report of whether the teen has a bad temper was a predictor of becoming a moderate to heavy smoker. Parental report of bad temper may be an alternative measure of

emotional states and it could be a sign of anxiety or unrecognized depression. To summarize, these findings proposed that smoking predicts the subsequent development of depressive symptoms.

Breslau and her colleagues (2004) studied the role of psychological disorders in predicting the subsequent onset of daily smoking and smokers' progression to nicotine dependence. They found that major depression, which is in its active stage, predicted augmented risk for the onset of daily smoking and for the development of nicotine dependence. On the other hand, previous studies propose that smoking may exacerbate depressive symptoms (Breslau et al., 1991; Breslau et al., 1998). These findings are consistent with the theories proposing that nicotine suppresses neurochemical systems linked with positive affect or emotion regulation, and this mechanism may cause depressive symptoms (Pomerleau & Pomerleau, 1984; cited in Prinstein & La Greca, 2009).

Lekka et al. (2007) investigated the relationship between smoking and mental health in a male, adult forensic population. In this study, it was found that higher depression scores were positively associated with the amount of daily smoking. Park et al. (2009) suggested that there is a relationship between smoking and postpartum depressive symptoms, and postpartum relapse. They reported that women who are smoking after birth have a greater score of depressive symptoms relative to women who are nonsmokers, and depressive symptoms are significantly related to the risk of relapse. Ludman et al. (2000) found that women who quit smoking early in pregnancy have lower level of depression, thus depressive symptoms have a significant association with smoking cessation.

Murphy et al. (2003) studied on data collected from interviews with adult population samples in 1952, 1970, and 1992. They investigated the prevalence and incidence of depression over a 40-year period, smoking and its link with depression. This study revealed that a smoker is three times more likely to be depressed than a non-smoker in 1992, although the links between smoking and depression are non-significant in 1952 and 1970. Additionally, subjects who became depressed were more likely to begin smoking, to continue smoking, not to quit than subjects who never became depressed. Besides, the findings of this study proposed that subjects who became depressed were more involved with nicotine than subjects who were never depressed.

In their longitudinal study conducted on adolescents of 14-18 years old, Audrain-McGovern and her colleagues (2009) found evidence for a bidirectional relationship between adolescent smoking and depression, and for the mediator role of the peer smoking on this relationship. According to their results, depressive symptoms at middle adolescence predicted smoking progression across middle to late adolescence. Higher levels of depressive symptoms predicted an increase in the number of smoking peers, which in turn, predicted smoking progression. Furthermore, a significant indirect effect revealed that smoking progression predicts a decrease in depressive symptomatology from middle to late adolescence, while higher smoking at the middle adolescence predicts a decrease in the number of smoking peers across time, which predicts a decrease in depressive symptoms from middle adolescence to late adolescence. Windle and Windle (2001) found evidence to support a reciprocal relationship between smoking behavior and depression after controlling for the relevant confounding factors such as parental smoking, social support, peer substance use, self substance use, and activity level.

Providing support to the noncasual models, Kendler and colleagues (1993) found that both smoking and major depression shared the same genetic liability, which is a common factor contributing to both depression and smoking. Sullivan and Kendler (1999) claimed that the data from family, adoption, and twin studies support a significant genetic influence on the initiation and maintenance of smoking. Dierker et al. (2002) evaluated familial mechanism of comorbidity between depression and smoking. The results of this study indicated a shared etiology between dysthymia and heavy smoking, while major and double depression did not demonstrate a shared liability with heavy smoking. Consistent with the noncasual models, Roy, Parker, Mitchell, and Wilhelm (2001) have also supported the idea that both smoking and depression share similar early deprivational factors such as personality domains, physical violence in childhood, long-term anxiolytic and illicit drug use, rather than the idea that smoking causes depression or vice versa.

In a study examining the relationship between depression and smoking cessation, it was found that smokers with a history of major depression were seven times more probable to develop a new episode of major depression after they quit smoking (Glassman, Covey, Stetner, & Rivelli, 2001). In a longitudinal study, which was conducted on adult smokers without current depression and other psychiatric disorders based on DSM-IV, it was found that smokers with high scores on Beck Depression Inventory (BDI) were less likely to quit than those who got low scores on BDI (Berlin & Covey, 2006). In other words, high scores on BDI, even for smokers who did not meet a current diagnosis of depression, predicted unsuccessful attempt to quit. It was also reported that personality traits and coping skills do not mediate the relationship between depression scores on BDI and smoking.

1.2.2.2. Anxiety

Several cross-sectional and longitudinal studies, which have been conducted to examine the relationship between anxiety and the onset of smoking, have produced inconsistent results. In general, cross-sectional studies revealed that adolescents experiencing anxiety symptoms had an increased risk for the onset of smoking as compared to asymptomatic adolescents (Patton et al., 1996; Dudas, Hans, & Barabas, 2005), and that adolescents and young adults with social fears were at higher risk for the development of nicotine dependence (Sonntag, Wittchen, Hofler, Kessler, & Stein, 2000).

Longitudinal studies have yielded more equivocal set of findings. Some studies have revealed that anxiety disorders did not predict the onset of smoking but smoking was reported to be associated with the onset of anxiety disorders during adolescence and adulthood. To illustrate, Johnson et al. (2000) found that heavy smoking increased the risk for development of anxiety disorders including panic disorder, agoraphobia, and GAD in early adulthood after controlling for age, gender, difficult childhood temperament, alcohol and drug use, depressive disorder during adolescence, and parental smoking, education level, and psychopathology. On the other hand, anxiety disorders during adolescence were not found to be significantly associated with smoking during early adulthood. Similarly, Rohde et al. (2004b) stated that the presence of any anxiety disorder does not predict later progression to daily smoking. Breslau and Klein (1999) did also show that smoking increased the risk for the first onset of panic attacks and panic disorder.

In contrast to these findings, Breslau and her colleagues (2004) reported that anxiety disorders, which are in their active stage, predicted augmented risk for the onset of daily smoking and for the development of nicotine dependence. In addition, they determined that current but not past smoking is significantly associated with the onset of panic disorder and agoraphobia; and the risk for developing panic disorder or agoraphobia decreased over time in past smokers. Patton et al. (1998) reported that anxiety was a strong predictor of smoking initiation and transition to daily smoking. Adolescents with high anxiety were also twice as likely to be smokers after controlling for academic level, sex, alcohol use, and parental smoking (Patton et al., 1996). If we consider these findings together, it can be asserted that the directionality of the relationship between anxiety and smoking initiation is still unclear.

In the literature, some studies demonstrated a relationship between anxiety and the severity of smoking status (e.g. Amering et al., 1999; Breslau, Kilbey, Andrews, 1991; Breslau et al., 1994; Breslau et al., 2004; Grunau et al., in press), although this link has not received as much attention as the association between smoking and depression. Breslau et al. (1991) found that nicotine dependence is associated with anxiety disorders and comorbidity levels depended on severity of nicotine dependence as defined by DSM-III-R (APA, 1987) diagnostic criteria. It was reported that the lifetime prevalence for any anxiety disorders in smokers with mild nicotine dependence was 36.8%, and the lifetime prevalence for those with moderate nicotine dependence was 62.3%. The results of this study revealed that the association between anxiety and smoking was significantly stronger in persons with moderate nicotine dependence than in persons with mild nicotine dependence. Furthermore, persons who met criteria for nicotine dependence had significantly higher rates of anxiety disorders compared to

nonsmokers and nondependent smokers after controlling for age and other drug dependencies. In Pederson and von Soest's longitudinal study (2009), which was carried out throughout the transition period from adolescence to young adulthood, it was reported that smoking dependence was associated with anxiety symptoms.

Some studies have reported that smokers with anxiety disorders had higher anxiety symptoms than nonsmokers (e.g. Morissette, Brown, Kamholz, & Gulliver, 2006). McCabe et al. (2004) compared smoking behaviors across three anxiety disorder groups: panic disorder with or without agoraphobia (PD), obsessive compulsive disorder (OCD), and social phobia (SP). Results revealed that a greater proportion of the PD group (40.4%) reported smoking relative to the SP (20%) and OCD (22.4) groups. Moreover, smokers obtained significantly higher scores on anxiety, depression, and distress measures as compared to nonsmokers.

Collins and Lepore (2009) carried out a cross-sectional study with black and middle-aged males participating in an ongoing cancer prevention trial in order to investigate the relation between smoking status and anxiety symptoms. Apart from a significant association between smoking and anxiety, it was reported that current smokers whose severity of dependence were heavy got higher anxiety scores, while this association was not relevant among former smokers who were defined as persons quitted smoking.

Kick and Cooley (1997) conducted a cross-sectional study on medicine outpatients to examine the symptoms of anxiety and current smoking. They reported that current smokers had higher scores on anxiety and depression. However, the link between anxiety and current smoking disappeared when depressive symptomatology were controlled. Similarly, Lekka et al. (2007) reported that anxiety was not an

independent predictor of smoking in their study, which was conducted on adult forensic population. Mykletun, Overland, Aaro, Liabo, and Stewart (2008) performed a cross-sectional study on a large community sample the age of which ranged from 20 to 89 years to investigate the relationship among smoking, anxiety, and depression; to determine the comorbidity between the two mental disorders; and to examine the levels of anxiety and depression in former smokers. According to their results, anxiety was more strongly linked with smoking than depression. It was found that the link with smoking was strongest in comorbid anxiety depression, followed by anxiety, and only marginal significant in depression, in addition, it was reported that the links were stronger in females and young participants. Furthermore, anxiety and comorbid anxiety and depression were associated more strongly with current smoking relative to former smoking. Also, the association between smoking and anxiety and comorbid depression and anxiety were the highest in smokers, followed by former smokers, and then non-smokers. The authors suggested that the link between depression and smoking might have been overestimated when comorbid anxiety and confounding or mediating factors such as sociodemographic variables, alcohol problems, and somatic symptoms were ignored.

Feldner et al. (2007) investigated the association between posttraumatic stress symptoms and smoking motives. It was found that higher levels of posttraumatic stress symptoms were linked with smoking to reduce negative affect even after controlling for number of cigarettes smoked per day and gender. It was also suggested that smoking was used for managing anxiety and other negative mood states.

In general, smokers attribute their smoking lapses and relapses to their anxiety in spite of little scientific evidence (Brandon, Tiffany, Obremski, & Baker, 1990). Many

studies have been carried out to investigate the effects of negative affect on smoking but only a limited number of studies have focused on the specific influence of anxiety (Morissette, Tull, Gulliver, Kamholz, & Zimering, 2007). Brandon et al. (1990) indicated that 16% of smokers reported feeling of anxiousness before an initial lapse. In addition, individuals who lapsed after smoking cessation as a result of anxiety and stress were more likely to return to regular smoking as compared to other smokers. Park et al. (2009) found that women who were smoking by 24 weeks postpartum had higher scores of anxiety than women who were nonsmokers, although there was not a significant effect of anxiety on 24-week smoking status. Although some women reported that they smoked due to their feelings of nervousness and anxiety, the findings of the study indicated that stress affected smoking more than anxiety.

In the study of Zvolensky et al. (2009), it was found that anxiety symptoms were not associated with early smoking lapse or relapse. In addition, it was reported that the prevalence of lifetime diagnosed anxiety was highest among unsuccessful quitters and lowest among successful quitters. However, unsuccessful quitters did not have a significantly higher prevalence of anxiety symptoms than non-quitters and the prevalence of anxiety symptoms among successful quitters was significantly lower than current smokers (McClave et al. 2009).

1.3.Stress and smoking

Several studies have found associations between various indices of psychological stress and smoking; and it was hypothesized that stress, measured in different ways, is linked to the risk across all stages of smoking: initiation, maintenance, quitting, and relapse.

Stress was found to be linked with smoking initiation since smoking has been reported to be a way of coping with stress among adolescent (Mates & Allison, 1992; cited in Koval et al., 2000, p.464). Stressful life events (Booker, Gallahar, Unger, Rith-Olson, & Johnson, 2004), child maltreatment (Topitzes, Mersky, & Reynolds, in press), perceived stress (Magid et al., 2009), parental divorce (Patton et al, 1998), negative life events (Koval & Pederson, 1999), and acute and chronic stressors (Koval et al., 2000) have been found to increase the risk for smoking onset. Besides, affective distress and negative life events seem to predict transition from experimental smoking to daily smoking in the literature (Koval et al., 2000; Miller & Volk, 2002). Koval et al. (2000) investigated the association between smoking and acute and chronic stressors on a Grade 6 cohort of students. They stated that increased stress was associated with increased involvement with smoking. Koval and Pederson (1999) conducted a study to examine stress-coping hypothesis and psychological risk factors for smoking in Grade 6 students. They measured stress with the number of negative life events. It was found that stress is a significant predictor of smoking for both males and females while depression is determined as a confounder in the stress-smoking relationship in males but not in females. In this study, rebelliousness and attitudes toward the effects of second-hand smoke were found to be the most important factors for males, while mother smoking was found to be the most important factor followed by rebelliousness for females. Koval et al. (2000) and Koval and Peterson (1999) emphasized that although stress was important for both male and female adolescents, the mechanisms underlying smoking seemed to be different for males and females. Similarly, Byrne and Mazanov (1999) found that the effect of different types of stressors on smoking uptake varied by gender. Associations between the sources of adolescent stress and smoking were found

to be stronger and broader for girls than for boys, and smoking was predominantly linked with family related stress. A prospective study performed by Byrne and Mazanov (2003) revealed that stress was weakly associated with smoking onset in males, however, prospective associations between smoking and stress were stronger and more largely signified across different domains of adolescent stress in females. These findings provide evidence for the proposal that gender is a potential moderator for the association between initiation of smoking and stress.

Unger et al. (2001) performed a study on Chinese adolescents to examine the associations among smoking and stressful life events, alcohol use, and depression. They developed a scale for measuring stressful life events consisting of 95 unique life events, 76 of which were in the domains of school, family, and peer relationships. The result of this study indicated that life events, particularly those including negative school-related events, were associated with smoking, alcohol use, and depressive symptoms. The mediational analyses employed in this study revealed that depressive symptoms mediate the association between negative school-related events and smoking in girls, whereas depressive symptoms mediate the association between negative school-related events and alcohol use in boys.

When examining current smoking status, some studies utilized between-subject designs to compare smokers with nonsmokers on stress and proposed that smokers experience more stress than nonsmokers (Parrott, 1999). Specifically, Mackey et al. (2008) reported that smokers had higher stress levels and lower stress management scores, and the ability to manage stress confounded the consequence drawn for the effect of stress on smoking. Ng and Jeffery (2003) claimed that perceived stress levels of both male and female working adults was positively linked with current smoking,

and negatively linked with self-efficacy for quit smoking and for not to smoke under stress. Bell and Lee (2003) found that higher levels of perceived stress were related to the current smoking among young adult women in Australia. In addition, Falba, Teng, Sindelar, and Gallo (2005) observed that the stress of job loss was associated with smoking. . When we consider these findings together, it might be concluded that consistent evidence has been provided for the positive association between various indices of stress and onset and maintenance of smoking.

In addition to initiation and maintenance of smoking, stress has also been demonstrated as being associated with smoking cessation. Cohen and Lichtenstein (1990) reported that changes in smoking status in persons attempting to quit smoking were linked with changes in perceived stress levels. In other words, higher perceived stress was related to higher rates of smoking in trying abstinence. Manning, Catley, Harris, Mayo, and Ahluwalia (2005) examined the pattern between the probability of quitting and stress among urban African American smokers. In this study, it was found that baseline stress did not predict quitting although higher coexisting stress levels were related to not being abstinent. Moreover, declines in perceived stress predicted abstinence at the end of the cessation program.

Stress has also been linked with smoking relapse (McKee, Maciejewski, Falba, & Mazure, 2003). Falba et al. (2005) found that older workers had a greater risk for relapse subsequent to involuntary job loss. McKee et al. (2003) reported that change of residence and adverse financial events were associated with increased incidence of relapse. Furthermore, females were more likely than men to relapse in occurrence of an adverse financial event and less likely than men to quit in reaction to an adverse health event. Park et al. (2009) investigated whether stress symptoms are linked with

postpartum relapse to smoking. They found that stress symptoms were linked with increased risk of relapse while smokers had higher scores on perceived stress symptoms than nonsmokers. Women reported the effect of stress on their relapse and they claimed that they smoked to cope with stress. Likewise, Ludman et al. (2000) found that women who quit smoking early in pregnancy had lower levels of stress than baseline smokers.

Apart from these survey studies examining the link between stress and smoking in terms of initiation, maintenance, quitting, and relapse stages of smoking, laboratory researches have also been conducted to show the relation between stress and smoking. The results obtained from these studies demonstrated that exposure to stressors could increase the volume of smoke inhaled and puff rate (Rose, Ananda, & Jarvik, 1983, cited in Todd, 2004, p.31), nicotine intake (Pomerlau & Pomerlau, 1987), and wish to smoke (Perkins & Grobe, 1992).

Vlahov et al. (2002) carried out a naturalistic study 5-8 weeks after the September 11 terrorist attacks on adults living in New York to assess the elevation in the prevalence of cigarette smoking, alcohol consumption, and marijuana use. The data revealed that 28.8% of the participants reported an elevation in any use of these three substances and 9.7% of those reported an elevation in regular smoking. Furthermore, depression and PTSD was found to be related with substance use. Vlahov et al. (2004) have also conducted a follow up study in New York City six to nine months following the attacks. Smoking augmented in 9.9% of the participants and was linked with PTSD and depression. On the other hand, the prevalence of PTSD and depression declined by more than half in the first six months after attacks, whereas the increase in substance use did not decline significantly. The authors claimed that substance use after disasters may be a public health problem.

Nandi, Galae, Ahern, and Vlahov (2005) conducted a naturalistic study 4 months after the September 11 terrorist attacks on adults living in New York City in order to evaluate cigarette smoking and symptoms of probable cigarette dependence. In this study, it was found that a) frequency of smoking increased in 36.8% of the smokers; b) 10.4% of the participants reported three or more symptoms of cigarette dependence based on DSM criteria; c) 18.1% of the dependent smokers had developed PTSD, while 5.7% of the nonsmokers and nondependent smokers had developed PTSD; and d) 23.6% of the dependent smokers were depressed, while 6.0% of the nonsmokers and nondependent smokers were depressed. These results showed that the September 11 terrorist attack influenced the smoking behaviors and mental health of dependent smokers.

Creson, Schmitz, and Arnouovic (1996) found that there was a substantial increase in smoking among health workers in Sarajevo, Bosnia, during war time in spite of the high cost of cigarettes and the need to use the inadequate money for essential goods for the self and family. The health care workers attributed their increased smoking to stress-related reasons. Thus, the authors interpreted these results within the smoking-to-cope framework.

Todd (2004) studied the relations among daily negative events, perceived stress, smoking, and smoking urges in naturalistic settings by using a multilevel daily process design. This study demonstrated that negative events and perceived stress were associated with increases in smoking and urges to smoke on occasions with higher numbers of negative life event and higher levels of perceived stress; also, the relationships between stress and smoking variables were stronger for males than for females. It was hypothesized that smokers may use smoking to cope with stressors

independent of affective consequences that could be potentially attributable to acute nicotine withdrawal.

Numerous studies have revealed that the relationship between stress and smoking appears to be robust, whereas a few studies have found that this relation might be tenuous. In a longitudinal study which was conducted on college students the relationships among negative affect, stress, and smoking were examined, while controlling for alcohol and marijuana use (Magid et al., 2009). The analyses indicated that perceived stress and negative affect were positively associated with smoking, whereas objective stressful events were negatively associated with smoking. In addition, the links among negative affect, smoking and perceived stress and objective stressful life events reduced after controlling for alcohol and marijuana use. It was reported that the relationship between perceived stress and objective stressful life events were no longer statistically significant, although the association between negative affect and smoking remained significant. Reijneveld, Crone, Verhulst, and Verloove-Vanhorick (2003) found that adolescents who experienced a fire in a cafe in Netherlands reported anxiety, depression, thought problems, aggression, and a large increase in excessive alcohol use but they were not reported an increase in smoking and marijuana use.

To conclude, correlational, experimental and naturalistic studies focusing on various indices of psychological stress and smoking can be accepted as consistent in general, indicating that higher levels of stress is linked to the risk across all stages of smoking including initiation, maintenance, quitting, and relapse.

1.4. Mediator and moderator variables among smoking dependence and depression, anxiety, stress

In the relevant literature, the mediator roles of several variables on the relationships among depression, anxiety, stress and smoking dependence have gained substantial research attention. According to Patton et al.'s (1998) proposal, depressive and anxiety symptoms were associated with higher risk for smoking initiation with the help of an increased vulnerability to peer smoking influences. Similarly, Audrain-McGovern and her colleagues (2009) found that peer smoking mediated the relationship between smoking and depression such that higher depressive symptoms predicted an increase in the number of smoking peers which, in turn, predicted the smoking progression in adolescent.

In Klonoff and Landrine's study (2001), the relationship between depression and smoking was tested among US black adults and no significant association between depression and smoking was found. Thus, the authors reached the conclusion that race could be considered as a moderator variable.

Schleicher, Harris, Catley, and Nazir (2009) assumed that expectancies about nicotine's ability to assuage negative mood status may play a role in the relationship between smoking and depression. They conducted a cross-sectional study on college students and found that negative affect regulation expectancies fully mediated the positive relationship between level of smoking and depressive symptoms.

In an experimental study examining the effects of two induced mood on smoking behavior, it was found that depression affected smoking behavior in response to the mood induction (Fucito & Juliano, 2009). When exposed to the sad condition, participants with high depression scores took more cigarette puffs, smoked longer, and

experienced a greater increase in expired air CO from baseline to post-smoking than participants with low depression scores. Moreover, the decrease in positive mood ratings partially mediated the effect of condition on smoking behavior in participants with high depression scores. The authors argued that decrease in positive mood may have a higher effect on smoking behavior in depression-prone smokers.

Ong and Walsh (2001) reported that depressed smokers received higher scores on Fagerström Test of Nicotine Dependence scale than nondepressed smokers; and goal cognitions such as self-efficacy and self-monitoring significantly moderated the predictive effect of depression on nicotine dependence. Kenney and Holahan (2008) found that smokers with high depressive symptoms smoked more cigarettes per day than smokers with low in depressive symptoms, and the relationship between depressive symptoms and smoking was explained by self-efficacy.

Physical activity is also a variable reported as mediating the effect of stress and stress management on smoking. Additionally, stress management might confound the effect of stress on smoking (Mackey et al.2008). Maladaptive coping styles and less physical activity were found to be associated with depression among smokers (Vickers et al., 2003). Furthermore gender was reported moderator variable between stress and smoking (McKee et al., 2003).

Aronson, Almedia, Stawski, Klein, and Kozlowski (2008) demonstrated that increase in the amount of smoking was related to negative affect when smokers experienced stressful events, whereas the increase in smoking had no effect on negative affect when they did not experience any stressful events. In addition, the moderating effect of stressful events was still significant after controlling for the number and intensity of daily stressors stated by the participants.

The underlying mechanisms of relationship between smoking and psychological states are still not entirely clear and there seems to be a complex and circular relationships among smoking dependence and depression, anxiety, and stress. Research examining moderator and mediator variables between these pathways is essential.

1.4.1. The Mediator Role of Metacognitive Factors

The metacognitive theory proposes that dysfunctional beliefs about cognitions, which constitute the metacognitions, are central to the development and maintenance of psychological disorders (Wells, 2000; Wells & Mathews, 1994). Metacognitive theory emphasizes the importance of both cognitive and metacognitive dimensions of thinking. According to this theory, the concept of metacognition is believed to play a significant role in psychopathology (Wells & Mathews, 1994).

Flavell (1979), who studied cognitive development, was first introduced the concept of metacognition and defined it as “cognitions about one’s cognition”. From the clinical psychology perspective, metacognition was defined as “the psychological structures, knowledge, events, and processes that are involved in the control, modification, and interpretation of thinking itself” (Wells & Cartwright-Hatton, 2004, p. 385).

Since metacognition refers to the knowledge, processes, and strategies that appraise, monitor, and control cognition (Flavell, 1979; Wells, 2000), it can be accepted as a multidimensional concept. In particular, it consists of three basic aspects as metacognitive knowledge, metacognitive experience, and metacognitive regulation (Flavell, 1979; Wells, 2000). Metacognitive knowledge refers to the theories and beliefs that individual have about their own cognition and learning strategies and task factors

having an impact on it (Wells, 2000). The metacognitive experience comprises appraisals of the meaning of specific mental events, metacognitive feelings and judgments of the status of cognition while it uses the information developed from metacognitive monitoring operations (Wells, 2000). Metacognitive regulation means a broad spectrum of executive functions, such as monitoring, planning, checking, attention, and detection of errors in performance (Wells, 2000).

The metacognitive model of psychopathology is based on the theoretical framework called Self-Regulatory Executive Function (S-REF, Wells & Matthews, 1994). The S-REF model describes mechanisms of problematic information processing that ultimately results in emotional disorders. The S-REF theory conceptualizes multiple metacognitive factors as control mechanisms of information processing that influences the development and persistence of psychological disorders. In the literature, it was observed that the S-REF theory has affected the development of current disorder-specific models and treatment procedures of GAD, obsessions, depression, PTSD, and social phobia (Papageorgiou & Wells, 2003; Holeva, Tarrier, & Wells, 2001; Wells, 2000). The S-REF model emphasizes that vulnerability to and maintenance of all psychological disorders are causally associated with the tendency to and activation of a particular pattern of cognition that is called Cognitive Attentional Syndrome (CAS; Wells 2000). The CAS comprises self-focused attention in the form of repetitive thinking styles of worry and rumination, reduced cognitive functioning, activation of dysfunctional self-beliefs, persistent allocation of attention to internal and external sources of danger, and use of maladaptive coping strategies which hinder modification of dysfunctional beliefs (Matthews & Wells, 2004). In other words, psychological disorders are maintained by selection and execution of maladaptive coping strategies,

such as preservative thinking (e.g., rumination, obsession, and worry), attention allocation to threat monitoring, avoidance and thought suppression, which fail to modify dysfunctional self-beliefs and increase the accessibility of negative information about self (Wells, 2000).

The CAS is comprehended from the person's metacognitive knowledge that is triggered during problematic situations and drives processing. To remind, metacognitive knowledge includes the beliefs, information, and theories which people have about their own cognitions and emotional states. Spada, Nikcevic, Moneta, and Wells (2007) restated that metacognitive knowledge does also contain beliefs concerning the importance of particular types of thoughts, and beliefs about other cognitive phenomena, such as memory and judgement.

In the metacognition literature, the role of metacognitive knowledge has been examined by means of Metacognitions Questionnaire (Cartwright-Hatton & Wells, 1997; Wells & Cartwright-Hatton, 2004). This questionnaire was developed and broadly used to assess metacognitive factors related to psychopathology. It is composed of five correlated but conceptually distinct subscales: (1) Positive Beliefs about Worry, which assesses the extent to which a person believes that perseverative thinking is useful; (2) Negative Beliefs about Worry Concerning Uncontrollability and Danger, which measures the extent to which a person thinks that perseverative thinking is dangerous and uncontrollable; (3) Lack of Cognitive Confidence, assessing confidence in attention and memory; (4) Beliefs about Need to Control Thoughts; and (5) Cognitive Self-consciousness, which measures the tendency to monitor one's own thoughts and focus attention inwards. In the literature, numerous studies have supported the relationship between individual dimensions of metacognition and psychological

disorders including, pathological worry and GAD (Cartwright-Hatton & Wells, 1997; Wells & Carter, 2001; Yılmaz, Gençöz, & Wells, 2008), test-anxiety (Spada, Nikcevic, Moneta, & Ireson, 2006), post-traumatic stress disorder (Holeva, Tarrier, & Wells, 2001), obsessive-compulsive symptoms (Wells and Papageorgiou, 1998; Yılmaz, Gençöz, & Wells, 2008), depression (Papageorgiou & Wells, 2003; Yılmaz, 2007), hypochondriasis (Bouman & Meijer, 1999), psychosis (Morrison, Wells, Nothard, 2000), and problem drinking (Spada & Wells, 2005; Spada, Zandvoort, & Wells, 2007).

Considering the assertion that metacognitive beliefs or experiences lead to persistent and maladaptive forms of coping as raised by the S-REF theory, Spada and his colleagues (2007) suggested that although smoking is perceived as a maladaptive coping skill in the long term because of its negative consequences, in the short term, it may appear as an adaptive coping strategy in order to regulate withdrawal-related negative affect. Therefore, Spada and his colleagues (2007) hypothesized that the relationship between smoking dependence and emotion (depression and anxiety) would be mediated by metacognitions. In their cross-sectional study, which was conducted on college students, it was found that the relationship between smoking dependence and emotion was partially mediated by three dimensions of metacognition. These dimensions were positive beliefs about worry, lack of cognitive confidence, and beliefs about need to control thoughts. Spada et al. (2007) suggested that positive beliefs about worry (e.g., “Worrying helps me to get things sorted out in my mind”; “I need to worry in order to work well”; “I need to worry in order to remain organized”) and lack of cognitive confidence (e.g., “I do not trust my memory”; “I have a poor memory”; “My memory can mislead me at times”) may be a marker for low metacognitive confidence including metacognitive knowledge about the ineffectiveness of memory. In other

words, these variables may demonstrate reduced confidence in coping and a need to predict problems (by means of worrying) and control cognition to be able to function properly. These dimensions of metacognition may lead to smoking dependence, since smoking enhances subjective cognitive confidence. In support of this idea, smoking or nicotine administration has been reported to improve memory (Krebs, Petros, & Beckwith, 1994), attention (Kassel, 1997), and motor performance (Sherwood, 1995). Previous studies did also show that performance in vigilance task (Koelega, 1993), visual information processing (Koelega, 1993), immediate free recall (Rusted & Eaton-Williams, 1991), mental arithmetic (Landers, Crews, Boutcher, Skinner, & Gustafsen, 1992), executive function as measured by the Stroop test (Landers et al., 1992) can be enhanced by smoking. Thus, as Spada and his colleagues (2007) claimed, metacognitive discomfort may be diminished by smoking.

Furthermore, Spada et al. (2007) speculated that beliefs about need to control thoughts may contribute to the smoking in order to reach desired levels of mental state such as temporary decline in negative affect. It was also stated that beliefs about need to control thoughts may be associated with attitudes toward intrusive thoughts resulting from craving. Individuals may believe that they must control their craving related thoughts, if they do not want their behaviour to be controlled by these thoughts. If maladaptive strategies such as perseverative thinking, thought suppression, and smoking are used in order to control thoughts, this will eventually lead to an increase in the accessibility of negative information about self.

Nikcevic and Spada (2008) did also examine the role of metacognition on high-dependency smokers, low-dependency smokers, and nonsmokers. They found that high-dependency smokers obtained higher scores on positive beliefs about worry, and high

and low-dependency smokers had higher scores on beliefs about need to control thoughts as compared to nonsmokers. On the other hand, beliefs about need to control thoughts were found to be the only metacognitive dimension in predicting category membership as a dependent smoker. It was assumed that these beliefs may play a role in smoking and smoking may be conceptualized as a tactic for controlling negative affect that is influenced by metacognitions.

Some studies have been suggested that metacognitions may play a role in problem drinking (Spada & Wells, 2005, 2006, 2008; Spada, Zandvoort, & Wells, 2006). These studies reported that there was a positive association between beliefs about the need to control thoughts and alcohol use after controlling for the negative affect in a community sample. In addition, beliefs about need to control thoughts and beliefs about lack of cognitive confidence predicted alcohol use and being a problem drinker. Moreover, Toneatto (1999) proposed that metacognition may mediate the relationship between negative affect and substance use in treatment-seeking substance abusers.

Adding the stress factor into the picture, Spada, Nikcevic, Moneta, and Wells (2008) investigated the relationship between metacognition, perceived stress, and negative affect (depression and anxiety). The results of this study that was conducted on student and non-student samples revealed that metacognition was positively and significantly correlated with perceived stress, depression, and anxiety. Furthermore, there was a significant and positive correlation between perceived stress, depression, and anxiety. It was also reported that metacognition moderated the relationship between perceived stress and negative affect.

The mechanism of relationship between smoking and stress is similar to the relationship between smoking and negative affect. Smoking may act as a coping strategy for stress in order to regulate the independent dimensions of negative and positive affect. On the other hand, it was stated that smoking is a maladaptive coping strategy due to its negative consequences on human body. For that reason, the relationship between smoking and stress may be mediated by metacognitions, if the relationship between smoking and negative affect is partially mediated by metacognition.

1.5. Studies in Turkey

While there exists a broad range of studies investigating the relationships among smoking, depression, anxiety, and stress in the literature, rigorous research on these topics is missing in Turkey. In an only study comparing Turkish smokers and nonsmokers in terms of stress management, Ünalın, Çelikten, Öztürk, and Şenol (2008) found no significant differences on stress management between these two groups. In a study conducted on university students in Turkey by Yazıcı (2008), it was reported that current smokers had a tendency to score higher than nonsmokers on depressive symptoms. It was found that smokers had higher scores on depression scale than nonsmokers in university students (Marakoğlu, Çivi, Şahsıvar, & Özdemir, 2006). Also Keleş (2007) claimed that smoking in pregnancy was a significant predictor of postpartum depression. Moreover, in a study performed on teachers in Edirne, it was stated that there was an association between smoking and anxiety scores (Tunç, 2007). In addition, psychological disorders, depressive symptoms, and anxiety symptoms were

determined as barriers to quit smoking in a Turkish adult sample (Kaya, Danacı, Şakar, & Yorgancıoğlu, 2005).

1.6. Aims and significance of the current study

A review of the available literature demonstrated that there is insufficient research in Turkey concerning the mechanism underlying the relationships among smoking dependence and depression, anxiety, and stress. In order to fill the research gap that exist in this field in Turkey, more studies are needed focusing on the relationships among smoking dependence, depression, anxiety, and stress, as well as the moderator and mediator variables affecting these relationships.

Although there is a considerable amount of literature based on the relationship between smoking dependence and depression/anxiety/stress, there is respectively little research attention given to the mediator variables of the relationships among smoking dependence, depression, anxiety, and stress. To date only one study (Spada et al., 2007) examined the possible associations between smoking dependence and metacognitions as a mediator between smoking and negative affect (depression and anxiety) among college students with the mean of age 22.2 years. On the other hand, there is no attempt to explore the possible links between individual dimensions of metacognition, smoking dependence, and stress in a single design.

In view of these findings, the general goal of the present study is to investigate relationships among depression, anxiety, stress, and metacognition in Turkish adult smokers who are between 25 and 50 years of age. In particular, the current study aimed to test a mediation model in which anxiety, depression, and stress predict metacognition, which in turn predicts smoking dependency among Turkish adult

smokers. This mediation model was tested by using six mediator variables (the total metacognition score and the five metacognitive dimensions, namely, positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, lack of cognitive confidence, beliefs about the need to control thoughts, and cognitive self-consciousness). Based on all of the findings mentioned above, the hypotheses of the present study are as follows:

(1) Higher levels of depression would be associated with the higher levels of smoking dependence;

(2) Higher levels of anxiety would be associated with the higher levels of smoking dependence;

(3) Higher levels of stress would be associated with the higher levels of smoking dependence;

(4) Total scores of metacognition and/or the individual metacognitive dimensions would mediate the relationship between smoking dependence and depression;

(5) Total scores of metacognition and/or the individual metacognitive dimensions would mediate the relationship between smoking dependence and anxiety;

(6) Total scores of metacognition and/or the individual metacognitive dimensions would mediate the relationship between smoking dependence and stress.

CHAPTER 2

METHOD

2.1. Participants

A total of 202 volunteer adult smokers living in Istanbul took part in the present study. To be included in this study, the person should be between 25 and 50 and s/he should smoke at least 10 cigarettes per day. Therefore, the participants who are between 25 and 50 years of age, who have a self-reported smoking rate of at least 10 cigarettes per day, and who gave consent to participate in this study were included. Of the total sample, 44.6 % were female ($n = 90$), 55.4 % were male ($n = 112$), and their ages ranged between 25 to 50 years, with the mean of age 34.77 ($SD = 7.55$). In terms of education level, 1% of them ($n = 2$) were illiterate or literate but not educated, 5.9% ($n = 12$) of them primary school graduates, 6.9% ($n = 14$) of them were secondary school graduates, 32.2% ($n = 65$) of them were high school graduates, 6.9% ($n = 14$) were drop out from university, 7.4% ($n=15$) were college (university 2 years) graduate, 31.7% ($n= 64$) of them were university graduate, and 6.9% ($n = 14$) were master/PhD graduate. The marital status of participants was as follows; 33.2% single ($n = 67$), 51% married ($n = 103$), 9.4% divorced ($n = 19$), 4.5% engaged ($n = 9$), and 2% widowed ($n = 4$). Sociodemographic characteristics of the participants are presented in Table 1.

When looking at the smoking related variables, the participants' reported mean number of cigarettes smoked per day was 20.87 ($sd = 9.26$, range =10-6) and they had

been smoking for a mean number of 187.54 months ($sd = 92.47$, range = 6-480). Approximately, 63.4% of total sample had tried, at least once, to unsuccessfully quit smoking. Some the smoking related variables of the participants are showed in Table 1.

Table 1. Demographic characteristics and smoking history of the sample

Variables	N	%	Mean	SD	Range
Gender					
Female	90	44.6			
Male	112	55.4			
Age			34.77	7.55	25-50
Education					
High School and Lower Education	93	46			
University and Higher Education	107	53			
Marriage					
Married	103	51			
Nonmarried	99	49			
Paternal Education					
Primary School and Lower Education	99	49			
Secondary School and Higher Education	102	50.5			
Maternal Education					
Primary School and Lower Education	141	69.8			
Secondary School and Higher Education					

Table 1 (Continued)

Variables	N	%	Mean	SD Range
Father Living Status				
Dead	64	31.7		
Alive	138	68.3		
Mother Living Status				
Dead	21	10.4		
Alive	179	88.6		
Marital Status of Parents				
Married	133	65.8		
Divorced	22	10.9		
Widowed	39	19.3		
Dead	7	3.5		
Having Step Sibling(s)				
Yes	15	7.4		
No	182	90.1		
Mother Smoking Status				
Yes	46	22.8		
No	152	75.2		
Father Smoking Status				
Yes	75	37.1		
No	117	57.9		

Table 1 (Continued)

Variables	N	%	Mean	SD	Range
Sibling(s) Smoking Status					
Yes	129	63.9			
No	67	33.2			
Partner Smoking Status					
Yes	58	28.7			
No	48	23.8			
Having a Partner					
Yes	116	57.4			
No	85	42.1			
Friends Smoking Status					
Yes	196	97			
No	5	2.5			
Birthplace					
Others (village, town, city)	95	47			
Big City	105	52			
Living place					
Others (village, town, city)	53	26.2			
Big City	146	72.3			
Perceived SES					
Low	31	15.3			
Middle	128	63.4			
Upper	43	21.3			

Table 1 (Continued)

Variables	N	%	Mean	SD Range
Physical Illness				
Yes	23	11.4		
No	167	82.7		
Psychological Illness				
Yes	19	9.4		
No	173	85.6		
Using Alcohol				
Yes	121	59.9		
No	81	40.1		
Trying to Quit				
Yes	128	63.4		
No	74	36.6		
Using Alcohol in Last 30 Days				
Yes	108	53.5		
No	93	46		
Frequency of Alcohol Use				
Once or Less in a Month	51	25.2		
Two or Four Times in a Month	38	18.8		
Two or Three Times in a Week	27	19.4		

Table 1 (Continued)

Variables	N	%	Mean	SD
Range				
Four Times or More in a Week	17	8.4		
Amount of Alcohol Drunk at Once				
1-2 glasses	55	27.2		
3-4 glasses	52	25.7		
5-6 glasses	22	10.9		
7-8 glasses	7	3.5		

2.2. Instruments

The questionnaire set used in this study included demographic information form, Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979), Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Ster, 1988), The Meta-Cognitions Questionnaire-30 (MCQ-30; Wells & Cartwright, 2004), Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978), and Fagerström Test of Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991).

2.2.1. Demographic Information Form

Demographic information form was prepared by the researcher and it included both open ended and multiple choice questions about the participant's gender, age, education, marital status, maternal education, paternal education, whether mother and

father were alive, marital status of parents, perceived income, whether siblings are step, smoking status of mother, smoking status of father, smoking status of partner, smoking status of siblings and friends, place of birth, place they spent most of their life, whether they have physical and psychological illness, whether they are treated, alcohol use, frequency of alcohol use, and amount of alcohol drunk by participants. This form also was administered to collect information on participants' alcohol consumption. A copy of this form is presented in Appendix A.

2.2.2. Beck Depression Inventory (BDI)

Beck Depression Inventory (BDI; Beck et al., 1979) is a self-report rating scale including 21 items, and measuring emotional, motivational, and cognitive symptoms of depression. The participants complete the questionnaire by taking into consideration their last week. Each item contains four statements representing varying levels of depressive symptoms. Scoring for each item ranges from 0 to 3, and the total score ranges from "0" to "63". As the score on this inventory increases, the level of depressive symptoms increases. The BDI has a well-established reliability with a mean coefficient alpha .86 in psychiatric populations and .81 in non-psychiatric populations (Beck, Steer, & Garbin, 1988).

A psychometric evaluation and adaptation of the Turkish version of the BDI (See Appendix D) was carried out by Hisli (1988; 1989). The split-half reliability was found to be .74 when applying this scale to 259 university students (Hisli, 1988). The concurrent validity, when correlated with Minnesota Multiphasic Personality Inventory Depression Scale, was found .63 in a psychiatric sample (Hisli, 1988), and .50 in

student sample (Hisli, 1989). In the present study, the Cronbach Alpha coefficient was found to be .88.

2.2.3. Beck Anxiety Inventory

The BAI (Beck, Epstein, Brown, & Ster, 1988) was designed to measure the frequency of the anxiety symptoms. The scale consists of 21 self report items about anxiety symptoms felt last week. Good internal consistency and high short-term test-retest reliability has been demonstrated in mixed psychiatric samples and patients with anxiety disorders (Beck et al., 1988; de Beurs, Wilson, Chambless, Goldstein, & Feske, 1997), as well as nonclinical samples (e.g., Creamer, Foran, & Bell, 1995). BAI was adapted into Turkish by Ulusoy, Sahin, and Erkmen (1996) (See Appendix C). The Cronbach alpha for the Turkish version was found to be as .93. In the present study, Cronbach Alpha coefficient was found to be .92.

2.2.4. Meta-Cognitions Questionnaire-30 (MCQ-30)

The MCQ-30 (Wells & Cartwright-Hatton, 2004) was developed to assess individual differences in metacognitive beliefs, judgments and monitoring tendencies. The person rates himself/herself on a 4 point scale between 1 (*do not agree*) and 4 (*agree very much*), and the scores range from 30 to 120. The MCQ-30 consist of five correlated but conceptually distinct factors assessed by 30 items: (1) positive beliefs about worry, which measures the extent to which person believes that worrying is helpful (e.g. “Worrying helps me cope”); (2) negative beliefs about worry, measuring the extent to which the person believes that worrying is uncontrollable and dangerous (e.g. “When I start worrying I cannot stop”); (3) beliefs about lack of cognitive

confidence, assessing confidence in memory, (e.g. “My memory can mislead me at times”); (4) beliefs about need to control thoughts and consequences of not controlling one’s own thoughts, (e.g. “Not being able to control my thoughts is a sign of weakness”); and (5) cognitive self-consciousness, which assesses the tendency to monitor one’s own thoughts and focus attention inwards (e.g., “I pay close attention to the way my mind works”). The MCQ-30 was also validated in both normal and clinical groups. The MCQ-30 has a good internal consistency and convergent validity as well as acceptable test-retest reliability.

The MCQ-30 was translated and adapted into Turkish (See Appendix B) by Yılmaz, Gençöz, and Wells (2008). Psychometric evaluation of the scale was carried out in students and non-students who were employees of universities, and its psychometric properties were found to be similar to its original. The Cronbach’s alpha was found to be 0.87, indicating high reliability for the total score; while split-half reliability procedures indicated that the instrument and its subscales possess high reliability. Moreover, test–retest coefficients and tests of differences between two applications supported the stability of MCQ-30 and its subscales across time in a Turkish sample as parallel to the findings in the original study (Wells & Cartwright-Hatton, 2004) Yılmaz et al. (2008) compared the results from the original English non-clinical sample (Wells & Cartwright-Hatton, 2004) and the Turkish sample. They reported that the factor structure is quite similar and the same factor names used in the original study were assigned to these factors. In the present study, the same factor structure and names in two studies (Wells & Cartwright-Hatton, 2004, Yılmaz et al., 2008) were used. In the present study the Cronbach’s alpha coefficients were found to be as 0.88 for the total MCQ-30 score, 0.83 for positive beliefs about worry, 0.85 for

negative beliefs about worry, 0.78 for lack of cognitive confidence, 0.70 for the need to control thoughts, and 0.82 for cognitive self-consciousness.

2.2.5. Life Experiences Survey

Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978) is a 57-item self-report measure assessing major life events. It permits respondents to suggest events they have experienced during the past 6 months and 1 year. The scale is composed of two parts: Section 1, which is designed for all individuals, includes 47 specific life events that are common to individuals in a wide variety of situations, and three blank spaces in which respondents can indicate other events that they may have experienced. Section 2 contains a list of 10 events designed specifically only for students. Section 1 is appropriate for using with all subjects drawn from the general population, while both sections are relevant for students. In this study, section 1 was used. The respondents are also asked the perceived impact of that particular event on their life as being positive and negative. Response options ranges on a 7-point scale from extremely negative (-3) to extremely positive (+3). Summating the impact ratings of events indicated as being positive by the subject gives the “positive change score” (LES-P), whereas the summation of the negatively indicated events provide the “negative change score” (LES-N). A “total change score” (LES-T) can be obtained by summating these two scores. The LES has been shown to have acceptable test-retest reliability over five to six weeks and convergent validity (Sarason et al., 1978).

The first section of LES was adapted to Turkish culture by Aslanoğlu (1978). In this adaptation study, the translated items were given to a judge group. Some additional items which were suggested by the majority of this judge group as relevant to Turkish

culture were embedded in the scale. Similarly, some other items agreed as irrelevant to Turkish culture were either revised or excluded from the scale. The internal consistency of this adapted Turkish version of the LES was found to be .68 in Aslanoglu's study. Yılmaz (2007) found the internal consistency as 0.74 for LES, 0.79 for LES-N, and 0.61 for LES-P, while the retest correlation for the total LES score reported as 0.64 ($p < .01$), 0.67 for the LES-N, and 0.62 ($p < .01$) for the LES-P scores. In addition LES, LES-N, and LES-P possess a satisfactory convergent validity.

In the present study, the participants filled in only section 1 and only “negative change score” (LES-N) was used to assess negative impact of life experiences on respondents. A copy of this scale is presented in Appendix E. In the present study the Cronbach's alpha coefficients were found to be as 0.77 for negative change score (LES-N).

2.2.6. Fagerström Test of Nicotine Dependence

The Fagerström Tolerance Questionnaire (FTQ) was developed in 1978 (Fagerström, 1978), and a revised version, the Fagerström Test for Nicotine Dependence (FTND), was published in 1991 (Heatherton, Kozlowski, Frecker, & Fagerström, 1991). In FTND two items were deleted and the scoring of two of the remaining items was revised (Heatherton et al., 1991). The FTND is a self-administered 6 item questionnaire, which is widely-used as a measure of nicotine dependence with scores ranging from 0 to 10. Higher scores denote higher levels on nicotine dependence, with cut-off points of 3 and 5, respectively indicating moderate and high nicotine dependence. The FTND has adequate internal consistency reliability (Cronbach's alpha = 0.61; Heatherton et al., 1991). Prior studies have found the Fagerström scale to

correlate with biochemical measures of nicotine dependence including exhaled air carbon monoxide ($r = 0.24$) (Pinto, Abrams, Monti, & Jacobus, 1987) and plasma cotinine ($r = 0.33$ – 0.46) (Pomerleau, Pomerleau, Majchrzak, Kioska, & Alakuti, 1990).

The FTND (see Appendix F) was translated and adapted into Turkish by Uysal, Kadakal, Karşıdağ, Bayram, Uysal, and Yılmaz (2004). The Cronbach's alpha of the Turkish version was 0.56, indicating satisfactory reliability. In this study Cronbach's alpha was found to be 0.68.

2.3. Procedure

Participants who were volunteers were recruited from the staff of various workplaces (schools, government offices, companies) and public places. Potential respondents were approached and asked to participate in this study after introducing the researchers and explaining the aim of the study. The age of participant and the number of cigarettes smoked per day were also asked. Having taken the written informed consent, a set of measurements was given to them who lived in Istanbul, who were between 25 and 50 years of age, and who had a self-reported smoking rate of at least 10 cigarettes per day. The participants completed questionnaires individually at their work environments. Instructions for completing the questionnaires were given both verbally and written, in addition, their questions about questionnaires were answered during administration. Some of the participants needed the question being read to them due to their problems in reading. The questions were read and the answers were marked for them by the researcher in that case. Scale administration to one participant took approximately 25-40 minutes. There was no time limitation. That is, the participants took breaks because they had to work and they might be very busy in their worksite.

The scales were presented in random order to each participant in order to eliminate the effect of sequencing. All participants were debriefed following the completion of the questionnaire. Moreover, they informed about the researcher's e-mail address in case of having any questions about the study in the future.

2.4. Data Analyses

The data was analyzed by using Statistical Package for Social Sciences-15 (SPSS-15) (Green, Salkind, & Akey, 1997). Prior to the main analyses, separate analyses of variance and t-tests were performed to examine the possible effects of demographic and smoking history variables on the measures of anxiety and depression symptoms, metacognitions, negative impact of life experiences, and smoking dependence.

Following the correlational analyses, for testing the mediation models, path analyses were run. To test all hypotheses of the study, 12 mediation models were tested, that is 24 path analyses were run.

CHAPTER 3

RESULTS

3.1. Group Comparisons

Group comparisons on depression, anxiety, metacognitions, negative impact of life experiences, amount of cigarette smoked per day, duration of cigarette smoking, the time of the first cigarette in the morning, and smoking dependence were performed by using independent samples t-test. Gender, education level, marital status, paternal and maternal education, father and mother living status, having step siblings, sibling(s) smoking status, having a partner, partner smoking status, birthplace, place where participants have spent most of their life, physical illness, psychological illness, alcohol use, drinking alcohol in the last 30 days, and trying to quit trials from smoking were used as independent variables that may affect depression, anxiety, metacognitions, negative impact of life experiences, amount of cigarette smoked per day, time of the first cigarette in the morning, duration of cigarette smoking, and smoking dependence. Means, standard deviations and ranges of the measures that were used in the study were presented in Table 2.

Table 2: Means, standard deviations and ranges of the variables

	Mean	Standard Deviation	Min.	Max.
BAI	12.99	10.80	0	56

Table 2 (Continued)

	Mean	Standard Deviation	Min.	Max.
BDI	10.31	8.21	0	44
MCQ-30	63.80	14.01	35	106
MCQ-1	11.41	4.06	6	24
MCQ-2	11.93	4.58	6	24
MCQ-3	11.84	4.15	6	24
MCQ-4	13.18	4.01	6	23
MCQ-5	15.44	4.35	7	24
NILE	8.57	8.69	0	43
FTND	4.35	2.59	0	10
Duration of smoking (in months)	187.54	92.47	6	480
First Cigarette (in minutes)	56.77	52.33	1	300
Amount of Cigarette (per day)	20.87	9.26	10	65

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.

As can be seen in Table 3, there was a significant difference between males and females in terms of anxiety ($t(200) = 6.59, p < .001$), depression ($t[200] = 2.75, p < .01$), negative beliefs about worry concerning uncontrollability and danger ($t(200) = 4.37, p < .001$), negative impact of life experiences ($t[200] = 3.91, p < .001$), and amount of cigarette smoked per day ($t[200] = -3.28, p < .001$). Females got significantly higher

scores on anxiety ($m = 18.07$, $sd = 11.22$) than males ($m = 8.92$, $sd = 8.52$). Similarly, depression scores of females ($m = 12.06$, $sd = 8.71$) were significantly higher than males' depression scores ($m = 8.91$, $sd = 7.54$). Furthermore, as compared to males ($m = 10.72$, $sd = 3.83$), females ($m = 13.43$, $sd = 4.99$) received significantly higher scores on negative beliefs about worry concerning uncontrollability and danger. In addition, males smoked more cigarette ($m = 22.74$, $sd = 10.14$) than females ($m = 18.54$, $sd = 7.48$). Also, females ($m = 11.14$, $sd = 9.02$) obtained higher scores on negative impact of life experiences than males ($m = 6.5$, $sd = 7.86$).

Table 3: Descriptive statistics and T-test results for gender

	Female		Male		df	t
	m	sd	m	sd		
BAI	18.07	11.22	8.92	8.52	200	6.59***
BDI	12.06	8.71	8.91	7.54	200	2.75**
MCQ-30	65.50	14.84	62.43	13.22	200	1.55
MCQ-1	11.08	3.71	11.68	4.33	200	-1.03
MCQ-2	13.43	4.99	10.72	3.83	200	4.37***
MCQ-3	12.38	4.25	11.40	4.03	200	1.69
MCQ-4	13.21	4.08	13.17	3.97	200	.07
MCQ-5	15.40	4.27	15.47	4.44	200	-.12
NILE	11.14	9.02	6.5	7.86	200	3.91***
FTND	4.24	2.77	4.44	2.45	200	-.53
Duration of smoking	178.73	88.88	194.63	95.07	200	-1.22
First Cigarette	59.63	55.32	54.48	49.94	196	.69

Table 3 (Continued)

	Female		Male		df	t
	m	sd	m	sd		
Amount of Cigarette	18.54	7.47	22.74	10.14	200	-3.28***

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.*** $p < .001$, ** $p < .01$, * $p < .05$

As shown in Table 4, when the education level of the participants was examined, it was found that there was a significant difference between the participants who were graduated from high school or had lower education level and the participants who graduated from university or had higher education level in terms of duration of cigarette smoking ($t [198] = 2.48, p < .01$). The participants who were graduated from high school or had lower education level had been smoking for longer duration (more months) ($m = 204.39, sd = 90.53$) than the participants who graduated from university or had higher education level ($m = 172.26, sd = 92.09$).

Table 4: Descriptive statistics and T-test results for education level

	High School or Lower		University or Higher		df	t
	m	sd	m	sd		
BAI	12.95	11.30	13.05	10.45	198	-.07
BDI	10.36	7.89	10.23	8.43	198	.11
MCQ-30	63.91	14.62	63.63	13.37	198	.14

Table 4 (continued)

	High School or Lower		University or Higher		df	t
	m	sd	m	sd		
MCQ-1	11.80	4.43	11.05	3.73	198	1.31
MCQ-2	12.10	4.43	11.84	4.72	198	.39
MCQ-3	12.01	4.23	11.67	4.06	198	.58
MCQ-4	13.04	3.87	13.28	4.08	198	-.43
MCQ-5	14.96	4.23	15.79	4.42	198	-1.35
NILE	8.69	8.03	8.32	9.13	198	.30
FTND	4.15	2.50	4.52	2.68	198	-1.01
Duration of smoking	204.39	90.53	172.26	92.09	198	-2.48**
First Cigarette	55.62	52.95	58.13	52.35	194	-.33
Amount of Cigarette	21.05	9.95	20.57	8.55	198	.37

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.*** $p < .001$, ** $p < .01$, * $p < .05$

As can be seen in Table 5, there was a significant difference between the participants who were married and those who were not married in terms of anxiety ($t [200] = -2.35, p < .05$), cognitive self-consciousness ($t [200] = -2.04, p < .05$), and duration of cigarette smoking ($t [200] = 3.97, p < .001$). The participants who were not married had significantly higher scores on anxiety ($m = 14.79, sd = 10.90$) than those who were married ($m = 11.26, sd = 10.47$). Similarly, the participants who were not

married had significantly higher scores on cognitive self-consciousness ($m = 16.07$, $sd = 4.30$) than those who were married ($m = 14.83$, $sd = 4.33$). On the contrary, the participants who were married had been smoking for longer duration ($m = 211.98$, $sd = 91.48$) than those who were not married ($m = 162.12$, $sd = 86.88$).

Table 5: Descriptive statistics and T-test results for marital status

	Married		Not Married		df	t
	m	sd	m	sd		
BAI	11.26	10.47	14.79	10.90	200	-2.35*
BDI	9.26	7.37	11.40	8.91	200	-1.86
MCQ-30	62.24	14.98	65.43	12.80	200	-1.62
MCQ1	11.45	4.59	11.37	3.88	200	.14
MCQ2	11.62	4.59	12.25	4.56	200	.97
MCQ3	11.57	4.21	12.12	4.09	200	.94
MCQ4	12.76	3.96	13.62	4.04	200	-1.52
MCQ5	14.83	4.33	16.07	4.30	200	-2.04*
NILE	7.79	8.13	9.38	9.20	200	-1.31
FTND	4.20	2.44	4.51	2.74	200	-.85
Duration of smoking	211.98	91.48	162.12	86.88	200	3.97***
First Cigarette	54.33	43.95	59.35	60.10	196	-.67
Amount of Cigarette	20.17	9.04	21.60	9.48	200	-1.09

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to

Table 5 (Continued)

control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. *** $p < .001$, ** $p < .01$, * $p < .05$

As demonstrated in Table 6, there was a significant difference between the participants whose fathers were graduated from primary school or had lower education level and the participants whose fathers were graduated from secondary school or had higher education level in terms of duration of cigarette smoking ($t [199] = 2.79, p < .01$). The participants whose fathers were graduated from primary school or had lower education level had been smoking for longer duration ($m = 205.33, sd = 96.42$) than the participants whose fathers were graduated from secondary school or had higher education level ($m = 169.53, sd = 85.45$).

Table 6: Descriptive statistics and T-test results for paternal education level

	Primary School/Lower		Secondary School/Higher		df	t
	m	sd	m	sd		
BAI	11.96	10.35	14.08	11.18	199	-1.39
BDI	9.98	7.78	10.67	8.66	199	-.60
MCQ-30	62.90	14.48	64.58	13.61	199	-.85
MCQ-1	11.43	4.32	11.33	3.79	199	.17
MCQ-2	11.96	4.60	11.87	4.59	199	.14
MCQ-3	11.74	4.39	11.94	3.93	199	-.35
MCQ-4	12.73	3.88	13.64	4.12	199	-1.61
MCQ-5	15.04	4.19	15.80	4.51	199	-1.23

Table 6 (Continued)

	Primary School/Lower		Secondary School/Higher		df	t
	m	sd	m	sd		
NILE	8.53	8.54	8.65	8.90	199	-.10
FTND	4.41	2.66	4.28	2.54	199	.35
Duration of smoking	205.33	96.42	169.53	85.45	199	2.79**
First Cigarette	50.65	50.63	63.09	53.69	195	-1.67
Amount of Cigarette	20.58	8.88	21.19	9.70	199	-.47

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.*** $p < .001$, ** $p < .01$, * $p < .05$

Table 7 shows descriptive statistics and t-test results for maternal education level. While the effect of maternal education was tested, it was found that there was a significant difference between the participants whose mothers were graduated from primary school or had lower education level and the participants whose mothers were graduated from secondary school or had higher education level in terms of duration of cigarette smoking ($t [200] = 4.50, p < .001$). The participants whose mothers were graduated from primary school or had lower education level had been smoking for longer duration ($m = 205.96, sd = 93.75$) than the participants whose fathers were graduated from secondary school or had higher education level ($m = 144.98, sd = 74.17$).

Table 7: Descriptive statistics and T-test results for maternal education level

	Primary School/Lower		Secondary School/Higher		df	t
	m	sd	m	sd		
BAI	12.89	10.41	13.22	11.74	200	-.19
BDI	10.13	7.67	10.73	9.39	200	-.47
MCQ-30	63.32	13.98	64.91	14.15	200	-.74
MCQ-1	11.34	4.10	11.59	4.01	200	-.40
MCQ-2	11.79	4.62	12.25	4.49	200	-.66
MCQ-3	11.97	4.21	11.52	4.01	200	.70
MCQ-4	13.02	4.03	13.56	3.97	200	-.88
MCQ-5	15.20	4.18	15.99	4.71	200	-1.18
NILE	8.86	8.40	7.90	9.35	200	.72
FTND	4.41	2.60	4.21	2.59	200	.50
Duration of smoking	205.96	93.75	144.98	74.17	200	4.50***
First Cigarette	53.70	50.38	63.82	56.36	196	-1.25
Amount of Cigarette	21.03	9.27	20.51	9.32	200	-.37

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.***p< .001, **p< .01, *p< .05

When the effects of mother living status was tested (see Table 8), it was found that there were significant differences between participants whose mothers were dead

and participants whose mothers were alive in terms of negative beliefs about worry concerning uncontrollability and danger ($t [198] = 2.03, p < .05$) and duration of cigarette smoking ($t [198] = 3.08, p < .01$). The participants whose mothers were dead got significantly higher scores on negative beliefs about worry concerning uncontrollability and danger ($m = 13.81, sd = 5.72$) than participants whose mothers were alive ($m = 11.68, sd = 4.40$). In addition, the participants whose mothers were dead had been smoked for longer duration ($m = 245.71, sd = 86.90$) than the participants whose mothers were alive ($m = 181.07, sd = 91.40$).

Table 8: Descriptive statistics and T-test results for participants' mother living status

	Dead		Alive		df	t
	m	sd	m	sd		
BAI	15.93	12.68	12.57	10.57	198	1.35
BDI	10.26	7.29	10.19	8.27	198	.03
MCQ-30	64.35	12.04	63.51	14.14	198	.26
MCQ-1	11.29	3.29	11.35	4.11	198	-.07
MCQ-2	13.81	5.72	11.68	4.40	198	2.03*
MCQ-3	11.68	3.83	11.88	4.20	198	-.23
MCQ-4	12.60	3.22	13.18	4.05	198	-.62
MCQ-5	14.98	4.19	15.42	4.35	198	-.44
NILE	8.71	8.27	8.51	8.79	198	.10
FTND	4.19	2.60	4.36	2.61	198	-.29
Duration of smoking	245.71	86.90	181.07	91.40	198	3.08
First Cigarette	55.38	56.37	57.17	52.19	194	-.15

Table 8 (Continued)

	Dead		Alive		df	t
	m	sd	m	sd		
Amount of Cigarette	19.00	8.89	21.07	9.35	198	-.97

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.*** $p < .001$, ** $p < .01$, * $p < .05$

As can be seen in Table 9, there was significant differences between participants who had step sibling(s) and participant who didn't have step sibling(s) in smoking dependence ($t(195) = -2.27, p < .05$) and beliefs about lack of cognitive confidence ($t [195] = -2.15, p < .05$). Participants who had step sibling(s) ($m = 5.80, sd = 3.05$) obtained higher scores on smoking dependence than participants who did not had step sibling(s) ($m = 4.24, sd = 2.53$). Similarly, participants who had step sibling(s) ($m = 14.07, sd = 4.38$) got higher scores on beliefs about lack of cognitive confidence than participants who did not have step sibling(s) ($m = 11.67, sd = 4.12$).

Table 9: Descriptive statistics and T-test results for participants having step sibling(s)

	Yes		No		df	t
	m	sd	m	sd		
BAI	15.80	9.40	12.61	10.92	195	-1.10
BDI	10.29	8.59	10.21	8.26	195	-.03
MCQ-30	66.62	13.18	63.54	14.03	195	-.82

Table 9 (Continued)

	Yes		No		df	t
	m	sd	m	sd		
MCQ-1	11.40	3.52	11.44	4.09	195	.04
MCQ-2	13.47	4.97	11.76	4.55	195	-1.39
MCQ-3	14.07	4.38	11.67	4.12	195	-2.15*
MCQ-4	12.03	3.90	13.25	4.02	195	1.13
MCQ-5	15.67	4.20	15.43	4.38	195	-.20
NILE	11.33	10.1	8.32	8.63	195	-1.28
FTND	5.80	3.05	4.24	2.53	195	-2.27*
Duration of smoking	221.60	80.10	185.93	93.65	195	-1.43
First Cigarette	44.93	51.88	57.66	52.80	191	.87
Amount of Cigarette	20.93	7.91	20.74	8.87	195	-.08

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.*** $p < .001$, ** $p < .01$, * $p < .05$

As shown in Table 10, there was a significant difference between the participants with smoking sibling(s) and the participants with nonsmoking sibling(s) in terms of duration of cigarette smoking ($t [194] = -2.53, p < .01$) and the time of first cigarette in the morning ($t [194] = -2.32, p < .05$). The participants with smoking sibling(s) had been smoking for longer duration ($m = 199.81, sd = 90.65$) than the participants with

nonsmoking sibling(s) ($m = 165.31, sd = 90.18$). Likewise, the participants with smoking sibling(s) smoked their first cigarette earlier ($m = 50.39, sd = 48.77$) than the participants with nonsmoking sibling(s) ($m = 68.92, sd = 58.56$).

Table 10: Descriptive statistics and T-test results for participants' sibling(s) smoking status

	Nonsmokers		Smokers		df	t
	m	sd	m	sd		
BAI	11.69	10.11	13.58	11.21	194	-.53
BDI	9.87	8.55	10.53	8.13	194	-1.16
MCQ-30	63.77	13.52	63.91	14.23	194	-.07
MCQ-1	11.25	3.67	11.54	4.23	194	-.48
MCQ-2	11.57	4.40	12.10	4.72	194	-.77
MCQ-3	12.12	4.18	11.71	4.12	194	.66
MCQ-4	13.01	3.82	13.28	4.03	194	-.45
MCQ-5	15.82	4.15	15.28	4.44	194	.83
NILE	7.43	9.13	9.21	8.54	194	-1.35
FTND	4.10	2.56	4.50	2.65	194	-1.01
Duration of smoking	165.31	90.18	199.81	90.65	194	2.53**
First Cigarette	68.92	58.56	50.39	48.77	190	-2.32*
Amount of Cigarette	19.84	8.78	21.12	9.01	194	-.95

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to

Table 10 (Continued)

control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. *** $p < .001$, ** $p < .01$, * $p < .05$

As demonstrated in Table 11, there was also significant difference between the participants who had a partner and the participants who did not have a partner in terms of depression ($t [199] = 2.30, p < .05$), anxiety ($t(199) = 2.30, p < .05$), beliefs about the need to control thoughts ($t [199] = 2.04, p < .05$), cognitive self-consciousness ($t [199] = 2.71, p < .01$), and duration of cigarette smoking ($t [199] = 2.30, p < .001$). In addition, there was a marginally significant difference between the participants who had a partner and the participants who did not have a partner in terms of total metacognition scores ($t [199] = 1.90, p < .059$). The participants without a partner obtained significantly higher scores on depression ($m = 11.82, sd = 9.22$) than the participants with a partner ($m = 9.16, sd = 7.24$). Similarly, the participants without a partner got significantly higher scores on anxiety ($m = 15.01, sd = 10.38$) than the participants with a partner ($m = 11.49, sd = 10.95$). Moreover, the participants without a partner had significantly higher scores on beliefs about the need to control thoughts ($m = 13.82, sd = 4.08$) than the participants with a partner ($m = 12.66, sd = 3.87$). In addition, the participants without a partner had significantly higher scores on cognitive self-consciousness ($m = 16.35, sd = 4.26$) than the participants with a partner ($m = 14.70, sd = 4.27$). On the other hand, the participants without a partner had been smoking for shorter duration (less month) ($m = 153.18, sd = 81.44$) than participants with a partner ($m = 213.10, sd = 92.48$).

Table 11: Descriptive statistics and T-test results for participants having a partner

	Yes		No		df	t
	m	sd	m	sd		
BAI	15.01	10.38	11.49	10.95	199	2.30*
BDI	11.82	9.22	9.16	7.24	199	2.30*
MCQ-30	65.82	12.77	62.08	14.53	199	1.90*
MCQ-1	11.29	3.85	11.43	4.17	199	-.24
MCQ-2	12.22	4.58	11.43	4.17	199	.86
MCQ-3	12.14	4.28	11.62	4.07	199	.87
MCQ-4	13.82	4.08	12.66	3.87	199	2.04*
MCQ-5	16.35	4.26	14.70	4.27	199	2.71**
NILE	9.47	9.65	7.86	7.90	199	1.30
FTND	4.45	2.76	4.28	2.48	199	.47
Duration of smoking	153.18	81.44	213.10	92.48	199	-4.77***
First Cigarette	62.04	62.85	52.98	43.48	195	1.20
Amount of Cigarette	21.08	9.56	20.72	9.12	199	.27

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. *** $p < .001$, ** $p < .01$, * $p < .05$

When the effects of partner smoking was examined (see Table 12), it was found that there was a significant difference between the participants with a smoking partner and the participants with a nonsmoking partner in terms of depression ($t [114] = -2.61, p$

< .01), anxiety ($t [114] = -2.89, p < .01$), negative beliefs about worry concerning uncontrollability and danger ($t [114] = -2.68, p < .01$), negative impact of life experiences ($t [114] = -3.20, p < .01$), and amount of cigarette smoked per day ($t [114] = -2.35, p < .05$). The participants with a smoking partner had significantly higher scores on depression ($m = 10.87, sd = 7.99$) than the participants with a nonsmoking partner ($m = 7.45, sd = 5.98$). Correspondingly, the participants with a smoking partner received significantly higher scores on anxiety ($m = 14.34, sd = 13.32$) than the participants with a nonsmoking partner ($m = 8.64, sd = 6.92$). Besides, the participants with a smoking partner obtained significantly higher scores on negative beliefs about worry concerning uncontrollability and danger ($m = 12.77, sd = 5.16$) than the participants with a nonsmoking partner ($m = 10.56, sd = 3.63$). Moreover, the participants with a smoking partner had significantly higher scores on negative impact of life experiences ($m = 10.12, sd = 8.59$) than the participants with a nonsmoking partner ($m = 5.60, sd = 6.48$). Finally, the participants with a smoking partner used to smoke significantly more cigarettes ($m = 22.67, sd = 10.98$) than the participants with a nonsmoking partner ($m = 18.78, sd = 6.27$).

Table 12: Descriptive statistics and T-test results for participants' partner smoking status

	Nonsmoker		Smoker		df	t
	m	sd	m	sd		
BAI	8.64	6.92	14.34	13.32	114	-2.89**
BDI	7.45	5.98	10.87	7.99	114	-2.61**

Table 12 (Continued)

	Nonsmoker		Smoker		df	t	
	m	sd	m	sd			
MCQ-30	59.97	12.84	64.18	15.88	114	-1.57	
MCQ-1	11.33	3.84	11.53	4.52	114	-.26	
MCQ-2	10.56	3.63	12.77	5.16	114	-2.68**	
MCQ-3	11.41	4.15	11.82	4.02	114	-.54	
MCQ-4	12.53	3.65	12.80	4.10	114	-.38	
MCQ-5	14.15	4.03	15.26	4.45	114	-1.41	
NILE	5.60	6.48	10.12	8.59	114	-3.20**	
FTND	4.03	2.30	4.53	2.65	114	-1.07	
Duration of smoking	210.83	89.01	215.38	96.56	114	-.26	
First Cigarette		53.96	42.30	52.02	44.97	113	.24
Amount of Cigarette	18.78	6.27	22.67	10.98	114	-2.35*	

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.*** $p < .001$, ** $p < .01$, * $p < .05$

As demonstrated in Table 14, there was a significant difference between the participants who were born in a big city and the participants who were born in other places (city, town or village) in terms of beliefs about lack of cognitive confidence ($t [198] = 2.33, p < .05$), negative impact of life experiences ($t [198] = -1.97, p < .05$) and smoking dependence ($t [198] = 2.22, p < .05$). The participants who were born in a big

city had significantly lower scores on beliefs about lack of cognitive confidence ($m = 11.19, sd = 3.83$) than the participants who were born in other places such as city, town or village ($m = 12.55, sd = 4.43$). On the contrary, the participants who were born in a big city got significantly higher scores on negative impact of life experiences ($m = 9.70, sd = 8.98$) than the participants who were born in other places such as city, town or village ($m = 7.29, sd = 8.28$). On the other hand, the participants who were born in a big city received significantly lower scores on smoking dependence ($m = 3.95, sd = 2.52$) than the participants who were born in other places such as city, town or village ($m = 4.76, sd = 2.61$). However, the participants who were born in a big city had been smoking for shorter duration ($m = 164.86, sd = 78.19$) than the participants who were born other places ($m = 212.91, sd = 101.36$).

Table 13: Descriptive statistics and T-test results for participants' birthplace

	Others (City, Town, Village)		Big City		df	t
	m	sd	m	sd		
BAI	11.64	10.07	14.24	11.41	198	-1.70
BDI	10.33	8.36	10.21	8.16	198	.11
MCQ-30	65.01	14.02	62.54	13.80	198	1.25
MCQ-1	11.86	4.24	10.96	3.81	198	1.60
MCQ-2	11.55	4.18	12.26	4.91	198	-1.09
MCQ-3	12.55	4.43	11.19	3.83	198	2.33*
MCQ-4	13.14	3.90	13.14	4.11	198	.01
MCQ-5	15.90	4.39	15.01	4.24	198	1.48

Table 13 (Continued)

	Others (City, Town, Village)		Big City		df	t
	m	sd	m	sd		
NILE	7.29	8.28	9.70	8.98	198	-1.97*
FTND	4.76	2.61	3.95	2.52	198	2.22*
Duration of smoking	212.91	101.36	164.86	78.19	198	3.77***
First Cigarette	52.12	52.83	61.35	52.01	194	-1.23
Amount of Cigarette	21.45	9.50	20.27	9.10	198	.90

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. *** $p < .001$, ** $p < .01$, * $p < .05$

In terms of participants' living place (see Table 14), there was a significant difference between the participants who have spent most of their life in a big city and the participants who have spent most of their life in other places in terms of negative impact of life experiences ($t [197] = -2.26, p < .05$). The participants spending most of their life in a big city had significantly higher scores on negative impact of life experiences ($m = 9.40, sd = 8.88$) than the participants spending most of their life in other places ($m = 6.26, sd = 7.97$).

Table 14: Descriptive statistics and T-test results for participants' living place

	Others (City, Town, Village)		Big City			
	m	sd	m	sd	df	t
BAI	11.01	10.37	13.82	10.94	197	-1.63
BDI	9.74	7.33	10.52	8.55	197	-.59
MCQ-30	64.46	13.31	63.51	14.19	197	.43
MCQ-1	11.31	3.90	11.44	4.09	197	-.20
MCQ-2	10.97	3.57	12.31	4.84	197	-1.83
MCQ-3	12.52	4.24	11.57	4.13	197	1.43
MCQ-4	13.67	3.78	12.97	4.08	197	1.09
MCQ-5	15.99	4.26	15.23	4.36	197	1.09
NILE	6.26	7.97	9.40	8.88	197	-2.26*
FTND	4.39	2.74	4.28	2.51	197	.26
Duration of smoking	187.02	101.94	187.07	89.47	197	-.01
First Cigarette	54.32	57.37	58.32	50.81	193	-.47
Amount of Cigarette	19.91	8.49	21.07	9.53	197	-.78

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.***p< .001, **p< .01, *p< .05

When the effects of having physical illness was tested (see Table 15), it was found that there were significant differences between the participants who had physical illness and the participants who did not have physical illness in terms of anxiety (t [188]

= -2.30, $p < .05$), the time of first cigarette in the morning ($t [184] = 1.97, p < .05$) and smoking dependence ($t [188] = -2.48, p < .01$). The participants who had physical illness had higher scores on anxiety ($m = 17.56, sd = 12.05$) than the participants who did not have physical illness ($m = 12.12, sd = 10.41$). Similarly the participants who had physical illness received higher scores on smoking dependence ($m = 5.61, sd = 2.41$) than the participants who did not have physical illness ($m = 4.21, sd = 2.56$). The participants who had physical illness did also smoke first cigarettes earlier ($m = 35.70, sd = 29.56$) than the participants who did not have physical illness ($m = 58.28, sd = 53.83$).

Table 15: Descriptive statistics and T-test results for participants' physical illness

	Yes		No		df	t
	m	sd	m	sd		
BAI	17.56	12.05	12.12	10.41	188	-2.30*
BDI	11.44	9.21	10.22	8.18	188	-.50
MCQ-30	63.09	13.38	63.75	14.26	188	.21
MCQ-1	10.56	3.01	11.61	4.21	188	1.16
MCQ-2	13.04	4.72	11.68	4.46	188	-1.37
MCQ-3	12.96	3.76	11.65	4.28	188	-1.39
MCQ-4	12.65	3.82	13.22	4.05	188	.63
MCQ-5	13.88	3.68	15.60	4.41	188	1.78
NILE	10.78	8.52	8.36	8.79	188	-1.24
FTND	5.61	2.41	4.21	2.56	188	-2.48**
First Cigarette	35.70	29.56	58.28	53.83	184	1.97*
Amount of Cigarette	24.09	10.18	20.64	9.27	188	-1.65

Table 15 (Continued)

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. *** $p < .001$, ** $p < .01$, * $p < .05$

As can be seen in Table 16, there were also significant difference between the participants who had psychological illness and the participants who did not have psychological illness in terms of anxiety ($t [190] = -4.29, p < .001$), depression ($t(190) = -2.09, p < .05$), negative beliefs about worry concerning uncontrollability and danger ($t [190] = -3.89, p < .001$), and smoking dependence ($t [190] = -1.98, p < .05$). The participants who had psychological illness obtained higher scores on anxiety ($m = 22.53, sd = 14.71$) than the participants who did not have psychological illness ($m = 11.82, sd = 9.77$). Moreover, the participants who had psychological illness received higher scores on depression ($m = 14.08, sd = 7.90$) than the participants who did not have psychological illness ($m = 9.95, sd = 8.24$). Similarly, the participants who had psychological illness got higher scores on negative beliefs about worry concerning uncontrollability and danger ($m = 15.52, sd = 5.35$) than the participants who did not have psychological illness ($m = 11.44, sd = 4.22$). The participants who had psychological illness got higher scores on smoking dependence ($m = 5.47, sd = 2.91$) than the participants who did not have psychological illness ($m = 4.24, sd = 2.53$).

Table 16: Descriptive statistics and T-test results for participants' psychological illness

	Yes		No		df	t
	m	sd	m	sd		
BAI	22.53	14.71	11.82	9.77	190	-4.29***
BDI	14.08	7.90	9.95	8.24	190	-2.09*
MCQ-30	67.67	14.08	63.23	14.12	190	-1.30
MCQ-1	10.75	3.49	11.55	4.16	190	.82
MCQ-2	15.52	5.35	11.44	4.22	190	-3.89***
MCQ-3	13.37	4.35	11.64	4.16	190	-1.71
MCQ-4	13.66	4.48	13.12	3.98	190	-.56
MCQ-5	14.38	3.84	15.49	4.41	190	1.05
NILE	12.05	9.14	8.26	8.66	190	-1.80
FTND	5.47	2.91	4.24	2.53	190	-1.98*
Duration of sm0king	215.68	85.48	184.27	93.85	190	-1.40
First Cigarette	41.21	57.59	57.70	51.45	186	1.31
Amount of Cigarette	23.26	9.76	20.66	9.28	190	-1.16

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. ***p< .001, **p< .01, *p< .05

As shown in Table 17, there was a marginally significant difference between the participants who used alcohol and the participants who did not use alcohol in positive

beliefs about worry ($t [200] = 1.93, p < .055$); and there was a significant difference between the participants who used alcohol and the participants who did not use alcohol in terms of the amount of cigarette smoked per day ($t [200] = -2.95, p = .01$). The participants who did not use alcohol got higher scores on positive beliefs about worry ($m = 12.08, sd = 4.33$) than the participants who used alcohol ($m = 10.96; sd = 3.83$). The participants who used alcohol smoked more cigarette ($m = 22.41, sd = 10.41$) than the participants who did not use alcohol ($m = 18.57, sd = 7.23$).

Table 17: Descriptive statistics and T-test results for using alcohol

	Yes		No		df	t
	m	sd	m	sd		
BAI	13.27	10.56	12.57	11.21	200	-.45
BDI	10.01	8.32	10.77	8.06	200	.64
MCQ-30	63.21	12.88	64.68	15.60	200	.73
MCQ-1	10.96	3.83	12.08	4.33	200	1.93*
MCQ-2	11.52	4.29	12.52	4.94	200	1.52
MCQ-3	11.83	4.09	11.85	4.26	200	.04
MCQ-4	13.12	3.86	13.28	4.24	200	.28
MCQ-5	15.77	4.19	14.94	4.56	200	-1.34
NILE	7.95	8.25	9.49	9.27	200	1.24
FTND	4.50	2.68	4.13	2.45	200	-1.00
Duration of smoking	184.46	90.81	192.15	95.29	200	.58
First Cigarette	58.20	55.67	54.61	47.11	196	-.47
Amount of Cigarette	22.41	10.14	18.57	7.23	200	-2.95**

Table 17 (Continued)

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. *** $p < .001$, ** $p < .01$, * $p < .05$

As demonstrated in Table 18, there were significant differences between the participants who used alcohol in the last 30 days and the participants who did not use alcohol in the last 30 days in terms of anxiety ($t [199] = -2.16, p < .05$) and amount of cigarette smoked a day ($t [199] = -3.36, p < .001$). The participants who used alcohol in the last 30 days got higher scores on anxiety ($m = 14.51, sd = 11.44$) than the participants who did not use alcohol in last 30 days ($m = 11.24, sd = 9.84$). Participants who used alcohol in the last 30 days smoked more cigarettes ($m = 22.91, sd = 10.48$) than the participants who did not use alcohol in the last 30 days ($m = 18.62, sd = 6.95$).

Table 18: Descriptive statistics and T-test results for using alcohol in last 30 Days

	Yes		No		df	t
	m	sd	m	sd		
BAI	14.51	11.44	11.24	9.84	199	-2.16*
BDI	10.52	8.54	9.92	7.75	199	-.52
MCQ-30	63.87	13.12	63.75	15.12	199	-.06
MCQ-1	11.03	3.82	11.86	4.33	199	1.46
MCQ-2	11.72	4.45	12.18	4.75	199	.71

Table 18 (Continued)

	Yes		No		df	t
	m	sd	m	sd		
MCQ-3	12.13	4.22	11.52	4.08	199	-1.03
MCQ-4	13.19	3.93	13.05	4.13	199	-.43
MCQ-5	15.71	4.12	15.14	4.64	199	-.92
NILE	8.37	8.76	8.56	8.49	199	-.16
FTND	4.65	2.68	4.04	2.44	199	-1.69
Duration of smoking	183.56	90.64	192.00	95.33	199	.64
First Cigarette		57.96	52.89	55.34	195	-.35
Amount of Cigarette	22.91	10.48	18.62	6.95	199	-3.36***

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.*** $p < .001$, ** $p < .01$, * $p < .05$

When the participants who tried to quit smoking and the participants who did not try to quit smoking compared to each other (see Table 19), it was found that the only significant difference was in terms of the time of first cigarette in the morning ($t [196] = -2.33, p < .05$). The participants who tried to quit smoking used to smoke their first cigarette later ($m = 63.38, sd = 56.99$) than the participants who did not try to quit smoking ($m = 45.69, sd = 41.46$).

Table 19: Descriptive statistics and T-test results for quit trials

	Yes		No		df	t
	m	sd	m	sd		
BAI	12.78	10.61	13.36	11.19	200	.37
BDI	10.76	8.07	9.54	8.44	200	.45
MCQ-30	63.94	14.84	63.56	12.55	200	-.18
MCQ-1	11.40	4.31	11.44	3.63	200	.07
MCQ-2	11.82	4.59	12.11	4.58	200	.44
MCQ-3	11.84	4.07	11.84	4.31	200	-.01
MCQ-4	13.39	4.26	12.82	3.53	200	-.97
MCQ-5	15.49	4.42	15.35	4.27	200	-.22
NILE	9.23	9.08	7.42	7.88	200	-1.44
FTND	4.17	2.49	4.66	2.75	200	1.30
Duration of smoking	191.77	93.55	180.24	91.95	200	-.85
First Cigarette	63.38	56.99	45.69	41.46	196	-2.33*
Amount of Cigarette	20.32	9.11	21.82	9.51	200	.08

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence.***p< .001, **p< .01, *p< .05

To test the effect of marital status of parents, one way ANOVA was performed on the continuous variables of the study, which are depression, anxiety, total metacognition score, positive beliefs about worry, negative beliefs about worry

concerning uncontrollability and danger, beliefs about lack of cognitive confidence, beliefs about the need to control thoughts, cognitive self-consciousness, negative impact of life experiences, duration of cigarette smoking, the time of first cigarette in the morning, amount of cigarettes smoked per day, and smoking dependence (see Table 20). The effect of marital status of parents on negative impact of life experiences was found to be significant ($F [3,197] = 4.91, p < .01$). Post hoc analyses using Tukey HSD test indicated that participants who had divorced parents got significantly higher scores on negative impact of life experiences ($m = 14.86, sd = 10.64$) than the participants who had widowed ($m = 6.69, sd = 8.40$) and married parents ($m = 8.01, sd = 8.17$). In addition, the effect of marital status of parents on duration of smoking was significant ($F [3,197] = 4.02, p < .01$). Post hoc analyses using Tukey HSD test yielded that the participants who had widowed parents smoked for longer duration ($m = 223.69, sd = 95.90$) than the participants who had married parents ($m = 178.60, sd = 91.30$).

Table 20: Descriptive statistics (means with standard deviations in parentheses) and one-way ANOVA results for marital status of participants' parents

	Married	Divorced	Widowed	Dead	F (3,197)
BAI	12.99 (11.01)	15.90(11.25)	11.24(10.13)	13.29(9.84)	.87
BDI	10.07 (8.36)	13.16(9.44)	9.06(7.24)	12.25(5.11)	1.36
MCQ-30	63.18 (13.60)	67.68(14.33)	62.79(14.68)	65.00(14.99)	.74
MCQ-1	11.21 (3.87)	11.64(4.33)	11.46(4.51)	13.00(3.65)	.48
MCQ-2	11.49 (4.17)	13.62(5.10)	12.08(5.10)	13.29(6.52)	1.63
MCQ-3	11.82(4.23)	12.67(4.31)	11.69(3.95)	10.29(3.55)	.63
MCQ-4	13.16(4.05)	13.50(4.27)	12.80(3.79)	13.71(3.68)	.20

Table 20 (Continued)

	Married	Divorced	Widowed	Dead	F (3,197)
MCQ-5	15.48(4.22)	16.26(4.69)	14.76(4.43)	14.71(4.96)	.64
NILE	8.01(8.17)	14.86(10.64)	6.69(8.40)	9.14(5.93)	4.91**
FTND	4.30(2.53)	4.73(2.91)	4.59(2.68)	2.86(2.19)	1.05
Dur. of smo.	178.60(91.30)	161.45(68.46)	223.69(95.90)	244.29(107.71)	4.02**
First Cig.	56.08(47.96)	57.19(71.42)	56.68(58.85)	68.57(41.40)	.13
Amount of Cig.	21.09(9.90)	0.77(8.09)	21.05(8.24)	16.14(5.61)	.63

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. First Cig. $F(3,193)$. *** $p < .001$, ** $p < .01$, * $p < .05$

To examine the effects of perceived socio economic status (SES), one way ANOVA was performed on the continuous variables of the study which are depression, anxiety, total metacognition scores, positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, beliefs about lack of cognitive confidence, beliefs about the need to control thoughts, cognitive self-consciousness, negative impact of life experiences, duration of cigarette smoking, the time of first cigarette in the morning, amount of cigarettes smoked per day, and smoking dependence (see Table 21). The effect of perceived socio economic status on negative impact of life experiences was significant ($F [2,199] = 7.92, p < .001$). Post hoc analyses using Tukey HSD test revealed that low SES group ($m = 12.19, sd = 9.96$) had higher scores on

negative impact of life experiences than low SES group ($m = 4.58, sd = 5.51$). Similarly, the effect of perceived SES on smoking dependence was significant ($F [2,199] = 3.48, p < .05$). Post hoc analyses using Tukey HSD test indicated that the low SES group ($m = 5.00, sd = 2.71$) had higher scores on smoking dependence than high SES group ($m = 3.51, sd = 2.38$). Furthermore, the effect of perceived social economic status on the time of first cigarette in the morning was found to be significant ($F [2,195] = 3.14, p < .05$); post hoc analyses using Tukey HSD test indicated that high SES group smoked their first cigarette later in the morning ($m = 74.26, sd = 57.63$) than low SES group ($m = 51.88, sd = 45.90$). Although the effect of perceived SES on the duration of cigarette smoking was found to be significant, ($F [4,199] = 3.01, p < .05$); post hoc analyses using Tukey HSD test indicated that there was no significant difference between high and low SES groups.

Table 21: Descriptive statistics (means with standard deviations in parentheses) and one-way ANOVA results for participants' perceived SES

	Low	Middle	High	F (2, 199)
BAI	13.24(10.94)	13.66(11.35)	10.81(8.76)	1.14
BDI	12.20(8.03)	10.58(8.47)	8.15(7.20)	2.41
MCQ-30	63.98(16.10)	65.17(13.72)	59.55(12.71)	2.61
MCQ-1	11.19(3.90)	11.71(4.25)	10.67(3.57)	1.11
MCQ-2	12.16(5.28)	12.18(4.66)	10.72(3.59)	1.92
MCQ-3	11.57(4.04)	12.18(4.34)	11.02(3.56)	1.32
MCQ-4	13.63(4.86)	13.34(3.86)	12.40(3.77)	1.12
MCQ-5	15.43(4.46)	15.67(4.15)	14.76(4.87)	.70

Table 21 (Continued)

	Low	Middle	High	F (2, 199)
NILE	12.19(9.96)	9.03(8.78)	4.58(5.51)	7.92***
FTND	5.00(2.71)	4.48(2.58)	3.51(2.38)	3.48*
Dur. of smo.	224.32(92.44)	182.20(89.67)	176.93(96.29)	3.01*
First Cig.	52.07(65.41)	51.88(45.90)	74.26(57.63)	3.14*
Amount of Cig.	22.61(7.90)	20.84(9.27)	19.70(10.13)	.89

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. First Cig. $F(2, 195)$. *** $p < .001$, ** $p < .01$, * $p < .05$

One way ANOVA was run to examine the effects of frequency of alcohol use on the continuous variables of the study which are depression, anxiety, total metacognition score, positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, beliefs about lack of cognitive confidence, beliefs about the need to control thoughts, cognitive self-consciousness negative impact of life experiences, duration of cigarette smoking, the time of first cigarette in the morning, amount of cigarettes smoked per day, and smoking dependence (see Table 22). The effect of frequency of alcohol use on smoking dependence was found to be significant ($F [3,129] = 3.93, p < .01$). According to the post-hoc analysis conducted with Tukey's HSD at .05 alpha level, participants who drank alcohol four times and more in a week had higher smoking dependence scores ($m = 5.82, sd = 2.79$) than participants who drank alcohol once and less in a month ($m = 3.80, sd = 2.60$) and participants who drank

alcohol twice or three times in a week ($m = 3.72, sd = 2.49$). The effect of frequency of alcohol use on amount of cigarette was significant ($F [3,129] = 4.23, p < .01$). Post hoc analyses using Tukey HSD test revealed that participants who drank alcohol four times and more in a week smoked more cigarettes ($m = 28.47, sd = 13.12$) than participants who drank alcohol once and less in a month ($m = 19.67, sd = 7.93$) and participants who drank alcohol twice or three times in a week ($m = 20.41, sd = 8.12$). The effect of frequency of alcohol use on the time of first cigarette in the morning was also significant ($F [3,126] = 3.58, p < .05$). Post hoc analyses using Tukey HSD test indicated that participants who drank alcohol four times and more in a week smoked their first cigarette earlier ($m = 26.88, sd = 43.96$) than participants who drank alcohol twice or three times in a week ($m = 78.19, sd = 59.48$).

Table 22: Descriptive statistics (means with standard deviations in parentheses) and one-way ANOVA results for frequency of alcohol use

	Once or less in a month	Twice or four times in a month	Twice or three times in a month	Four times or more	F (3,129)
BAI	12.32(11.38)	13.15(10.06)	13.50(11.53)	15.21(11.73)	.30
BDI	8.44(6.89)	9.38(7.06)	10.36(7.65)	12.79(12.40)	1.36
MCQ-30	59.51(12.41)	63.34(11.56)	65.50(13.23)	66.73(13.72)	2.18
MCQ-1	10.47(4.02)	10.89(3.85)	11.22(3.61)	11.71(3.67)	.53
MCQ2	10.67(3.84)	11.04(3.13)	12.21(4.93)	12.52(5.53)	1.36
MCQ-3	11.28(3.65)	12.71(4.61)	11.41(3.96)	12.34(4.24)	1.07
MCQ-4	12.29(3.78)	12.92(3.50)	14.07(4.01)	14.06(4.45)	1.71
MCQ-5	14.80(4.20)	15.79(4.13)	16.58(4.06)	16.12(4.53)	1.23

Table 22 (Continued)

	Once or less in a month	Twice or four times in a month	Twice or three times in a month	Four times or more	F (3,129)
NILE	6.67(7.49)	8.00(8.23)	7.41(6.73)	11.76(11.69)	1.68
FTND	3.80(2.27)	4.98(2.51)	3.72(2.49)	5.82(2.79)	3.93**
Dur. of smo.	175.06(88.84)	189.00(94.90)	186.00(87.16)	184.94(91.98)	.20
First Cig.	63.60(54.41)	51.49(49.89)	78.19(59.48)	78.19(59.48)	3.58*
Amount of Cig.	19.67(7.93)	23.79(10.84)	20.41(8.12)	28.47(13.12)	4.23**

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. First Cigarette $F(3,126)$ *** $p < .001$, ** $p < .01$, * $p < .05$

One way ANOVA was run to examine the effects of amount of alcohol that was drunk by participants on the continuous variables that are depression, anxiety, total metacognition scores, positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, beliefs about lack of cognitive confidence, beliefs about the need to control thoughts, cognitive self-consciousness, negative impact of life experiences, duration of cigarette smoking, the time of first cigarette in the morning, amount of cigarettes, and smoking dependence (see Table 23). The effect of amount of alcohol that was drunk by participants on smoking dependence was significant ($F [3,132] = 3.84, p < .01$). Post hoc analyses using Tukey HSD test indicated that the participants who drank seven or nine glasses at once got higher scores on smoking dependence ($m = 6.86, sd = 1.86$) than the participants who drank one or

two glasses of alcohol ($m = 3.86$, $sd = 2.50$) and the participants who drank five or six glasses at once ($m = 3.73$, $sd = 2.35$). The effect of amount of alcohol that was drunk by participants on amount of cigarettes was also significant ($F [3,132] = 4.41$, $p < .01$). Post hoc analyses using Tukey HSD test indicated that participants who drank seven or nine glasses at once smoked more cigarettes ($m = 32.86$, $sd = 16.29$) than participants who drank one or two glasses alcohol ($m = 20.09$, $sd = 8.05$) and participants who drank five or six glasses at once ($m = 19.91$, $sd = 7.69$).

Table 23: Descriptive statistics (means with standard deviations in parentheses) and one-way ANOVA results for amount of alcohol drunk by the participants at once

	1-2 glasses	3-4 glasses	5-6 glasses	7-9 glasses	F (3,132)
BAI	12.35(11.29)	12.30(10.43)	17.45(9.84)	14.00(16.05)	1.33
BDI	8.05(6.18)	10.01(8.37)	13.14(8.82)	13.28(14.86)	2.56
MCQ-30	60.90(12.26)	61.98(12.78)	66.85(11.53)	67.00(20.31)	1.44
MCQ-1	10.72(4.08)	10.62(3.59)	11.82(3.62)	11.29(4.46)	.58
MCQ2	11.01(4.06)	11.30(4.00)	12.31(4.64)	11.71(6.65)	.50
MCQ-3	11.42(3.96)	11.81(3.53)	11.81(4.16)	13.00(6.03)	.36
MCQ-4	12.67(3.71)	12.80(3.67)	14.27(4.91)	14.29(4.23)	1.18
MCQ-5	15.07(4.09)	15.46(4.22)	16.64(4.38)	16.71(4.89)	.92
NILE	7.22(7.92)	7.37(7.89)	11.32(9.15)	10.86(14.22)	1.62
FTND	3.86(2.50)	4.77(2.73)	3.73(2.35)	6.86(1.86)	3.84**
Dur. of smo.	183.60(85.05)	194.77(96.43)	142.09(68.27)	178.29(58.14)	1.95
First Cig.	65.56(51.80)	57.66(55.52)	58.05(60.56)	14.57(21.27)	1.88

Table 23 (Continued)

	1-2 glasses	3-4 glasses	5-6 glasses	7-9 glasses	F (3,132)
Amount of Cig.	20.09(8.05)	23.35(10.66)	19.91(7.69)	32.86(16.29)	4.41**

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Need to control thoughts, MCQ-5 = Cognitive self-consciousness, NILE = Negative impact of life experiences, FTND = Fagerström Test of Nicotine Dependence. First Cigarette $F(3,129)$. *** $p < .001$, ** $p < .01$, * $p < .05$

3.2. Correlations

The zero order correlation coefficients among the measures were examined in order to investigate the relationships among the variables of the current study. As can be seen in Table 25, correlations among the demographic variables of current study indicated that there was a significant and positive correlation between duration of smoking and the amount of cigarette ($r = .27, p < .01$), and smoking dependence ($r = .20, p < .01$), although there was a significant and negative correlation between duration of smoking and the time of first cigarette in the morning ($r = -.16, p < .05$) and beliefs about the need to control thoughts ($r = -.14, p < .05$).

There was a significant and positive correlation between amount of cigarette and using alcohol in the last 30 days ($r = .23, p < .01$), frequency of alcohol use ($r = .21, p < .01$), amount of alcohol that was drunk at once ($r = .18, p < .05$), duration of smoking ($r = .27, p < .01$), and smoking dependence ($r = .59, p < .01$). On the other hand, it was negatively correlated with the time of first cigarette in the morning ($r = -.39, p < .01$).

In addition, results indicated that depression was positively correlated with psychological illness ($r = .15, p < .05$), amount of alcohol that was drunk at once ($r = .23, p < .01$), anxiety ($r = .53, p < .001$), total scores of metacognition ($r = .46, p < .001$), positive beliefs about worry ($r = .23, p < .001$), negative beliefs about worry concerning uncontrollability and danger ($r = .48, p < .001$), beliefs about lack of cognitive confidence ($r = .26, p < .001$), beliefs about the need to control thoughts ($r = .39, p < .001$), cognitive self-consciousness ($r = .15, p < .05$), smoking dependence ($r = .20, p < .01$), and negative impact of life events ($r = .55, p < .001$). On the other hand, it was negatively correlated with gender ($r = .19, p < .01$) and the time of first cigarette in the morning ($r = -.14, p < .05$).

Moreover, anxiety was found as related to marital status ($r = .16, p < .05$), partner smoking ($r = .21, p < .01$), physical illness ($r = .17, p < .05$), psychological illness ($r = .30, p < .01$), using alcohol in the last 30 days ($r = .15, p < .05$), the time of first cigarette in the morning ($r = -.14, p < .05$), depression ($r = .53, p < .01$), total scores of metacognition ($r = .44, p < .01$), negative beliefs about worry concerning uncontrollability and danger ($r = .58, p < .01$), beliefs about lack of cognitive confidence ($r = .26, p < .01$), beliefs about the need to control thoughts ($r = .33, p < .01$), smoking dependence ($r = .23, p < .01$), and negative impact of life events ($r = .48, p < .01$).

Furthermore, total metacognition score was positively correlated with frequency of alcohol use ($r = .21, p < .01$), depression ($r = .46, p < .01$), anxiety ($r = .44, p < .01$), negative impact of life events ($r = .38, p < .01$), and it was negatively correlated with the time of first cigarette in the morning ($r = -.16, p < .05$).

In addition positive beliefs about worry was positively correlated with depression ($r = .23, p < .01$) and negative impact of life events ($r = .18, p < .01$).

Moreover, negative beliefs about worry concerning uncontrollability and danger was correlated with depression ($r = .48, p < .01$), anxiety ($r = .58, p < .01$), and negative impact of life experiences ($r = .45, p < .01$). Results indicated that beliefs about lack of cognitive confidence was found to be related to depression ($r = .26, p < .01$), anxiety ($r = .26, p < .01$), smoking dependence ($r = .14, p < .05$), and negative impact of life experiences ($r = .15, p < .05$). Furthermore, there was a significant and negative correlation between beliefs about the need to control thoughts and duration of smoking ($r = -.14, p < .05$), and the time of first cigarette in the morning ($r = -.15, p < .05$). On the other hand, it had a significant and positive correlation with depression ($r = .39, p < .01$), anxiety ($r = .33, p < .01$), and negative impact of life experiences ($r = .32, p < .01$).

Results also revealed that cognitive self-consciousness was related to depression ($r = .15, p < .05$) and negative impact of life experiences ($r = .17, p < .05$).

Smoking dependence was negatively correlated with birthplace ($r = -.16, p < .05$), perceived SES ($r = -.18, p < .01$), and the time of first cigarette in the morning ($r = -.71, p < .01$); and it was positively correlated with having stepsibling ($r = .16, p < .05$), physical illness ($r = .18, p < .01$), psychological illness ($r = .14, p < .05$), duration of smoking ($r = .20, p < .01$), amount of cigarette ($r = .59, p < .01$), depression ($r = .20, p < .01$), anxiety ($r = .23, p < .01$), and beliefs about lack of cognitive confidence ($r = .14, p < .05$).

Negative impact of life experiences was found to be related to depression ($r = .55, p < .01$), anxiety ($r = .48, p < .01$), total metacognition score ($r = .38, p < .01$), positive beliefs about worry ($r = .18, p < .05$), negative beliefs about worry concerning

uncontrollability and danger ($r = .45, p < .01$), beliefs about lack of cognitive confidence ($r = .15, p < .05$), beliefs about need to control thoughts ($r = .32, p < .01$), and cognitive self-consciousness ($r = .17, p < .05$).

Table 24: Correlation coefficients among variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Gender	1.00															
2. Age	.05	1.00														
3. Education	-.03	-.15*	1.00													
4. Father Education	-.02	-.20**	.36**	1.00												
5. Mother Education	.03	-.30**	.36**	.56**	1.00											
6. Number of Siblings	.12	.33**	-.29*	-.41**	-.36**	1.00										
7. Mother Smoking	-.19**	-.28**	.09	.17*	.27**	-.31**	1.00									
8. Father Smoking	-.04	-.09	-.02	.03	.01	-.12	.16*	1.00								
9. Sibling Smoking	-.04	.06	.04	-.12	.02	.05	.07	.01	1.00							
10. Partner Smoking	-.23**	-.33**	.22**	.10	.22**	-.11	.12	.03	-.02	1.00						
11. Birthplace	-.12	-.28**	-.02	-.03	.03	-.18*	.10	.02	.05	.17*	1.00					
12. Perceived SES	-.03	-.04	.18*	.26**	.24**	-.15*	.05	-.25*	.04	.04	-.03	1.00				
13. Alcohol Use	.02	-.07	.13	.20**	.14*	-.12	.01	.08	.09	.23**	.07	.03	1.00			
14. Duration of Smoking	.09	.85**	-.17*	-.19**	-.30**	.31**	-.23*	-.04	.13	-.30**	-.26**	-.14*	-.04	1.00		
15. The Time of The First Cig.	-.05	-.15*	.03	.12	.09	-.10	.01	-.07	-.12	.08	.09	.14*	.03	-.16*	1.00	
16. Amount of Cigarette	.23**	.14*	-.03	.03	-.03	.02	-.01	.04	.13	.07	-.06	-.09	.20**	.27**	-.39**	1.00

Note. Education = 1: High school and lower, 2: University and higher, Paternal and Maternal Education = 1: Primary school and lower, 2: Secondary school and higher, Mother Smoking = 0: No, 1: Yes, Father Smoking = 0: No, 1: Yes, Sibling Smoking = 0: No, 1: Yes, Partner Smoking = 0: No, 1: Yes, Birthplace = 1: Others, 2: Big city, Perceived SES = 1: Low, 2: Middle, 3: Upper, Alcohol Use = 0: No, 1 = Yes. For all correlations, * $p < .05$; ** $p < .01$

Table 25: Correlation coefficients among variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1. Gender	1.00																											
2. Age	.05	1.00																										
3. Education	-.04	-.15*	1.00																									
4. Marital Status	.14**	.28**	.23**	1.00																								
5. Mother Living Status	.08	-.39**	.07	.07	1.00																							
6. Having Stepsiblings	-.09	.08	.07	.07	-.02	1.00																						
7. Partner Smoking	-.23**	-.33**	.22*	.85**	.05	.06	1.00																					
8. Birthplace	-.12	-.28**	.02	.15*	.10	-.03	.17**	1.00																				
9. Perceived SES	-.03	-.04	.18*	.05	.01	.07	.04	-.03	1.00																			
10. Physical Illness	.17*	.11	.03	.05	-.02	-.05	-.01	-.03	-.04	1.00																		
11. Psy. Illness	-.13	.07	-.10	.02	-.05	-.10	.01	.02	-.12	.39**	1.00																	
12. Alcohol in 30 Days	.04	-.09	.21**	.20**	.17*	.01	.23**	.08	.04	-.01	-.01	1.00																
13. Frequency of Alcohol	.27**	.02	.10	.11	.07	.10	.05	.04	.01	-.01	.01	.40**	1.00															
14. Amount of Alcohol	.26**	-.17	.17*	.28**	.08	.01	.20*	.14	-.02	-.01	-.04	.34**	.61**	1.00														
15. Quit Trial	.17*	.09	.01	-.22**	.01	.10	-.19**	-.10	-.04	.02	-.14*	.06	.03	-.06	1.00													
16. Duration of Smoking	.09	.85**	-.17*	-.27**	.21**	.10	-.30**	-.26**	-.15*	.13	.10	-.05	.05	-.10	.06	1.00												
17. Morning Cigarette	-.05	-.15*	.03	.05	.01	-.06	.08	.09	.14*	-.14	-.10	.03	-.11	-.16	.16*	-.16*	1.00											
18. Amount of Cigarette	.23**	.14*	.03	.07	.07	.01	.07	-.06	-.09	.12	.08	.23**	.21*	.18*	-.08	.27**	-.39**	1.00										
19. BDI	-.19**	-.10	-.01	.13	-.01	.01	.20**	-.01	-.15*	.04	.15*	.04	.17	.23**	.07	-.10	-.14*	.07	1.00									
20. BAI	.42**	-.09	-.01	.16*	-.10	.08	.21**	.12	-.07	.17*	.30**	.15*	.08	.12	-.03	-.07	-.14*	.11	.53**	1.00								
21. MCQ-30	-.11	-.10	-.02	.11	-.02	.06	.16*	.09	-.11	-.02	.09	.01	.21**	.16	.01	-.10	-.16	.01	.46**	.44**	1.00							
22. MCQ-1	.07	-.04	-.09	.01	.01	-.01	-.01	-.11	-.05	-.08	-.06	-.10	.11	.08	-.01	.04	-.14*	-.05	.23**	.13	.66**	1.00						
23. MCQ-2	-.30*	-.04	-.03	.07	-.14*	.10	.11	.08	-.11	.10	.27**	-.05	.17	.09	-.03	-.06	-.09	.01	.48**	.58**	.75**	.36**	1.00					
24. MCQ-3	-.12	-.03	-.04	.07	.02	.15*	.07	-.16*	-.05	.10	.12	.07	.06	.08	.00	-.01	-.08	.12	.26**	.26**	.41**	.05	.25**	1.00				
25. MCQ-4	-.01	-.13	.03	.11	.04	-.08	.15*	.00	-.10	-.05	.04	.03	.19*	.14	.07	-.14*	-.15*	.01	.39**	.33**	.81**	.43**	.50**	.13*	1.00			
26. MCQ-5	.01	-.11	.10	.14*	.03	.02	.21**	-.10	-.06	-.13	-.08	-.07	.15	.14	-.02	-.09	-.09	-.05	.15*	.14	.68**	.36**	.32--	-.08	.64**	1.00		
27. FTND	.04	.11	.07	.06	.02	.16*	.05	-.16*	.18**	.18*	.14*	.12	.17	.16	-.09	.20**	-.71**	.59**	.20**	.23**	.10	.01	.12	.14*	.04	.02	1.00	
28. NILE	.27**	-.11	.02	.09	-.01	.09	.15*	.14	.27**	.09	.13	.01	.16	.16	.10	-.05	-.13	.06	.55**	.48**	.38**	.18**	.45**	.15*	.32**	.17*	.13	1.00

Note. BAI = Beck Anxiety Inventory, BDI = Beck Depression Inventory, MCQ-30 = Metacognitions Questionnaire-30, MCQ-1 = Positive beliefs about worry, MCQ-2 = Negative beliefs about worry concerning uncontrollability and danger, MCQ-3 = Lack of cognitive confidence, MCQ-4 = Beliefs about the need to control thoughts, MCQ-5 = Cognitive self-consciousness, FTND = Fagerström Test of Nicotine Dependence, NILE = Negative impact of life experiences. Gender = 1: Female, 2: Male, Education = 1: High school and lower, 2: University and higher, Marital status = 1: Married, 2: Non-married, Mother Living Status = 0: Dead, 1: Alive, Having step sibling = 0: No, 1: Yes, Partner Smoking 0: No, 1: Yes, Birthplace = 1: Others, 2: Big city, Perceived SES = 1: Low, 2: Middle, 3: Upper, Physical/ Psychological illness/Alcohol use in last 30 days/Quit trial = 0: No, 1: Yes, Frequency of alcohol use = 1: Once or less in a month, 2: twice or four times in a month, 3: Twice or three times in a week, 4: Four times or more in week, Amount of Alcohol = 1: 1-2 glasses, 2: 2-3 glasses, 3: 4-5 glasses, 4: 7-9 glasses *** For all correlations, * p < .05; ** p < .01;

3.3. Model Testing

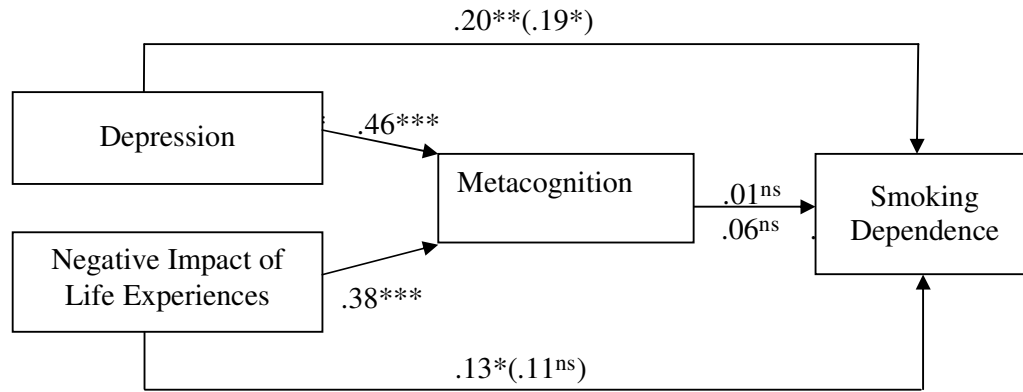
In order to test the main hypotheses of the study, 12 mediation models were tested. Using total scores of metacognition, positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, beliefs about lack of cognitive confidence, beliefs about need to control thoughts, and cognitive self-consciousness as mediators, the models included depression, anxiety, and negative impact of life experiences as independent variables; and smoking dependence as the dependent variable. According to Baron and Kenny (1986), the following conditions must hold to establish mediation: a) the independent variable must affect the mediator in the first equation, b) the independent variable must be revealed to affect the dependent variable in the second equation, and c) the mediator must affect the dependent variable in the third equation. If all these conditions hold in the predicted direction, then the effect of the independent variable on the dependent variable must be less in the third equation than in the second or vanish fully. Perfect mediation holds if the independent variable has no effect when the mediator is controlled. Accordingly, three regression analyses were run for each model by using standard multiple regression analysis.

3.3.1. Mediation Model for Depression and Negative Impact of Life

Experiences

Six mediation models were proposed for depression and negative impact of life experiences being independent variables while dependent variable was smoking dependence. The mediators were metacognition, positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, beliefs about lack of

cognitive confidence, beliefs about the need to control thoughts, and cognitive self-consciousness.



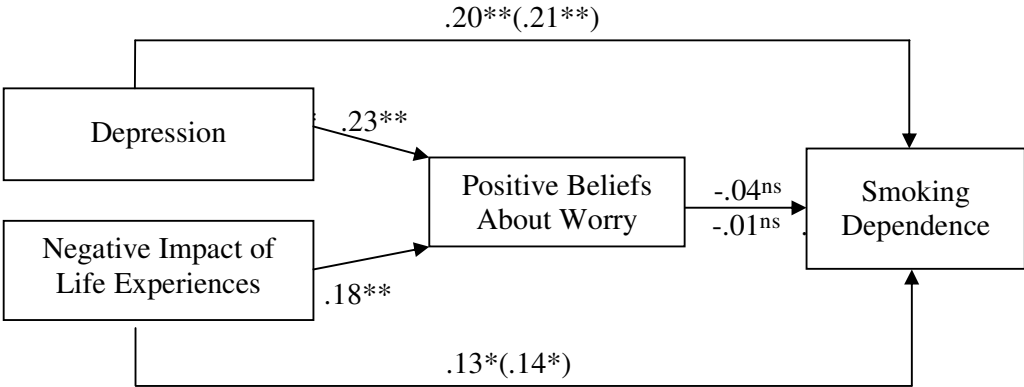
Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Figure 1. The model testing the mediating role of total metacognition score on the relationship between depression/negative impact of life experiences and smoking dependence.

Depression predicted total metacognition score ($\beta = .46, p < .001$) and smoking dependence significantly ($\beta = .20, p < .01$) but metacognition did not predict smoking dependence ($\beta = .01, p = .86$). As the conditions of mediation were not met, total metacognition score did not mediate the relationship between depression and smoking dependence (See Figure 1).

Total metacognition score did not mediate the relationship between negative impact of life experiences and smoking, as well (See Figure 1). Although negative impact of life experiences was a significant predictor of metacognition ($\beta = .38, p < .001$) and a marginally significant predictor of smoking dependence ($\beta = .13, p = .058$), total

metacognition score did not predict smoking dependence ($\beta = .06, p = .44$) significantly while controlling for negative impact of life experiences. Thus, the analyses suggested that total metacognition score did not mediate the relationship between depression/negative impact of life experiences and smoking.

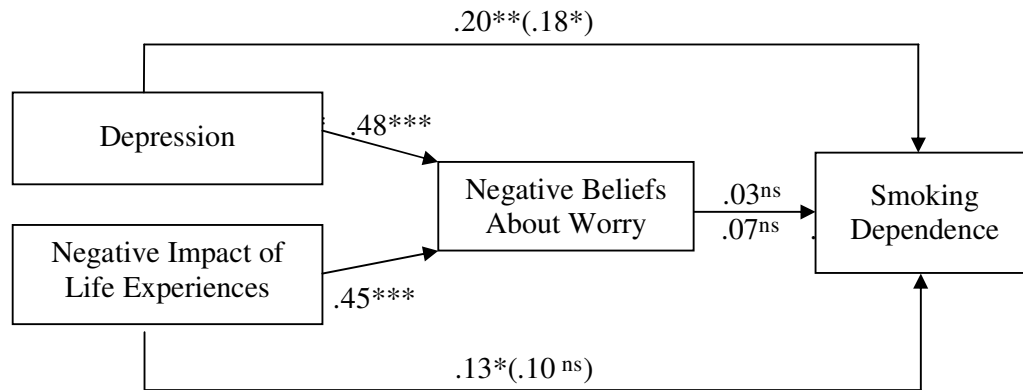


Note. $*p < .05$; $**p < .01$; $***p < .001$

Figure 2. The model testing the mediating role of positive beliefs about worry on the relationship between depression/negative impact of life experiences and smoking dependence

The relationship between depression and smoking dependency was not mediated by positive beliefs about worry, too (See Figure 2). Only following conditions of mediation were met: depression was a significant predictor of smoking dependency ($\beta=.20, p<.01$) and positive beliefs about worry ($\beta= .23, p<. 01$).Positive beliefs about worry did not predict smoking dependence. Therefore positive beliefs about worry did not mediate the relationship between depression and smoking dependence.

Negative impact of life experiences predicted positive beliefs about worry ($\beta= .18$, $p<.01$) significantly and smoking dependence ($\beta= .13$, $p= .058$) marginal significantly. However, positive beliefs about worry did not predict smoking dependence significantly ($\beta= -.01$, $p= .85$). Thus, positive beliefs about worry did not mediate the relationship between negative impact of life experiences and smoking dependence (See Figure 2).



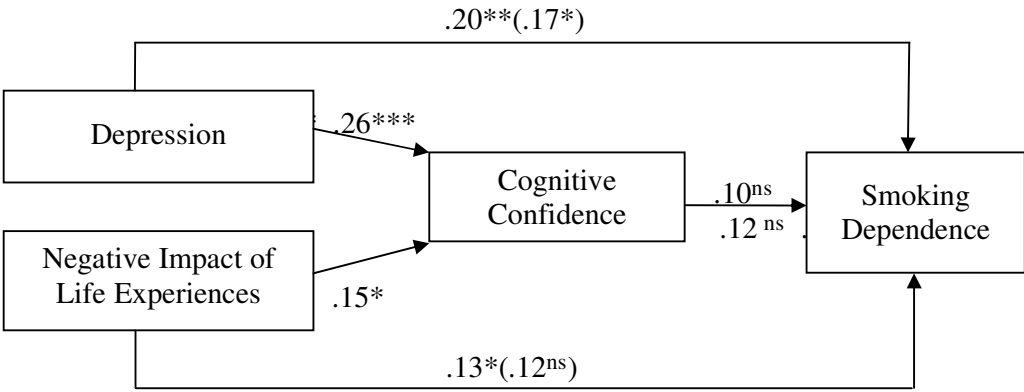
Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Figure 3. The model testing the mediating role of negative beliefs about worry concerning uncontrollability and danger on the relationship between depression/negative impact of life experiences and smoking dependence

The relationship between depression and smoking dependence was not mediated by negative beliefs about worry concerning uncontrollability and danger because the conditions of mediation were not fulfilled (See Figure 3). That is, although depression predicted smoking dependence ($\beta= .20$, $p < .01$) and negative beliefs about worry concerning uncontrollability and danger ($\beta= .48$, $p < .001$), negative beliefs about worry

concerning uncontrollability and danger did not predict smoking dependence ($\beta= .03, p=.70$) significantly.

The relationship between negative impact of life experiences and smoking dependence was not mediated by negative beliefs about worry about concerning uncontrollability and danger, too (See Figure 3). The following conditions of mediation were not met: negative impact of life experiences predicted negative beliefs about worry concerning uncontrollability and danger ($\beta= .45, p< .001$) significantly and smoking dependence ($\beta= .13, p= .058$) marginal significantly but negative beliefs about worry concerning uncontrollability and danger did not predict smoking dependence ($\beta= .07, p=.35$) significantly. Since the conditions of mediation were not met, negative beliefs about worry concerning uncontrollability and danger did not mediate between relationship between negative impact of life experiences and smoking dependence.

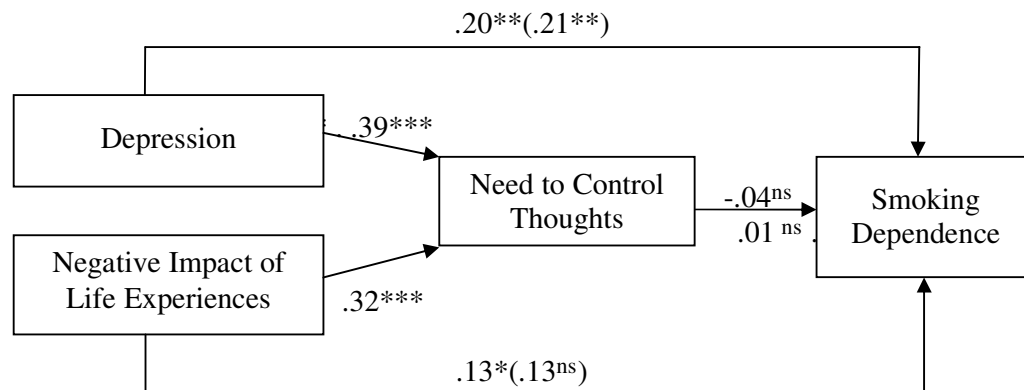


Note. $*p < .05$; $**p < .01$; $***p < .001$

Figure 4. The model testing the mediating role of beliefs about lack of cognitive confidence on the relationship between depression/negative impact of life experiences and smoking dependence

Similarly, the path for depression with beliefs about lack of cognitive confidence as the mediator was not significant (See Figure 4). Although depression predicted beliefs about lack of cognitive confidence ($\beta = .26, p < .001$) and smoking dependence ($\beta = .20, p < .01$), beliefs about lack of cognitive confidence did not predict smoking dependence ($\beta = .10, p = .18$) significantly. Therefore, beliefs about lack of cognitive confidence did not mediate the relationship between depression and smoking dependence.

Negative impact of life experiences predicted beliefs about lack of cognitive confidence ($\beta = .15, p < .05$) significantly and smoking dependence ($\beta = .13, p = .058$) marginal significantly. However, beliefs about lack of cognitive confidence did not predict smoking dependence significantly ($\beta = .12, p = .08$). Thus, beliefs about lack of cognitive confidence did not mediate the relationship between negative impact of life experiences and smoking (See Figure 4).



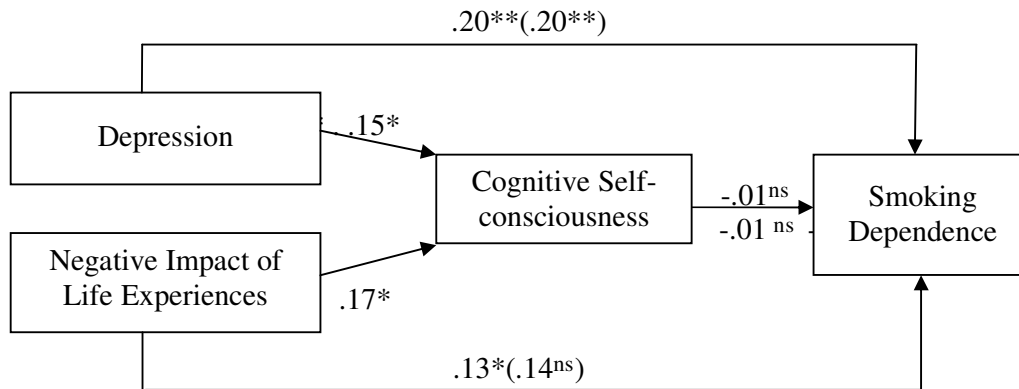
Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Figure 5 (Continued)

Figure 5. The model testing the mediating role of the need to control thoughts on the relationship between depression/negative impact of life experiences and smoking dependence

Beliefs about the need to control thoughts did not mediate the relationship between depression and smoking dependence, because beliefs about the need to control thoughts did not predict smoking dependence ($\beta = -.04, p = .60$). However the effect of depression on beliefs about the need to control thoughts ($\beta = .39, p < .001$) and smoking dependence ($\beta = .20, p < .01$) was significant (See Figure 5).

The relationship between negative impact of life experiences and smoking dependence was not mediated by beliefs about the need to control thoughts, as well. Although negative impact of life experiences predicted beliefs about the need to control thoughts ($\beta = .32, p < .001$) significantly and it predicted smoking dependence ($\beta = .13, p = .058$) marginal significantly, beliefs about the need to control thoughts did not predict smoking dependence when negative impact of life experiences was controlled ($\beta = .01, p = .98$). Therefore, beliefs about the need to control thoughts did not mediate the relationship between negative impact of life experiences and smoking dependence (See Figure 5).



Note. $*p < .05$; $**p < .01$; $***p < .001$

Figure 6. The model testing the mediating role of cognitive self-consciousness on the relationship between depression/negative impact of life experiences and smoking dependence

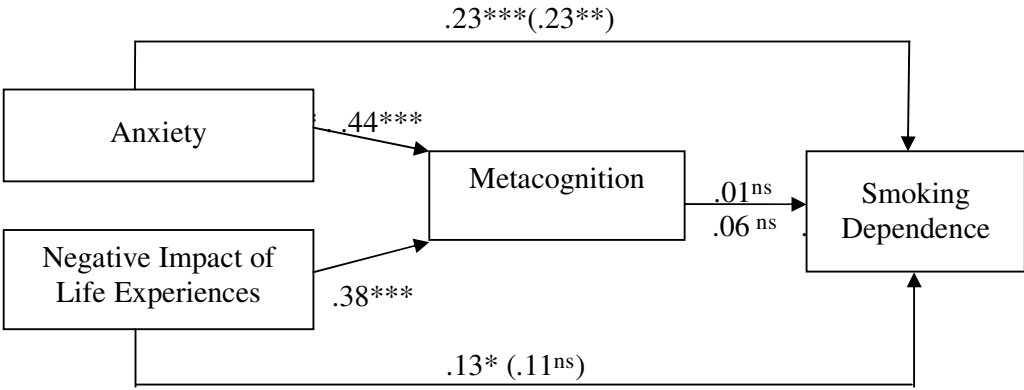
Depression was a significant predictor of cognitive self-consciousness ($\beta = .15$, $p < .05$) and smoking dependence ($\beta = .20$, $p < .01$), as shown Figure 6. However, cognitive self-consciousness was not a significant predictor of smoking dependence ($\beta = -.01$, $p = .86$). Thus, cognitive self-consciousness did not mediate the relationship between depression and smoking dependence.

Cognitive self-consciousness did not mediate the relationship between negative impact of life experiences and smoking dependence, too. Negative impact of life experiences predicted cognitive self-consciousness ($\beta = .17$, $p < .05$) significantly and it predicted smoking dependence ($\beta = .13$, $p = .058$) marginal significantly but cognitive self-consciousness did not predict smoking dependence ($\beta = -.01$, $p = .94$). Since the conditions

of mediation were not met, cognitive self-consciousness did not mediate the relationship between negative impact of life experiences and smoking dependence.

3.3.2. Mediation Model for Anxiety and Negative Impact of Life Experiences

Six mediation models were suggested for anxiety and negative impact of life experiences being independent variable while dependent variable was smoking dependence. The mediators were metacognition, positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, beliefs about lack of cognitive confidence, beliefs about the need to control thoughts, and cognitive self-consciousness.

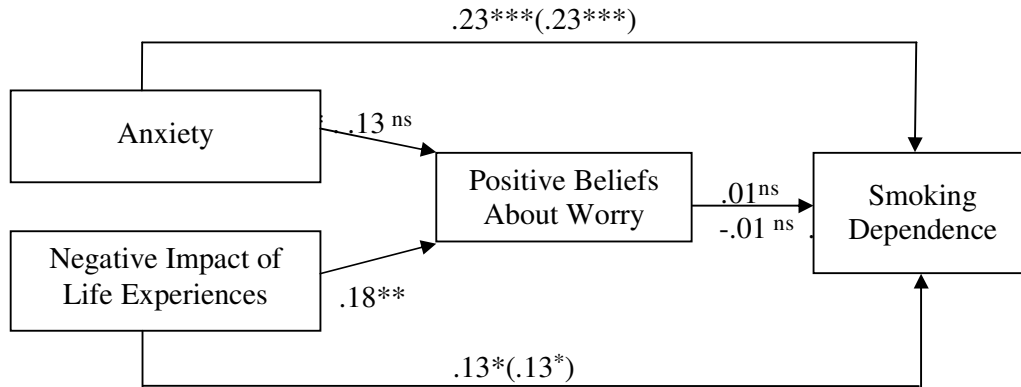


Note. $*p < .05$; $**p < .01$; $***p < .001$

Figure 7. The model testing the mediating role of total metacognition score on the relationship between anxiety/negative impact of life experiences and smoking dependence.

Anxiety predicted smoking dependence ($\beta = .23, p < .001$) and total metacognition score ($\beta = .44, p < .001$) significantly. However, total scores of metacognition did not predict smoking dependence ($\beta = .01, p = .98$). As the conditions of mediation were not met, total metacognition score did not mediate relationship between anxiety and smoking dependence (See Figure 7).

Total metacognition score did not mediate the relationship between negative impact of life experiences and smoking, as well (See Figure 7). Although negative impact of life experiences was a significant predictor of metacognition ($\beta = .38, p < .001$) and a marginally significant predictor of smoking dependence ($\beta = .13, p = .058$), total scores of metacognition did not predict smoking dependence ($\beta = .06, p = .44$) significantly while controlling for negative impact of life experiences. Thus, the analyses revealed that total metacognition score did not mediate the relationship between negative impact of life experiences and smoking.

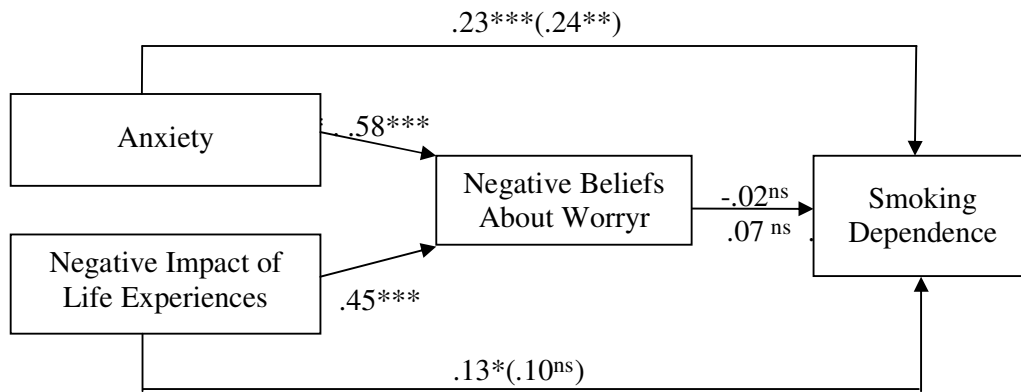


Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Figure 8. The model testing the mediating role of positive beliefs about worry on the relationship between anxiety/negative impact of life experiences and smoking dependence

Anxiety predicted smoking dependence significantly ($\beta = .23, p < .001$). However, it was not a significant predictor of positive beliefs about worry ($\beta = .13, p = .06$). As the conditions of mediation were not fulfilled, positive beliefs about worry did not mediate the relationship between anxiety and smoking (See Figure 8).

Negative impact of life experiences predicted positive beliefs about worry ($\beta = .18, p < .01$) significantly and smoking dependence ($\beta = .13, p = .058$) marginal significantly. However, positive beliefs about worry did not predict smoking dependence significantly ($\beta = -.01, p = .85$). Thus, positive beliefs about worry did not mediate the relationship between negative impact of life experiences and smoking dependence (See Figure 8).



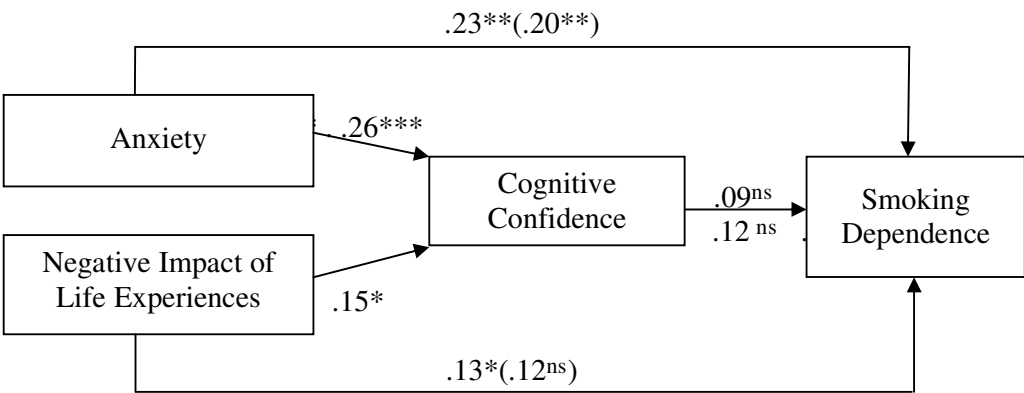
Note. $*p < .05$; $**p < .01$; $***p < .001$

Figure 9. The model testing the mediating role of negative beliefs about worry concerning uncontrollability and danger on the relationship between anxiety/negative impact of life experiences and smoking dependence

Similarly, the path for anxiety with negative beliefs about worry concerning uncontrollability and danger as the mediator was not significant (See Figure 9). Although anxiety predicted negative beliefs about worry concerning uncontrollability and danger ($\beta = .58, p < .001$) and smoking dependence ($\beta = .23, p < .001$), negative beliefs about worry concerning uncontrollability and danger did not predict smoking dependence significantly ($\beta = -.02, p = .80$). Therefore, negative beliefs about worry concerning uncontrollability and danger did not mediate the relationship between anxiety and smoking dependence.

The relationship between negative impact of life experiences and smoking dependence was not mediated by negative beliefs about worry about concerning uncontrollability and danger, too (See Figure 9). The following conditions of mediation were not met: negative impact of life experiences predicted negative beliefs about worry

concerning uncontrollability and danger ($\beta = .45, p < .001$) significantly and smoking dependence ($\beta = .13, p = .058$) marginal significantly but negative beliefs about worry concerning uncontrollability and danger did not predict smoking dependence ($\beta = .07, p = .35$) significantly. Since the conditions of mediation were not met, negative beliefs about worry concerning uncontrollability and danger did not mediate between relationship between negative impact of life experiences and smoking dependence.

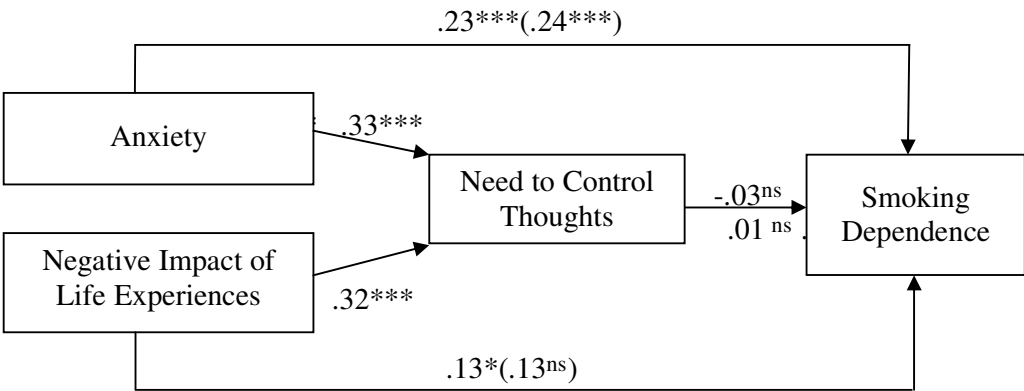


Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Figure 10. The model testing the mediating role of beliefs about lack of cognitive confidence on the relationship between anxiety/negative impact of life experiences and smoking dependence

The relationship between anxiety and smoking dependence was not mediated by beliefs about lack of cognitive confidence because the conditions of mediation were not fulfilled (See Figure 10). That is, although anxiety predicted smoking dependence ($\beta = .23, p < .001$) and beliefs about lack of cognitive confidence ($\beta = .26, p < .001$), beliefs about lack of cognitive confidence did not predict smoking dependence ($\beta = .09, p = .21$)

Negative impact of life experiences predicted beliefs about lack of cognitive confidence ($\beta = .15, p < .05$) significantly and smoking dependence ($\beta = .13, p = .058$) marginal significantly. However, beliefs about lack of cognitive confidence did not predict smoking dependence significantly ($\beta = .12, p = .08$). Thus, beliefs about lack of cognitive confidence did not mediate the relationship between negative impact of life experiences and smoking (See Figure 10).

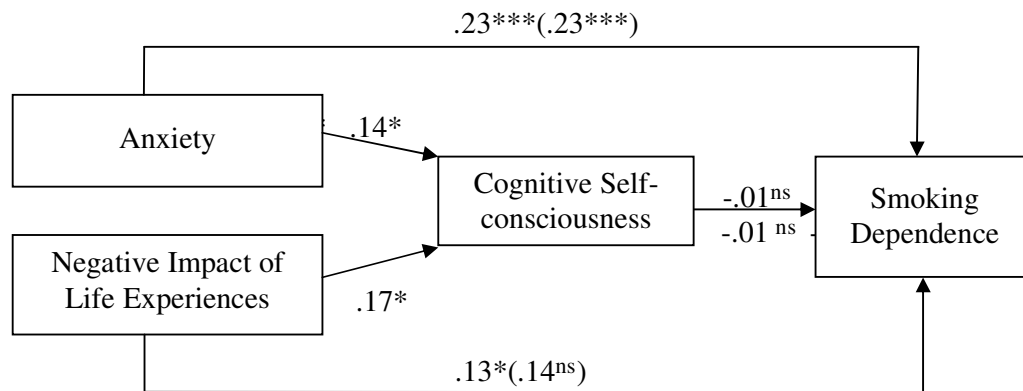


Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Figure 11. The model testing the mediating role of the need to control thoughts on the relationship between anxiety/negative impact of life experiences and smoking dependence

Anxiety was a significant predictor of beliefs about need to control thoughts ($\beta = .33, p < .001$) and smoking dependence ($\beta = .23, p < .001$), as shown Figure 11. However, beliefs about the need to control thoughts did not predict smoking dependence ($\beta = -.03, p = .64$). Thus, beliefs about the need to control did not mediate the relationship between anxiety and smoking dependence.

The relationship between negative impact of life experiences and smoking dependence was not mediated by beliefs about the need to control thoughts, as well. Although negative impact of life experiences predicted beliefs about the need to control thoughts ($\beta = .32, p < .001$) significantly and it predicted smoking dependence ($\beta = .13, p = .058$) marginal significantly, beliefs about the need to control thoughts did not predict smoking dependence when negative impact of life experiences was controlled ($\beta = .01, p = .98$). Therefore, beliefs about the need to control thoughts did not mediate the relationship between negative impact of life experiences and smoking dependence (See Figure 11).



Note. $*p < .05$; $**p < .01$; $***p < .001$

Figure 12. The model testing the mediating role of cognitive self-consciousness on the relationship between anxiety/negative impact of life experiences and smoking dependence

Cognitive self-consciousness did not mediate the relationship between depression and smoking dependence, because cognitive self-consciousness did not predict smoking

dependence ($\beta = -.01, p = .84$). However the effect of anxiety on cognitive self-consciousness ($\beta = .14, p < .05$) and smoking dependence ($\beta = .23, p < .001$) was significant (See Figure 12).

Cognitive self-consciousness did not mediate the relationship between negative impact of life experiences and smoking dependence, too (See Figure 12). Negative impact of life experiences predicted cognitive self-consciousness ($\beta = .17, p < .05$) significantly and it predicted smoking dependence ($\beta = .13, p = .058$) marginal significantly but cognitive self-consciousness did not predict smoking dependence ($\beta = -.01, p = .94$). Since the conditions of mediation were not met, cognitive self-consciousness did not mediate the relationship between negative impact of life experiences and smoking dependence.

To summarize, for the mediation model tested with depression, anxiety, negative impact of life experiences, and smoking dependence having metacognition (positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, beliefs about lack of cognitive confidence, beliefs about the need to control thoughts, cognitive self-consciousness). Sobel test did not conduct to test the significance of the indirect effect because the models did not satisfy the conditions of mediation.

CHAPTER 4

DISCUSSION

Smoking is a serious health problem throughout the world in spite of its well-known negative consequences. Smoking studies have been attended to identify factors that persuade smoking and underlying mechanism of smoking dependence. Identifying factors that related smoking and underlying mechanism of smoking dependence are very important for prevention studies and cessation programs. In the literature, numerous studies have suggested an association among smoking dependence, depression, anxiety and stress; and some studies concentrated on the mediator and moderator variables between those associations, examples of which were mentioned in Chapter I. The present study was one of those studies attempting to investigate the relationships among depression, anxiety, stress and metacognitions in Turkish adult smokers. The main aim of the present study was to decide whether metacognition mediated the relationship between smoking dependence and depression, anxiety, and stress. In addition, sociodemographic correlates of smoking were investigated.

4.1. Results of the Study

In this chapter, firstly the findings of the present study will be discussed in the light of the relevant literature. Then, clinical implications and limitations of the study will be presented. Lastly, suggestions for future research will be stated.

4.1. 1. The Effects of Sociodemographic Variables

The effects of some sociodemographic variables (gender, education level, marital status, paternal and maternal education, father and mother living status, having step siblings, sibling(s) smoking status, having a partner, partner smoking status, birthplace, place where the participants have spent most of their life, physical illness, psychological illness, alcohol use, and drinking alcohol in the last 30 days, and trying to quit trials from smoking) on depression, anxiety, total scores of metacognition, positive beliefs about worry, negative beliefs about worry concerning uncontrollability and danger, beliefs about lack of cognitive confidence, beliefs about need to control thoughts, cognitive self-consciousness, negative impact of life experiences, amount of cigarette, duration of cigarette, the time of first cigarette in the morning, and smoking dependence were investigated.

It was found that gender is an important variable related to anxiety, depression, negative beliefs about worry concerning uncontrollability and danger, negative impact of life experiences and amount of cigarette. Females experienced more anxiety and depression than males. The findings also supported Breslau's study (1995), in which it was reported that depression and anxiety were more frequent in women than in men. Furthermore, females had higher scores on negative beliefs about concerning uncontrollability and danger. Likewise, Yılmaz et al. (2008) found that the mean scores of women for negative beliefs about concerning uncontrollability and danger were significantly higher than men. Congruent with the literature (Tsai, Tsai, Yang, & Kou, 2008), males smoked significantly more cigarettes per day than females. This finding

can be explained by traditional values and normative gender expectations that may be a protective factor against smoking in females.

When the education level of the participants was examined, it was found that the participants who were graduated from high school or had lower education level had been smoking for longer duration than the participants who graduated from university or had higher education level. Moreover the participants whose fathers and mothers were graduated from primary school or had lower education level had been smoking for longer duration than the participants whose fathers and mothers were graduated from secondary school or had higher education level. Breslau (1995) found that the prevalence of smoking and nicotine dependence in persons who graduated from college were about one-half of those in persons with less than college education. It means that smoking and smoking dependence rates in individuals who graduated from college were about 50 percent lower than individuals with less than college education. It was reported that poor academic performance (Goodman & Capitman, 2000) is a risk factor for initiation of smoking. It was also found that the association between general stress and smoking status was stronger for females who were less educated (Fernanader & Schumacher, 2008). Rohde et al. (2004) reported that low parental education was associated with progression to daily smoking. To conclude, it can be claimed that higher levels of education or academic success can be considered as a protective factor for the sample of the current study.

Marital status was a variable that had an effect on continues variables of this study. According to the results of the present study, the non-married participants had higher scores on anxiety and cognitive self-consciousness than the married participants. Similarly, the effect of having a partner was also investigated in the current study. It

was found that the participants without a partner had significantly higher scores on depression, anxiety, beliefs about need to control thoughts, and cognitive self-consciousness. The reason of these findings could be having a partner may provide people with a more positive psychological well-being due to the social support received from the partner. However, the married participants and the participants who had a partner had been smoking for longer duration. On the other hand, younger ages of the single and engaged participants may be the reason for this difference in duration of smoking cigarettes.

The effect of mother living status was also investigated and it was found that the participants whose mothers were dead had higher scores on negative beliefs about worry concerning uncontrollability and danger. Spada et al. (2008) stated that there was an association between perceived stress and metacognition. Death of mother and lack of social support of mother could be a factor related to stress that enhances negative beliefs about worry concerning uncontrollability and danger. Moreover it was found that the participants whose mothers were dead had been smoking for a longer time. The association between negative life events and smoking dependence (eg. Booker et al., 2004; Koval & Pederson, 1999; Koval et al., 2000) can be possible explanation of this finding. In other words, death of mother and lack of social support of mother could be a factor related to initiation and maintenance of smoking.

Participants who had step sibling(s) had higher scores on smoking dependence. The literature suggested that parental separation or living in a single-parent home is a factor associated with smoking (Covey & Tam, 1990; Botvin, Epstein, Schinke, & Diaz, 1994). Participants who had step sibling(s) could experience parental separation. This parental separation or negative life events related to step sibling(s) can be possible

explanation of this finding. Similarly, the participants who had step sibling(s) had higher scores on beliefs about lack of cognitive confidence. Higher scores on smoking dependence and beliefs about lack of cognitive confidence seen in participants having step sibling(s) may also be accepted as consistent with Spada and his colleagues (2009) hypothesis, in which smoking is proposed as a coping tool with lack of cognitive confidence, or lack of cognitive confidence contributes to smoking dependence since smoking enhances subjective cognitive confidence in the short-term with leading to improvements in vigilance, rapid information processing, and verbal recall.

Another variable that was examined in terms of the potential effects on the continuous variables of this study was sibling smoking . This variable was reported as a risk factor for the initiation and maintenance of smoking (e.g., Grunau et al., in press; Koval et.al. 2000). Congruent with these studies, it was found that the participants with smoking siblings and the participants whose siblings quit smoking had been smoking for a longer time than participants with nonsmoking siblings. In addition, the results of the present study revealed that the participants with nonsmoking siblings smoked first cigarette later than those with smoking siblings.

Moreover, partner smoking was another variable reported as crucial for smoking dependence in the literature. The present study did also find that there was a significant difference between the participants with smoking and nonsmoking participants. The participants with a smoking partner had significantly higher scores on depression, anxiety, negative beliefs about worry concerning uncontrollability and danger, negative impact of life experiences, and amount of cigarette a smoked per day. As mentioned in Chapter I, smoking is significantly associated with depression, anxiety, and stress. For that reason, smoking partner may have anxiety or depression symptoms or may

experience stressful situations. Thus, living with this partner may be difficult and can lead to increase in the levels of anxiety, depression, and negative impact of life experiences, which in turn may cause increase in negative beliefs about worry concerning uncontrollability and danger, supporting the relationship between negative beliefs about worry and several psychological symptoms as reported by previous studies (Cartwright-Hatton & Wells, 1997; Wells & Carter, 2001; Wells, 2000; Yılmaz et al, 2008). Moreover, negative emotions may cause the consumption of more cigarettes.

Karakaş (2006) reported that adolescents born in big cities have higher risk for smoking than adolescents who are born in more rural regions. But the results of present study revealed that the participants who were born in big cities got lower scores on smoking dependence and they had been smoking for a shorter time than those who were born in other places such as city, town, and village. Moreover, the participants who were born in a big city had significantly lower scores on beliefs about lack of cognitive confidence. On the other hand, the participants who were born in a big city and the participants who spent most of their life in a big city received significantly higher scores on negative impact of life experiences. This finding could be evidence that life is more stressful in big cities.

Physical illness was another independent variable in the present study. Results yielded that participants who had physical illness got higher scores on anxiety. The similarities between anxiety symptoms and physical illness may explain this finding. Besides, participants who had physical illness obtained higher scores on smoking dependence and participants who had physical illness smoked their first cigarette earlier. The relationship between smoking dependence and physical illness can be attributed to negative consequences of smoking. In other words, physical illness may

result from smoking. Also, it can be considered that physical illness may cause stress. It is a well-known finding that smoking is linked with stress. Therefore, stress resulting from physical illness may be reason for smoking dependence.

The participants who had psychological illness got higher scores on anxiety, depression, negative beliefs about worry concerning uncontrollability and danger, and smoking dependence. This finding is consistent with various studies, reporting remarkable associations between smoking dependence and many psychological disorders (e.g. Breslau, 1995; Breslau, Kilbey, Andreski, 1991; Breslau, Kilbey, Andreski, 1994; Breslau, Novak, & Kessler, 2003; Dierker & Donny, 2008; Rohde, Kahler, Lewinsohn, & Brown, 2004b). It was also found that the participants who had psychological illness got higher scores on negative beliefs about worry concerning uncontrollability and danger, suggesting that metacognitive theory is relevant to understanding psychological disorders (Cartwright-Hatton & Wells, 1997; Wells & Carter, 2001; Wells, 2000; Yilmaz et al, 2008).

The effect of marital status of parents on the continuous variables of this study was also examined. The participants who had divorced parents had higher scores on negative impact of life experiences than the participants who had widowed and married participants. The reason for this difference could be the effect of parental separation which is perceived as an negative life experience leading to lack of social support from mother or father. Furthermore, marital status of parents has an effect on duration of cigarette smoking. The participants who had widowed parents had been smoking for a longer time than the participants who had married parents. These findings are consistent with the literature suggesting the association between negative life events and smoking dependence (eg. Booker et al., 2004; Koval & Pederson, 1999; Koval et al., 2000). In

other words, death of mother or father and lack of social support from mother or father could be a factor related to initiation and maintenance of smoking. Finally, Park (2009) reported that family support system such as a good relationship with parents and sibling(s) functions as a protective factor against initiation and maintenance of smoking.

Perceived socio economic status (SES) was investigated as a variable to have an effect on the continuous variables of the present study. Low SES group got higher scores on negative impact of life experiences and smoking dependence than high SES group. In addition, high SES group smoked their first cigarette later in the morning as compared to low SES group. In accord with this finding, Fernander and Schumacher (2008) found that the association between general stress and smoking status was stronger for females who had lower incomes. To conclude, higher levels of perceived SES can be accepted as a protective factor against stress and smoking dependence.

Numerous studies suggest that there is a strong link between tobacco smoking and drinking alcohol (Breslau, 1995; Goodman & Capitman, 2000; Dierker et al., 2002; Dierker & Donny, 2008; Foster, Papadopoulo, Dadzie, & Jayasinghe, 2007; Mackey et al., 2008; Patton et al., 1998; Reed et al., 2007; Rohde et al., 2004b). Results of the present study supported these findings, as well. Frequency of alcohol use and amount of alcohol were other variables that affected continuous variables of the present study. The participants who drunk alcohol four times and more in a week smoked first cigarette in the morning earlier than those who drank alcohol twice or three times in a week, in addition, the frequency of alcohol use and amount of alcohol drunk by participants increased, smoking dependence and amount of cigarette smoked a day increased, indicating that frequency of alcohol use and amount of alcohol drunk by participants were significant factors associated with smoking dependence. Furthermore, the

participants who used alcohol in last 30 days smoked more cigarettes and got higher scores on anxiety than those who did not use alcohol in last 30 days.

4.1.2. The mediation models

The mediating effects of total scores of metocognition and/or the individual metacognitive dimensions were investigated. Eighteen models proposed among depression, anxiety, stress, and smoking dependence. Although depression, anxiety and stress predicted metacognition, metacognition and the individual metacognitive dimensions did not predict smoking dependence. Thus, metacognition and the individual metacognitive dimensions did not mediate the relationship among depression, anxiety, stress and smoking dependence. Possible explanations of these results will be discussed.

4.1.2.1 Depression

In the present study, it was hypothesized that higher level of depression would be associated with the higher levels of smoking dependence. Consistent with the literature (e.g. Breslau, 1995; Breslau, Kilbey, Andreski, 1991; Breslau, Kilbey, Andreski, 1994; Breslau, Novak, & Kessler, 2003; Dierker & Donny, 2008; Rohde, Kahler, Lewinsohn, & Brown, 2004b), the results of the current study revealed that depression was associated with smoking dependence. Congruent with the literature (eg. Park, 2009; Prinstein and La Greca , 2009), it was found that depressive symptoms predicted smoking dependence.

Lerman, Audrain-McGovern, Orleans, Boyd, Gold, and Main (1996) clarify why this phenomenon occurs based on a “self-medication” hypothesis. According to this

hypothesis, depressed individuals initiate smoking so as to diminish their negative feelings. Through smoking, they try to change depressed moods into positive ones. Moreover, ample empirical studies have supported this hypothesis. Semba, Mataka, Yamada, Nankai, and Toru (1998) reported that nicotine has an antidepressant-like effect. In addition, Murphy et al. (2003) reported that depressed smokers are less likely to stop smoking than non-depressed ones. It was also reported that depressed smokers have a greater likelihood of experiencing difficulties in smoking cessation as compared to their non-depressed counterparts (eg. Hall et al. 1993). Finally, the use of antidepressants enhances a probability of abstaining from smoking (Hitsman, Spring, Borrelli, Niaura, & Papandonatos, 2001).

It is also worth emphasizing that the findings of the present study provided support for the metacognitive theory (Wells, 2000). Several studies have demonstrated the relationship between individual dimensions of metacognition and depression (eg. Papageorgiou & Wells, 2003). Consistent with the literature, the results of the current study revealed that there is a positive relationship between depression and metacognitive beliefs and processes. Finally, Spada et al. (2007) reported that depression predicts metacognition and smoking dependence, which was a consistent finding with the current study.

4.1.2.2. Anxiety

In the present study, it was hypothesized that higher levels of anxiety would be associated with the higher levels of smoking dependence. As consistent with the literature (eg. Breslau, 1995; Breslau et al., 1991, 1994; Breslau et al., 2004), the results obtained from the current study provided support for this hypothesis,. Breslau et al.

(1991) found that nicotine dependence is associated with anxiety disorders and comorbidity levels between anxiety disorders and smoking depends on the severity of nicotine dependence.. It was reported that the lifetime prevalence for any anxiety disorders in smokers with mild nicotine dependence was 36.8%, and the lifetime prevalence for those with moderate nicotine dependence was 62.3%. It was also found that the association between anxiety and smoking was significantly stronger in persons with moderate nicotine dependence than in persons with mild nicotine dependence.

In addition, the results of the current study revealed that there was a relationship between metacognition and anxiety. Wells and Carter (2001) proposed that individuals with Generalized Anxiety Disorder (GAD) hold metacognitions, especially positive beliefs about worry and negative beliefs about worry concerning uncontrollability and danger, while the combination of these metacognitions and associated responses leads to an increased frequency and generality of worrying, and thus, to pathological worry characteristic of GAD. Furthermore, Yılmaz et al. (2008) reported that there was a link between anxiety and several metacognitive dimensions. Finally, Spada et al. (2007) reported that anxiety predict metacognition and smoking dependence, which was consistent with the results of the current study.

4.1.2.3. Stress

In the present study, it was hypothesized that higher levels of stress would be associated with higher levels of smoking dependence. Correlational, experimental and naturalistic studies focusing on various indices of psychological stress and smoking can be accepted as consistent in general, indicating that higher levels of stress is linked to the risk across all stages of smoking including initiation, maintenance, quitting, and

relapse (e.g., Creson et al., 1996; Falba et al. 2005; Koval et al., 2000; Koval and Peterson, 1999; Todd, 2004). The results of path analyses conducted within the framework of the present study supported the findings of these studies. It was found that there was a relationship between negative impact of life experiences and smoking dependence.

Spada, Nikcevic, Moneta, and Wells (2008) investigated the relationship between metacognition, perceived stress, and negative affect (depression and anxiety). The results of this study conducted on student and non-student samples revealed that metacognition was positively and significantly correlated with perceived stress, depression, and anxiety. Furthermore, there was a significant and positive correlation between perceived stress, depression, and anxiety. Finally the current study yielded that negative impact of life experiences predict metacognition and smoking dependence.

4.1.2.4. The summary of the Mediation Models

Spada and his colleagues (2007) found that the relationship between smoking dependence and emotion (depression and anxiety) is partially mediated by metacognition. They reported that three dimensions of metacognition (positive beliefs about worry, beliefs about the need to control thoughts, and beliefs about lack of cognitive confidence) were positively and significantly correlated with smoking dependence. Providing only partial support to Spada and his colleagues' study (2007), beliefs about lack of cognitive confidence was significantly and positively correlated with smoking dependence in the current study, but neither total scores of metacognition nor the other individual metacognitive dimensions were found to be significantly correlated with smoking dependence. Furthermore, the path analyses revealed that

metacognition and the individual metacognitive dimensions did not mediate the relationship among depression, anxiety, stress, and smoking dependence.

Participants' age may be a potential explanation for these different findings. Spada and his colleagues conducted their study on university students with the mean age of 22.2 years ($SD=3.0$). On the other hand, the mean age of the present sample was 34.77 years ($SD=7.55$). At this point, age might be considered as a significant demographic variable for metacognition and smoking dependence. To illustrate, Spada, Mohiyeddini, and Wells (2008) carried out a study on a community sample aged between 18-69 years old ($M= 28.6, SD= 10.3$) and they found that younger participants had a tendency to score significantly higher on all metacognitive factors with the exception of beliefs about lack of cognitive confidence. This finding may be reason for the result of the current study that only lack of cognitive confidence was significantly correlated with smoking dependence. Furthermore, Yılmaz (2007) reported that age is significantly and negatively correlated with total scores of metacognition, negative beliefs about worry concerning uncontrollability and danger, beliefs about need to control thoughts, and cognitive self-consciousness. It was also reported that younger participants had a tendency to score significantly higher on all factors with the exception of positive beliefs about worry and beliefs about lack of cognitive confidence. The author concluded that as age increases, scores of metacognition decreases. Thus, it might be asserted that older people may have different metacognitive processes due to their age-related intellectual capabilities and experiences. Alternatively, measuring metacognitive beliefs specifically focusing on smoking behaviour and its consequences might be more conservative way of testing the hypotheses of the current study. However, such a specific metacognitive instrument does not exist in the present

literature. Thus, further research focusing on the development of an instrument measuring metacognitive beliefs and processes in relation to smoking behaviour is strongly encouraged.

Additionally, age has also been indicated among the important risk factors associated with smoking in the literature. Younger age was found to be a significant predictor of smoking, and younger people smoke more than older people (Lekka, et al., 2007; Murphy et al., 2003). Khuder, Dayal, and Mutgi (1999) found that those over 40 years old are more likely to quit than younger smokers, which is a change attributed to the raising consciousness of smoking related illness with advancing age. Older adult smokers may have different attributions and expectancies associated with smoking from younger smokers. Adult smokers may keep on the smoking behavior for social reasons instead of emotional reasons. Therefore, this set of explanations might be the other reason why metacognition and individual metacognitive dimensions did not mediate the relationship among depression, anxiety, stress and smoking dependence in adult smokers. Further replication studies on student populations should be conducted to test this hypothesis in a Turkish sample.

In addition, metacognition might not mediate the relationship among depression, anxiety, stress and smoking dependence due to Turkish smoking culture and ethnicity differences in smoking behavior. In spite of strong anti-smoking campaign, the new law related with the prohibition of smoking in public areas, restriction for the selling of cigarettes under eighteen, and limitation for the advertisements of cigarettes at the present day, smoking might be acceptable behavior and it might not perceived as a dependency in Turkish society when the participants of the present study were young. Therefore, they might not realize the negative consequences of smoking. Furthermore,

the results of the current study might be attributed to Turkish people's more accepting attitudes toward smoking. Moreover, their attributions and expectancies associated with smoking may differ from smokers in western countries because of the sociocultural context. That is, the reasons for smoking in Turkey might be different from western countries. For example, Turkish people may continue smoking for social reasons instead of emotional reasons like coping with stress and reducing negative affect. That is, rather than emotion regulation, smoking behaviour may function as a tool for social relationship and collective life.

4.2. Limitations of the Study and Future Suggestions

Besides the limitations and suggestions mentioned earlier, there are some other limitations of the study that should be taken into consideration when interpreting the results obtained from the present study. Foremost, the largest limitation of this study can be accepted as its cross-sectional design that prevents causal inferences. Due to the cross-sectional nature of this investigation, we have no evidence whether depression, anxiety and stress cause smoking dependence, or smoking dependence causes anxiety, depression and stress. Therefore, longitudinal studies are necessary to further clarify the intercorrelations among smoking dependence, depression, anxiety, stress and metacognition.

Another limitation of this study can be considered as the utilization of the self-report measurements. The participants may respond in socially desirable ways, and thus, underreport their amount of daily smoking, life experiences, negative emotions, etc. Also, errors in self-report measurement may result from self-report biases, context effects, and poor recall. Furthermore, Colby, Tiffany, Shiffman and Niaura (2000)

criticized the Fagerström Test of Nicotine Dependence (FTND). According to their criticism, the FTND was often found to have relatively low internal consistency coefficient. In addition, the FTND includes doubt as to which construct(s) it actually measures such as dependence or heaviness of smoking. It was also discussed whether the FTND assesses a unidimensional or multidimensional construct. Therefore, future research interested in smoking behaviour should employ objective indexes of smoking dependence like biological markers.

Considering the present sample, another potential criticism of this study is that there was unequal number of participants in groups of maternal education, mother living status, marital status of parents, having step sibling(s), sibling smoking and place where they have spent most of their life. The other criticism could be that the sample of the present study is quite well educated that 85.1 % of the participants had at least a high school education. High education level of the participants and inequalities in the group sizes can be attributed to the participant selection procedure. Participants were volunteers who were recruited from the staff of various worksites (schools, government offices, and companies) and public places in Istanbul. Potential respondents were approached and asked whether they would be willing to participate in the present study. If they approved to participate, a set of measurements was given to them. As a result, neither education levels nor the other sociodemographic variables except for the age of the participants and number of cigarettes smoked per day were taken into account as the selection criteria. However, future research may control these variables and may create equal groups in terms of number of participants.

The main aim of the present study was to examine the relationship between smoking dependence, depression, anxiety, negative impact of life experiences and

metacognition among Turkish adult smokers who were between 25 and 50 years old. Thus, the results are also limited by the fact that the sample comprises adults between 25 and 50 years old, so the findings should not be generalized to older and younger smokers. To date, Spada et al. (2007) investigated possible associations among individual dimensions of metacognition, emotion (anxiety and depression), and smoking dependence in college students with the age of eighteen or over. Another study in which the relationships among smoking dependence, depression, anxiety, negative impact of life experiences, and metacognition was examined in a single design was not found in the available literature. Thus, the findings of these two studies should be replicated by examining individuals representative of a broader age range. Although, Spada et al. (2007) found that metacognition partially mediate the relationship between emotion and smoking dependence, the results of the present study yielded that the relationship among depression, anxiety, negative impact of life experiences and smoking dependence are not mediated by the total scores of metacognition or any of the individual dimensions of metacognition. Therefore, the present study should be replicated on college students, adolescents, and individuals who are older than 50 years old.

Colby et al. (2000) suggested that cross-cultural research should be carried out to determine whether existing measures of smoking or nicotine dependence work equally well with persons from different cultures since cultural factors may mediate individuals' understanding of terms related with dependence. Therefore, cultural differences and similarities on smoking behavior and smoking expectancies should be investigated in studies conducted in Turkish culture. Additionally, cultural factors that

mediate the relationship among depression, anxiety, negative impact of life experiences, metacognition, and smoking dependence should be ascertained in future research.

In addition, Turkish researchers should attempt to investigate the risk factors for maintenance and onset of smoking and underlying mechanisms of smoking behaviour. Moreover, there exists a strong need for broader epidemiological studies focusing on evaluation of the prevalence of health behaviors, and measurement of the change through longitudinal examination of the smoking behavior due to the differences on risk factors for the onset and maintenance of smoking. Furthermore, it is declared that the effects of potential risk factors may differ across developmental processes (Ajdacic-Gross et al., 2009) and this may lead to reciprocal interaction between smoking and age or psychological development. Therefore, all possible sociodemographic, biological, social, and psychological variables, possible mediators, moderators and their interactions should be searched more profoundly adopting a developmental perspective among different age groups. Besides, protective factors for the onset and maintenance of smoking are also important and there is a need for the supplementary studies investigating protective factors that could be functional in the prevention programs.

The Meta-Cognitions Questionnaire-30 is not intended to particularly capture metacognitions in smoking dependence and, as suggested earlier, an instrument measuring metacognitive beliefs and processes in relation to smoking behaviour should be developed in order to be able to gain a proper understanding of the metacognitive beliefs and processes specific to smoking behaviour . Besides, as also suggested by Spada et al. (2007) ,future research should determine the relative contribution of metacognitions versus cognitions to smoking behavior. In addition, the role of metacognitions on the initiation and maintenance mechanisms of smoking should be

examined by means of longitudinal designs, apart from the need for future research for ascertaining whether metacognitions differ before and after smoking cessation. This could be carried out by establishing whether smoking dependence influences metacognitions.

4.3. Implications and Conclusions of the Study

In the present study, apart from the main focus of the relationship among smoking dependence, depression, anxiety, negative impact of life experiences (stress), and metacognition in Turkish adult smokers who are between 25 and 50 years old, sociodemographic correlates of smoking were investigated, as well. Results of the study pointed to importance of gender, education level, marital status, paternal education level, maternal education level, mother living status, marital status of parents, having step sibling(s), sibling smoking, partner smoking, having a partner, birthplace, perceived SES, physical illness, psychological illness, using alcohol, frequency of alcohol use, amount of alcohol which was drunk at once, and trying to quit smoking as sociodemographic correlates of smoking dependence and smoking behavior. Besides, results of the present study revealed that there are significant associations among depression/anxiety/negative impact of life experiences (stress) and smoking dependence. In general, it can be concluded that findings of the present study are consistent with the relevant literature. On the other hand, it was found that the relationship among depression/anxiety/negative impact of life experiences (stress) and smoking dependence is not mediated by the total scores of metacognition or individual dimensions of metacognition. This finding of the present study is inconsistent with Spada and his colleagues' study, in which it was found that the relationship between

emotion and smoking dependence is partially mediated by metacognition in college students.

Based on the findings of the present study, it can be concluded that awareness of risk factors for smoking enables clinicians to evaluate multiple factors including sociodemographic variables, illnesses, alcohol use variables, and trying to quit smoking which are associated with smoking dependence or smoking behavior. Thereby, multidirectional treatment approaches including these problematic areas, and effective prevention programs would be possible. Furthermore, such a multidirectional approach would provide support for declining the prevalence of smoking and relapse rates, and thereby, more continuing treatment outcomes would be available.

The present study aimed to fill the gap in smoking dependence research in Turkey concerning a relationship among depression/anxiety/stress and smoking dependence, as well as, possible and mediators in this relationship. It is believed that the results of the present study would inspire future research examining the relationship among depression/anxiety/stress and smoking dependence, as well as, possible moderators and mediators in this relationship.

A new law regarding restriction of cigarette smoking in public places was accepted by the Grand National Assembly of Turkey in January 2008. As required by this law, smoking in all public places was restricted in July 2009. For that reason, the trend for quitting smoking is becoming increasingly popular recently. This trend will increase the need for formal methods of smoking cessation. Under these circumstances, professionals working in smoking cessation area should immediately improve their treatment plans considering multiple sociodemographic factors affecting smoking

behavior as well as the effects of depression, anxiety and negative impact of life experiences (stress).

As mentioned in Chapter 1, the current literature suggests that anxiety disorders appear to be comorbid with smoking behavior and estimates of comorbidity are likely to be higher for greater levels of smoking dependence (Morrell & Cohen, 2006). Moreover, several studies have consistently demonstrated high comorbidity rates between depression and smoking. Also, depression was reported as an important predictor of relapse in attempting to quit smoking. Likewise, it is obvious in the literature that various indices of psychological stress are associated with all stages of smoking. The findings of present study are consistent with the previous studies. However, the underlying mechanisms of the relationship among depression, anxiety, stress and smoking dependence are not completely understood due to its complex nature, and consequently, more research investigating potential mediators and moderators is needed in this area. As a result, individual's smoking history, past and present levels of anxiety and depression, life experiences, alcohol use, quit attempt history, and potential factors with regard to previous relapse should be assessed in relation to treatment for smoking cessation. Morrell and Cohen (2006) suggest that therapy for smoking cessation may include education, well-validated brief treatment for anxiety and depression, supportive counseling, coping skills training, and long-term relapse prevention. In addition, treatment programs may be changed considering the needs and life experiences of each individual.

Although the results of the present study have not provided support for the suggested mediational model in which anxiety, depression, negative impacts of life experiences predicted metacognition which in turn predicted smoking dependence, it

was found that anxiety, depression, and negative life experiences predicted metacognition. In other words, the present study suggested that metacognitive beliefs and processes play a predictor role in explaining psychological symptoms in Turkish adult smokers. Therefore, it can be stated that smokers across the spectrum of emotional disorders (etc. anxiety, depression) are likely to benefit from metacognition-based intervention programs. The metacognitive theory stresses the importance of metacognitive beliefs and cognitive attentional syndrome including metacognitive regulations. As a result, metacognition-based treatment focuses on thinking styles and metacognitive beliefs and processes. In general, it might be stated that modifying dysfunctional metacognitive beliefs and maladaptive metacognitive thought control strategies can ameliorate negative emotional responses (Wells, 2000). In summary, metacognitive-based treatment approach intends to develop cognitive theory in a way that focuses on information processing aspects of cognition. Due to the effects of metacognition on the processing operations concerning depressive and anxious thoughts, the contents of thoughts should be modified; in addition, underlying metacognitions and their associating processing operation should be targeted (Yılmaz, 2007). To conclude, treatment for smoking cessation should be multidimensional since smoking dependence is reasonably complex with its sociodemographic, biological, social and psychological correlates.

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APPEDICES

APPENDIX A

KİŞİSEL BİLGİ FORMU

Aşağıdaki formu kişisel bilgilerinize göre doğru olarak doldurunuz. Yanıtlar grup halinde değerlendirileceği için isim yazmamıza gerek yoktur. Lütfen her soruya yanıt veriniz. Tüm soruları yanıtladığımız için teşekkür ederiz.

1. Cinsiyetiniz: _____

2. Yaşınız: _____

3. Eğitim durumunuz:

- a) Okur-yazar değil
- b) Okur-yazar fakat herhangi bir okulu bitirmemiş
- c) İlkokul mezunu
- d) Ortaokul mezunu
- e) Lise mezunu
- f) Üniversite terk
- g) Üniversite önlisans mezunu
- h) Üniversite lisans mezunu
- i) Yüksek lisans
- j) Doktora
- k) Diğer

4. Mesleğiniz: _____

5. Medeni durumunuz:

- a) Evli
- b) Bekar
- c) Nişanlı
- d) Dul
- e) Boşanmış

6. Evliyseniz eşinizin mesleği: _____

7. Ailenizin kaçınıcı çocuęusunuz: _____

8. Babanızın eęitim durumu:

- a) Okur-yazar deęil
- b) Okur-yazar fakat herhangi bir okulu bitirmemiř
- c) İlkokul mezunu
- d) Ortaokul mezunu
- e) Lise mezunu
- f) Üniversite terk
- g) Üniversite önlisans mezunu
- h) Üniversite lisans mezunu
- ı) Yüksek lisans
- j) Doktora
- k) Dięer

9. Babanızın mesleęi : _____

10. Babanız : a)Saę b) Saę deęil

a)Öz b) Öz deęil

11. Annenizin eęitim durumu:

- a) Okur-yazar deęil
- b) Okur-yazar fakat herhangi bir okulu bitirmemiř
- c) İlkokul mezunu
- d) Ortaokul mezunu
- e) Lise mezunu
- f) Üniversite terk
- g) Üniversite önlisans mezunu
- h) Üniversite lisans mezunu
- ı) Yüksek lisans
- j) Doktora
- k) Dięer

12. Annenizin mesleęi: _____

13. Anneniz a) Saę b) Saę deęil

a) Öz b) Öz deęil

14. Anneniz ve babanız:

- a) Evli
- b) Bořanmıř
- c) Ayrı yařıyorlar
- d) Dul

15. Őu an kiminle/kimlerle yaşıyorsunuz?

- a) Anne ve babanızla
- b) Annenizle
- c) Babanızla
- d) Akrabaların yanında
- e) Evde tek başına
- f) Evde arkadaşlarla
- g) Eşimle
- h) Eşimle ve çocuklarımla

16. Kardeş sayınız: _____

17. Kardeşleriniz arasında kendiniz de dahil olmak üzere üveylik var mı?

- a) Evet
- b) Hayır

18. Anneniz sigara içiyor mu? a) İçiyor b) İçmiyor d) İçiyordu bıraktı

19. Babanız sigara içiyor mu? a) İçiyor b) İçmiyor c) İçiyordu bıraktı

20. Kardeş veya kardeşleriniz sigara içiyor mu?

- a) İçiyor
- b) İçmiyor
- c) İçiyordu bıraktı
- d) Kardeşim yok

21. Eşiniz sigara içiyor mu? a) İçiyor b) İçmiyor c) İçiyordu bıraktı d) Evli değilim

22. Arkadaşlarımızdan herhangi birileri düzenli olarak sigara kullanır mı?

- a) Evet
- b) Hayır

23. Doğduğunuz yerleşim birimi:

- a) Köy
- b) Bucak
- c) Kasaba
- d) Şehir
- e) Büyükşehir

24. En uzun süreli yaşadığınız yerleşim birimi:

- a) Köy
- b) Bucak
- c) Kasaba
- d) Şehir
- e) Büyükşehir

25. Sizce ailenizin veya sizin genel ekonomik durumunuz:

- a) Alt
- b) Ortanın altı
- c) Orta
- d) Ortanın üstü
- e) Üst

26. Fiziksel bir hastalığınızın varsa adını ve bir tedavi alıp almadığınızı yazınız.

Hastalık adı:

Tedavi alma durumu:

- a) Alıyorum
- b) Almıyorum

27. Psikolojik bir hastalığınızın varsa adını ve bir tedavi alıp almadığınızı yazınız.

Hastalık adı:

Tedavi alma durumu:

- a) Alıyorum
- b) Almıyorum

28. Alkol kullanır mısınız?

- a) Evet
- b) Hayır

29. Son 30 günde hiç alkol kullandınız mı?

- a) Evet
- b) Hayır

30. Eğer alkol kullanıyorsanız ne kadar sıklıkla alkol kullanırsınız?

- a) Ayda bir ya da daha az
- b) Ayda iki ya da dört kez
- c) Haftada iki ya da üç kez
- d) Haftada dört ya da daha fazla

31. Alkol kullanmaya başladığınızda genellikle kaç kadeh (şarap,rakı gibi içecekler için) ya da kaç şişe (Bira gibi içecekler için) içersiniz?

- a) 1-2
- b) 3-4
- c) 5-6
- d) 7-9
- e) 10 ya da daha fazla

32. Daha önce hiç sigarayı bırakmayı denediniz mi?

- a) Evet (Evet ise kaç kere denediğinizi belirtiniz_____)
- b) Hayır

33. Önümüzdeki 6 ay içerisinde sigarayı bırakmayı ciddi olarak düşünüyor musunuz?

- a) Evet
- b) Hayır

34. Önümüzdeki 1 ay içerisinde sigarayı bırakmayı ciddi olarak düşünüyor musunuz?

- a)Evet
- b) Hayır

35. Son 6 ay içerisinde sigarayı tamamen bırakmayı denediniz mi?

- a) Evet (Evet ise kaç gün süreyle bıraktığınızı belirtiniz_____)
- b) Hayır

APPENDIX B

TURKISH VERSION OF THE META-COGNITIONS QUESTIONNAIRE-30

Bu anket insanların kendi düşünceleri hakkında sahip oldukları inançları ile ilgilidir. Aşağıda, insanların ifade ettikleri bazı inançlar listelenmiştir. Lütfen her maddeyi okuyunuz ve bu ifadeye genellikle ne kadar katıldığınızı uygun numarayı daire içine alarak belirtiniz.

Lütfen tüm maddelere cevap veriniz, doğru ya da yanlış cevap yoktur.

	Katılmıyorum	Biraz katılıyorum	Oldukça katılıyorum	Tamamen katılıyorum
1. Endişelenmek gelecekte olabilecek sorunları engellememe yardımcı olur	1	2	3	4
2. Endişelerim benim için tehlikelidir	1	2	3	4
3. Düşüncelerim hakkında çok düşünürüm	1	2	3	4
4. Endişelenerek kendi kendimi hasta edebilirim	1	2	3	4
5. Bir sorun üzerinde düşündüğüm esnada, zihnimin nasıl çalıştığının farkında olurum	1	2	3	4
6. Endişe verici bir düşünceyi kontrol altına almazsam, ve sonra bu düşüncem gerçekleşirse, bu benim hatam olur	1	2	3	4

	Katılmıyorum	Biraz katılıyorum	Oldukça katılıyorum	Tamamen katılıyorum
7. Planlı kalabilmek için endişelenmem gerekir	1	2	3	4
8. Kelime ve isimlerle ilgili hafızama güvenim azdır	1	2	3	4
9. Durdurmak için ne kadar uğraşsam da, endişe verici düşüncelerim devam eder	1	2	3	4
10. Endişelenmek işleri zihnimde bir düzene koymama yardımcı olur	1	2	3	4
11. Endişe verici düşüncelerimi görmezden gelmek elimde değildir	1	2	3	4
12. Düşüncelerimi izler, takip altında tutarım	1	2	3	4
13. Düşüncelerimi her zaman kontrolüm altında tutabilmem gerekir	1	2	3	4
14. Hafızam beni zaman zaman yanıltabilir	1	2	3	4
15. Endişelerim beni deliye döndürebilir	1	2	3	4
16. Düşüncelerimin sürekli farkındayım	1	2	3	4
17. Hafızam zayıftır	1	2	3	4
18. Zihnimin nasıl çalıştığına çok dikkat ederim	1	2	3	4
19. Endişelenmek yaşadıklarımla başetmeme yardımcı olur	1	2	3	4
20. Düşüncelerimi kontrol altına alamamak bir zayıflık işaretidir	1	2	3	4

	Katılmıyorum	Biraz katılıyorum	Oldukça katılıyorum	Tamamen katılıyorum
21. Endişelenmeye başladığımda, bunu durduramam	1	2	3	4
22. Bazı düşünceleri kontrol altına almadığım için cezalandırılacağım	1	2	3	4
23. Endişelenmek sorunları çözmeme yardımcı olur	1	2	3	4
24. Yerlerle ilgili hafızama güvenim azdır	1	2	3	4
25. Bazı düşünceleri akıldan geçirmek kötüdür	1	2	3	4
26. Hafızama güvenmem	1	2	3	4
27. Düşüncelerimi kontrol altına alamazsam, iş göremez hale gelirim	1	2	3	4
28. İyi çalışmak için, endişelenmem gerekir	1	2	3	4
29. Olaylarla ilgili hafızama güvenim azdır	1	2	3	4
30. Düşüncelerimi sürekli incelerim	1	2	3	4

APPENDIX C

TURKISH VERSION OF THE BECK ANXIETY INVENTORY

Aşağıda insanların kaygılı ya da endişeli oldukları zamanlarda yaşadıkları bazı belirtiler verilmiştir. Lütfen her maddeyi dikkatle okuyunuz. Daha sonra, her maddedeki belirtinin (bugün dahil) son bir haftadır sizi ne kadar rahatsız ettiğini aşağıdaki ölçekten yararlanarak maddelerin yanındaki cevabı yuvarlak içine alarak belirleyiniz.

0. Hiç 1. Hafif derecede 2. Orta derecede 3. Ciddi derecede

Sizi ne kadar rahatsız etti?

1. Bedeninizin herhangi bir yerinde uyuşma veya karıncalanma0.....1.....2.....3
2. Sıcak / ateş basmaları0.....1.....2.....3
3. Bacaklarda halsizlik, titreme.....0.....1.....2.....3
4. Gevşeyememe0.....1.....2.....3
5. Çok kötü şeyler olacak korkusu0.....1.....2.....3
6. Baş dönmesi veya sersemlik0.....1.....2.....3
7. Kalp çarpıntısı0.....1.....2.....3
8. Dengeyi kaybetme duygusu0.....1.....2.....3
9. Dehşete kapılma0.....1.....2.....3
10. Sinirlilik0.....1.....2.....3
11. Boğuluyormuş gibi olma duygusu0.....1.....2.....3

12. Ellerde titreme0.....1.....2.....3
13. Titreklilik0.....1.....2.....3
14. Kontrolü kaybetme korkusu.....0.....1.....2.....3
15. Nefes almada güçlük0.....1.....2.....3
16. Ölüm korkusu.....0.....1.....2.....3
17. Korkuya kapılma.....0.....1.....2.....3
18. Midede hazımsızlık ya da rahatsızlık hissi0.....1.....2.....3
19. Baygınlık.....0.....1.....2.....3
20. Yüzün kızarması.....0.....1.....2.....3
21. Terleme (sıcağa bağlı olmayan)0.....1.....2.....3

APPENDIX D

TURKISH VERSION OF THE BECK DEPRESSION INVENTORY

Aşağıda, kişilerin ruh durumlarını ifade ederken kullandıkları bazı cümleler verilmiştir. Her madde, bir çeşit ruh durumunu anlatmaktadır. Her maddede o duygu durumunun derecesini belirleyen 4 seçenek vardır. Lütfen bu seçenekleri dikkatlice okuyunuz. Son bir hafta içindeki (şu an dahil) kendi duygu durumunuzu göz önünde bulundurarak, size uygun olan ifadeyi bulunuz. Daha sonra, o madde numarasının karşısında, size uygun ifadeye karşılık gelen seçeneği bulup işaretleyiniz.

1. a) Kendimi üzgün hissetmiyorum.
b) Kendimi üzgün hissediyorum.
c) Her zaman için üzgünüm ve kendimi bu duygudan kurtaramıyorum.
d) Öylesine üzgün ve mutsuzum ki dayanamıyorum.
2. a) Gelecekte umutsuz değilim.
b) Geleceğe biraz umutsuz bakıyorum.
c) Gelecekte beklediğim hiçbir şey yok.
d) Benim için bir gelecek yok ve bu durum düzelmeyecek.
3. a) Kendimi başarısız görmüyorum.
b) Çevremdeki birçok kişiden daha fazla başarısızlıklarım oldu sayılır.
c) Geriye dönüp baktığımda, çok fazla başarısızlığımın olduğunu görüyorum.
d) Kendimi tümüyle başarısız bir insan olarak görüyorum.
4. a) Herşeyden eskisi kadar zevk alabiliyorum.
b) Herşeyden eskisi kadar zevk alamıyorum.
c) Artık hiçbirşeyden gerçek bir zevk alamıyorum.
d) Bana zevk veren hiçbir şey yok. Herşey çok sıkıcı.
5. a) Kendimi suçlu hissetmiyorum.
b) Arada bir kendimi suçlu hissettiğim oluyor.
c) Kendimi çoğunlukla suçlu hissediyorum.
d) Kendimi her an için suçlu hissediyorum.
6. a) Cezalandırıldığımı düşünmüyorum.
b) Bazı şeyler için cezalandırılabileceğimi hissediyorum.
c) Cezalandırılmayı bekliyorum.

- d) Cezalandırıldığımı hissediyorum.
7. a) Kendimden hoşnutum.
b) Kendimden pek hoşnut değilim.
c) Kendimden hiç hoşlanmıyorum.
d) Kendimden nefret ediyorum.
8. a) Kendimi diğer insanlardan daha kötü görmüyorum.
b) Kendimi zayıflıklarım ve hatalarım için eleştiriyorum.
c) Kendimi hatalarım için her zaman suçluyorum.
d) Her kötü olayda kendimi suçluyorum.
9. a) Kendimi öldürmek gibi düşüncelerim yok.
b) Bazen kendimi öldürmeyi düşünüyorum fakat bunu yapamam.
c) Kendimi öldürebilmeyi isterdim.
d) Bir fırsatını bulursam kendimi öldürürdüm.
10. a) Her zamankinden daha fazla ağladığımı sanmıyorum.
b) Eskisine göre şu sıralarda daha fazla ağlıyorum.
c) Şu sıralar her an ağlıyorum.
d) Eskiden ağlayabilirdim, ama şu sıralarda istesem de ağlayamıyorum.
11. a) Her zamankinden daha sinirli değilim.
b) Her zamankinden daha kolayca sinirleniyor ve kızıyorum.
c) Çoğu zaman sinirliyim.
d) Eskiden sinirlendiğim şeylere bile artık sinirlenemiyorum.
12. a) Diğer insanlara karşı ilgimi kaybetmedim.
b) Eskisine göre insanlarla daha az ilgiliyim.
c) Diğer insanlara karşı ilgimin çoğunu kaybettim.
d) Diğer insanlara karşı hiç ilgim kalmadı.
13. a) Kararlarımı eskisi kadar kolay ve rahat verebiliyorum.
b) Şu sıralarda kararlarımı vermeyi erteliyorum.
c) Kararlarımı vermekte oldukça güçlük çekiyorum.
d) Artık hiç karar veremiyorum.
14. a) Dış görünüşümün eskisinden daha kötü olduğunu sanmıyorum.
b) Yaşlandığımı ve çekiciliğimi kaybettiğimi düşünüyor ve üzülüyorum.
c) Dış görünüşümde artık değiştirilmesi mümkün olmayan olumsuz değişiklikler olduğunu hissediyorum.
d) Çok çirkin olduğumu düşünüyorum.
15. a) Eskisi kadar iyi çalışabiliyorum.
b) Bir işe başlayabilmek için eskisine göre kendimi daha fazla zorlamam gerekiyor.
c) Hangi iş olursa olsun, yapabilmek için kendimi çok zorluyorum.
d) Hiçbir iş yapamıyorum.

16. a) Eskisi kadar rahat uyuyabiliyorum.
b) Şu sıralar eskisi kadar rahat uyuyamıyorum.
c) Eskisine göre 1 veya 2 saat erken uyanıyor ve tekrar uyumakta zorluk çekiyorum.
d) Eskisine göre çok erken uyanıyor ve tekrar uyuyamıyorum.
17. a) Eskisine kıyasla daha çabuk yorulduğumu sanmıyorum.
b) Eskisinden daha çabuk yoruluyorum.
c) Şu sıralarda neredeyse herşey beni yoruyor.
d) Öyle yorgunum ki hiçbir şey yapamıyorum.
18. a) İştahım eskisinden pek farklı değil.
b) İştahım eskisi kadar iyi değil.
c) Şu sıralarda iştahım epey kötü.
d) Artık hiç iştahım yok.
19. a) Son zamanlarda pek fazla kilo kaybettiğimi sanmıyorum.
b) Son zamanlarda istemediğim halde üç kilodan fazla kaybettim.
c) Son zamanlarda beş kilodan fazla kaybettim.
d) Son zamanlarda yedi kilodan fazla kaybettim.
-Daha az yiyerek kilo kaybetmeye çalışıyorum. EVET () HAYIR () –
20. a) Sağlığım beni pek endişelendirmiyor.
b) Son zamanlarda ağrı, sızı, mide bozukluğu, kabızlık gibi sorunlarım var.
c) Ağrı, sızı gibi bu sıkıntılarım beni epey endişelendirdiği için başka şeyleri düşünmek zor geliyor.
d) Bu tür sıkıntılar beni öylesine endişelendiriyor ki, artık başka birşey düşünemiyorum.
21. a) Son zamanlarda cinsel yaşantımda dikkatimi çeken birşey yok.
b) Eskisine göre cinsel konularla daha az ilgileniyorum.
c) Şu sıralarda cinsellikle pek ilgili değilim.
d) Artık, cinsellikle hiçbir ilgim kalmadı.

APPENDIX E

TURKISH VERSION OF THE LIFE EXPERIENCES SURVEY

Aşağıdaki listede kişilerin hayatına değişiklik getiren ve yeniden sosyal uyum sağlamayı gerektiren bazı olaylar bulunmaktadır. Lütfen son bir yıl içerisinde başınızdan geçen her olay için bu olayın başınızdan hangi zaman dilimi içinde geçtiğini (son 0-6 ay veya 7 ay-1 yıl) işaretleyiniz. Eğer bu olay son bir yıl içinde başınızdan geçmediyse olmadı seçeneğine bir işaret koyunuz.

Ayrıca, başınızdan geçen her olayın, meydana geldiği sırada hayatınıza ne derece olumlu veya olumsuz bir etki yaptığını düşündüğünüzü ilgili rakamı daire içine alarak belirleyiniz. (-3) değerinde bir derecelendirme olayın çok olumsuz bir etkisi olduğu, (0) değerinde bir derecelendirme olayın olumlu veya olumsuz hiçbir etkisi olmadığı, (+3) değerinde bir dereceleme ise olayın çok olumlu bir etkisi olduğu anlamına gelmektedir.

1. Bölüm

	SON 1 YILDA BU OLAY:			OLAYIN, MEYDANA GELDİĞİ SIRADA HAYATINIZA ETKİSİ:						
	OLMADI	OLDU		Çok olumsuz	Oldukça olumsuz	Az olumsuz	Etkisiz	Az olumlu	Oldukça olumlu	Çok olumlu
		0-6 ay	7 ay- 1 yıl							
1. Evlilik				-3	-2	-1	0	+1	+2	+3
2. Hapishanede tutuklu kalma				-3	-2	-1	0	+1	+2	+3
3. Eşin ölümü				-3	-2	-1	0	+1	+2	+3
4. Uyku alışkanlığında önemli değişimler (daha fazla veya daha az uyuma)				-3	-2	-1	0	+1	+2	+3

	SON 1 YILDA BU OLAY:			OLAYIN, MEYDANA GELDİĞİ SIRADA HAYATINIZA ETKİSİ:						
	OLMADI	OLDU		Çok olumsuz	Oldukça olumsuz	Az olumsuz	Etkisiz	Az olumlu	Oldukça olumlu	Çok olumlu
		0-6 ay	7 ay-1 yıl							
5. Yakın bir aile üyesinin ölümü:										
a. Anne				-3	-2	-1	0	+1	+2	+3
b. Baba				-3	-2	-1	0	+1	+2	+3
c. Erkek kardeş				-3	-2	-1	0	+1	+2	+3
d. Kız kardeş				-3	-2	-1	0	+1	+2	+3
e. Büyükanne				-3	-2	-1	0	+1	+2	+3
f. Büyükbaba				-3	-2	-1	0	+1	+2	+3
g. Diğerleri (belirtiniz).....				-3	-2	-1	0	+1	+2	+3
6. Yemek alışkanlıklarında önemli değişimler (daha fazla veya daha az yemek yeme)				-3	-2	-1	0	+1	+2	+3
7. Borç ya da ipoteğin hacedilmesi				-3	-2	-1	0	+1	+2	+3
8. Yakın bir arkadaşın ölümü				-3	-2	-1	0	+1	+2	+3
9. Önemli bir kişisel başarı				-3	-2	-1	0	+1	+2	+3
10. Küçük çapta kanun ihlalleri (trafik, vergi cezaları vb.)				-3	-2	-1	0	+1	+2	+3
11. Erkek için: Karısının/kız arkadaşının (flörtünün) hamile kalması				-3	-2	-1	0	+1	+2	+3
12. Kadın için: Hamile kalma				-3	-2	-1	0	+1	+2	+3

	SON 1 YILDA BU OLAY:			OLAYIN, MEYDANA GELDİĞİ SIRADA HAYATINIZA ETKİSİ:						
	OLMADI	OLDU		Çok olumsuz	Oldukça olumsuz	Az olumsuz	Etkisiz	Az olumlu	Oldukça olumlu	Çok olumlu
		0-6 ay	7 ay-1 yıl							
13. İş durumunda değişiklik (farklı iş sorumluluğu, iş şartlarında, iş saatlerinde vs. değişiklikler)				-3	-2	-1	0	+1	+2	+3
14. Yeni bir işe girme				-3	-2	-1	0	+1	+2	+3
15. Yakın aile üyelerinden birinin ciddi bir hastalığa yakalanmış olması, kaza geçirmesi, yaralanması, sakatlanması:				-3	-2	-1	0	+1	+2	+3
a. Baba				-3	-2	-1	0	+1	+2	+3
b. Anne				-3	-2	-1	0	+1	+2	+3
c. Kız kardeş				-3	-2	-1	0	+1	+2	+3
d. Erkek kardeş				-3	-2	-1	0	+1	+2	+3
e. Büyükbaba				-3	-2	-1	0	+1	+2	+3
f. Büyükanne				-3	-2	-1	0	+1	+2	+3
g. Eş				-3	-2	-1	0	+1	+2	+3
h. Diğerleri (belirtiniz)				-3	-2	-1	0	+1	+2	+3
16. Cinsel sorunlar				-3	-2	-1	0	+1	+2	+3
17. İşverenle anlaşmazlık (işini kaybetme tehlikesi, çalışma koşullarında olanakların kısıtlanması, terfi edememe)				-3	-2	-1	0	+1	+2	+3
18. Kayınvalide, kayınpeder, kayınbirader veya görümce ile anlaşmazlık				-3	-2	-1	0	+1	+2	+3

	SON 1 YILDA BU OLAY:			OLAYIN, MEYDANA GELDİĞİ SIRADA HAYATINIZA ETKİSİ:						
	OLMADI	OLDU		Çok olumsuz	Oldukça olumsuz	Az olumsuz	Etkisiz	Az olumlu	Oldukça olumlu	Çok olumlu
		0-6 ay	7 ay-1 yıl							
19. Maddi olanaklarda önemli değişimler (daha iyi maddi olanaklara sahip olmak veya maddi durumun bozulması)				-3	-2	-1	0	+1	+2	+3
20. Aile üyelerinin yakın ilişkilerinde önemli değişimler (yakınlığın azalması veya çoğalması)				-3	-2	-1	0	+1	+2	+3
21. Aileye yeni bir üyenin katılması (doğum, evlat edinme, akrabalarından biri, vs.)				-3	-2	-1	0	+1	+2	+3
22. İkametgah değişikliği				-3	-2	-1	0	+1	+2	+3
23. Anlaşmazlık nedeni ile eşlerin birbirlerinden ayrı yaşamaları				-3	-2	-1	0	+1	+2	+3
24. Namaz kılma, camiye gitme, kuran okuma, oruç tutma, vb. gibi dini faaliyetlerde önemli değişimler (bu faaliyetlerin artması veya azalması)				-3	-2	-1	0	+1	+2	+3
25. Eşlerin tekrar birleşmesi				-3	-2	-1	0	+1	+2	+3
26. Karı-koca tartışmalarının sayısında önemli değişimler (daha çok veya daha az tartışma)				-3	-2	-1	0	+1	+2	+3

	SON 1 YILDA BU OLAY:			OLAYIN, MEYDANA GELDİĞİ SIRADA HAYATINIZA ETKİSİ:						
	OLMADI	OLDU		Çok olumsuz	Oldukça olumsuz	Az olumsuz	Etkisiz	Az olumlu	Oldukça olumlu	Çok olumlu
		0-6 ay	7 ay-1 yıl							
27. Evli erkek için: Evin dışında karısının işindeki değişiklik (çalışmaya başlaması, işini bırakması, yeni bir işe girmesi, vs.)				-3	-2	-1	0	+1	+2	+3
28. Evli kadın için: Kocasının işindeki değişiklikler (işini kaybetmesi, yeni bir işe başlaması, emeklilik, vs.)				-3	-2	-1	0	+1	+2	+3
29. Eğlenme ve dinlenme faaliyetlerinin türünde ve miktarında önemli değişimler				-3	-2	-1	0	+1	+2	+3
30. 10.000 TL (10 milyar TL) den fazla borç alma veya yatırım yapma (ev almak, iş kurmak vb. için)				-3	-2	-1	0	+1	+2	+3
31. 10.000 TL (10 milyar TL) den az borç alma (araba almak, ev eşyası almak, kira, okul, ev veya yurt masrafları, vb. için)				-3	-2	-1	0	+1	+2	+3
32. İşten çıkarılma				-3	-2	-1	0	+1	+2	+3
33. Erkek için: Karısının/kız arkadaşının çocuk aldırması				-3	-2	-1	0	+1	+2	+3
34. Kadın için: Çocuk aldırma				-3	-2	-1	0	+1	+2	+3
35. Kişinin kendisinin ciddi bir hastalığa yakalanmış olması, kaza geçirmesi, yaralanması veya sakatlanması				-3	-2	-1	0	+1	+2	+3

	SON 1 YILDA BU OLAY:			OLAYIN, MEYDANA GELDİĞİ SIRADA HAYATINIZA ETKİSİ:						
	OLMADI	OLDU		Çok olumsuz	Oldukça olumsuz	Az olumsuz	Etkisiz	Az olumlu	Oldukça olumlu	Çok olumlu
		0-6 ay	7 ay-1 yıl							
36. Sosyal faaliyetlerde önemli değişimler (örneğin; parti, sinema, arkadaş ziyaretleri gibi faaliyetlere katılmada azalma veya artma)				-3	-2	-1	0	+1	+2	+3
37. Ailenin yaşama şartlarında önemli değişimler (yeni ev yaptırma, evin tamir edilmesi ya da yeniden döşenmesi veya semtin, komşuların değişmesi, vb.)				-3	-2	-1	0	+1	+2	+3
38. Boşanma				-3	-2	-1	0	+1	+2	+3
39. Yakın bir arkadaşın kaza geçirmesi, yaralanması, sakatlanması veya ciddi bir hastalığa yakalanmış olması				-3	-2	-1	0	+1	+2	+3
40. Emekliye ayrılma				-3	-2	-1	0	+1	+2	+3
41. Kız veya erkek çocuğunun, evladın evden ayrılması (evlenme, okula gitme vb. nedeniyle)				-3	-2	-1	0	+1	+2	+3
42. Okulu bitirme				-3	-2	-1	0	+1	+2	+3
43. Geçici bir süre için eşten ayrı kalma (iş, seyahat, vs. nedeniyle)				-3	-2	-1	0	+1	+2	+3
44. Nişanlanma				-3	-2	-1	0	+1	+2	+3

	SON 1 YILDA BU OLAY:			OLAYIN, MEYDANA GELDİĞİ SIRADA HAYATINIZA ETKİSİ:						
	OLMADI	OLDU		Çok olumsuz	Oldukça olumsuz	Az olumsuz	Etkisiz	Az olumlu	Oldukça olumlu	Çok olumlu
		0-6 ay	7 ay-1 yıl							
45. Kız/erkek arkadaşla (flörtle) ilişkinin bozulması				-3	-2	-1	0	+1	+2	+3
46. Evden ilk defa ayrılma				-3	-2	-1	0	+1	+2	+3
47. Kız/erkek arkadaş (flört) ile barışma, tekrar bir araya gelme				-3	-2	-1	0	+1	+2	+3
Hayatınızı etkilemiş olan başka olaylar varsa, yazınız ve derecelendiriniz:				-3	-2	-1	0	+1	+2	+3
48.....				-3	-2	-1	0	+1	+2	+3
49.....				-3	-2	-1	0	+1	+2	+3
50.....				-3	-2	-1	0	+1	+2	+3

2. Bölüm: Bu bölüm sadece öğrenciler içindir

	SON 1 YILDA BU OLAY:			OLAYIN, MEYDANA GELDİĞİ SIRADA HAYATINIZA ETKİSİ:						
	OLMADI	OLDU		Çok olumsuz	Oldukça olumsuz	Az olumsuz	Etkisiz	Az olumlu	Oldukça olumlu	Çok olumlu
		0-6 ay	7 ay-1 yıl							
51. Üniversite eğitime başlama (lisans, yüksek lisans, vb.)				-3	-2	-1	0	+1	+2	+3
52. Üniversite değiştirme (lisans, yüksek lisans, vb. sırasında)				-3	-2	-1	0	+1	+2	+3
53. Akademik başarısızlık nedeniyle okuldan atılma tehlikesinin olması				-3	-2	-1	0	+1	+2	+3
54. Yurttan veya oturulan evden atılma				-3	-2	-1	0	+1	+2	+3
55. Önemli bir sınavda başarısız olma				-3	-2	-1	0	+1	+2	+3
56. Bölüm/alan değiştirme				-3	-2	-1	0	+1	+2	+3
57. Bir derste başarısız olma				-3	-2	-1	0	+1	+2	+3
58. Bir dersi bırakma, üzerinden düşürme				-3	-2	-1	0	+1	+2	+3

APPENDIX F

TURKISH VERSION OF THE FAGERSTRÖM TEST OF NICOTINE DEPENDENCE

Aşağıda sigara içme alışkanlığınıza yönelik sorular vardır. Size uygun olan şıkkı işaretleyiniz. Lütfen her soruya yanıt veriniz.

1. İlk sigaranızı sabah uyandıktan ne kadar sonra içersiniz?
 - a) Uyandıktan sonraki ilk 5 dakika içinde
 - b) 6-30 dakika içinde
 - c) 31-60 dakika
 - d) Bir saatten fazla
2. Sigara içmenin yasak olduğu örneğin; otobüs, hastane, sinema gibi yerlerde bu yasağa uymakta zorlanıyor musunuz?
 - a) Evet
 - b) Hayır
3. İçmeden duramayacağınız, diğer bir deyişle vazgeçemeyeceğiniz sigara hangisidir?
 - a) Sabah içtiğim ilk sigara
 - b) Diğer herhangi biri
4. Günde kaç adet sigara içiyorsunuz?
 - a) 10 adet veya daha az
 - b) 11-20
 - c) 21-30
 - d) 31 veya daha fazlası
5. Sabah uyanmayı izleyen ilk saatlerde, günün diğer saatlerine göre daha sık sigara içer misiniz?
 - a) Evet
 - b) Hayır
6. Günün büyük bölümünü yatakta geçirmenize neden olacak kadar hasta olsanız bile sigara içer misiniz?
 - a) Evet
 - b) Hayır